206-0001

Department of Energy
Portsmouth Site Office
P.O. Box 700
Piketon, Ohio 45661-0700
Phone: 614-897-5010

February 17, 2000
UE-54-9612

Ohio EPA - Division of Hazardous Waste Management
Southeast District Office
Attn: RCRA Group Leader
2195 Front Street
Logan, OH 43138

Ohio EPA - Division of Hazardous Waste Management
Attn: Tom Crepeau
Lazarus Government Center
122 South Front Street
Columbus, OH 43215

Dear Madam and Messrs:

RCRA PART B PERMIT RENEWAL APPLICATION
U.S. DEPARTMENT OF ENERGY/PORTSMOUTH GASEOUS DIFFUSION PLANT
OH7890008983

Enclosed is the RCRA Part B Permit Renewal Application for the container storage units at the Department of Energy Portsmouth Gaseous Diffusion Plant in Piketon, Ohio. This submittal incorporates all sections and changes to the Part B Permit that have been provided in draft form to Ohio EPA over the past 1 ½ years.

The following items are included in this submittal:

- A table summary of changes made in this permit renewal application and the justification for these changes (2 copies - Crepeau; 1 copy - Southeast District Ohio EPA; 1 copy US EPA Region V).

- The RCRA Part B Permit Renewal Application:
  - Volume 1 - Text
  - Volume 2 - Appendix C-1, Documentation Supporting Characterization, and Appendix C-2, Material Safety Data Sheets
  - Volume 3 - Appendix D-1, Engineering Drawings
  - Volume 4 - Appendix I-1, Closure Plan for the X-326 Unit, and Appendix I-2, Closure Plan for the X-7725 Unit.

  (2 copies - Crepeau; 1 copy - Southeast District Ohio EPA; 1 copy US EPA Region V).

- The Application for Renewal of Hazardous Waste Facility Installlation and Operation Permit (2 copies - Crepeau; 1 copy - Southeast District Ohio EPA)

A renewal form and a check in the amount of $1500.00 to cover the application fee for this renewal is being sent under separate cover to Ohio EPA - Office of Fiscal Administration.

Please note that a few additional changes have been made to the permit renewal application since submittal of the draft changes. For all sections, the format including the font, margins, headers, and/or spacing, may have been changed in an attempt to standardize the format of all sections of the permit application. Section G, Contingency Plan, is an exception because of the frequent revisions required to keep the plan up-to-date.

RECEIVED
FEB 21 2000

RECORD COPY

Other changes have been made to the permit renewal application to update information or provide operational flexibility. These changes are designated as "Changes Made Since Draft Submittal" in the justification tables.

In addition, as required by the Ohio Administrative Code 3745-50-51(D)(1)(a)(ii), the U.S. Department of Energy (DOE) and Bechtel Jacobs Company LLC hereby notifies you of Class 1 modifications to the RCRA Part B permit. These modifications are listed on the attached Identification and Justification matrix.

In accordance with Ohio Administrative Code (OAC) Rule 3745-50-51(D)(2)(a), the U.S. Department of Energy (DOE) and Bechtel Jacobs Company LLC request a Class 2 Modification to the RCRA Part B Permit, Procedures to Prevent Hazards, Section F, Table F-1 (Inspection Schedule). This revision is required in order to conform to requirements of the National Fire Protection Association requirments. A copy of the current and revised inspection schedules are enclosed.

The Class 1 and Class 2 modifications are being made as part of the Part B Permit renewal process and will not be implemented until final action is taken on the renewal.

The Department of Energy & Bechtel Jacobs Company LLC greatly appreciates Ohio EPA's efforts in working with us to develop this permit renewal application. If you have any questions or need additional information, please contact Melda Rafferty at 740/897-5521.

Sincerely,

L. Dennis Boggs
Acting Site Manager
Portsmouth Site Office

Enclosures

cc/enc: U.S. EPA, Region V
Attn: Ms. Harriet Croke
RCRA Permitting Branch, DRP-8J
77 West Jackson Boulevard
Chicago, Illinois 60604

J. E. King, Bechtel Jacobs Company Manager of Projects
Administrative Records

BECHTEL JACOBS
Bechtel Jacobs Company LLC

DOE Contract No. DE-AC05-98-OR22700
Job No. 23900
February 17, 2000

U.S. Department of Energy
Portsmouth Site Office
P.O. Box 700
Piketon, OH 45661

Attention: Mr. L. Dennis Boggs, Acting Site Manager

Subject: Resource Conservation and Recovery Act (RCRA) Part B Permit Renewal Application

Dear Mr. Boggs:

Please submit the enclosed RCRA Part B Permit Renewal Application to the Ohio EPA at the addresses listed below by February 17, 2000.

Part B, Renewal Form, Modification Matrix, Table F-1
(two copies to:)

Ohio EPA - Division of Hazardous Waste Management
Attn: Tom Crepeau
Lazarus Government Center
122 South Front Street
Columbus, OH 43215

Part B, Renewal Form, Modification Matrix, Table F-1
(one copy to:)

Ohio EPA - Division of Hazardous Waste Management
Southeast District Office
Attn: RCRA Group Leader
2195 Front Street
Logan, OH 43138

Part B (one copy to:)

U.S. EPA, Region V
Attn: Ms. Harriet Croke
RCRA Permitting Branch, DRP-8J
77 West Jackson Boulevard
Chicago, Illinois 60604

The following items are included in this submittal:

- Sample submittal letters to Ohio and U.S. EPA.
- A table summary of changes made in this permit renewal application and the justification for these changes.
- The RCRA Part B Permit Renewal Application:
  - Volume 1 - Text
  - Volume 2 - Appendix C-1, Documentation Supporting Characterizations, and Appendix C-2, Material Safety Data Sheets
  - Volume 3 - Appendix D-1, Engineering Drawings
  - Volume 4 - Appendix I-1, Closure Plan for the X-326 Unit, and Appendix I-2, Closure Plan for the X-7725 Unit.
- The Application for Renewal of Hazardous Waste Facility Installation and Operation Permit
- Table F-1 from Section F of the Part B Permit

In addition to the above, please submit the renewal fee of $1500.00 and a copy of the renewal form to:

Ohio EPA - Office of Fiscal Administration
Attn: Vicki Galilei
Department 631
Columbus, OH 43265-0631

If you have any questions concerning this submittal, please contact Rosemary Richmond at extension 2967.

Sincerely;

J. E. King
Manager of Projects

JEK:JRDearholt:RR:mcm
LTR-ESH-MCM-00-059

Enclosures

cc: J. Rick Dearholt/Rosemary Richmond
Janie Croswait, Administrative Record
File - DMC - RC
File - ESH

Ohio EPA - Division of Hazardous Waste Management
Southeast District Office
Attn: RCRA Group Leader
2195 Front Street
Logan, OH 43138

Ohio EPA - Division of Hazardous Waste Management
Attn: Tom Crepeau
Lazarus Government Center
122 South Front Street
Columbus, OH 43215

Re: RCRA Part B Permit Renewal Application
U.S. Department of Energy/Portsmouth Gaseous Diffusion Plant
OH7890008983

Dear Madame and Messrs.,

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Other changes have been made to the permit renewal application to update information or provide operational flexibility. These changes are designated as "Changes Made Since Draft Submittal" in the justification tables.

In addition, as required by the Ohio Administrative Code 3745-50-51(D)(1)(a)(ii), the U.S. Department of Energy (DOE) and Bechtel Jacobs Company LLC hereby notifies you of Class 1 modifications to the RCRA Part B permit. These modifications are listed on the attached Identification and Justification matrix.

In accordance with Ohio Administrative Code (OAC) Rule 3745-50-51(D)(2)(a), the U.S. Department of Energy (DOE) and Bechtel Jacobs Company LLC request a Class 2 Modification to the RCRA Part B Permit, Procedures to Prevent Hazards, Section F, Table F-1 (Inspection Schedule). This revision is required in order to conform to requirements of the National Fire Protection Association requirements. A copy of the current and revised inspection schedules are enclosed.

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The Department of Energy & Bechtel Jacobs Company LLC greatly appreciates Ohio EPA's efforts in working with us to develop this permit renewal application. If you have any questions or need additional information, please contact Melda Rafferty at 740/897-5521.

Sincerely;

L. Dennis Boggs
Acting Site Manager
Portsmouth Site Office

Enclosures

cc/enc: U.S. EPA, Region V
Attn: Ms. Harriet Croke
RCRA Permitting Branch, DRP-8J
77 West Jackson Boulevard
Chicago, Illinois 60604

J. E. King, Bechtel Jacobs Company, Manager of Projects
Administrative Records

Ohio EPA - Office of Fiscal Administration
Attn: Vicki Galilei
Department 631
Columbus, OH 43265-0631

Re: RCRA Part B Permit Renewal Application
U.S. Department of Energy/Portsmouth Gaseous Diffusion Plant
OH7890008983

Dear Ms. Galilei,

Enclosed is a check in the amount of $1500.00 to cover the application fee for renewal of the Part B Permit for the U.S. Department of Energy/Portsmouth Gaseous Diffusion Plant. A copy of the renewal form is also enclosed.

If you have any questions or need additional information, please contact Melda Rafferty at 740/897-5521.

Sincerely;

L. Dennis Boggs
Acting Site Manager
Portsmouth Site Office

cc: J. E. King, Bechtel Jacobs Company, Manager of Projects
Administrative Record

OHIO ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF HAZARDOUS WASTE MANAGEMENT

APPLICATION FOR RENEWAL OF HAZARDOUS WASTE
FACILITY INSTALLATION AND OPERATION PERMIT

FACILITY NAME: Portsmouth Gaseous Diffusion Plant

FACILITY LOCATION: Piketon (City) Ohio (State) 45661 (Zip Code)

FACILITY MAILING ADDRESS (If different from above): 3930 U.S. Route 23 South (Street)

Piketon (City) Ohio (State) 45661 (Zip Code)

U.S. EPA I.D. NO. OH789008983

OHIO PERMIT NO. 04-57-0680

FACILITY CONTACT: Melda J. Rafferty

Environmental Compliance Specialist (Title)

FACILITY TELEPHONE: (740) 897-5521

I hereby apply for renewal of the Ohio Hazardous Waste Facility Installation and Operation Permit issued for the facility indicated above.

CERTIFICATION STATEMENT

I certify under penalty of law that this document and attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for the knowing violations.

L. Dennis Boggs
(Name - Type or Print)

Acting Site Manager
(Title - Type or Print)

L. D. Boggs 2/17/2000
(Signature & Date)

143753
Revenue I.D. (Office Use)

$ 1500.00
Amount Enclosed

Check Receipt Date & No. (Office Use)

Identification and Justification for Changes to DOE-PORTS RCRA Part B Permit (04-57-0680)

Part A

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
Changes Made Since Draft Submittal					
1	V. Facility Contact	Changed name of facility contact	Informational change	B.1	1
3	X. Other Environmental Permits	Updated list of permits	Informational change	B.1	1
Draft Submittal Changes					
1	V. Facility Contact	Change in area code in phone number	Administrative and informational change; same change made wherever Portsmouth phone numbers are shown	B.1	1
2	VII. Operator Information	Box A, name of operator changed from Lockheed Martin Energy Systems, Inc. to Bechtel Jacobs Company LLC	Administrative and informational change; Director's Final Findings and Orders, journalized on March 31, 1998, approved Bechtel Jacobs Company LLC, under contract with the U.S. Department of Energy at the Portsmouth Gaseous Diffusion Plant, to take over day-to-day operations from Lockheed Martin Energy Systems, Inc.	B.1	1
2	VII. Operator Information	Box A, added phone number of Bechtel Jacobs Company LLC	Administrative and informational change	B.1	1
2	IX. SIC Code	Changed SIC Code to 4953	Notification of the SIC Code change from 2819 to 4953 submitted to the Director of the Ohio EPA on June 22, 1995, (EF-21-6922)	B.1	1

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OAC and Class (classification) refer to the OAC Appendix reference (OAC 3745-50-51) for the classification of the permit modification.

Identification and Justification for Changes to DOE-PORTS RCRA Part B Permit (04-57-0680)

Section B - Facility Description

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
Changes Made Since Draft Submittal					
B-1	Facility Contact	Changed name of DOE facility contact	Informational change	B.1	1
B-6	Table B-1, Hazardous Waste Management Units	Updated table	Informational change	B.1	1
B-7	Table B-2, Solid Waste Management Units	Updated table	Informational change	B.1	1
Draft Submittal Changes					
--	Table of Contents	Changed to reflect document modifications	Administrative and informational changes; Correction of typographical errors	B.1, B.2	1
B-1 to B-8	B-1, General Description	Editorial changes	Administrative and informational changes	B.1, B.2	1
B-8 to B14	B-2, Topographic Map	Editorial changes	Administrative and informational changes	B.1, B.2	1
B-14	B-3, Facility Location - Floodplain	Editorial changes	Administrative and informational changes	B.1, B.2	1
B-14	B-4, Facility Location - Seismic	Editorial changes	Administrative and informational changes	B.1, B.2	1
B-14 to B-16	B-5, Traffic Patterns	Editorial changes	Administrative and informational changes	B.1, B.2	1
B-17	Table B-1, Hazardous Waste Management Units	Units deleted; unit status updated	Seven units were closed and deleted from the list; changes in other units update their status	B.1, B.2	1
B-18	Table B-2, Solid Waste Management Units	Updated information	Reflects changes in status of SWMUs since table was originally compiled.	B.1, B.2	1

Identification and Justification for Changes to
DOE-PORTS RCRA Part B Permit (04-57-0680)

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
B-21	Table B-3, All DOE Vehicles Operating at PORTS – 1997	New Information - replaces previous Table B-4	Table needed updating to provide information about vehicle numbers since USEC took over operations.	B.1, B.2	1
B-22	Table B-4, Vehicles Operating at PORTS – 1990	Page Reformatted - no change in information; replaces original Table B-5	Administrative change	B.1, B.2	1
B-24	Table B-3, Well Construction/ Lithologic Data	Deleted	Information included in groundwater plans.	B.1	1
B-36	Table B-6, Estimated Travel Miles	Table deleted	Administrative change	B.1	1
B-38	Figure B-2, Major Site Facilities	Figure deleted	Administrative change; information included in map, Figure B-2	B.1	1
B-39	Figure B-3, Surrounding Land Use	Figure deleted	Administrative change; information included in map, Figure B-2	B.1	1
B-40	Figure B-4, Private Withdrawal Wells	Figure deleted	Administrative change; information included in map, Figure B-2	B.1	1
B-41	Figure B-5	Figure deleted	Administrative change; information included in maps, Figures B-2 to B-6	B.1	1
B-42	Figure B-6, Wind Rose	Figure deleted	Administrative change; information included in maps, Figures B-3 to B-6	B.1	1
B-43	Figure B-7, Secure and Non-secure Boundary	Figure deleted	Administrative change; information included in map, Figure B-2	B.1	1

Identification and Justification for Changes to DOE-PORTS RCRA Part B Permit (04-57-0680)

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
B-44	Figure B-8, Miles Traveled per Hour	Figure deleted	Administrative change; information not required	B.1	1

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Identification and Justification for Changes to DOE-PORTS RCRA Part B Permit (04-57-0680)

Section C - Waste Characteristics

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
Changes Made Since Draft Submittal					
Throughout Section		Deleted "U" designation from affected waste streams	Informational change	B.1	1
C-1	C-1, Chemical and Physical Analysis	Added sentence concerning storage of USEC waste to end of first paragraph	Informational change	B.1	1
C-2	C-1, Chemical and Physical Analysis	Updated discussion of benzene in petroleum products to reflect current conditions	Informational change	B.1	1
C-3	C-1, Chemical and Physical Analysis	Deleted discussion of "U" designated waste streams generated by USEC to reflect current conditions	Informational change	B.1	1
C-6	C-1, Chemical and Physical Analysis	Updated description of Non-Laboratory Off-Specification Chemicals	Informational change	B.1	1
C-6	C-1, Chemical and Physical Analysis	Updated description of Cleanup and Spill Residue	Informational change	B.1	1
C-8 to C-9	C-1, Chemical and Physical Analysis	Updated description of Groundwater and Related Water	Informational change	B.1	1
C-9	C-1, Chemical and Physical Analysis	Updated description of PPE and Miscellaneous Debris	Informational change	B.1	1
C-10	C-1, Chemical and Physical Analysis	Updated description of Neat Trichloroethylene	Informational change	B.1	1
C-17	C-1, Chemical and Physical Analysis	Updated description of Trap Material	Informational change	B.1	1

Identification and Justification for Changes to DOE-PORTS RCRA Part B Permit (04-57-0680)

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
C-25	C-1, Chemical and Physical Analysis	Updated description of Solvent Solution	Informational change	B.1	1
C-32	C-1, Chemical and Physical Analysis	Updated description of Mercuric Nitrate Solutions/Mercuric Sulfate Solutions	Informational change	B.1	1
C-41	C-1, Chemical and Physical Analysis	Updated description of Antifreeze	Informational change	B.1	1
C-53	C-3A, Waste Characterization	Removed reference to MSDSs and Appendix C-2 (not needed).	Informational change	B.1	1
C-106	Table C-1	Updated waste stream name from "Mercuric Nitrate Solutions" to "Mercuric Nitrate/Mercuric Sulfate Solutions"	Informational change	B.1	1
Draft Submittal Changes					
--	Table of Contents	Changed to reflect document modifications	Administrative and informational changes; Correction of typographical errors	B.1, B.2	1
C-1	C-1, Chemical and Physical Analysis	Editorial changes and updated information	Administrative and informational changes, and more precise classification of existing waste streams	B.1	1
C-56	C-2, Waste Analysis Plan	Editorial changes and updated information	Administrative and informational changes	B.1	1
C-67	C-3, Waste Analysis Requirements Pertaining to Land Disposal Restrictions	Editorial changes and updated information	Administrative and informational changes	B.1	1
C-84	Table C-1, Summary of Generated Waste Stream	Updated information	Administrative and informational changes	B.1	1

Identification and Justification for Changes to
DOE-PORTS RCRA Part B Permit (04-57-0680)

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
C-132	Table C-2, Waste Analysis Plan	Updated information	Administrative and informational changes	B.1	1
C-194	Table C-3, Analytical Methods for Waste Characterization	Deleted	Information not required or found in other places	B.1	1
C-196	Table C-4, Sampling Methods for Waste Characterization	Deleted	Information not required or found in other places	B.1	1
C-192	Table C-5, Summary of Wastes Prohibited from Land Disposal	Deleted	Information not required or found in other places	B.1	1

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Identification and Justification for Changes to DOE-PORTS RCRA Part B Permit (04-57-0680)

Section D - Containers

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
Changes Made Since Draft Submittal					
D-4	D-1A(2), Container Management Practices	Deleted minimum aisle space required for fork lifts	Informational change - information not required	B.1	1
D-5	D-1A(3)(a) Requirements for the Base or Liner to Contain Liquids	Removed reference to Figure D-9	Figure D-9, Coating Specifications was lined-out in the previous submittal but the text was not changed to reflect removal of this figure	B.1	1
Draft Submittal Changes					
--	Table of Contents	Changed to reflect document modifications	Administrative and informational changes; Correction of typographical errors	B.1, B.2	1
D-1	Process Information	Deleted	Information found in other places	B.1	1
D-4	D-1A, Containers with Free Liquids	Editorial changes and updated information	Administrative and informational changes	B.1	1
D-4	D-1A(1), Description of Containers	Editorial changes and updated information	Administrative and informational changes	B.1	1
D-5	D-1A(2), Container Management Practices	Editorial changes and updated information	Administrative and informational changes	B.1	1
D-8	D-1A(3), Secondary Containment Systems Design and Operation	Editorial changes and updated information	Administrative and informational changes	B.1	1
D-9	D-lA(3)(a) Requirements for the Base or Liner to Contain Liquids	Editorial changes and updated information	Administrative and informational changes	B.1	1
D-11	D-1A(3)(d)	Editorial changes and updated information	Administrative and informational changes	B.1	1

Identification and Justification for Changes to
DOE-PORTS RCRA Part B Permit (04-57-0680)

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
D-12	D-1A(3)(e)	Editorial changes and updated information	Administrative and informational changes	B.1	1
D-12	D-2, Tank Systems through D-8, Miscellaneous Units	Editorial changes	Consolidated D-2 through D-8 because the permitted areas are for containers only and not other forms of storage units	B.1	1
D-25	Table D-2, Maximum Container Stacking Heights	Editorial changes	Deleted unnecessary information	B.1	1
D-28	Table D-5, X-7725 Container Storage Unit Basis for Calculations	Editorial changes	Administrative and informational changes	B.1	1

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Identification and Justification for Changes to DOE-PORTS RCRA Part B Permit (04-57-0680)

Section F - Procedures to Prevent Hazards

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
Changes Made Since Draft Submittal					
Throughout section		Changed text per Ohio EPA comment so that container storage areas are inspected at least weekly, whether or not the areas are in use			
F-1	F-1a(2), Barrier and Means to Control Entry	Updated third paragraph concerning employee, contractor, and visitor access control	Informational change	B.1	1
Draft Submittal Changes					
--	Table of Contents	Changed to reflect document modifications	Administrative and informational changes; Correction of typographical errors	B.1, B.2	1
F-1	F-1a, Security Procedures and Equipment	Deleted last sentence	Administrative and informational changes	B.1	1
F-1	F-1a(1), 24-Hour Surveillance System	Editorial changes	Administrative and informational changes	B.1	1
F-1	F-1a(2), Barrier and Means to Control Entry	Editorial changes	Administrative and informational changes	B.1	1
F-2	F-1a(3), Warning Signs	Editorial changes	Administrative and informational changes	B.1	1
F-3	F-1b, Waiver	Deleted entire section	PORTS does not request a waiver of security procedures or equipment requirements	B.1	1
F-3	F-1b(1), Injury to Intruder	Deleted entire section	PORTS does not request a waiver of security procedures or equipment requirements	B.1	1
F-3	F-1b(2), Violation Caused by Intruder	Deleted entire section	PORTS does not request a waiver of security procedures or equipment requirements	B.1	1
F-3	F-2a, General Inspection Requirements	Editorial changes	Administrative and informational changes	B.1	1
F-4	F-2a(1), Types of Problems	Editorial changes	Typographical error	B.2	1

Identification and Justification for Changes to
DOE-PORTS RCRA Part B Permit (04-57-0680)

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
F-4	F-2a(2), Frequency of Inspections	Editorial changes	Administrative and informational changes	B.1	1
F-5	F-2b(1), Containers	Editorial changes	Administrative and informational changes	B.1	1
F-6	F-2b(2), Tank Inspection	Deleted entire section	PORTS does not operate a tank for treatment, storage or disposal of hazardous waste	B.1	1
F-6	F-2b(3), Waste Pile Inspection	Deleted entire section	PORTS does not operate a waste pile for treatment, storage or disposal of hazardous waste	B.1	1
F-6	F-2b(4), Surface Impoundment Inspection	Deleted entire section	PORTS does not operate a surface impoundment for treatment, storage or disposal of hazardous waste	B.1	1
F-6	F-2b(5), Incinerator and Associated Equipment Inspection	Deleted entire section	PORTS does not operate an incinerator for treatment, storage or disposal of hazardous waste	B.1	1
F-6	F-2b(6), Landfill Inspection	Deleted entire section	PORTS does not operate a landfill for treatment, storage or disposal of hazardous waste	B.1	1
F-6	F-2b(7), Land Treatment Facility Inspection	Deleted entire section	PORTS does not operate a land treatment facility for treatment, storage or disposal of hazardous waste	B.1	1
F-7	F-2b(8), Miscellaneous Unit Inspection	Deleted entire section	PORTS does not operate a miscellaneous unit for treatment, storage or disposal of hazardous waste	B.1	1
F-7	F-2b(9), Subpart AA Inspection Requirements	Deleted entire section	PORTS does not have any equipment subject to Subpart AA	B.1	1
F-7	F-2b(10), Subpart BB Inspection Requirements	Deleted entire section	PORTS does not have any equipment subject to Subpart BB	B.1	1
F-7	F-2c, Remedial Action	Editorial	Administrative and informational changes	B.1	1

Identification and Justification for Changes to
DOE-PORTS RCRA Part B Permit (04-57-0680)

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
F-8	F-2d, Inspection Log	Deleted entire section	Inspection log addressed in section F-2a, General Inspection Requirements	B.1	1
F-8	F-3, Waiver of Preparedness and Prevention Requirements	Editorial	Administrative and informational changes	B.1	1
F-8	F-3a(1), Internal Communications	Editorial	Administrative and informational changes	B.1	1
F-9	F-3a(2), External Communications	Editorial	Administrative and informational changes	B.1	1
F-10	F-3a(3), Emergency Equipment	Editorial	Administrative and informational changes	B.1	1
F-10	F-3a(4), Water for Fire Control	Editorial	Administrative and informational changes	B.1	1
F-11	F-3b, Aisle Space Requirement	Editorial	Administrative and informational changes; Specific aisle space requirements addressed in Section D of the Permit; Specific emergency response equipment is addressed in Section G of the Permit	B.1	1
F-12	F-4, Prevention Procedures, Structures and Equipment	Editorial	Administrative and informational changes	B.1	1
F-13	F-4a, Unloading Operations	Editorial	Administrative and informational changes	B.1	1
F-13	F-4b, Runoff	Editorial	Administrative and informational changes; Specific information on runoff is addressed in Section B of the Permit	B.1	1
F-14	F-4c, Water Supplies	Editorial	Administrative and informational changes	B.1	1
F-14	F-4d, Equipment and Power Failure	Editorial	Administrative and informational changes	B.1	1

Identification and Justification for Changes to
DOE-PORTS RCRA Part B Permit (04-57-0680)

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
F-15	F-4e, Personal Protection Equipment	Editorial	Administrative and informational changes; Specific emergency response equipment is addressed in Section G of the Permit; Specific employee training information is addressed in Section H of the Permit	B.1	1
F-15	F-5a Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Wastes	Editorial	Administrative and informational changes; Specific container management practices for ignitable or reactive wastes are addressed in Section D of the Permit	B.1	1
F-16	F-5b, General Precautions for Handling Ignitable or Reactive Wastes and Mixing of Incompatible Wastes	Editorial and additional information	Administrative and informational changes; Specific container management practices for ignitable or reactive wastes are addressed in Section D of the Permit	B.1	1
F-17	F-5c, Management of Ignitable or Reactive Wastes in Containers	Deleted specific information from this section	Specific container management practices for ignitable or reactive wastes are addressed in Section D of the Permit; Specific location information of storage areas is addressed in Section B of the Permit; Specific information on waste analysis is addressed in Section C of the Permit	B.1	1
F-17	F-5d, Management of Incompatible Waste in Containers	Deleted specific information from this section	Specific container management practices for incompatible wastes are addressed in Section D of the Permit	B.1	1
F-18	F-5e, Management of Ignitable or Reactive Wastes in Tanks	Deleted entire section	PORTS does not operate a tank for treatment, storage or disposal of hazardous waste	B.1	1
F-18	F-5f, Management of Incompatible Wastes in Tank Systems	Deleted entire section	PORTS does not operate a tank system for treatment, storage or disposal of hazardous waste	B.1	1

Identification and Justification for Changes to
DOE-PORTS RCRA Part B Permit (04-57-0680)

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
F-18	F-5g, Management of Ignitable or Reactive Wastes in Waste Piles	Deleted entire section	PORTS does not operate a waste pile for treatment, storage or disposal of hazardous waste	B.1	1
F-19	F-5h, Management of Incompatible Wastes in Waste Piles	Deleted entire section	PORTS does not operate a waste pile for treatment, storage or disposal of hazardous waste	B.1	1
F-19	F-5i, Management of Ignitable or Reactive Wastes in Surface Impoundments	Deleted entire section	PORTS does not operate a surface impoundment for treatment, storage or disposal of hazardous waste	B.1	1
F-19	F-5j, Management of Incompatible Wastes in Surface Impoundments	Deleted entire section	PORTS does not operate a surface impoundment for treatment, storage or disposal of hazardous waste	B.1	1
F-19	F-5k, Management of Ignitable or Reactive Wastes in Landfills	Deleted entire section	PORTS does not operate a landfill for treatment, storage or disposal of hazardous waste	B.1	1
F-19	F-5l, Management of Incompatible Wastes in Landfills	Deleted entire section	PORTS does not operate a landfill for treatment, storage or disposal of hazardous waste	B.1	1
F-20	F-5m, Management of Ignitable or Reactive Wastes Placed in Land Treatment Units	Deleted entire section	PORTS does not operate a land treatment unit for treatment, storage or disposal of hazardous waste	B.1	1
F-20	F-5n, Management of Incompatible Wastes in Land Treatment Units	Deleted entire section	PORTS does not operate a land treatment unit for treatment, storage or disposal of hazardous waste	B.1	1
F-21 - F-39	Figures F-1 - F-13	Deleted figures from text	Revised inspection schedule; drainage information is addressed in Section B, Facility Description	B.1	1

Identification and Justification for Changes to DOE-PORTS RCRA Part B Permit (04-57-0680)

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
F-40 - F-41	Table F-1, Inspection Schedule	Revised inspection schedule	Conformance with the National Fire Protection Association requirements	C.4	2

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Identification and Justification for Changes to
DOE-PORTS RCRA Part B Permit (04-57-0680)

Section G - Contingency Plan

Because the Contingency Plan is updated regularly and submitted to Ohio EPA, this table reflects only those changes made since the last Contingency Plan update (submission date 01/07/00).

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
Changes Made Since 1/07/2000 Submittal					
G-5	G-1, General Information	Updated information on the X-326 facility (first paragraph)	Informational change	B.1	1
G-16	G-4F, Storage and Treatment of Released Material	Removed reference to Figure G-7 (procedure for repackaging/ transferring waste)	Sufficient information provided in Contingency Plan, 30-page procedure not required	B.1	1
G-17	G-4I, Container Spills and Leakage	Removed reference to Figure G-7 (procedure for repackaging/ transferring waste)	Sufficient information provided in Contingency Plan, 30-page procedure not required	B.1	1
--	Figure G-7	Removed Figure G-7 (procedure for repackaging/ transferring waste)	Sufficient information provided in Contingency Plan, 30-page procedure not required	B.1	1

[1] Page designates the page of the permit renewal application submitted February 21, 2000.

OAC and Class (classification) refer to the OAC Appendix reference (OAC 3745-50-51) for the classification of the permit modification.

Identification and Justification for Changes to DOE-PORTS RCRA Part B Permit (04-57-0680)

Section H - Personnel Training

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
Changes Made Since Draft Submittal					
H-1	H-1, Outline of Training	Changed personnel response to emergency requirements to a reference to Section G-3	Informational change	B.1	1
Draft Submittal Changes					
--	Table of Contents	Changed to reflect document modifications	Administrative and informational changes; Correction of typographical errors	B.1, B.2	1
H-1	H-1, Outline of Training	Editorial changes and updated information	Administrative and informational changes	B.1, B.2	1
H-1	H-1A, Job Titles/Job Descriptions	Editorial changes and updated information	Administrative and informational changes	B.1, B.2	1
H-2	H-1B, Training Content, Frequency and Technique	Editorial changes and updated information	Administrative and informational changes	B.1, B.2, C.5.b	1
H-4	H-1.2.1, Job Qualification	Deleted	Information incorporated into section H-1B, Training Content, Frequency and Technique	B.1, B.2	1
H-4	H-1C, Training Director	Editorial changes and updated information	Administrative and informational changes	B.1, B.2	1
H-5	H-1D, Relevance of Training to Job Position	Editorial changes	Administrative changes	B.1, B.2	1
H-5	H-1E, Training for Emergency Response	Editorial changes and updated information	Administrative and informational changes	B.1, B.2	1
H-6	H-2, Implementation of Training Programs	Editorial changes	Administrative changes	B.1, B.2	1

Identification and Justification for Changes to DOE-PORTS RCRA Part B Permit (04-57-0680)

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
H-6	H-2A, Implementation	Editorial changes	Administrative changes	B.1, B.2	1
H-7	H-2B, Recordkeeping	Editorial changes and updated information	Administrative and informational changes	B.1, B.2	1
H-8	Appendix H-1	Deleted	Information not required	B.1	1

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Identification and Justification for Changes to DOE-PORTS RCRA Part B Permit (04-57-0680)

Section I - Closure Plans

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
Changes Made Since Draft Submittal					
Throughout Appendices I-1 and I-2		Updated facility operator, facility descriptions, and other facility information	Administrative and informational changes	B.1	1
	Appendix I-1 and I-2, Table 4	Deleted parameters from list	Parameters are not regulated under RCRA (radiologicals) or not associated with wastes stored in the permitted areas (metals)	E.1.d	1
	Appendix I-1 and I-2, Appendix C	Deleted or updated standard operating procedures	Informational changes	E.1.d	1
Draft Submittal Changes					
--	Table of Contents	Changed to reflect document modifications	Administrative and informational changes; Correction of typographical errors	B.1, B.2	1
I-1	I-1, Closure Plans	Updated information	Administrative and informational changes	B.1	1
I-1	I-3 to I-8	Editorial Changes	Administrative change	B.1	1

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Identification and Justification for Changes to DOE-PORTS RCRA Part B Permit (04-57-0680)

Section J - Recordkeeping

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
Changes Made Since Draft Submittal - None					
Draft Submittal Changes					
--	Table of Contents	Changed to reflect document modifications	Administrative and informational changes	B.1, B.2	1
J-1	J-1, Use of a Manifest System	Updated information	Administrative and informational changes	B.1, B.2	1
J-2	J-2, Operating Record	Updated information	Administrative and informational changes	B.1, B.2, C.3	1
J-4 to J-7	Table J-1, Contents of Operating Record	Deleted	Information not required	B.1, C.3	1

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Identification and Justification for Changes to DOE-PORTS RCRA Part B Permit (04-57-0680)

Section K - Other Federal Laws

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
Changes Made Since Draft Submittal - None					
Draft Submittal Changes					
--	Table of Contents	Changed to reflect document modifications	Administrative and informational changes; Correction of typographical errors	B.1, B.2	1
K-1	K-1, Other Federal Laws	Information updated	Administrative and informational changes; Correction of typographical errors	B.1, B.2	1

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OAC and Class (classification) refer to the OAC Appendix reference (OAC 3745-50-51) for the classification of the permit modification.

Identification and Justification for Changes to DOE-PORTS RCRA Part B Permit (04-57-0680)

Section L - Air Emissions

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
Changes Made Since Draft Submittal - None					
Draft Submittal Changes					
--	Table of Contents	Changed to reflect document modifications	Administrative and informational changes; Correction of typographical errors	B.1, B.2	1
L-1	L-1, Specific Part B Information Requirements for Process Vents	Deleted unnecessary information; Editorial Changes	Editorial and Administrative changes	B.1, B.2	1
L-2	L-2, Specific Part B Information Requirements for Equipment	Deleted unnecessary information; Editorial Changes	Editorial and Administrative changes	B.1, B.2	1
L-3	L-3, Specific Part B Information Requirements for Facilities that Store Hazardous Waste in Containers	Added information	The permitted facilities are used to store hazardous waste in containers	B.1	1

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Identification and Justification for Changes to DOE-PORTS RCRA Part B Permit (04-57-0680)

Section M - Solid Waste Management Units

Page[1]	Section	Modification	Justification	OAC[1]	Class[1]
Changes Made Since Draft Submittal					
M-1	M-1, Solid Waste Management Units	Deleted references to Appendix M-1 and drawings in Appendix B-1	Appendix M-1 was deleted in the line-out copy previously submitted to Ohio EPA but was not deleted from the clean-copy submittal. Appendix B-1 no longer exists; therefore, the reference to it was deleted	B.1	1
M-2	Table M-1, Solid Waste Management Units	Updated table	Informational change	B.1	1
Draft Submittal Changes					
--	Table of Contents	Changed to reflect document modifications	Administrative and informal changes	B.1, B.2	1
M-1	M-1, Solid Waste Management Units	Editorial changes; deleted verbiage from opening paragraph	Administrative and informal changes	B.1, B.2	1
M-1 through M-4	Table M-1, List of Solid Waste Management Units	Editorial changes and modification of List of Solid Waste Management Units	Administrative and informal changes	B.1	1

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OAC and Class (classification) refer to the OAC Appendix reference (OAC 3745-50-51) for the classification of the permit modification.

Table F-1 with Change Information

SUBMISSION DATE: 7/26/93

TABLE F-1
INSPECTION SCHEDULE

AREA/EQUIPMENT	SPECIFIC ITEM	TYPES OF PROBLEMS	FREQUENCY OF INSPECTION
Safety and Emergency Equipment	Emergency Shower and Eyewash	Water Pressure, Leaking	Weekly
	Spill Control Equipment	Stock Items	Weekly
	Fire Alarm System	Power Failure	Monthly
	Fire Water Suppression Systems	Low Pressure, failure to auto-start, bad sprinkler head, batteries on back-up system need recharged	Monthly
	Fire Hydrants	Damage, valves hard to open, accessibility	Semi-Annually
	Fire Extinguishers	Seals and gauges broken, proper location, accessibility, needs charging, water pressure	Quarterly
Alarm/Communication	Telephone System and Hand Held Radios	Power Failure, Equipment Malfunction	Weekly
	Plant Loudspeaker System/Red Phones	Power Failure, Equipment Malfunction	Every 8 Hours
	Disaster/Fire Siren/ Radiation Alarm System	Malfunctions	Semi-Annually
Emergency Lighting and Facility Lighting	Emergency Lighting and Facility Lights	Battery needs recharged or replaced, bulbs need to be replaced	Semi-Annually
Security Devices	Facility Fence and Signs	Corrosion or Damage to fence or barbed wire	Daily
	Gates and Controls	Corrosion or Damage	Daily
Safety Signs	No Smoking, Unauthorized Entry Signs	Missing, Damaged	Weekly

SUBMISSION DATE: 7/26/93

Aisle Space	Inadequate for spill response or inspection PER DIMENSIONS PROVIDED IN SECTION D-1a(2) FOR EACH AREA	Aisle space blocked by containers or equipment	Weekly
Spill Control Equipment	Spill Kits/Carts	Equipment used and not replaced, inadequate materials available	Weekly
Personal Protective Equipment	Tyvek Coveralls, Neoprene gloves, booties, face shields, tape	Equipment used and not replaced, inadequate materials available	Weekly
Container Integrity	Each Container holding hazardous waste	Corrosion, leaks, bulges, missing bungs, dents which jeopardize container's structural integrity	Weekly
Secondary Containment	Liquid hazardous waste	Liquid hazardous waste in storage without secondary containment	Weekly
Container Labeling	Hazardous waste identification label, accumulation start date	Damaged or missing labels, improper or incomplete information on label	Weekly
Operating Equipment	Barrel lifts, fork lifts, trucks, scales overhead cranes	Malfunction, safety lights/horns, brakes	Daily when in use/PM Yearly
Structural Equipment	Dikes, floors	Cracked floor coating, broken/cracked dikes or ramps, SPILLS, LEAKS, STAINS OR OTHER EVIDENCES OF HAZARDOUS WASTE RELEASED	Weekly

Table F-1 - Revised Version

Table F-1
Inspection Schedule

Inspection or Equipment	Element of Inspection	Frequency
Container Storage Unit Inspections		
"Danger Unauthorized Personnel Keep Out," or equivalent, signs posted	missing or damaged signs	Weekly
Dikes	broken/cracked dikes or ramps	Weekly
Floors	cracked floor coating; spills, leaks, stains or other evidence of hazardous waste released	Weekly
Container Labeling (hazardous waste identification label)	damaged or missing labels, improper or incomplete information	Weekly
Container Integrity	corrosion, leaks, bulges, missing bungs, dents which jeopardize structural integrity	Weekly
Secondary Containment for liquid hazardous waste	absence of secondary containment for liquid hazardous waste	Weekly
Personal Protective Equipment	inadequate materials available, inventory not replaced	Weekly
Spill Control Equipment	inadequate materials available, inventory not replaced	Weekly
Aisle Space	aisle space blocked by containers or equipment	Weekly
Telephone system	power failure, equipment malfunction	Weekly
Loading/Unloading Areas		
Operating Equipment	malfunction, safety lights, horns, brakes	Daily, when in use
Container Integrity	corrosion, leaks, bulges, missing bungs, dents which jeopardize structural integrity	Daily, when in use
Container Labeling (hazardous waste identification label)	damaged or missing labels, improper or incomplete information	Daily, when in use
Dikes	broken/cracked dikes or ramps	Daily, when in use
Floors	cracked floor coating; spills, leaks, stains or other evidence of hazardous waste released	Daily, when in use
Building Inspections and Surveys		
Fire Prevention Inspection	housekeeping, fire hazards, blocked fire lanes and/or fire doors, access to equipment, etc.	Semi-annually
Fire Protection Engineering Surveys	risk evaluations, detailed hazard assessment	Annually

Table F-1 (continued)

Inspection or Equipment	Element of Inspection	Frequency
Automatic Sprinkler Systems		
Visual Inspection of wet pipe sprinkler and dry pipe sprinkler (risers only)	control valve status, gauge pressure, system hardware and associated equipment	Monthly
Main drainflow	flow test	Annually
Inspector's test valve	flow and alarm test	Annually
Trip test of dry pipe system	functional test	Annually
Operational inspection of sprinkler control valves	cycle valves	Annually
Fire Alarm Systems		
Manual pull stations	operational test	Annually
X-7725 evacuation buttons	operational test	Annually
Water Supply Systems		
Electric fire pump	operational test	Monthly
Diesel fire pump	operational test and battery test	Monthly
Diesel pump fuel supply level	check amount, refill as needed	Quarterly
Automatic starting test	operational test	Annual
Water flow test (underground piping)	hydraulic gradient	Every three (3) years
Hydrants	damage; flush	Annually
Capacity test (pumps)	functional test	Annually
Underground valves	cycle valves	Annually
Water storage tanks (exterior)	damage or leaks	Annually
Portable Fire Extinguishers		
Visual Inspection	operational test	Monthly
Carbon dioxide extinguisher hose	Continuity test	Annual
Container hydrostatic test	per manufacturer's instructions	per manufacturer's instructions
Building Equipment and Facilities		

Table F-1 (continued)

Inspection or Equipment	Element of Inspection	Frequency
Standpipe systems	damage	Annually
Hose rollers	damage	Annually
Mobile Fire Apparatus		
Routine inspections and test	road test, equipment operational test, inventory	Weekly
Fire pump capacity test	functional test	Annually
Pumper truck hoses	hydrostatic test	Annually

DOE/OR/11-3037/V1&D0

RCRA Part B Permit Renewal Application

At the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio

Volume 1. Text

This document has received the appropriate reviews for release to the public. Date: 02/15/00

EQ MIDWEST

contributed to the preparation of this document and should not be considered an eligible contractor for its review.

DOE/OR/11-3037V1&D0

RCRA Part B Permit Renewal Application for the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio

Volume 1. Text

Part A Permit Application
Sections B through N

Date Issued — February 21, 2000

Prepared by
EQ Midwest, Inc.
Cincinnati, OH
under subcontract 23900-SC-SM002F

Prepared for the
U.S. Department of Energy
Office of Environmental Restoration and Waste Management

BECHTEL JACOBS COMPANY LLC
managing the
Environmental Management Activities at the
Portsmouth Gaseous Diffusion Plant

Bechtel Jacobs Company LLC
P.O. Box 900
Piketon, Ohio 45661

under contract DE-AC05-98OR22700
for the
U.S. DEPARTMENT OF ENERGY

This document has received the appropriate
reviews for release to the public.

SUBMISSION DATE: February 21, 2000

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or EPA Regional Use Only	Hazardous Waste Permit Application Part A	For State Use
Date Received		

I. ID Number(s)

A. EPA ID Number	B. Secondary ID Number *(if applicable)*
OH7890008983	

II. Name of Facility

Portsmouth GDP

III. Facility Location *(Physical address not P. O. Box or Route Number)*

A. Street

3930 U.S. Route 23 South

City or Town	State	ZIP Code
Piketon	Ohio	45661

County Code *(if known)*	County Name
	Pike

B. Land Type *(enter code)*	C. Geographic Location LATITUDE *(degrees, minutes, & seconds)*	LONGITUDE *(degrees, minutes, & seconds)*	D. Facility Existence Date
F	39° 00' 030"	083° 00' 028"	01/14/1955

IV. Facility Mailing Address

Street or P. O. Box

P. O. Box 700

City or Town	State	ZIP Code
Piketon	Ohio	45661-0700

V. Facility Contact *(Person to be contacted regarding waste activities at facility)*

Name *(last)*	*(first)*
Rafferty	Melda J.
Job Title	**Phone Number** *(area code and phone number)*
Environmental Protection Specialist	(740) 897-5521

VI. Facility Contact Address *(See instructions)*

A. Contact Address		B. Street or P. O. Box
Location	Mailing X	P.O. Box 700

City or Town Piketon	State OH	ZIP Code 45661

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EPA I.D. Number *(enter from page 1)*			Secondary I.D. Number *(enter from page 1)*	
OH7890008983				
VII. Operator Information *(see instructions)*				
A. Name of Operator				
U. S. Department of Energy Bechtel Jacobs Company LLC, Co-Operator				
Street or P. O. Box				
P. O. Box 900				
City or Town			**State**	**ZIP Code**
Piketon			Ohio	45661
Phone Number *(area code and number)*	**B. Operator Type**	**C. Change of Operator Indicator**		**Date Changed**
(740) 897-5010 (DOE) (740) 897-2331 (Bechtel Jacobs Company LLC)	F	**Yes**	**No** X	
VIII. Facility Owner *(see instructions)*				
A. Name of Facility's Legal Owner				
U. S. Department of Energy				
Street or P. O. Box				
P. O. Box 700				
City or Town			**State**	**ZIP Code**
Piketon			Ohio	45661-0700
Phone Number *(area code and number)*	**B. Owner Type**	**C. Change of Owner Indicator**		**Date Changed**
(740) 897-5010	F	**Yes**	**No** X	

IX. SIC Codes *(4-digit, in order of significance)*			
Primary		**Secondary**	
4953	Refuse Systems		
Secondary		**Secondary**	

X. Other Environmental Permits		
A. Permit Type/Number	**B. Description**	**C. Permit**
0IO00000	DOE NPDES Permit	Permit to Discharge

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X. Other Environmental Permits (continued)

PERMIT TYPE / NUMBER	DESCRIPTION	PERMIT
P007	X-744G Glove Box	Permit to Operate
P019	X-624 Groundwater Treatment Facility	Permit to Operate
F010	X-734 Solid Waste Landfill Closure	Permit to Operate
P018	X-623 Groundwater Treatment Facility	Registered
P027	X-749 Contaminated Materials Disposal Facility	Registered
P028	X-7725 Fluorescent Bulb Crusher	Registered
B005	X-345 Emergency Generator	Registered
T005	X-345 Security Fuel Oil Tank	Registered
B006	X-744G Oil Fired Furnace	Registered
T008	X-744G Fuel Oil Tank (South)	Registered
P020	X-744G Aluminum Melter	Registered
F006	X-735 Landfill Storage Piles	Registered
T006	X-735 Fuel Oil Tank	Registered
P022	X-326 Glove Box	Permit to Operate
P023	X-735 Landfill Cap and Venting System	Permit to Operate

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XI. NATURE OF BUSINESS (PROVIDE A BRIEF DESCRIPTION)

The Portsmouth Gaseous Diffusion Plant has been operating since 1954 enriching uranium for national defense and commercial nuclear reactors. Since July 1, 1993 the uranium enrichment process has been leased to and operated by the United States Enrichment Corporation (USEC), a private corporation formerly owned by the government. DOE's continuing mission at Portsmouth is to safely and effectively manage the environmental restoration, environmental compliance, decontamination and decommissioning activities, waste management including treatment, storage and disposal of hazardous, low-level radioactive and mixed waste, shut-down of the highly enriched uranium operations, and administration of lease agreements.

XII. PROCESS - CODES AND DESIGN CAPACITIES

PROCESS CODE	PROCESS	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
	DISPOSAL:	
D79	INJECTION WELL	GALLONS; LITERS; GALLONS PER DAY; OR LITERS PER DAY
D80	LANDFILL	ACRE-FEET OR HECTARE-METER
D81	LAND APPLICATION	ACRES OR HECTARES
D82	OCEAN DISPOSAL	GALLONS PER DAY OR LITERS PER DAY
D83	SURFACE IMPOUNDMENT	GALLONS OR LITERS
	STORAGE:	
S01	CONTAINER (barrel, drum, etc.)	GALLONS OR LITERS
S02	TANK	GALLONS OR LITERS
S03	WASTE PILE	CUBIC YARDS OR CUBIC METERS
SO4	SURFACE IMPOUNDMENT	GALLONS OR LITERS
	TREATMENT:	
T01	TANK	GALLONS PER DAY OR LITERS PER DAY
T02	SURFACE IMPOUNDMENT PER DAY	GALLONS PER DAY OR LITERS
T03	INCINERATOR	SHORT TONS PER HOUR; METRIC TONS ER HOUR; GALLONS PER HOUR; LITERS PER HOUR; OR BTU'S PER HOUR
T04	OTHER TREATMENT *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided in item XIII.)*	GALLONS PER DAY; LITERS PER DAY; POUNDS PER HOUR; SHORT TONS PER HOUR; KILOGRAMS PER HOUR; METRIC TONS PER DAY; METRIC TONS PER HOUR; OR SHORT TONS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G
GALLONS PER HOUR	E
GALLONS PER DAY	U
LITERS	L
LITERS PER HOUR	H
LITERS PER DAY	V
SHORT TONS PER HOUR	D
METRIC TONS PER HOUR	W
SHORT TONS PER DAY	N
METRIC TONS PER DAY	S
POUNDS PER HOUR	J
KILOGRAMS PER HOUR	R
CUBIC YARDS	Y
CUBIC METERS	C
ACRES	B
ACRES-FEET	A
HECTARES	Q
HECTARE-METER	F
BTU'S PER HOUR	K

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XII. Process - Codes and Design Capacities *(continued)*

EXAMPLE FOR COMPLETING ITEM XII *(shown in line numbers X-1 and X-2 below): A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.*

Line Number	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY		C. PROCESS TOTAL NUMBER OF UNITS	FOR OFFICIAL USE ONLY
		1. AMOUNT *(specify)*	2. UNIT OF MEASURE *(enter code)*		
1	S01	1.33 x 10^5 [X-326]	G	1	
2	S01	5.456 x 10^6 [X-7725]	G	1	
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

NOTE: *If you need to list more than 12 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, taking into account any lines that will be used for additional treatment processes in item XIII.*

XIII. Additional Treatment Processes *(follow instructions from item XII)*

Line Number *(enter numbers in sequence with item XII)*	A. PROCESS CODE	B. TREATMENT PROCESS DESIGN CAPACITY		C. PROCESS TOTAL NUMBER OF UNITS	D. DESCRIPTION OF PROCESS
		1. AMOUNT *(specify)*	1.UNIT OF MEASURE *(enter code)*		
	T04				

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XIV. Description of Hazardous Wastes	

A. EPA HAZARDOUS WASTE NUMBER - Enter the four-digit number from 40 CFR, Part 261 Subpart D of each listed hazardous waste you will handle. For hazardous wastes which are not listed in 40 CFR, Part 261 Subpart D, enter the four-digit number(s) from 40 CFR, Part 261 Subpart C that describes the characteristics and/or the toxic contaminants for those hazardous wastes.

B. ESTIMATED ANNUAL QUANTITY - *For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.*

C. UNIT OF MEASURE - *For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:*

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed hazardous waste: For each listed hazardous waste entered in column A select the code(s) from the list of process codes contained in Item XII A. on page 3 to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed hazardous waste: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process codes contained in Item XII A. on page 3 to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous waste that process the characteristic or toxic contaminant.

NOTE: THREE SPACES ARE PROVIDED FOR ENTERING PROCESS CODES. IF MORE ARE NEEDED:

1. *Enter the first two as described above.*
2. *Enter "000" in the extreme right box of Item XIV-D(1).*
3. *Enter in the space provided on page 7, Item XIV-E, the line number and the additional code(s).*

2. PROCESS DESCRIPTION: *If a code is not listed for a process that will be used, describe the process in the space provided on the form (D.(2)).*

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER - *Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:*

1. *Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.*
2. *In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.*
3. *Repeat step 2 for each EPA Hazardous Waste Number that can be used to describe the hazardous waste.*

EXAMPLE FOR COMPLETING ITEM XIV *(shown in line numbers X-1, X-2, X-3, and X-4 below) - A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.*

Line Number	A. EPA HAZARD WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESS			
				(1) PROCESS CODES (enter)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
X1	K054	900	P	T03	D80		
X2	D002	400	P	T03	D80		
X3	D001	100	P	T03	D80		
X4	D002						Included With Above

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XIV. Description of Hazardous Wastes *(continued)*

Line Number	A. EPA HAZARD WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESS			
				(1) PROCESS CODES (enter)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
1	D001	27,200	P	S01			
2	D002	85,000	P	S01			
3	D003	1,000	P	S01			
4	D004	10	P	S01			
5	D005	20	P	S01			
6	D006	100,000	P	S01			
7	D007	10,000	P	S01			
8	D008	5,000	P	S01			
9	D009	100	P	S01			
10	D010	10	P	S01			
11	D011	10	P	S01			
12	D015	10	P	S01			
13	D016	10	P	S01			
14	D018	10,000	P	S01			
15	D019	100	P	S01			
16	D020	100	P	S01			
17	D021	100	P	S01			
18	D022	100	P	S01			
19	D023	100	P	S01			
20	D024	100	P	S01			
21	D025	100	P	S01			
22	D027	100	P	S01			
23	D028	10,000	P	S01			
24	D029	10,000	P	S01			
25	D030	10,000	P	S01			
26	D031	100	P	S01			
27	D032	100	P	S01			
28	D033	100	P	S01			
29	D034	100	P	S01			
30	D035	10,000	P	S01			
31	D036	100	P	S01			
32	D037	100	P	S01			
33	D038	1,000	P	S01			
34	D012	10	P	S01			
35	D013	10	P	S01			
36	D014	10	P	S01			
37	D017	10	P	S01			
38	D026	10	P	S01			
39	D039	10	P	S01			
40	D040	10	P	S01			

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XIV. Description of Hazardous Wastes *(continued)*	

Line Number	A. EPA HAZARD WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESS			
				(1) PROCESS CODES (enter)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
41	D041	10	P	S01			
42	D042	10	P	S01			
43	D043	10	P	S01			
44	D-XXXX	*	P	S01			
45	F001	2,400	P	S01			
46	F002	1,200	P	S01			
47	F003	2,500	P	S01			
48	F004	1,000	P	S01			
49	F005	1,000	P	S01			
50	F006	1,000	P	S01			
51	F007	400	P	S01			
52	F027	100	P	S01			
53	F-XXXX		P	S01			
54	K-XXXX		P	S01			
55	P001	10	P	S01			
56	P003	13	P	S01			
57	P004	10	P	S01			
58	P005	10	P	S01			
59	P008	10	P	S01			
60	P010	10	P	S01			
61	P011	10	P	S01			
62	P012	10	P	S01			
63	P013	10	P	S01			
64	P015	10	P	S01			
65	P016	10	P	S01			
66	P018	10	P	S01			
67	P020	10	P	S01			
68	P021	10	P	S01			
69	P022	10	P	S01			
70	P023	10	P	S01			
71	P024	10	P	S01			
72	P028	10	P	S01			
73	P029	10	P	S01			
74	P030	10	P	S01			
75	P031	4.4	P	S01			

* Represents any waste code not listed in this description list.

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XIV. Description of Hazardous Wastes *(continued)*							
Line Number	A. EPA HAZARD WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESS			
				(1) PROCESS CODES (enter)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
76	P033	2.2	P	S01			
77	P037	10	P	S01			
78	P038	10	P	S01			
79	P041	10	P	S01			
80	P042	10	P	S01			
81	P046	10	P	S01			
82	P047	10	P	S01			
83	P048	0.01	P	S01			
84	P050	10	P	S01			
85	P051	10	P	S01			
86	P056	0.6	P	S01			
87	P058	10	P	S01			
88	P059	10	P	S01			
89	P060	10	P	S01			
90	P063	10	P	S01			
91	P064	50	P	S01			
92	P068	10	P	S01			
93	P070	10	P	S01			
94	P071	10	P	S01			
95	P072	10	P	S01			
96	P073	10	P	S01			
97	P074	10	P	S01			
98	P075	10	P	S01			
99	P076	2.6	P	S01			
100	P077	10	P	S01			
101	P078	1.5	P	S01			
102	P082	10	P	S01			
103	P087	1.5	P	S01			
104	P089	10	P	S01			
105	P093	10	P	S01			
106	P095	0.1	P	S01			
107	P098	10	P	S01			
108	P099	10	P	S01			
109	P104	10	P	S01			
110	P105	10	P	S01			
111	P106	10	P	S01			
112	P108	10	P	S01			
113	P110	10	P	S01			
114	P111	10	P	S01			
115	P113	10	P	S01			

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XIV. Description of Hazardous Wastes *(continued)*

Line Number	A. EPA HAZARD WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESS			
				(1) PROCESS CODES (enter)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
116	P114	10	P	S01			
117	P115	10	P	S01			
118	P116	10	P	S01			
118	P119	10	P	S01			
120	P120	10	P	S01			
121	P121	10	P	S01			
122	P123	10	P	S01			
123	P-XXXX	*	P	S01			
124	U001	10	P	S01			
125	U002	10	P	S01			
126	U003	10	P	S01			
127	U004	10	P	S01			
128	U006	10	P	S01			
129	U007	10	P	S01			
130	U008	10	P	S01			
131	U009	10	P	S01			
132	U012	10	P	S01			
133	U017	10	P	S01			
134	U018	10	P	S01			
135	U019	10	P	S01			
136	U020	10	P	S01			
137	U021	10	P	S01			
138	U022	10	P	S01			
139	U023	10	P	S01			
140	U026	10	P	S01			
141	U028	10	P	S01			
142	U029	10	P	S01			
143	U030	10	P	S01			
144	U031	10	P	S01			
145	U032	10	P	S01			
146	U033	10	P	S01			
147	U034	10	P	S01			
148	U036	10	P	S01			
149	U037	10	P	S01			
150	U039	10	P	S01			
151	U041	100	P	S01			
152	U042	10	P	S01			
153	U043	10	P	S01			
154	U044	10	P	S01			

* Represents any waste code not listed in this description list.

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XIV. Description of Hazardous Wastes *(continued)*							
Line Number	A. EPA HAZARD WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESS			
				(1) PROCESS CODES (enter)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
155	U045	10	P	S01			
156	U046	10	P	S01			
157	U047	10	P	S01			
158	U048	10	P	S01			
159	U050	10	P	S01			
160	U051	10	P	S01			
161	U052	10	P	S01			
162	U055	10	P	S01			
163	U056	10	P	S01			
164	U057	10	P	S01			
165	U060	10	P	S01			
166	U061	10	P	S01			
167	U063	10	P	S01			
168	U064	10	P	S01			
169	U066	10	P	S01			
170	U067	10	P	S01			
171	U068	10	P	S01			
172	U069	10	P	S01			
173	U070	10	P	S01			
174	U071	10	P	S01			
175	U072	10	P	S01			
176	U073	10	P	S01			
177	U074	10	P	S01			
178	U075	10	P	S01			
179	U076	10	P	S01			
180	U077	10	P	S01			
181	U078	10	P	S01			
182	U079	10	P	S01			
183	U080	10	P	S01			
184	U081	10	P	S01			
185	U082	10	P	S01			
186	U083	10	P	S01			
187	U084	10	P	S01			
188	U086	10	P	S01			
189	U088	10	P	S01			
190	U092	10	P	S01			
191	U094	10	P	S01			
192	U096	10	P	S01			
193	U101	10	P	S01			
194	U102	10	P	S01			
195	U105	10	P	S01			

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EPA I.D. Number *(enter from page 1)*	Secondary I.D. Number *(enter from page 1)*
OH7890008983	
XIV. Description of Hazardous Wastes *(continued)*	

Line Number	A. EPA HAZARD WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESS			
				(1) PROCESS CODES (enter)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
196	U106	10	P	S01			
197	U107	10	P	S01			
198	U108	10	P	S01			
199	U109	10	P	S01			
200	U110	10	P	S01			
201	U112	10	P	S01			
202	U113	10	P	S01			
203	U117	10	P	S01			
204	U118	10	P	S01			
205	U120	10	P	S01			
206	U121	10	P	S01			
207	U122	10	P	S01			
208	U123	10	P	S01			
209	U126	10	P	S01			
220	U127	10	P	S01			
211	U128	10	P	S01			
212	U129	10	P	S01			
213	U130	10	P	S01			
214	U131	10	P	S01			
215	U133	10	P	S01			
216	U134	10	P	S01			
217	U135	10	P	S01			
218	U137	10	P	S01			
219	U138	10	P	S01			
220	U140	10	P	S01			
221	U141	10	P	S01			
222	U142	10	P	S01			
223	U144	10	P	S01			
224	U145	10	P	S01			
225	U146	10	P	S01			
226	U147	10	P	S01			
227	U149	10	P	S01			
228	U150	10	P	S01			
229	U151	100	P	S01			
230	U152	10	P	S01			
231	U153	10	P	S01			
232	U154	10	P	S01			
233	U159	10	P	S01			
234	U160	10	P	S01			
235	U161	10	P	S01			
236	U162	10	P	S01			

EPA I.D. Number *(enter from page 1)*	Secondary I.D. Number *(enter from page 1)*
OH7890008983	

XIV. Description of Hazardous Wastes *(continued)*

Line Number	A. EPA HAZARD WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESS			
				(1) PROCESS CODES (enter)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
237	U165	10	P	S01			
238	U167	10	P	S01			
239	U169	10	P	S01			
240	U170	10	P	S01			
241	U171	10	P	S01			
242	U182	10	P	S01			
243	U183	10	P	S01			
244	U184	10	P	S01			
245	U185	10	P	S01			
246	U188	10	P	S01			
247	U190	10	P	S01			
248	U191	10	P	S01			
249	U196	10	P	S01			
250	U197	10	P	S01			
251	U201	10	P	S01			
252	U202	10	P	S01			
253	U204	10	P	S01			
254	U205	10	P	S01			
255	U207	10	P	S01			
256	U208	10	P	S01			
257	U209	10	P	S01			
258	U210	10	P	S01			
259	U211	100	P	S01			
260	U213	10	P	S01			
261	U214	10	P	S01			
262	U215	10	P	S01			
263	U216	10	P	S01			
264	U217	10	P	S01			
265	U218	10	P	S01			
266	U219	10	P	S01			
267	U220	10	P	S01			
268	U222	10	P	S01			
269	U223	10	P	S01			
270	U225	10	P	S01			
271	U226	10	P	S01			
272	U227	10	P	S01			
273	U228	10	P	S01			
274	U234	10	P	S01			
275	U235	10	P	S01			

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EPA I.D. Number *(enter from page 1)*				Secondary I.D. Number *(enter from page 1)*			
OH7890008983							
XIV. Description of Hazardous Wastes *(continued)*							
Line Number	A. EPA HAZARD WASTE NO. *(enter code)*	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE *(enter code)*	D. PROCESS			
				(1) PROCESS CODES (enter)			(2) PROCESS DESCRIPTION (If a code is not entered in D(1))
276	U236	10	P	S01			
277	U238	10	P	S01			
278	U239	10	P	S01			
279	U240	500	P	S01			
280	U243	10	P	S01			
281	U246	10	P	S01			
282	U247	10	P	S01			
283	U248	10	P	S01			
284	U328	10	P	S01			
285	U353	10	P	S01			
286	U359	10	P	S01			
287	U-XXXX	*	P	S01			

* Represents any waste code not listed in this description list.

EPA I.D. Number *(enter from page 1)*	Secondary I.D. Number *(enter from page 1)*
OH7890008983	

XIV. Description of Hazardous Waste *(continued)*

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 6.

Line Number	Additional Process Codes *(enter)*								

XV. Map

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in this map area. See instructions for precise requirements.

XVI. Facility Drawing

All existing facilities must include a scale drawing of the facility (see instructions for more detail).

XVII. Photographs

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment, and disposal areas; and sites of future storage, treatment or disposal areas (see instructions for more detail).

XVIII. Certification(s)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Owner Signature	Date Signed
L. D. Boggs	2/17/2000

Name and Official Title *(type or print)*

L. Dennis Boggs, Acting Site Director Portsmouth Site Office

Operator Signature	Date Signed
J. E. King	2/17/00

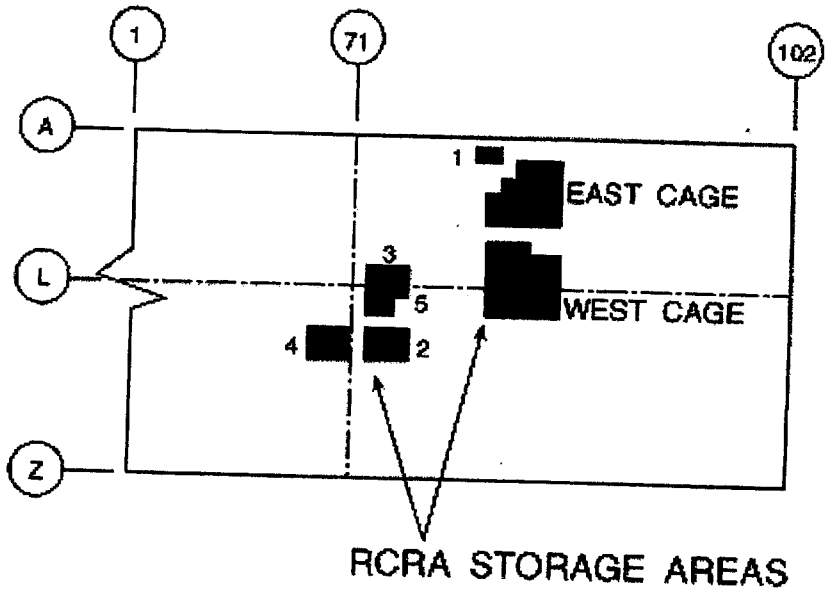
Name and Official Title *(type or print)*

J. E. King, Manager of Projects Bechtel Jacobs Company LLC - Portsmouth Project

XIX. Comments

Facility Drawing

X-326 Mixed Waste Storage Unit

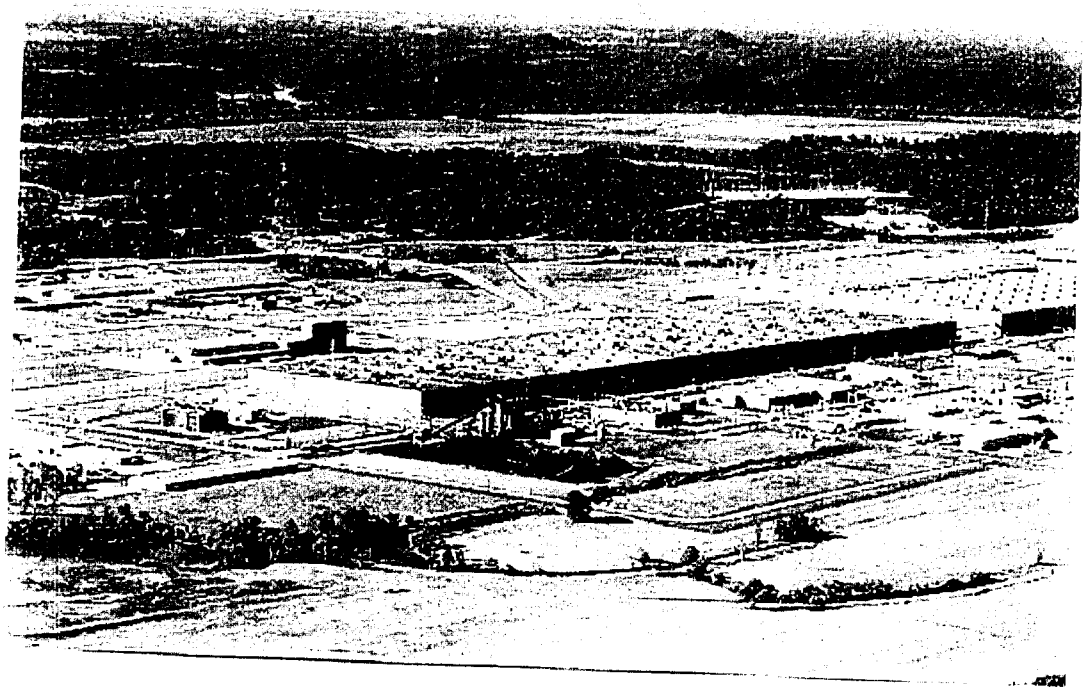


X-326 BUILDING

FLOOR PLAN

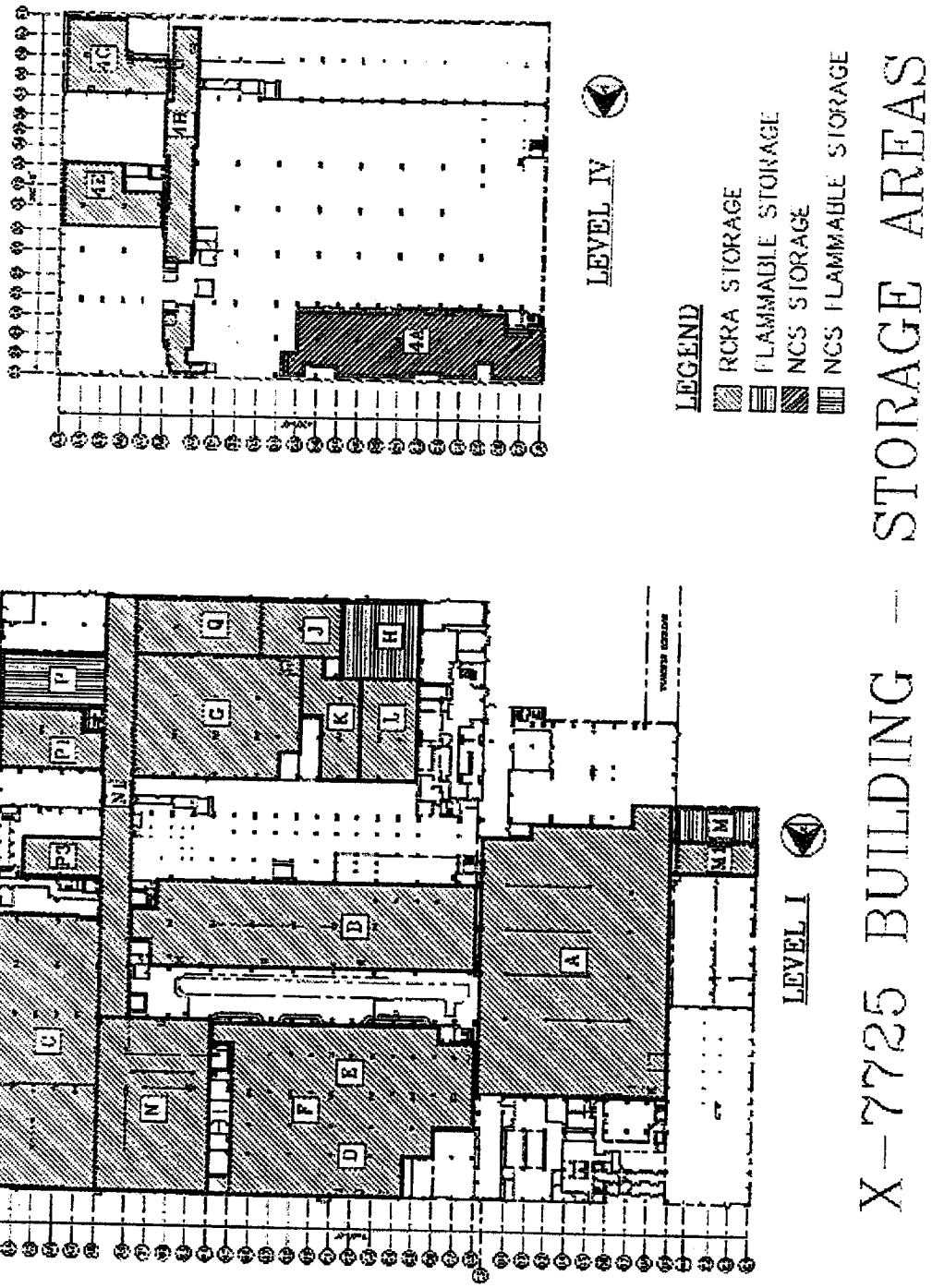
RCRA STORAGE AREAS

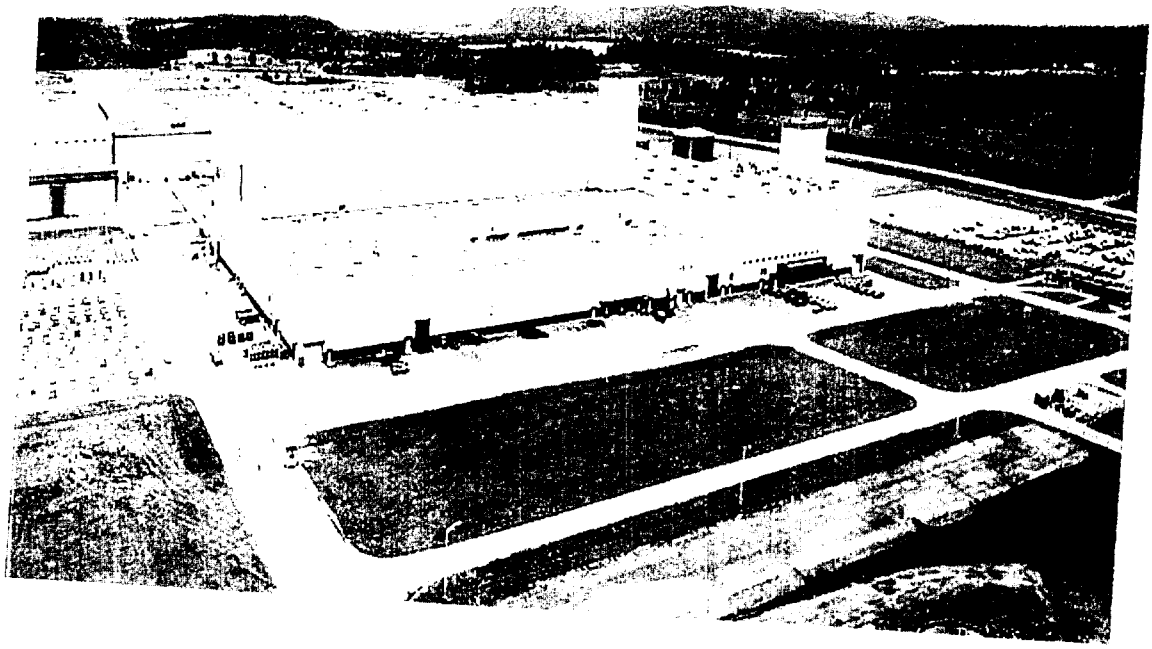
SCALE: NONE



1. X-326 Overview

Unit Drawing
X-7725 BUILDING LAYOUT





1. X-7725 Overview

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Section B

Facility Description

B-1 General Description [3745-50-44(A)(1)]

This facility description section is intended to provide the permit application reviewer with a general overview of the Portsmouth Gaseous Diffusion Plant (PORTS) facility and the activities conducted at the site by the U. S. Department of Energy (DOE). The RCRA Part B Hazardous Waste Permit Application that comprises this document is for a final permit for container storage units X-326 and X-7725 and is divided into Sections A through N. Documents and information required to support a particular section are provided within that section. Section A of this permit comprises the requirements of the "Part A" permit application for the X-326 and X-7725 hazardous waste storage units at PORTS.

PORTS is owned by DOE and is contractor managed by Bechtel Jacobs Company LLC. For the purposes of this permit application, DOE and Bechtel Jacobs Company LLC are Co-Operators of the X-326 and X-7725 Hazardous Waste Storage Units. Currently, DOE activities at PORTS employ approximately 200 people. The address for the facility is:

U.S. Department of Energy
Portsmouth Gaseous Diffusion Plant
3930 U.S. 23 South
Piketon, OH 45661

The mailing address for all correspondence is:

U.S. Department of Energy
Attention: Melda J. Rafferty
P.O. Box 700
Piketon, OH 45661

The primary contact for hazardous waste storage activities at PORTS is:

U.S. Department of Energy
Attention: Melda J. Rafferty
P.O. Box 700
Piketon, OH 45661

SUBMISSION DATE: February 21, 2000

The U.S. EPA identification number for DOE Operations at PORTS is:

OH7890008983

PORTS is located at 39°00'30" N latitude and 83°00'28" W longitude on a 3,714-acre federally owned reservation in Pike County, Ohio. Pike County, one of the state's lesser populated counties, encompasses an area of approximately 444 square miles. The site is located approximately equidistant between Chillicothe and Portsmouth, Ohio, as shown in Fig. B-1. The plant site is approximately 4 miles southeast of Piketon, Ohio, 1.5 miles east of U.S. Route 23, 2 miles east of the Scioto River, and 70 miles south of Columbus, Ohio. Major site facilities are shown in Fig. B-2. Figs. B-3 through B-6 each present one-quarter of the site in greater detail with topographic contours.

PORTS has operated since 1954, enriching uranium for national defense and commercial nuclear reactors. That enrichment is accomplished by the gaseous diffusion process.

As of 1993, all uranium enrichment operations at PORTS are conducted by the United States Enrichment Corporation, formed as a government-owned corporation by the Energy Policy Act of 1992, that became private in July 1998. As such, DOE's mission at the PORTS site has changed to environmental restoration, waste management, removal of highly enriched uranium, and operation of nonleased facilities.

As a result of historical and current enrichment operations, and as is typical of large industrial plants, a wide variety of hazardous wastes are generated. These include analytical laboratory wastes, spent solvents, electroplating wastes, paint wastes, sludges, corrosive wastes, and environmental restoration generated wastes. Table B-1 shows the status of active hazardous waste management units at PORTS and includes the hazardous waste container storage units X-326 and X-7725. Descriptions of X-326 and X-7725 are provided in the paragraphs that follow. Table B-2 provides a listing of solid waste management units at PORTS.

X-326 Hazardous Waste Container Storage Unit

The X-326 Storage Unit is located in the central part of the PORTS site. The X-326 Building has been in use since 1956 for the enrichment of uranium hexafluoride. The structure is 2,230 feet long, 552 feet wide, and 62 feet high. It contains 58 acres of floor space. The X-326 Building is totally enclosed with a built-up roof, transite walls, and concrete floors. There are six areas of the building, totaling approximately 31,888 square feet, designated for the storage of hazardous

wastes. The storage areas are located on the first floor towards the south end of the building (Fig. B-4).

The X-326 Storage Unit is intended for the storage of high assay uranium bearing hazardous wastes until further uranium classification, or off-site shipment for recovery, treatment, or disposal is completed. Waste types to be stored in the X-326 hazardous waste storage areas may include any or all of the waste codes specified in Part A of this permit application.

Six areas have been delineated for the storage of hazardous wastes in the X-326 building. These are: Areas 1, 2, 3, 4, and 5, and the "L" Cage (the "L" Cage consists of both the east cage and the west cage). Storage area floors are primed and finished with a urethane-based sealant. All storage areas are surrounded by a 1" x 1" x 1/8" angle iron dike set in a chemically resistant elastomeric sealant. The floors are 0.8 feet thick and constructed of concrete.

X-7725 Hazardous Waste Container Storage Unit

The X-7725 Building was originally designed for Gaseous Centrifuge Enrichment (GCEP) activities. However, after GCEP was canceled in 1985, the X-7725 Building was selected as the site for hazardous waste container storage because it has a large area of floor space kept under climate-controlled conditions. The building consists of five floors with 20 acres of total floor space under roof. Approximately 9 acres of floor space are used for hazardous waste container storage activities. The building is divided into a number of rooms, staging areas, open bays, and offices (Fig. B-4).

The X-7725 Building has built-up roofing over rigid insulation and metal decking. Room and bay ceiling heights range from 11 feet to 75 feet. Each level of the roof is designed to direct rainwater drainage to metal downspouts, which discharge to a storm sewer. The flooring is constructed of reinforced concrete slabs varying from 6 to 17 inches thick. The entire building is climate-controlled. Heat is provided by recirculating heating water and cooling by chilled water systems.

Wastes that may be stored in the X-7725 Building hazardous waste storage areas include any of the waste codes listed in Part A of this application.

All hazardous waste storage areas in the X-7725 Building have berms to provide for a secondary containment capacity of 10% of the total waste volume of hazardous waste stored and 25% of the total waste volume where RCRA/TSCA wastes are stored. The floor of the X-7725 Building is free of cracks and gaps and is sealed with a chemically resistant sealant.

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B-2 Topographic Map [3745-50-44(A)(19]

The topographic contours for the PORTS site are presented in Figs. B-3 through B-6 and indicate map scale, surface waters and intermittent streams, surrounding land uses, orientation, legal boundaries of the DOE reservation, access control to the limited area, buildings, barriers for drainage and/or flood control, as well as the location of the X-326 Building and X-7725 Building hazardous waste storage areas.

Fig. B-2 shows the 100-year floodplain areas because they do not extend close enough to be included in the quadrant maps; in addition, the DOE boundary is shown with a margin that extends at least 1,000 feet beyond any unit boundary. The scale of 1 inch equals 450 feet was used to show the complete facility on one map. All units lie more than 1,000 feet from the boundary of the site. All other maps are rendered at the required scale. The surrounding land usage is farmland and timberland with scattered residences, as evidenced by the map.

All private withdrawal wells within 1,000 feet of the DOE boundary are shown on Figs. B-3 through B-6. This information was obtained from the Ohio Department of Natural Resources.

B-3 Facility Location - Floodplain [3745-50-44(A)(11)(c)]

A flood hazard boundary map for Pike County, Ohio, was obtained to determine whether the facility is located in a 100-year floodplain. The information from this map is depicted in Fig. B-2 and was derived from the Federal Insurance Administration (FIA) map panels 110 and 125 of FIA map No. 39131C0000. As presented on Fig. B-2, the X-326 and X-7725 hazardous waste storage units do not lie within a 100-year floodplain.

B-4 Facility Location - Seismic [3745-54-18(A)]

Appendix VI of 40 CFR 264 lists political jurisdictions in which compliance with seismic standards must be demonstrated. Pike County, Ohio, is not listed in Appendix VI; therefore seismic considerations need not be addressed.

B-5 Traffic Patterns [3745-50-44(A)(10)]

Traffic associated with waste movement at PORTS is limited to on-site waste generation movement and off-site waste shipments to commercial and/or government treatment or disposal facilities.

Access to PORTS for off-site shipments is from five major roads: State Route 32 from the north; U.S. Route 23 from the west; Old Route 23 from the southwest; Big Run Road from the south; and Dutch Run Road from the east. Commercial carriers are instructed to use U.S. Route 23 or State Route 32.

The PORTS controlled area is traversed by approximately 17 miles of paved roads. These roadways provide vehicular access to all buildings and remote facilities and are capable of bearing heavy loads, such as construction equipment, tanker trucks, and trailers. The base of the road system at PORTS is comprised of 9-12 inches of aggregate base material meeting Ohio Department of Transportation specification 304 and also incorporates a minimum 3 inches of asphaltic concrete surface. This type of construction meets the American Association of State Highway Official specification for a roadway surface requiring an 18,000 pound per axle loading capacity.

All roadways at PORTS accommodate two-way traffic and have posted speed limits. Vehicular traffic at all intersections is controlled by traffic lights, stop signs or yield signs, as appropriate. The PORTS security police provide traffic control on the plant perimeter road.

A traffic survey was conducted by the Portsmouth Safety Analysis Department in 1988 and updated in 1990. Traffic flow and volume at PORTS indicate a rise in morning traffic as the workforce arrives, a sustained level during the daylight hours, and a reduction in late afternoon as the day shift leaves. Volume estimates are supplied in Tables B-3 and B-4.

Table B-1
Hazardous Waste Management Units

Unit	Status
X-326 Hazardous Waste Container Storage Unit	Operating as Permitted Storage Unit
X-7725 Hazardous Waste Container Storage Unit	Operating as Permitted Storage Unit
X-326 DMSA	Closure Work Completed and Approved by Ohio EPA
X-744Y Radiological Waste Storage Yard	Unit integrated into RCRA Corrective Action Program
X-231B Land Treatment Unit	Unit integrated into RCRA Corrective Action Program
X-701B Surface Impoundment	Unit integrated into RCRA Corrective Action Program
X-735 North Landfill	Closure Completed: In Post-closure Care
X-749 Landfill	Closure Completed: In Post-closure Care
X-616 Surface Impoundment	Closure Completed: In Post-closure Care
X-230J7 Surface Impoundment	Unit integrated into RCRA Corrective Action Program
X-701C Neutralization Pit	Unit integrated into RCRA Corrective Action Program

Table B-2
Solid Waste Management Units

UNIT NUMBER	UNIT TITLE
X-231A	OIL BIODEGRADATION PLOT
X-231B	OIL BIODEGRADATION PLOT
X-701BP	NORTHEAST OIL BIODEGRADATION PLOT
X-614A	SEWAGE LIFT STATION
X-614B	SEWAGE LIFT STATION
X-614D	SEWAGE LIFT STATION
X-614P	SEWAGE LIFT STATION
X-615	ABANDONED SANITARY SEWAGE TREATMENT PLANT
X-616	EFFLUENT CONTROL FACILITY/FORMER CHROMIUM SLUDGE LAGOONS
X-617	pH ADJUSTMENT
X-622T	CARBON FILTRATION UNIT
X-622	SOUTH GROUNDWATER TREATMENT FACILITY
X-623	NORTH GROUNDWATER TREATMENT FACILITY
X-624	GROUNDWATER TREATMENT FACILITY
X-625	GROUNDWATER TREATMENT FACILITY
X-626	RECIRCULATING WATER PUMP HOUSE AND COOLING TOWER
X-630	COOLING TOWER BASIN
X-630-1 X-630-2 X-630-2	RECIRCULATING WATER PUMP HOUSE, COOLING TOWER, AND ACID HANDLING STATION
X-633	RECIRCULATING WATER PUMP HOUSE AND COOLING TOWER
X-701E	NEUTRALIZATION FACILITY
X-230G	RCW SYSTEM
X-6614E	SEWAGE LIFT STATION
X-6614J	SEWAGE LIFT STATION
X-6619	SEWAGE TREATMENT FACILITY
	SANITARY SEWER SYSTEM

Table B-2 (continued)

UNIT NUMBER	UNIT TITLE
	STORM SEWER SYSTEM
X-103	AUXILIARY OFFICE BUILDING
X-104A	INDOOR FIRING RANGE
X-114A	FIRING RANGE
X-120	OLD TRAINING FACILITY SITE
X-326	PROCESS BUILDING
X-330	PROCESS BUILDING
X-333	PROCESS BUILDING
X-343	FEED VAPORIZATION AND SAMPLING FACILITY
X-344C X-344D	HF STORAGE FACILITY AND HF NEUTRALIZATION PIT
X-600 X-600A	COAL FIRED STEAM PLANT AND COAL STORAGE YARD
X-700	CHEMICAL CLEANING FACILITY (SOILS ONLY)
X-700 X-705	PROCESS WASTE LINE SOILS
X-700T	TCE/TCA OUTSIDE STORAGE TANK (SOILS ONLY)
X-701C	NEUTRALIZATION PIT (SOILS ONLY)
X-705	DECONTAMINATION BUILDING (SOILS ONLY)
X-705A X-705B	RADIOACTIVE WASTE INCINERATION /CONTAMINATED BURNABLES STORAGE LOT (SOILS ONLY)
X-710	TECHNICAL SERVICES BUILDING AND NEUTRALIZATION PIT (SOILS ONLY)
X-720	MAINTENANCE BUILDING (SOILS ONLY)
X-736	CONSTRUCTION SPOILS AREA
X-744Y X-744G	WASTE STORAGE YARD AND BULK STORAGE BUILDING (SOILS ONLY)
X-744W	SURPLUS AND SALVAGE WAREHOUSE
X-749	CONTAMINATED MATERIALS DISPOSAL FACILITY (SOILS ONLY)
X-751	MOBILE EQUIPMENT GARAGE

Table B-2 (continued)

UNIT NUMBER	UNIT TITLE
X-760	PILOT INVESTIGATION BUILDING AND NEUTRALIZATION PIT (SOILS ONLY)
X-770	MECHANICAL TESTING FACILITY
X-3001	PROCESS BUILDING
X-3346	FEED AND WITHDRAWAL FACILITY
	BARREN AREA
	OLD NORTHWEST FIRING RANGE (RUBY HOLLOW)
	RAILROAD SPUR YARD STORAGE AREA
	TRANSFORMER CLEANING STORAGE PAD
X-530A X-530B X-530C X-530D X-530E X-530F X-530G	SWITCHYARD, SWITCH HOUSE, TEST AND REPAIR BUILDING, OIL HOUSE, VALVE HOUSE, AND GCEP OIL PUMPING STATION
X-533A X-533B X-533C X-533D X-533E X-533F X-533H	SWITCHYARD, SWITCH HOUSE, TEST AND REPAIR BUILDING, OIL HOUSE AND ASSOCIATED FRENCH DRAINS, VALVE HOUSES, AND GAS RECLAIMING CART GARAGE
X-747G	NORTHEAST CONTAMINATED MATERIAL STORAGE YARD (SOILS ONLY)
X-747F	MISCELLANEOUS MATERIALS STORAGE YARD
X-747H	NORTHWEST SURPLUS AND SCRAP YARD
	DON MARQUIS SUBSTATION (DRAINAGE COLLECTION PONDS) AND CONSTRUCTION SPOILS
X-326	CONTAINER STORAGE UNIT (L-CAGE)
X-326	PCB STORAGE UNIT
X-330	PCB STORAGE AREA
X-333	PCB STORAGE AREA
X-705B	CONTAMINATED BURNABLES STORAGE LOT
X-741	OIL DRUM STORAGE FACILITY

Table B-2 (continued)

UNIT NUMBER	UNIT TITLE
X-744G	UNRESTRICTED CONTAINER STORAGE UNIT
X-744G	RESTRICTED CONTAINER STORAGE UNIT
X-744P X-744N X-744Q	WAREHOUSES AND ASSOCIATED OLD CONSTRUCTION HEADQUARTERS
X-744S X-744T X-744U	WAREHOUSES
X-744RW	RETRIEVABLE WASTE STORAGE AREA
X-744Y	RAD WASTE STORAGE YARD
X-745B	ENRICHMENT PROCESS GAS YARD
X-745C	WEST CYLINDER STORAGE YARD
X-745E	NORTHWEST INTERNATIONAL PROCESS GAS YARD
X-745F	NORTH PROCESS GAS STOCKPILE YARD
X-752	HAZARDOUS WASTE STORAGE FACILITY
XT-847	WAREHOUSE
X-7725 X-7745R BFS FACILITY	RECYCLE & ASSEMBLY BUILDING, RECYCLE & ASSEMBLY STORAGE YARD, AND INITIAL CONSTRUCTION BULK FUEL STORAGE AREA (BULK FUEL STORAGE SWMU)
X-7725	CONTAINER STORAGE UNIT
X-7725	NON-HAZARDOUS WASTE CONTAINER STORAGE UNIT
X-7725R	STORAGE YARD
X-334	TRANSFORMER STORAGE AND CLEANING BUILDING
X-342A X-342B X-342C	FEED VAPORIZATION AND FLUORINE GENERATION BUILDING, FLUORINE STORAGE BUILDING, AND WASTE HF NEUTRALIZATION PIT
X-344 X-344A	URANIUM HEXAFLUORIDE SAMPLING FACILITY AND SETTLING TANK
X-344D	HF NEUTRALIZATION PIT
X-700CT	CHEMICAL AND PETROLEUM STORAGE CONTAINMENT TANKS

Table B-2 (continued)

UNIT NUMBER	UNIT TITLE
X-701C	NEUTRALIZATION PIT
X-701E	NEUTRALIZATION FACILITY
X-710	RADIOACTIVE WASTE PIT
X-720	NEUTRALIZATION PIT AND SOILS
X-740	WASTE OIL HANDLING FACILITY
X-750	MOBILE EQUIPMENT MAINTENANCE SHOP, FUEL STATION, AND WASTE OIL TANK
X-751	MOBILE EQUIPMENT GARAGE
X-760	NEUTRALIZATION PIT
	CHEMICAL AND PETROLEUM CONTAINMENT BASINS (EAST OF X-533A) AND EMERGENCY CONTAINMENT TANKS
	GCEP UNDERGROUND STORAGE TANKS
X-230J3	RUNOFF POND
X-230J3	WEST ENVIRONMENTAL SAMPLING BUILDING AND INTERMITTENT CONTAINMENT BASIN
X-230J5	WEST HOLDING POND AND OIL SEPARATION BASIN
X-230J6	NORTHEAST HOLDING POND, MONITORING STATION, AND SECONDARY OIL COLLECTION BASIN
X-230J7	EAST HOLDING POND AND OIL SEPARATION BASIN
X-230K	SOUTH HOLDING POND
X-611A	NORTH, MIDDLE, AND SOUTH LIME SLUDGE LAGOONS
X-611B	LIME SLUDGE LAGOON
X-621	COAL PILE RUNOFF TREATMENT FACILITY
X-701B	HOLDING POND, CONTAINMENT PONDS AND RETENTION SOILS
X-2230M	SOUTHWEST HOLDING POND, WASTE PILE AND X-617 pH ADJUSTMENT UNIT
X-2230N	WEST HOLDING POND NO. 2
X-734 X-734A X-734B	OLD SANITARY LANDFILL, CONSTRUCTION SPOILS LANDFILL, AND OLD CONSTRUCTION SPOILS LANDFILL
X-735	RCRA LANDFILL

Table B-2 (continued)

UNIT NUMBER	UNIT TITLE
X-735 AND X-735A	SANITARY LANDFILL AND LANDFILL UTILITY BUILDING
X-749 NORTH	HAZARDOUS WASTE LANDFILL
X-749 SOUTH	SOLID WASTE LANDFILL
X-749A	CLASSIFIED MATERIALS DISPOSAL UNIT
X-749B	PETER KIEWIT LANDFILL
	BIG RUN CREEK
	EAST DRAINAGE DITCH
	LITTLE BEAVER CREEK
	NORTH DRAINAGE DITCH, X-230L NORTH HOLDING POND, AND UNNAMED CONSTRUCTION FILL AREA
	NORTHEAST DRAINAGE DITCH
	WEST DRAINAGE DITCH
	5-UNIT GROUNDWATER PLUME
	7-UNIT GROUNDWATER AREA
	X-701B AREA GROUNDWATER AREA
	X-740 WASTE OIL HANDLING FACILITY (GROUNDWATER ONLY)
	X-749/X-120 GROUNDWATER PLUME

Table B-3
All DOE Vehicles Operating at PORTS – 1998

Description	Number
Auto	2
Pickup	33
Van	6
Truck (1 ton and up)	8
Bulldozer	2
Grader/Paver	1
Fork Lift	37
Allied Wagner Cylinder Stacker	1
Track Hoe	1
Garbage Truck	1
(Other) Front End Loader	1
(Other) Trash Compacter	2
Total	95

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Table B-4
Vehicles Operating at PORTS* – 1990

Dept. Number	Dept. Name	No. of Vehicles	Trips/ Day	Miles/ Day	Miles/ Year
001	Off-site Contractors	21	48	139	34,730
002	Credit Union	1	2	2	500
221	Training	3	22	38	9,500
330	Materials & Services	12	52	60	15,000
501	Quality/Technical Service	1	8	16	4,000
540	Data Processing	4	32	104	26,000
541	Lab Services	1	1	2	500
542	Mail & Records	3	21	210	52,500
543	Reproduction	4	22	44	11,000
551	Quality Control	6	20	74	18,500
611	Electrical Engineering	1	3	6	1,500
621	Mechanical/Civil Engineering	2	4	10	2,500
632	Construction Engineering	4	3	24	6,000
633	GCEP Engineering Management	2	14	56	14,000
700	Maintenance	261	936	705	176,107
811	X-333 Building	1	5	8	1,875
812	X-330 Building	2	12	21	5,250
814	X-326 Building	1	5	10	2,500
823	Chemical Operations	12	71	142	35,600
829	Uranium Materials Handling	5	27	54	13,800
831	Power Operations	6	27	76	19,000
832	Utilities Operations	11	453	1260	315,075
911	Police	29	70	968	242,100
912	Security & Police	13	24	75	18,750
920	Fire Protection Services	2	12	6	1,500
921	Fire Department	8	14	40	10,000
	TOTAL	**416**	**1,908**	**4,150**	**1,037,787**

*Excludes all vehicles that travel solely within a building or production area.

FIGURE B-1
Plantsite Location within State of Ohio

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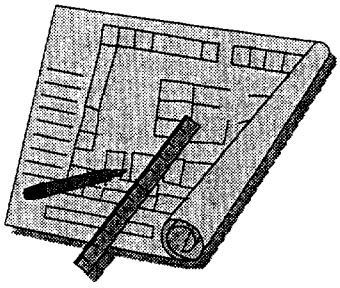
FIGURE B.2



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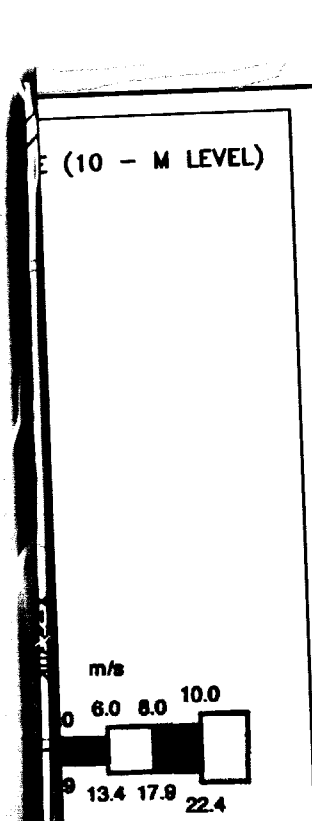

N
True
North

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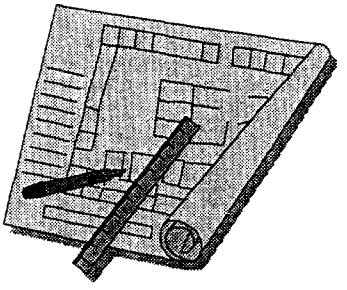
FIGURE B-3
SOUTHEAST QUADRANT

SAIC®

Science Applications International Corporation — *Columbus, Ohio*



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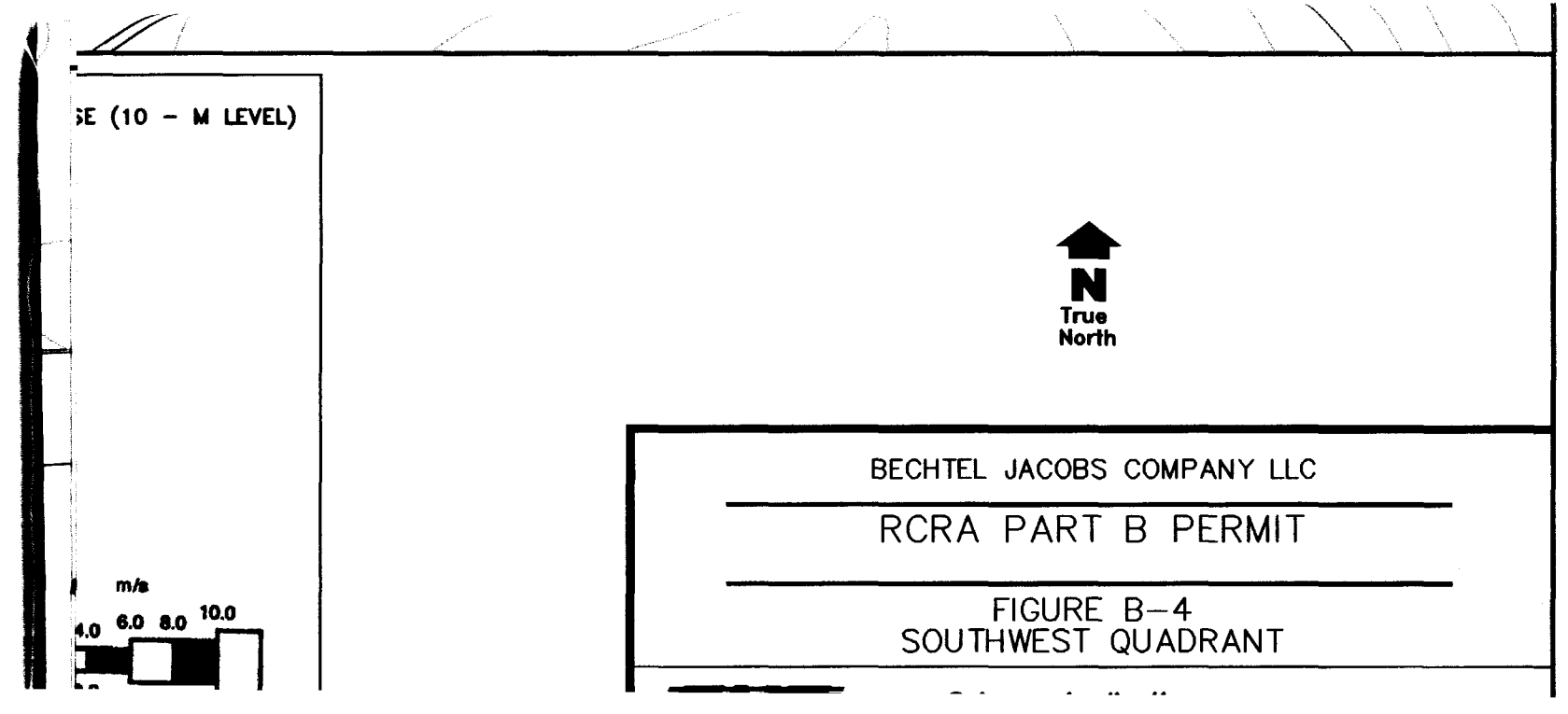

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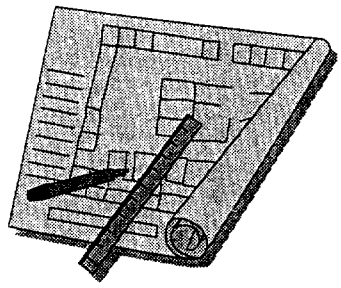
FIGURE B-4
SOUTHWEST QUADRANT



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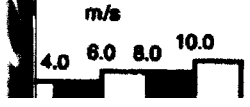

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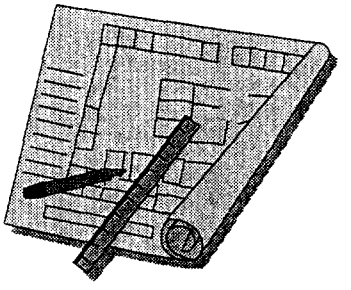
FIGURE B-5
NORTHEAST QUADRANT



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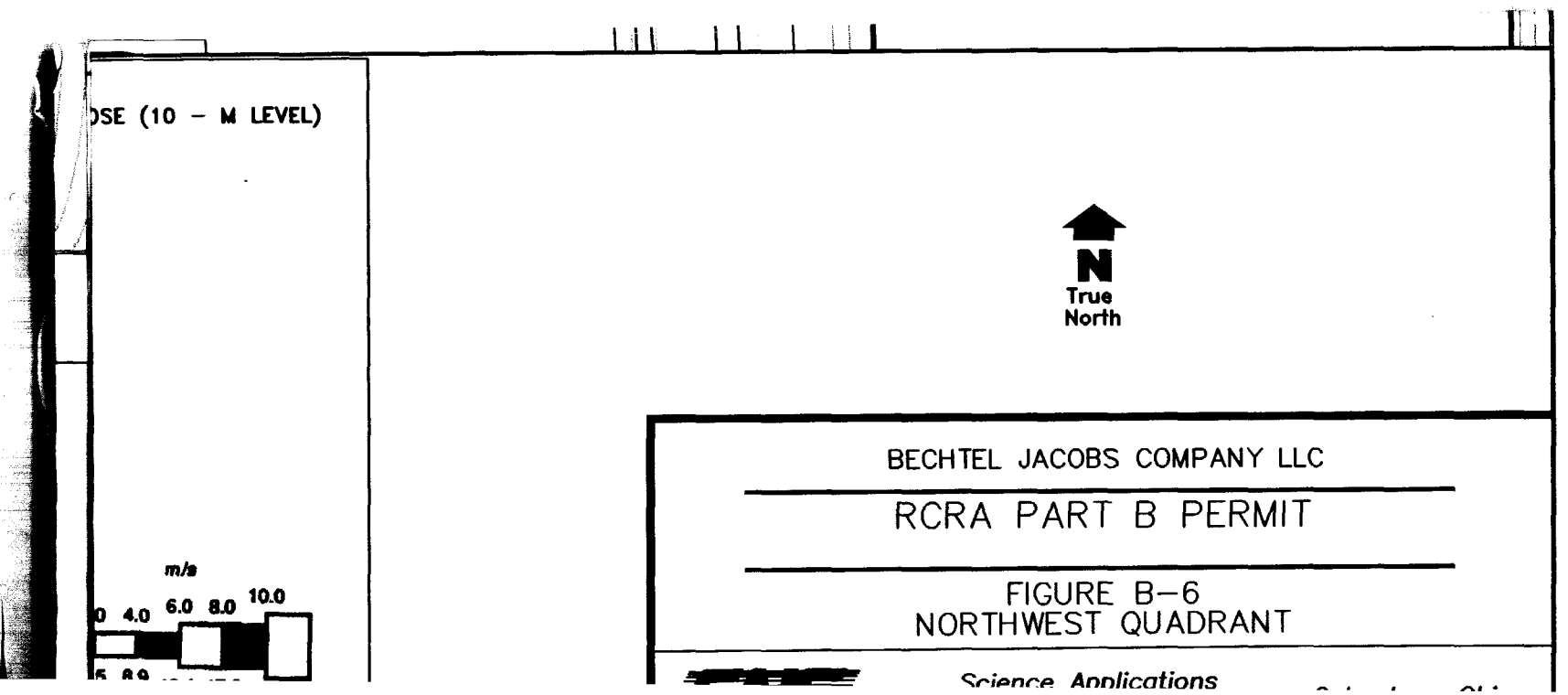

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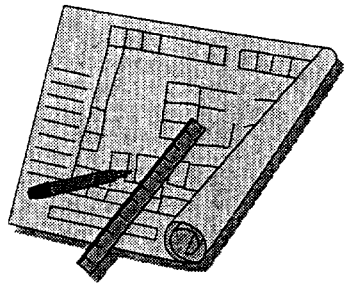
FIGURE B–6
NORTHWEST QUADRANT

Science Applications



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Section C

Waste Characteristics

C-1 Chemical and Physical Analysis [3745-50-44(A)(2), 3745-54-13(A)]

The Portsmouth Gaseous Diffusion Plant (PORTS) is a large, industrial, chemical processing complex that generates a variety of wastes. The Department of Energy is responsible for environmental restoration and waste management at the site. The gaseous diffusion process buildings and related facilities were leased to United States Enrichment Corporation (USEC) on July 1, 1993. USEC is responsible for the waste generated as a result of the gaseous diffusion process. The X-326 and X-7725 container storage units are used to store waste generated by DOE from current environmental restoration and waste management activities and waste generated prior to the lease agreement with USEC. Some USEC-generated wastes are also stored in the container storage units. Limitations on the storage of USEC Land Disposal Restriction wastes are provided by a separate Director's Finding and Orders for USEC. DOE and Bechtel Jacobs Company LLC are not responsible for compliance with the USEC Order.

Waste managed by DOE includes a variety of closure and remediation wastes, such as excavated soils, wastewater treatment sludge, neat trichloroethylene, and "legacy" waste generated from the gaseous diffusion plant operations prior to the lease agreement with USEC. The gaseous diffusion process, which has been operated by USEC since July 1, 1993, produces enriched uranium using conventional mechanical equipment.

All of the hazardous wastes generated at PORTS by DOE are currently assumed to include radioactive material from DOE operations and must be stored onsite as mixed (hazardous and radioactive) waste. Wastes determined to be mixed wastes are managed at the X-326 or X-7725 container storage units or shipped to another DOE Facility until approved treatment and disposal methods for mixed wastes are available. If sufficient documentation is developed to demonstrate that a waste contains no added radioactive constituents, the waste will be shipped offsite to a commercial treatment, storage, disposal, or recycling facility.

The largest volume of wastes generated by DOE are from environmental restoration activities at the site. The hazardous wastes generated by diffusion-related activities, currently conducted by USEC, consists of oils, solvents, and other cleaning agents produced in decontamination and maintenance activities. These hazardous wastes are predominantly

characterized on the basis of process knowledge. PORTS assumes that suspected contaminants are present until further investigation and/or analysis proves the constituents are not present or are present at concentrations below characteristic regulatory thresholds. All hazardous wastes are stored in the container storage units located within the X-326 and X-7725. A detailed description of these units is presented in Section D.

The following text and Table C-1 provide a brief description of each hazardous waste stream stored at PORTS presented by activity or area of generation. These descriptions include the following information for each waste stream: the generating process; the history of the process (where relevant); the hazardous characteristic or nature of each waste stream; and the basis for characterization. The constituency and hazardous waste code designations provided represent a survey of the general nature of each waste stream. Actual constituency and waste codes will not necessarily include all those provided in the following discussion. These waste streams and sources include certain historically generated wastes remaining in storage because of a lack of offsite treatment or disposal methods. In addition, waste streams and sources identified in this section include wastes/sources that are currently anticipated from planned activities. Proper storage of all wastes is ensured through the use of the waste stream review/analysis procedures provided in Section C-2.

The list of waste streams presented in Table C-1 includes a brief explanation of the basis for characterization for each waste stream. PORTS most commonly uses its understanding of generating processes, manufacturer's knowledge and materials used to characterize its wastes, and Table C-1 reflects this characterization. PORTS often uses Material Safety Data Sheets (MSDSs) in support of its waste characterizations based on process knowledge. PORTS has conducted analysis for several wastes to confirm characterization. Table C-1 indicates whether or not analysis exists and example analytical reports are presented in Appendix C-1. In addition, representative MSDSs used to support waste characterization are presented in Appendix C-2. All data supporting waste characterizations are maintained in the facility operating record for a minimum of 3 years.

It is important to note that many petroleum products are used at PORTS, and because benzene is commonly found in many petroleum products, benzene has been identified as a potential constituent of the waste oils and fuels found at PORTS. Accordingly, PORTS is currently managing many petroleum products as hazardous wastes because the analytical method previously used had detection limits that were higher than the regulatory threshold for benzene. This problem has been overcome with improved analytical techniques.

Waste streams have been assigned numbers to facilitate cross referencing between the waste stream narrative, Table C-1, and the support documents in Appendix C-1. Waste stream numbers begin with number or letter designations representing the building or activity that is the primary source of the wastes. Letter precursors of PORTS building numbers such as "X" have been omitted to simplify the numbering system. Following the characters identifying the source is a number representing each individual waste stream from a generating source. For example, waste stream number 100-1 represents the first waste stream discussed from the X-100 Administration Building. In the case of waste streams that are common across the plant site, the letters "SW" are used as the designated source of the wastes, representing wastes that are generated site wide. Waste stream numbers have relevance only in this permit application and do not reflect any numbers that are or will be assigned by DOE and/or Bechtel Jacobs Company LLC in managing the X-326 or the X7725 container storage units.

Site Wide (SW)

Many waste streams generated at PORTS are common to various locations around the site. Rather than discuss these wastes in the context of each building or generating source, the following text describes them as they occur site-wide.

Laboratory Off-Specification Chemicals

Due to the nature of the laboratory activities conducted in various locations at PORTS, a large number of small containers of chemicals are required for testing and formulation. These chemicals are routinely depleted, but occasionally they must be considered waste due to process changes or to chemicals being stocked past their shelf lives. Laboratory off-specification chemicals (SW-1) are now classified as with metals (SW-1A) or without metals (SW-1B), when possible, and are characterized as hazardous wastes through process knowledge (as shown on Table C-1) according to the nature of the constituents identified on the containers or MSDSs.

Rags, Gloves, Wipes, Absorbent Material, etc.

Operations at PORTS involve the use of rags, gloves, wipes, absorbent materials, etc. in support of processes and activities in every building. These materials (SW-2) are primarily used in general cleaning, spill cleanup, material handling, and various maintenance activities as provided in Table C-1. Such materials are characterized as hazardous wastes through process knowledge and MSDS information on the basis of their usage and constituency. In addition, analysis of these

wastes from several sources has found the wastes may contain chromium (D007), lead (D008), and/or benzene (D018).

Floor Sweepings

Floor Sweepings (SW-3) are generated by housekeeping activities in all PORTS process-related buildings. Based on analytical results, these sweepings are characterized as hazardous wastes because they contain cadmium (D006), chromium (D007), lead (D008), and/or selenium (D010). Metals found in floor sweepings are from maintenance or machining activities in the cascade process buildings.

Batteries

Operations at PORTS involve the use of batteries in a variety of applications. Batteries managed as hazardous waste include lithium batteries (SW-4A), mercury batteries (SW-4B), spent and/or broken lead-acid batteries (SW-4C), and nickel-cadmium batteries (SW-4D). These waste batteries are characterized as D003, D007; D009; D002, D008; and D006 hazardous wastes, respectively, due to the presence of acid and chromium; mercury; acid and lead; or cadmium, as identified in MSDS for the batteries. Waste Stream SW-4 is maintained for historical battery waste that are mixed battery types.

Light Bulbs

Spent fluorescent bulbs (SW-5A), mercury-vapor bulbs (SW-5B), and sodium-vapor and other incandescent light bulbs (SW-5C) are characterized as hazardous wastes at PORTS due to the presence of mercury (D009) and/or lead (D008). Waste stream SW-5 is maintained for spent light bulbs that are not releasable due to radiological concerns. Metallic constituents in the light bulbs were identified by the bulb manufacturers. Available documentation supporting the hazardous waste characterization of waste bulbs is provided in Appendix C-1.

Antifreeze

During routine and preventative maintenance operations of facilities and machinery, quantities of waste antifreeze solutions are generated. Waste antifreeze (SW-6) is characterized as hazardous waste as a result of analytical data, which indicates the presence of selenium (D010).

Gas Cylinders

Spent commercial compressed-gas cylinders (SW-7) are generated at PORTS. A cylinder of hydrogen cyanide (P063) became off-specification when instruments that used hydrogen cyanide in their calibration process were replaced with instruments that did not. Other spent off-specification cylinder contained gases, such as chlorine trifluoride (D003) or acetylene (D001), are also anticipated to be generated as a result of process changes.

Aerosol Cans

PORTS uses aerosol cans containing various paints, cleaning solutions, oils, and pesticides in numerous applications throughout the plant. In general, these products are depleted, but occasionally are damaged or determined to contain dated materials and must be managed as wastes. Waste aerosol cans (SW-8) containing product are characterized as hazardous waste based on process knowledge (as provided in Table C-1) according to the nature of their contents as indicated on container markings and labels, as well as on MSDSs. Aerosol cans are stored in drums and labpacks.

Diesel Fuel, Gasoline and Kerosene

Routine and periodic maintenance of generators, pumps, vehicles, and other petroleum-powered devices generates waste fuels. These waste fuels (SW-9) are characterized as hazardous waste based on process knowledge and MSDS information because they may be ignitable (D001) and may contain lead (D008) and benzene (D018). In addition, analysis has found the waste fuels may contain chromium (D007) and confirms that lead (D008) is present in the wastes.

Recirculating Cooling Water/Recirculating Heating Water (RCW/RHW) System Waste

In mid 1991, PORTS completed the process of substitution of a phosphate-based corrosion inhibitor for the chromate-based inhibitor that had been used in cooling and heating water systems. Due to system chromium residuals, chromium-bearing (D007) solid and liquid wastes (SW-10) continue to be generated throughout the plant as a result of the maintenance of the cooling and heating system equipment, and are characterized as hazardous wastes based on analysis.

Non-Laboratory Off-Specification Chemicals

A variety of chemicals are used in production and support operations at PORTS. Aside from the wastes generated from the use of these chemicals that are described elsewhere in this text, these chemicals also sometimes become wastes in unused form. Waste unused chemicals (SW-11) are classified as with metals (SW-11A) and without metals (SW-11B) when possible, and are generated as a result of process changes and expired shelf lives. Unused chemicals are characterized as hazardous wastes based on process knowledge according to the nature of the constituents as indicated on container labels and markings, as well as manufacturer's information, including MSDS information as shown in Appendix C-2.

Flushing Solution

After antifreeze is drained from diesel generators during routine and preventative maintenance activities, as discussed above for waste stream SW-6, a weak sulfamic acid solution is used to flush the generator cooling systems. The resulting waste flushing solution (SW-12) is characterized as a hazardous waste based on analytical data indicating the presence of lead (D008) and on process knowledge because it may be acidic (D002).

Circuit Boards and Miscellaneous Equipment Components

Repair of electronic equipment at PORTS frequently generates waste circuit boards (SW-13). Waste circuit boards are characterized as hazardous wastes containing lead (D008) and silver (D011) based on process knowledge because of solder and other metallic parts on the boards. Photoreceptor drums from copy machines and various fuses from electrical equipment are characterized as hazardous wastes containing lead (D008) based on analytical data.

Cleanup and Spill Residue

Site cleanup and spill response activities generate wastes of varying character. These wastes may be environmental media containing hazardous wastes or may be used chemicals or formulations. These wastes are initially characterized based on process knowledge and, as necessary, later characterized based on analytical data. These wastes may be solid (SW-14A) or liquid (SW-14B) and could have any waste code, depending on the material spilled.

Glass Media

This waste stream (SW-16) is a combination of several historical waste streams that were composed of glass blasting media. These wastes result from very small diameter glass particles used in a sand-blasting environment to remove rust, scale, or radiological contaminants from metal equipment. Additionally, this waste stream includes used glassware derived from various sampling operations and consists of empty sample bottles, lab glassware, and used COLIWASAs. The glassware may be broken. These wastes are similar as far as media characteristics and contaminants and will require similar treatment for disposal. Analytical data indicates the presence of cadmium (D006) and lead (D008).

Metal Shavings

This waste stream (SW-17) is a combination of several historical waste streams, that were comprised of miscellaneous metal shavings or other small pieces of metals. Several operations throughout the plant site generate small metallic shavings through various machining operations such as drilling, filing, and cutting, etc. These wastes, along with the brass shell casings, are being combined due to their similarity of characteristics and contaminants. Process knowledge and analytical data indicated the presence of cadmium (D006), lead (D008), and benzene (D018).

Brick/Concrete and Masonry Wastes

This waste stream (SW-18) results from brick, concrete, and other masonry material wastes that are generated from removal of these materials as the result for spills of listed chemicals or of historical spills in operational facilities. The characteristics of the wastes will be determined on a case-by-case basis.

Miscellaneous Burnable Debris

This waste stream (SW-19) results from wood, rubber/plastic, and other burnable material wastes that are generated from the removal of these materials as the result of spills of listed chemicals or of historical spills in operational facilities. The characteristics of the wastes will be determined on a case-by-case basis.

Soil from non-ER Activities

This waste stream (SW-20) results from soil and other earthen wastes that are generated from removal of these materials as the result of spills of listed chemicals or of historical spills in operational facilities. The characteristics of the wastes will be determined on a case-by-case basis.

Contaminated Water from non-ER Projects

Contaminated waters (SW-21) result from projects other than environmental restoration project. These waters can be generated from the collection of surface water, decontamination, or rinsing of equipment at the project site. The characteristics of the wastes will be determined on a case-by-case basis.

Sludges from Groundwater, Decontamination Water, Surface Water, etc.

This waste stream (SW-22) is primarily sediments that have settled from different wastewaters that have been generated in various activities. The hazardous characteristics of this waste stream will be derived from the originating waste.

Sludges from Oils or Other Organic Liquids

This waste stream (SW-23) is primarily sediments that have settled from the different organic wastes that have been previously generated in various activities. The hazardous characteristics of this waste stream will be derived from the originating waste.

Environmental Restoration (ER)

Environmental Restoration is responsible for oversight of the RCRA Facility Investigation (RFI) and closure of inactive RCRA units at PORTS. The wastes generated as a result of these activities will commonly be managed as hazardous wastes contained in an environmental medium, such as groundwater.

Groundwater and Related Water

Environmental restoration activities often include the installation, pumping, or sampling of groundwater wells. As a result, groundwater, excess sample water, and decontamination water (ER-1) are generated and commonly treated at wastewater treatment facilities located at the X-622, X-622T, X-623, X-624, or X-625. Occasionally however, such waters must be stored due

to treatment facility down time. These wastewaters are stored as hazardous wastes based on the knowledge that they may contain trichloroethylene, a spent solvent (F001), on the presumption that only degreasing activities caused groundwater contamination. Analysis has confirmed that some groundwater and related water contain 1,1,1-trichloroethane, as well as trichloroethylene and related degradation products.

PPE and Miscellaneous Debris

Personal Protective Equipment (PPE) and other similar debris such as rags and wipes become contaminated by contact with soil and water during environmental restoration and closure activities. Waste PPE, rags and wipes (ER-2) are managed as wastes contaminated with environmental media that may contain trichloroethylene, a spent solvent (F001). In addition, analysis of these wastes has found that some waste PPE, rags, and wipes contain trichloroethylene and related degradation products, as well as acetone. The source of the acetone has not been determined, but may result from environmental restoration decontamination activities.

Soils

Environmental restoration activities generate soil (ER-3) as a result of investigation and clean-up work. Soils generated by environmental restoration activities contain low levels of trichloroethylene (TCE), 1,1,1-trichloroethane (TCA), and other related degradation products. Analysis of the soils has found that some contain acetone, trichloroethylene, and 1,2-dichloroethylene. The source of the acetone has not been determined, but may result from Environmental Restoration decontamination activities, rather than soil contamination. The presence of acetone is under investigation to confirm the source of the solvent.

Oil and Debris

Other minor wastes streams generated by Environmental Restoration include small amounts of waste oils (ER-4A) and debris (ER-4B) from the equipment used for investigation and clean-up activities. These wastes are characterized as hazardous wastes based on process knowledge because they may contain benzene (D018).

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Carbon Sludge and Spent Treatment Filters

Carbon sludge (ER-5A) is generated from the groundwater recovery and treatment facilities at PORTS, which are located at the X-622, X-622T, X-623, and X-624. The carbon sludge may contain trichloroethylene,1,1,1-trichloroethane, and related degradation products. Spent treatment filters (ER-5B) are used to remove sediments from the groundwater prior to the water entering the carbon units. These filters are managed as hazardous wastes because they include environmental media containing waste constituents that may be identifiable as spent solvent (F001) hazardous wastes. Analysis of the waste filters has also found they contain carbon tetrachloride (D019), chloroform (D022), 1,2-dichloroethane (D028), and 1,2-dichloroethylene (D029).

Additionally, spent treatment filters are occasionally generated from treating groundwater during underground storage tank closure activities. Waste filters are currently characterized as hazardous wastes because they may contain benzene (D018) as a result of oil or fuel leakage from the tanks.

Neat Trichloroethylene (TCE)

Neat TCE (ER-6) is generated from the groundwater remediation activities conducted at the X-623 and X-624 groundwater treatment facilities. This facility has an air stripper that operates in conjunction with activated carbon filter units. The air stripper produces neat (nearly pure) TCE as a waste along with the spent activated carbon (ER-5A).

Surface Water

Occasionally during the environmental restoration of historical solid waste management units, rain may fall on the contaminated soil within the area of contamination. This surface water is collected and managed as a hazardous waste because of its contact with contaminated soil. The collected surface water (ER-7) is typically classified as an F001 waste and treated at one of the activated carbon filtration units following analysis to meet the unit waste acceptance criteria.

Decontamination Water

During the environmental restoration of many historical solid waste management units, equipment is decontaminated using water and occasionally a mild detergent. The decontamination water (ER-8) is collected and treated at one of the activated carbon filtration units following analysis

to meet the unit waste acceptance criteria. The decontamination water typically is classified as a F001 waste.

Brick, Concrete, and Masonry Wastes

This waste stream (ER-9) results from brick, concrete, and other masonry material wastes that are generated from removal of these materials from closure or decontamination and decommissioning activities. The characteristics of the wastes will be determined on a case-by-case basis.

Floor Sweepings, Vacuum Dust, Etc.

This waste stream (ER-10) will result from the initial cleaning of buildings or other facilities scheduled to undergo closure or decontamination and decommissioning activities. The characteristics of the wastes will be determined on a case-by-case basis.

X-100 Administration Building (100)

The X-100 Administration Building is the main office building for plant operations and also contains areas for document storage and reproduction, photography, printing, and office machine repair.

Office Machine Repair Solvents

Historically, waste isopropyl alcohol and 1,1,1-trichloroethane are generated from office machine repair activities as a result of cleaning parts and machines when servicing office equipment. These waste solvents (100-1) are characterized as ignitable (D001) hazardous wastes based on analysis and as spent solvent (F002) hazardous wastes based on process knowledge and MSDS information.

Printing Solvents Waste

Waste solvents (100-2) are generated in the cleaning of several pieces of reproduction equipment located in the office services department. Reproduction equipment includes a multi TCS System-7 with camera, multi offset printing press, multi graphic duplicator-250, and photographic equipment. Cleaning solutions and printing chemicals used on the equipment contain ethyl alcohol, petroleum naphtha, tetrachloroethylene, trichloroethylene, and methylene chloride. These waste

solvents and associated wastes are characterized as hazardous wastes based on analysis that found they are ignitable (D001). Based on process knowledge and MSDS information, the waste solvents are characterized as hazardous wastes because they contain spent solvents (F002) and may contain chromium (D007), lead (D008), tetrachloroethylene (D039), and trichloroethylene (D040).

Blue Print Solution

Waste blue print solution (100-3) is generated from using aqua ammonia solution in the reproduction of engineering drawings or blue prints in the engineering records section. The waste solution is initially characterized as an alkaline hazardous waste (D002) based on process knowledge and MSDS information. Subsequent analysis (i.e., pH measurement) has indicated a large portion of this waste stream is not hazardous.

Oil

Waste oil (100-4) is generated while repairing refrigeration equipment and while draining equipment using oil-drip collection pans. These waste oils are characterized as hazardous wastes based on process knowledge because they may contain benzene (D018).

Flammable Solvents

Historically, ethyl alcohol was used to clean the rollers on the printing machine and to clean photographic equipment. Naphtha is also used for cleaning printing machine rollers. Once used, these waste solvents (100-5) are characterized as ignitable (D001) hazardous wastes based on process knowledge. An electrostatic solution is used in the diagram plotter in the electrical engineering department in the X-100. The spent solution has been determined by process knowledge to be an ignitable (D001) hazardous waste when removed from the plotter during routine maintenance.

Film/Microfilm

Waste film and microfilm (100-6) are discarded when they are no longer needed. Waste X-ray film is generated by the X-101 hospital. Waste film/microfilm/X-ray film is characterized as hazardous waste based on process knowledge because it may contain silver (D011).

Photoreceptors

During the routine maintenance performed on photocopying machines, the spent photoreceptors (100-7) are removed and managed as hazardous waste. The spent photoreceptors have been determined by analysis to be hazardous for lead (D008).

Silver Recovery Cartridges

As photographic film is developed, a small amount of silver is dissolved from the film. As the photographic solution is discharged, the solution passes through an ion exchange cartridge that removes the silver from the solution. The spent cartridges (100-9) are managed as hazardous waste due to the silver content of the cartridge.

X-101 Hospital (101)

PORTS maintains a hospital facility at the X-101. The hospital is used to conduct worker physicals and respond to health emergencies.

Silver Solution and Related Materials

X-ray development at the hospital generates spent silver solutions and related materials such as filter cartridges (101-2). These wastes are both characterized as hazardous waste based on process knowledge because of the presence of silver (D011).

X-104A Indoor Firing Range (104)

The X-104A Indoor Firing Range Building is used for the training of security forces in the use of various firearms. The firing range is adjacent to the X-104 Police Headquarters, which is the office and dispatch building for the PORTS guard force.

Cleaning Solution

Mop water is generated as a result of normal cleaning of the indoor firing range. This waste solution (104-1) is characterized as a hazardous waste based on analysis that found it contains lead (D008).

Lead Dust/Debris, Filters, PPE

Lead dust and debris are generated from the sweeping of any lead material that may have fallen on the floor. PPE (coveralls, gloves, etc.) is generated when the X-104A facility is cleaned or when it becomes necessary to change the ventilation filters. Waste PPE is also generated when the spent lead bullets are removed from the bullet trap. The indoor firing range ventilation system consists of pre-filters and HEPA filters. As the filters become contaminated with lead dust they are removed from service. Waste dust/debris, filters, and PPE (104-2) are characterized as hazardous wastes based on analysis that found they contain lead (D008), arsenic (D004), barium (D005), cadmium (D006), chromium (D007) and heptachlor (D031).

Lead Bullets

Waste lead bullets (104-3) are recovered from the firing range, most commonly from the bullet trap. The bullets are characterized as hazardous wastes based on process knowledge because they contain leachable lead (D008).

X-326, X-330, and X-333 Cascade Process Buildings (Cascade)

The gaseous diffusion process produces enriched uranium at PORTS in the X-326, X-330, and X-333. Uranium hexafluoride (UF_6) enriched in the uranium-235 isotope is produced in the enrichment process. This creates a very harsh environment for the materials and equipment that come in contact with the UF_6, thus the process equipment must be periodically taken out of service for maintenance or repair. Prior to maintenance or repair, the equipment must be decontaminated to remove uranium and other radioactive constituents. Decontamination is performed using materials that will remove uranium without harming the equipment. The process equipment must also be cleaned after maintenance or repair to remove all contaminants that could react with the fluorinating atmosphere in the cascade process prior to reassembly of the equipment. Halogenated hydrocarbons have been used for this operation because they are compatible with the cascade equipment, and dry without leaving a residue that will react in the cascade process.

The hazardous waste-related activities performed in the process buildings in support of the diffusion processes include minor laboratory work, as well as electrical and mechanical maintenance and decontamination operations.

Gas Analyzer Wastes

Process vent gas analyzers have been used in X-326 to monitor uranium content in production equipment exhaust gases. These analyzers generated spent indicator solutions (Cascade-1) that contain ethanol and acidic liquids and are characterized as corrosive (D002) hazardous wastes based on analysis, and as ignitable (D001) hazardous wastes based on process knowledge. In addition, the X-326 and X-333 utilize sampling areas to collect small amounts of process gas for quality control testing, which is performed at the X-710 Technical Services Building. Wastes produced in these areas include spent nitric acid and acetone from sample container cleaning. These container cleaning wastes are characterized as ignitable (D001) and corrosive (D002) hazardous wastes based on process knowledge.

Solvent

Maintenance work in the cascade process buildings often involves the use of solvents for cleaning and degreasing, which results in the generation of waste solvents (Cascade-2) including: 1,1,1-trichloroethane, trichloroethylene, carbon tetrachloride, methylene chloride, tetrachloroethylene, refrigerant 113, xylene, acetone, methyl ethyl ketone, and toluene. These wastes have been characterized as ignitable (D001) and spent solvent (F001, F002, F003, F005) hazardous wastes, based on process knowledge and MSDS information. In addition, analysis confirmed these waste solvents do contain tetrachloroethylene, methylene chloride, and selenium (D010).

Decontamination Waste Solutions

Decontamination of equipment, which is required prior to maintenance activities, generates aqueous waste solutions (Cascade-3). These waste solutions are characterized as hazardous wastes based on analysis that indicate the solutions may contain chromium (D007) and lead (D008). Based on process knowledge and MSDS information, the solutions may also be acidic or basic (D002), and may contain: arsenic (D004), barium (D005), cadmium (D006), mercury (D009), selenium (D010), silver (D011), and benzene-bearing oils (D018).

Oil/Solvent

Historically, waste oils were found to contain 1,1,1-trichloroethane and other ignitable solvents as a result of equipment flushing activities; however, solvents are no longer used for this purpose. The waste oil/solvents (Cascade-4) currently in storage at PORTS are characterized as

hazardous wastes based on process knowledge and MSDS information because they may contain chromium (D007), lead (D008), and benzene (D018), and because they are considered ignitable (D001) and spent degreasing solvents (F001).

Oil

In the cascade buildings, routine and emergency maintenance is performed on equipment ranging in size from small pumps to large heat transfer equipment and process converters. Maintenance activities generate waste oils from compressors and other production equipment. Waste oils (Cascade-5) have been characterized as hazardous waste based on analysis that found the waste oils contain cadmium (D006), chromium (D007), lead (D008), and mercury (D009). Based on process knowledge, the waste oils may also contain benzene (D018).

Decontamination Waste Solids

In addition to the aqueous wastes described above, decontamination operations often generate various waste solids including sludges and other solids removed from process equipment. Waste solids from decontamination (Cascade-6) are characterized as hazardous wastes because analysis found that the waste solids contain cadmium (D006). Based on process knowledge, the waste solids may contain arsenic (D004), barium (D005), chromium (D007), lead (D008), mercury (D009), selenium (D010), silver (D011), benzene (D018), methyl ethyl ketone (D035), and trichloroethylene (D040). Decontamination sludges and solids may also contain trichloroethylene, 1,1,1-trichloroethane, refrigerant-113, xylene, acetone, methyl ethyl ketone, and toluene, which are considered to be spent solvent (F001, F002, F003, F005) hazardous wastes.

Mercury and Debris

Maintenance of instruments such as manometers occasionally generates small volumes of mercury and associated materials such as broken glass and clean-up materials. These wastes, mercury (Cascade-7A) and the associated debris (Cascade-7B), are characterized as mercury-bearing hazardous wastes (D009) based on process knowledge. The historical waste stream, Cascade-7, is being maintained until the waste is properly treated and disposed.

X-ray Solutions

As part of maintenance and inspection procedures, cascade equipment is X-rayed in place to determine whether it is necessary to remove the equipment for repair or replacement. The X-ray

film is developed in the cascade buildings as a contamination control procedure and to minimize delays in reporting the inspection results. The spent solutions (Cascade-8) from the development of the X-rays are similar to other X-ray development solutions (e.g., 101-1) hazardous for silver (D011), as indicated by the analytical data.

Trap Material

This waste stream (Cascade-10) consists of alumina, magnesium fluoride, sodium fluoride or similar materials from the cascade. Analytical data indicates that some of the material is hazardous for arsenic (D004), cadmium (D006), chromium (D007), lead (D008), and mercury (D009).

X-342 Feed Vaporization and Fluorine Generation Facility (342)

The X-342 feed vaporization facility is used for the sampling and refeed of UF_6 from the cascade process. This facility also contains fluorine generation equipment, also used in support of the cascade process.

Generator Scrap and Debris

Fluorine is generated onsite for process applications by an electrolytic process using potassium fluoride and hydrogen fluoride. When the solution becomes spent, the remaining sludge and liquid are removed and the generator cell is inspected prior to reuse. If necessary, the interior metallic parts and carbon arc blades are removed and become waste generator scrap (342-1). PPE, gloves, rags, and other debris are also generated by this activity. Waste fluorine generator scrap and debris are characterized as hazardous wastes based on analysis that found them to contain arsenic (D004).

Generator Solutions and Sludge

Historically, the fluorine generator cells were opened after the solution was spent and the waste solution was neutralized with lime. Waste generator solution (Decon) (342-2) and the sludge (342-3) that was previously generated in the cells are characterized as hazardous waste based on analysis that found the wastes contain arsenic (D004).

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X-343 Feed Vaporization Sampling Facility (343)

The Feed Vaporization Sampling Facility is used for feed sampling and contains seven autoclaves for vaporization of UF_6. The feed cylinders are brought into the facility, placed in the autoclaves and heated for sampling.

Parts Cleaning Solutions

Decontamination of equipment is required prior to maintenance activities, and this process generates aqueous waste solutions (343-2). These waste solutions are characterized as hazardous waste based on analysis that found the solutions contain lead (D008). Based on process knowledge and MSDS information, the solutions may also contain benzene-bearing oils (D018).

X-344 UF_6 Sampling and Shipping Facility (344)

The X-344 facility is used for sampling and shipping of enriched uranium product produced at PORTS.

Oil/Filters and Oil Debris

The autoclaves and pumps on the autoclaves contain hydraulic oil and gearbox oil that is occasionally changed. Waste oils and oil filters (344-1A, 344-1B, respectively) are characterized as hazardous wastes based on process knowledge because they may contain benzene (D018).

Solvent

Maintenance personnel uses refrigerant-113 and ethyl alcohol to clean equipment parts when performing routine equipment maintenance. Based on analysis, these waste solvents (344-2) are characterized as hazardous wastes as these solvents are ignitable (D001) and contain cadmium (D006); based on process knowledge, these solvents are spent solvent (F001) hazardous wastes. Historically, trichloroethylene, methyl chloroform and kerosene have also been used for this purpose.

Decontamination Solutions

Decontamination of equipment is required prior to maintenance activities. The process generates aqueous waste solutions (344-5). These waste solutions are characterized as

hazardous waste based on analysis that found the solutions contain lead (D008). Based on process knowledge and MSDS information, the solutions may also contain benzene-bearing oils (D018).

X-530 and X-533 Electrical Switchyards (Switch)

The primary function of the X-530 and X-533 electrical switchyards is the distribution of electrical power to plant processes and facilities. The types of equipment at these facilities are transformers, circuit breakers, switchgear, busses, and synchronous condensers.

Lead Cable

Routine maintenance at the buildings generates waste lead cable (Switch-1). Based on process knowledge, the lead cable is characterized as hazardous waste due to the lead content (D008).

Oil

Maintenance activities in the switchyards also generate waste oils (Switch-2), which are characterized as hazardous waste based on analysis that found it to contain lead (D008), and based on process knowledge because the waste oils may contain benzene (D018). Waste oil from the synchronous condensers have been found to contain PCBs in excess of 50 ppm.

Switches

During routine or preventative maintenance activities on switchyard equipment, many components are replaced; these and other maintenance activities often generate waste mercury-filled switches. Waste switches (Switch-3) contain mercury (D009) and are characterized as hazardous waste based on process knowledge.

X-600 Steam Plant (600)

The X-600 Steam Plant is a coal-fired facility used to produce high temperature steam for heating and process uses at PORTS.

Solvent and Oil

Routine maintenance on the mechanical equipment at the facility has produced waste 1,1,1-trichloroethane (600-1) which was used in degreasing, as well as small amounts of waste oil

(600-2). Based on process knowledge, the waste 1,1,1- trichloroethane is characterized as a spent solvent (F001) and the waste oil is considered to be toxic (D018) because it may contain benzene.

PPE and Related Solids

Protective equipment and related debris (600-3) are generated during maintenance activities. These wastes are characterized as hazardous based on analytical data which found they often contain arsenic (D004).

X-600B Steam Plant Maintenance Building (600B)

The X-600B Steam Plant Maintenance Building is used as a storage area for small replacement parts and maintenance equipment for the X-600 Steam Plant. Maintenance crews generally perform the repair and maintenance activities in the steam plant, not in the maintenance building.

Parts Cleaning Solutions

Various aqueous cleaning agents (600B-2) are used in the cleaning of parts from the steam plant prior to maintenance of the equipment. The spent solutions have been analyzed and found to be hazardous for cadmium (D006), chromium (D007), lead (D008), and mercury (D009). Based on process knowledge and MSDS information, the solutions may also contain benzene-bearing oils (D018).

X-608B Raw Water Pump House (608)

All deep-well pumps that utilized mercury seals have been replaced with pumps using mechanical seals in the X-608B well system. Historically, wastes containing mercury have been generated.

Mercury Cleanup Materials

During well pump changes, mercury was occasionally generated due to the failure of a mercury pump seal. Mercury clean-up materials (608-1) have been characterized as hazardous wastes through process knowledge because they contain mercury (D009).

Oil

Waste oil (608-2) was periodically generated through routine maintenance operations performed on water pumping equipment. Maintenance of this equipment has generated waste oils that have been characterized as hazardous wastes through process knowledge because they contain mercury (D009) and benzene (D018).

Mercury, Oil, Water, and Sand

In 1989, the #6-B well pump mercury seal failed and released mercury into the well. Waste oil, water, and sand (608-3) were generated during the cleanup of the well; these substances are characterized as hazardous waste based on analysis that found them to contain mercury (D009).

X-611 Water Treatment Facility (611)

The X-611 Water Treatment Facility provides the plant with potable water, fire control water, as well as make-up water for the Recirculating Cooling Water (RCW) System. Water can be supplied to X-611 from the X-608 A & B Wells, X-6609 Wells, X-605G Wells, and X-611-B Lagoon.

Oil and Filters

Routine maintenance operations performed on water treatment-related equipment periodically generate waste oil and waste oil filters. Based on process knowledge, waste oil and oil filters (611-1) are characterized as hazardous wastes because they may contain benzene (D018).

Mercury

Instrument maintenance activities occasionally generate waste mercury (611-2); waste mercury (D009) is characterized as hazardous waste based on analysis.

X-616 Liquid Effluent Treatment Facility (616)

The X-616 Facility was originally designed to remove chromium from recirculating cooling water via a chemical reduction. A chromium-based corrosion inhibitor was used in the recirculating cooling water until 1990 and, since the conversion to a phosphate-based corrosion inhibitor, chromium-bearing wastes are no longer produced at this facility.

Oil and Filters

The maintenance of wastewater treatment equipment occasionally generates waste oil and filters (616-1). Waste oil and filters are characterized as hazardous waste based on process knowledge because they may contain benzene (D018).

Soil/Sludge, Filter Cloth, and PPE

Historic chromium-bearing wastes that are in storage are the result of spills or treatment of cooling water or precipitate sludge at the facility. Treatment and clean-up wastes include contaminated soil and the spilled waste sludge containing chromium (616-2) as well as spent treatment filters and waste PPE (616-3). Waste soils, sludges, filters, and PPE are characterized as hazardous wastes based on process knowledge and analytical data because they contain chromium (D007).

X-626, X-630, X-633, and X-6000 Pump Houses and Cooling Towers (Pump)

The recirculating cooling water systems at the X-626, X-630, and X-633 are for the removal of the heat of compression generated in the diffusion process, and consist of pumps, cooling towers, and associated piping to the various cascade process buildings.

Mercury Spill Cleanup

Manometers in the pump houses are periodically serviced or removed. This maintenance, as well as mercury spill cleanup, generates mercury wastes (D009) (Pump-1) that have been characterized as hazardous wastes based on process knowledge.

Cooling Tower Curtains

In order to improve the efficiency of the cooling towers during adverse weather conditions, large canvas curtains are placed on the towers. These curtains are periodically discarded. Waste canvas cooling tower curtains (Pump-2) are characterized as hazardous waste because analysis has found them to contain chromium (D007).

Oil

Various types of oil are used in the pump houses and cooling towers. Waste oils (Pump-3) generated from this use are characterized as hazardous waste based on process knowledge

because they may contain benzene (D018). Waste oils previously generated in X-6000 occasionally contained 1,1,1-trichloroethane (F001) from cleaning and flushing activities.

X-700 Converter Maintenance and Chemical Cleaning Building (700)

The X-700 Converter Maintenance and Chemical Cleaning Building is used for equipment maintenance support for non-radioactive or low-level radioactively contaminated equipment from the gaseous diffusion process.

Chemical Cleaning Side

The purpose of this operational area is to clean various equipment parts that have a low probability for being contaminated with radionuclides. This area also serves as the home base for the field chemical cleaning personnel who perform cleaning and decontamination activities on materials with a low probability of being radioactively contaminated.

Chromic Acid Tank Closure Waste

Chromic acid tank closure waste (700-1) was generated by the closure of Tank #7. Past operations performed in this tank included bright dipping of aluminum parts. A variety of sludges and miscellaneous solids were generated in closure activities and characterized, based on process knowledge and MSDS information, as wastewater treatment sludge from an electroplating process (F006). Analytical data indicates the primary contaminant of concern is chromium (D007).

Cleaning Tank Solution

Cleaning tank solution containing trichloroethylene was used by activities or projects that are no longer required by plant operations. Waste cleaning tank solution (700-2) was generated from the cleaning out of the inactive vapor degreaser, and is characterized as a spent solvent (F001) hazardous waste based on process knowledge and analytical data.

Clean-up Debris

Waste clean-up debris (700-3) is generated from cleaning the basement floor and general operating area surrounding and beneath the cleaning tanks. Waste clean-up debris may be contaminated with trichloroethylene from past degreasing operations and from groundwater

containing trichloroethylene in the basement sump area. Based on process knowledge and analytical data, the waste is managed as a spent solvent (F001) hazardous waste.

Carbon Sludge

Historically, waste activated carbon sludge (700-4) was generated from groundwater treatment activities that took place in the X-700. Based on process knowledge, the sludge is managed as a hazardous waste because it was derived from groundwater that contained trichloroethylene, which is believed to have been derived from spent solvent (F001) that may have contaminated the groundwater.

Neutralization Pit Sludge

Historically, neutralization pit sludge (700-5) was generated from the cleaning out of a neutralization pit that accepted the discharge from the immersion cleaning tanks, which are located in the eastern portion of the building. The sludge is characterized as a hazardous waste through process knowledge and analytical data as spent trichloroethylene degreasing solvent (F001).

Fuels or Oil with Water

Waste fuels or oil with water (700-6) are generated from field activities involving the draining of diked fuel storage areas after inclement weather. The water is containerized if a visible sheen is apparent on its surface. Waste fuels or oil with water are characterized as hazardous waste through process knowledge and MSDS information because the water may contain lead (D008) and benzene (D018).

Caustic Solutions

Waste caustic solution (700-7) is generated by cleaning various ferrous metal parts. The corrosive (D002) hazardous waste is characterized based on process knowledge and MSDS information indicating the presence of sodium hydroxide. Analytical data indicates that the waste is also hazardous for metals.

Nickel Stripping Solutions

Nitric acid is used to strip nickel from the surface of nickel plated steel parts prior to the reworking of these parts. Waste nitric acid stripping solution (700-8) is characterized as an acidic (D002) hazardous waste based on process knowledge and MSDS information.

Solvent Solution

Waste solvents (700-9) containing methylene chloride and tetrachloroethylene may be generated during equipment degreasing. Based on process knowledge, these waste solvents are characterized as ignitable (D001), spent solvent (F001, F002, F003) hazardous wastes.

Oil

Waste oil (700-10) is generated by the draining of oil reservoirs on various equipment. The waste oil is characterized as hazardous waste because analysis has found it to contain chromium (D007) and lead (D008) and, based on process knowledge, it may contain benzene (D018).

HEPA Filters

Waste HEPA Filters (700-11) are generated by the change-out of filters on mercury vacuum cleaners. The vacuum cleaners are used by the field cleaning crew to collect small spills of mercury at various plant locations. Waste filters are characterized as hazardous waste based on process knowledge due to the presence of mercury (D009).

Tank Residue

This waste is generated by the cleaning out of various immersion cleaning tanks that held groundwater. Based on process knowledge and because the groundwater may have contained waste trichloroethylene, the waste tank residue (700-12) is managed as a spent solvent (F001) hazardous waste.

Maintenance Side

This area is used as a weld shop and converter maintenance area. Activities in this area are primarily related to welding, cutting, drilling, grinding, and buffing.

Oil

Waste oil (700-13) is generated from draining oil reservoirs on various pieces of equipment and is characterized as hazardous waste based on process knowledge due to the possible presence of benzene (D018).

Mercury Canisters

Respiratory equipment is required when entering areas where the breathing atmosphere is contaminated with various chemicals, including mercury. When the atmosphere is determined to contain elevated levels of mercury, "mer-sorb" canisters are utilized to provide safe working conditions. When spent, these canisters (700-14) are collected and managed as hazardous waste based on process knowledge [i.e. the presence of mercury (D009)].

X-705 Decontamination Building (705)

The X-705 Decontamination Building is a support building for maintenance activities associated with equipment removed from the cascade system and other processes that handle uranium, such as the X-700, X-710 and X-720. Its purpose is to decontaminate, clean and/or recondition process and auxiliary equipment prior to further maintenance activities or reuse. This building also contains decontamination and rinse solutions treatment systems.

Typically, process equipment is disassembled inside the X-705. Large pieces of equipment are decontaminated in mechanized spray booths or in a self-contained annex on the south side of the building. Smaller pieces of equipment are cleaned in special sinks or tables, while oily equipment is cleaned in a dip tank or on a floor pan. Auxiliary equipment such as gas cylinders or polybottles are also cleaned and reconditioned prior to reuse.

Decontamination is usually accomplished through the use of various wet methods that employ acid or alkaline solutions. These solutions are processed through a liquid-liquid extraction system to recover the uranium as an oxide. Liquid raffinate waste from this process is neutralized and filtered to produce a sludge cake, and a clear filtrate stream that is processed through ion exchange columns for removal of technetium and through the X-700 biodenitrification system for removal of nitrates prior to discharge to the sewage treatment plant.

Dilute rinse solutions are processed through a microfiltration system that produces a sludge cake and a clear filtrate solution. The filtrate is discharged to the sewage treatment plant.

Alkaline Solutions

Grease, which interferes with recovery and microfiltration, is removed by placing parts in an alkaline (sodium hydroxide) solution. The spent solution (705-1) is characterized as a corrosive (D002) hazardous waste based on MSDS information and, based on process knowledge, may also contain cadmium (D006), lead (D008), and benzene (D018).

Heavy Metal Sludge

Waste from the extraction columns is processed through a filter to remove precipitated heavy metals. Waste heavy metal sludge (705-2) from this process is characterized as hazardous waste based on analysis that shows it to contain cadmium (D006) and, based on process knowledge, the sludge may also contain lead (D008) and mercury (D009).

Microfiltration Sludge and Filters

All solutions containing low uranium concentrations are processed through microfiltration. This process results in a water that is discharged to the sewage treatment facility and a filter press sludge (705-3), which is characterized as hazardous waste because analysis has found it to contain cadmium (D006) and, based on process knowledge, the sludge may also contain lead (D008). Waste microfiltration filters (705-3) are also generated that are characterized as hazardous wastes based on process knowledge because they may contain cadmium (D006) and lead (D008).

Oil/Solvents

Vacuum pumps are drained and disassembled yielding waste oil (705-4). Waste oil is characterized as hazardous waste based on process knowledge that it may contain benzene (D018). Waste oil containing trichloroethylene and 1,1,1-trichloroethane, which equipment cleaning and flushing generates, is characterized as a spent solvent (F001) hazardous waste based on process knowledge.

Uranium Recovery Solvent

Uranium is recovered from nitrated solution by liquid extraction. The solvent phase of this process is made up of tri-butyl phosphate and mineral spirits or stoddard solvent. Based on process knowledge, spent solvent (705-5) from this process is characterized as a corrosive (D002) hazardous waste that contains cadmium (D006), lead (D008), and mercury (D009), as indicated by analytical data.

Ion Exchange Resin

The filtrate from the heavy metal process is passed through ion exchange columns to remove technetium. Hydroxyl form anionic resin is used to capture the technetium; based on analysis, spent resin (705-7) is characterized as hazardous waste due to the presence of mercury (D009).

Mercury Waste

Occasionally, the disassembly of manometers and other mercury-bearing equipment and the cleanup of associated spills generates mercury in the X-705. Such mercury wastes (705-8) are characterized as hazardous wastes based on process knowledge due to the presence of mercury (D009).

Bag Filters

In-line bag filters are used to remove suspended solids and oils from solutions flowing into recovery or microfiltration. When plugged, waste bag filters (705-9) are discarded and characterized as hazardous waste through process knowledge because they may contain benzene (D018), cadmium (D006), and lead (D008).

Incinerator Ash

Containers of ash and debris were generated in the closure of the X-705 Incinerator. This historic incinerator ash waste (705-10) is derived from spent trichloroethylene waste and is characterized, through process knowledge, as a spent solvent (F001) hazardous waste that may contain various toxicity characteristic metals (D004 through D008, D010, D011).

Filter Table Gunk

Some uranium-bearing solutions are filtered through a diatomaceous earth medium to remove suspended solids. The resultant filter table "gunk" (705-11) is characterized as hazardous waste because analysis has found it to contain mercury (D009).

Laboratory Waste

The process laboratory supports the decontamination building operation, by providing uranium analysis at several different stages of the process. A uranium shake-out procedure was used that utilized tributylphosphate and mineral spirits, which generated an acidic waste (D002) (705-12) that is being stored at PORTS and is characterized as hazardous waste based on process knowledge. The uranium shake-out procedure currently being used is a bromo-padap developed procedure that incorporates methanol and is managed as an acidic hazardous waste. Waste (705-12) from the bromo-padap procedure is characterized as an acidic (D002), ignitable (D001), spent solvent (F003) hazardous waste based on process knowledge. And, in addition, may contain

chloroform (D022), which is used in the determination of technetium. Tributylphosphate and mineral spirits remain constituents of lab organics due to their continued use in recovery as extraction solvents. An alternative shake-out procedure uses trioctylphosphine oxide and n-heptane when phosphates and citrates are present in the solution. Waste (705-12) from this procedure is characterized as an ignitable (D001) hazardous waste based on process knowledge.

Oil & Grease Filter Cake

Small parts are often degreased with sodium hydroxide or soap solution. The resulting solution is then processed through the oil and grease removal unit where the grease is removed as a filter cake (705-15). The filter cake is characterized as hazardous waste through process knowledge because it may contain benzene (D018) and metals including cadmium (D006), chromium (D007), and lead (D008).

Grease

Various cascade equipment is brought to the X-705 decontamination facility for cleaning prior to maintenance. The equipment can vary in size from small oil pumps to large UF_6 compressors with lubricated bearings. The grease and oil residue (705-16) in this equipment becomes contaminated with dust or dirt, UF_6, and metal particles. Analysis has shown the grease to be hazardous for lead (D008) and benzene (D018).

X-710 Technical Services Building (710)

The X-710 Laboratory is responsible for providing analytical services for PORTS. These services include preparing controls and standards, assuring that various raw materials meet specifications, and providing general analytical services for environmental, safety, and health samples and process support analysis. As is typical with analytical laboratories, a large variety of wastes are generated in small quantities. A brief description of the various laboratory functions and the generated wastes follows. The controls and standards laboratory is responsible for the preparation of controls and standards for all other laboratories in the building. Standards are prepared using various acids and caustics, and may contain various Tc metals depending on the standards being processed.

The process services laboratory is responsible for performing specification analysis on coal, various oils, lime, and process gas (UF_6) samples. Materials used in the analyses include various acids and caustics, halogenated and nonhalogenated solvents, and ignitable solvents.

The materials sampling and testing laboratory is responsible for the maintenance of UF_6 sampling systems, the inspections of UF_6 cylinders, and the decontamination of UF_6 containers, valves, and traps.

The uranium analysis laboratory is responsible for determining the uranium content of various solutions and solids and for preparing solutions for spectrographic analysis. Materials used in these analyses are various acids, caustics, and nonhalogenated solvents.

The radiochemistry laboratory performs radiochemical and isotopic analyses on solid and liquid samples. In performing these analyses, various acids are used to dissolve the samples and acetone, xylene, cyclohexane, and amyl acetate are used in the analytical process. The primary concern of the spectroscopy and analytical support laboratory is the determination of metals concentrations in samples submitted from other laboratory groups and from across plant site.

The organic analytical services laboratory is responsible for conducting organic constituent analysis on environmental, industrial hygiene, and waste samples. Hexane, methylene chloride, methanol, propanol, refrigerant-113, ethyl ether, and acetone are used as extraction fluids and/or carriers in most of the required analyses.

The material and chemical technology department performs all sampling and analysis on process vents, performs extractions for TCLP analysis, and tests a wide variety of metals and commercial products to determine suitability for site uses. Mechanical testing of valves and equipment is conducted by the chemical technology department. Testing is also performed on epoxies, resins, coatings, and metals using acids, caustics, halogenated and nonhalogenated solvents, and various other aqueous and organic solutions.

One section of the material and chemical technology department performs mechanical testing on process and other equipment throughout PORTS. Typical wastes consist of waste oils and small amounts of 1,1,1-trichloroethane (TCA) used to clean metal components prior to testing.

The remaining sections of the material and chemical technology department perform analysis on asbestos samples and perform X-ray diffraction and X-ray fluorescence analysis on a wide variety of samples. Various acids, nonhalogenated solvents, and photographic materials are used in the analytical procedures.

The laboratory services group maintains and repairs all electronic, electrical, and mechanical systems in the X-710 laboratory. This group also fabricates special laboratory systems and equipment as necessary.

The environmental/industrial hygiene analytical services laboratories group is responsible for providing analytical services on all environmental and industrial hygiene samples. The primary

function of the group is to determine the various anions, such as chlorides and sulfates, and the very low levels of radiochemical constituents.

Wastes generated from the numerous laboratories in X-710 include a large number of small volume, corrosive, solvent-bearing and metal-bearing wastes. Wastes are routinely managed in small containers at satellite accumulation points in the laboratories and are transferred to a 90-day accumulation area where the wastes are placed in lab packs or are combined with similar materials in drums.

Based on the waste generation discussion provided above for each of the laboratories, wastes stored from the X-710 may include the following streams.

Oil/Solvents

Routine maintenance and laboratory equipment fabrications operations also generate hazardous wastes in support of all laboratory operations in X-710. Wastes generated from these activities include waste oils (710-1) that are characterized as hazardous waste through process knowledge because they are ignitable (D001) and may contain benzene (D018). Waste oils sometimes also contain trichloroethylene or 1,1,1-trichloroethane from degreasing and flushing of equipment and are characterized as spent solvent (F001) hazardous wastes. Analysis of waste oils has found that chromium (D007) and lead (D008) are present. Analytical procedures on oils also result in a waste which contains methylene chloride (F002) and carbon disulfide (F005).

Acids/Bases

As described above, a variety of waste acids (710-2A) and bases (710-2B) (including hydrochloric, sulfuric, phosphoric, and nitric acids and sodium hydroxide) are generated in the X-710 facility. Waste stream 710-2 is maintained for current waste in storage with a pH between 2 and 12.5, and in some cases, until reclassification to 710-2A or 710-2B can occur. Based on analysis, the wastes contain cadmium (D006) and chromium (D007). Through process knowledge and MSDS information, these wastes are also characterized as corrosive (D002) hazardous wastes that may contain arsenic (D004), barium (D005), lead (D008), mercury (D009), selenium (D010), and silver (D011).

Solvents

A variety of spent solvents (710-3) are generated in the X-710 laboratories that include: refrigerant-113, trichloroethylene, and 1,1,1,-trichloroethane; acetone, methanol, xylene, ethyl

ether, and n-butyl alcohol; toluene, pyridine, and methyl ethyl ketone; mineral spirits, heptane, ethanol, and various other alcohols; and chloroform. Based on process knowledge and MSDS information, these wastes contain arsenic (D004), barium (D005), cadmium (D006), chromium (D007), lead (D008), mercury (D009), selenium (D010), and silver (D011) and are characterized as spent solvent (F001, F002, F003, F005) and toxic (D018, D022, D035, D038 and D040) hazardous wastes. In addition, analysis of the spent solvents has found that they may be ignitable (D001).

Cyanide Bearing Solutions

Analytical procedures generate wastes which contain cyanide compounds (710-5) and are characterized as hazardous for reactivity (D003). Waste electrostatic solutions from the X-100 are also included in this waste stream. Analytical data has also shown that this waste stream may contain lead (D008) and selenium (D010).

Machine Coolant

Metal processing and machining equipment in the X-710 laboratory uses an oil/water based coolant to cool the machine and metal parts. The spent coolant (710-6) is managed as a hazardous waste because analysis has shown it to contain lead (D008) above the regulatory limit. Based on process knowledge and MSDS information, the solutions may also contain benzene-bearing oils (D018).

Mercuric Nitrate/Mercuric Sulfate Solutions

Mercuric nitrate solutions were used in the analytical laboratory to determine the chloride content of water. Based on process knowledge, the spent solutions (710-7) were classified as hazardous waste because of the mercury content (D009). A new laboratory procedure has been developed, and these solutions are no longer generated.

Acetone

Acetone is used in the laboratory to clean and dry laboratory glassware and minimize cross-contamination of chemicals. Spent acetone (710-8) is managed as an ignitable (D001) solvent waste (F003). This waste stream is minimized by reusing the acetone until it is no longer effective for cleaning and drying applications.

Arsenic Trioxide Solution

Arsenic trioxide solutions were used to prepare standard solutions containing various concentrations of arsenic. These solutions would become waste (710-9) if the shelf life of the solution were exceeded following preparation. The waste identification code is P012 for the unused solutions and D004 for those solutions that were used in the analytical process.

Rags, Wipes and Laboratory Refuse

The analytical laboratory uses rags and wipes to clean spilled solutions and to wipe off the sides of glassware to prevent cross-contamination. Additionally, the plastic tips from automatic pipettes and other disposable materials and equipment are placed into this waste stream (710-10). The waste identification code will be dependent on the work being performed and analytical data, where available. Typical waste ID codes may include metal or solvent characteristic codes (D004 - D043) and spent solvent codes (F001 - F005).

X-720 Maintenance and Stores Building (720)

The X-720 is the primary maintenance and storage facility at PORTS. The building contains a variety of craft shops to support plant operations.

Instrument Shop

The instrument shop is used for disassembling, cleaning, repairing and reassembling all instruments from PORTS.

Oil

Waste lubrication oils (720-1) are generated in the cleaning and repair of equipment. Waste oils are characterized as hazardous wastes based on analysis that has found the oils contain barium (D005), cadmium (D006), chromium (D007), and lead (D008), and through process knowledge as due to the possible presence of benzene (D018).

Silver Solder Slag

The slag (720-2) from the silver solder process of fabricating pigtails is characterized as hazardous waste through process knowledge and MSDS information since it contains silver (D011).

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Mercury

Manometers from PORTS are dismantled and cleaned, and the waste or spilled mercury and mercury-contaminated materials (720-3) are characterized as a D009 hazardous waste, based on analysis and MSDS information.

Solvent

Spent 1,1,1-trichloroethane (720-4) is generated from maintenance activities involving equipment cleaning and degreasing. The waste 1,1,1-trichloroethane is characterized as a spent solvent (F001, F002) hazardous waste based on process knowledge.

Plating Solution

Small parts used to connect instruments to production equipment require a nickel plating to prevent corrosion from UF_6. Currently, nickel plating is performed using an electroless process. Waste nickel plating solution (720-5) is occasionally generated and is characterized as hazardous waste through process knowledge and MSDS information because it is acidic (D002).

Cyanide Plating Solutions

Historically, the small plating process in the instrument shop involved the use of cyanide solutions containing metals. Waste plating solutions (720-6) from the cyanide process are characterized through process knowledge and MSDS information as a reactive (D003) waste plating bath (F007) hazardous waste that may contain chromium (D007) and silver (D011).

Cleaning Solutions

Before plating in the electroless process, parts are cleaned using compounds containing soap, water, isopropyl and ethyl alcohols, and 1,1,1-trichloroethane. Wastes (720-7) from parts cleaning are characterized through process knowledge as ignitable (D001) and spent solvent (F001) hazardous wastes.

Oil/Solvents

Degreasing solvents and lubrication oils are generated in the cleaning and repair of equipment. Spent 1,1,1-trichloroethane (F001) mixed with oil (720-8) that may contain benzene (D018) is generated as a result of equipment flushing and is characterized as hazardous waste

through process knowledge. In addition, analysis of the spent solvent/oil has found it to contain cadmium (D006), chromium (D007), lead (D008), mercury (D009), and selenium (D010).

Seal Shop

The seal shop is responsible for rebuilding, reassembly, and precision machining of seals for the compressors used in the cascade operations.

Acetone

After machining, compressor seals are dipped in acetone to remove any foreign particles. Based on process knowledge and MSDS information, waste acetone (720-10) is managed as an ignitable (D001) spent solvent (F003) hazardous waste that may contain cadmium (D006), chromium (D007), and lead (D008).

Kerosene and Oil

The seal shop uses kerosene as a cleaner in precision machining. Based on process knowledge and MSDS information, waste kerosene (720-11) may be ignitable (D001) and may contain chromium (D007) and lead (D008), as well as benzene (D018) resulting from oil in the waste kerosene.

Compressor Shop

The compressor shop deals solely in the rebuilding of process multi-stage compressors for the cascade process.

Spent Solvents

Waste 1,1,1-trichloroethane (720-12) is generated in the shop from cleaning compressor parts. Based on process knowledge and MSDS information, the waste 1,1,1-trichloroethane is characterized as a spent solvent (F002) hazardous waste.

Degreaser Sludge

The compressor shop utilizes a 1,1,1-trichloroethane vapor degreaser that is cleaned periodically. Cleaning of the degreaser results in the generation of sludge containing spent 1,1,1-trichloroethane. The degreaser sludge (720-13) is characterized through process knowledge

and MSDS information as a spent solvent (F001) hazardous waste that may contain benzene (D018).

Machine Shop

The function of the machine shop is to machine parts for close tolerances through boring and machining processes and to fabricate new parts from bar stock supplies.

Machine Coolant/Oil

Machinery in the machine shop uses a water-based coolant for the cooling of parts and lathes, grinders, chippers, boring machines, and lapping machines. Periodically, a coolant waste (720-15) is generated by the machinery that contains oil as a result of cross contamination during the machining process. Waste coolant/oil is characterized as hazardous waste because analysis has shown it to contain cadmium (D006) and lead (D008). Based on process knowledge, waste oil in the coolant may contain benzene (D018).

Oil

Waste lubricating oil (720-16) for the previously mentioned machinery is generated from scheduled changes. Waste oil is characterized as a hazardous waste through process knowledge because it may contain benzene (D018).

Grinding Sludge

The grinders in the shop have a collection basin for sludge that is created in the process. This basin is periodically cleaned and the resulting waste sludge (720-17) is characterized as hazardous waste on the basis of process knowledge that indicates the presence of cadmium (D006) and lead (D008).

Electric Shop

The electric shop is primarily used for oil testing and electric motor repairs.

Spent Solvent

Xylene is used in the cleaning process of small motors. The cleaning process generates spent xylene (720-19), which is characterized through analysis as an ignitable (D001) hazardous waste and a spent solvent (F003) hazardous waste based on process knowledge.

Oil/Test Solution

Waste test oil, solvents and associated debris are periodically generated from moisture testing of oils and dielectric fluids from transformers and other electrical equipment. This waste stream (720-20) consists of isopropyl alcohol, chloroform, methanol, pyridine, toluene, methyl ethyl ketone, and lubricating oil. The waste test oils and solvents are characterized as hazardous waste based on analysis that found the waste to be ignitable (D001); through process knowledge and MSDS information, the waste was determined to be a toxic (D018, D022, D035, D038) and spent solvent (F002, F003, F005) hazardous waste.

Hydrostatic Test Shop

The function of this shop is to hydrostatically test pressure vessels and relief valves.

Lead Seals

Waste lead seals (720-21) are generated from pressure relief valve testing. The waste seals are characterized as hazardous waste based on process knowledge and MSDS information because they contain lead (D008).

Silver Plating Compound

In the hydrostatic pressure testing of vessels and other equipment that takes place in the hydrostatic test shop, it is often necessary to attach various tubing and instrument lines to the item being tested using a silver plating compound. During disassembly at the conclusion of the test, waste silver plating compound (720-22) is generated. This waste is characterized as a hazardous waste based on process knowledge and MSDS information because it contains silver (D011).

Motor Shop

The motor shop is used for the repair, rewinding, and cleaning of electric motors.

Kerosene and Oil

Cleaning activities in the motor shop generate waste kerosene and oil (720-23). Based on process knowledge, the waste kerosene/oil is ignitable (D001) and the waste oil may contain benzene (D018). Historically, this waste stream also contained trichloroethylene (F001).

Motor Cleaning Solution

The motor shop operates a spray booth to clean motors in preparation for maintenance or repair. The motor wash and rinse water generated in the spray booth is contained in an 800-gallon, stainless steel container until it can be processed through the X-705 microfiltration system after analytical results are received. Shutdown of the microfiltration process may necessitate storage of this material in the stainless steel container in X-7725 until it can be processed at the X-705. Based on process knowledge, potential constituents of the wash and rinse water solution include grease, iron, copper, nickel, zinc, and chromium, and small amounts of oil. The waste cleaning solution (720-24) is characterized as hazardous waste because analysis has found it to contain cadmium (D006) and lead (D008).

Paint Shop

The paint shop includes a sign facility and paint booth facilities, and also contains materials and equipment for painting applications plant-wide.

Booth Water

Waste booth water (720-26) is generated from cleaning out the paint booth and is characterized as hazardous waste based on analysis that found it to contain cadmium (D006), chromium (D007), and lead (D008), and through process knowledge because it may contain methyl ethyl ketone (D035) and toluene (F005).

Cement Dust

The paint shop may paint and/or seal any onsite building floor. Before this can be done, the floor must be stripped to remove the previous sealant/paint. PORTS uses a machine called a "Blas-Trac" that not only removes the sealant/paint, but also removes small amounts of the concrete floor. These chips/dust (720-27) may be characterized as hazardous waste through process knowledge that indicates the potential presence of heavy metals including chromium (D007) and lead (D008).

Paints and Thinners

The paint shop produces a primarily liquid waste stream from using mineral spirits, lacquers, and/or solvent-containing thinners to clean paint from brushes, rollers and other equipment used by the paint shop. These thinners may contain constituents including: methylene chloride, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, methanol, xylene, toluene, and methyl ethyl ketone. Based on process knowledge and MSDS information, the waste solvents and paints (720-28) have been characterized as ignitable (D001) and spent solvent and toxic (F002, F003, F005, D035) hazardous wastes, as well as toxic for lead (D008). In addition, analysis of the wastes has found that the waste solvents and paints contain cadmium (D006), chromium (D007), and lead (D008). Waste latex paint (720-28B) is hazardous for lead (D008).

Paint Sludge and Solids

Waste paint sludge and solids (720-29) are periodically generated from the cleaning out of water-based spray booths and are characterized as hazardous wastes through process knowledge due to the presence of methyl ethyl ketone (D035), cadmium (D006), chromium (D007), and lead (D008).

Valve Shop

The valve shop is used to tear down, repair, and reassemble pumps and valves of various sizes.

Oil

Waste vacuum pump oil and waste lubricating oils (720-31) are generated in the maintenance of a variety of pumps and have been characterized as hazardous wastes based on analysis that found that the oils contain cadmium (D006) and mercury (D009). In addition based on process knowledge, the oils may contain benzene (D018). Some of the oils have also been characterized as spent solvent (F001) hazardous wastes through process knowledge and MSDS information because they contain 1,1,1-trichloroethane from the flushing of the pumps.

Refrigeration Shop

The function of this shop is to service instrument lines and refrigeration equipment.

Parts Cleaning Solution

SX-11/sulfamic acid is used in the X-720 maintenance facility for the cleaning and removal of scale from instrument lines and refrigeration equipment. When this solution becomes spent (720-34), it is managed as a hazardous waste due to the low pH (D002). The SX-11 is a commercially available product containing phosphoric acid and sulfamic acid. The use of this product is being phased out in favor of a sulfamic acid solution because the phosphoric acid presented problem in treatment and disposal. Small quantities of this waste will be generated as the remaining SX-11 is used.

Mixed Acids

Various acids (720-35) are used in the instrument shop for the cleaning of process instrument lines. The acids include hydrochloric acid, sulfuric acid, and acetic acid in diluted concentrations. Although dilute, the pH of the solutions is less than 2.0 (D002).

X-750 Garage (750)

The X-750 Garage repairs, inspects, and performs preventative maintenance on vehicles and mobile equipment in use at PORTS.

Oil

Various grades and weights of both motor and lube oil wastes (750-1) are generated from routine maintenance operations on a wide variety of cars, trucks, vans, carts, and other mobile equipment in use at the plant. Waste oils from the shop are characterized as hazardous waste since analysis has found them to contain cadmium (D006), chromium (D007), lead (D008), and process knowledge indicates they may contain benzene (D018). Historically, waste oils have contained cleaning and flushing solvents including spent 1,1,1-trichloroethane, tetrachloroethylene, methylene chloride, xylene, ethyl ether, cresylic acid, methyl ethyl ketone, and toluene. Waste oils mixed with solvents from the X-750 Garage remaining in storage at PORTS have been characterized as hazardous waste based on process knowledge and MSDS information because they contain ignitable (D001) spent solvent hazardous wastes (D026, D035, D039, F001, F003, F004, F005) and may contain cadmium (D006), chromium (D007), and lead (D008). Currently, spent solvents and waste oils generated in the X-750 Garage are segregated.

Filters

Waste fuel and oil filters (750-2) that are generated in the X-750 Maintenance Shop are characterized as hazardous wastes through process knowledge because they may contain benzene (D018).

Solvents

Spent solvent wastes that were formerly combined with waste oils (see waste stream 750-1 discussion) are now managed as separate wastes (750-3). Spent solvent wastes commonly contain methylene chloride, 1,1,1-trichloroethane, tetrachloroethylene, xylene, and methyl ethyl ketone. The solvent wastes may also contain small amounts of gasoline, diesel fuel, and oil resulting from cleaning and flushing activities. Waste solvents are characterized through process knowledge and MSDS information as hazardous wastes because they are ignitable (D001) and contain spent solvents (F001, F003, and F005) and may also contain benzene (D018) as a result of gasoline or oil in the waste. Analysis has confirmed that the waste solvents are ignitable (D001) hazardous wastes.

Gasoline/Diesel Fuel

Used fuel (750-4) is generated as a result of maintenance of vehicles and mobile equipment. Used fuel is generated or used as a solvent during oil changes, engine overhauls, and other mechanical work at the garage. Used fuel is characterized as a hazardous waste because it is ignitable (D001) and may contain benzene (D018).

Antifreeze

Used antifreeze (750-5) is generated as a result of maintenance of vehicles and mobile equipment when drained from vehicle cooling systems at the garage. The used antifreeze is characterized as hazardous waste based on analytical data that indicates the presence of selenium (D010).

X-752, X-744G(R), and X-744G(U) Container Storage Units (Stor)

The X-752, X-744G(R), and X-744G(U) units are former hazardous waste storage areas. The facilities were certified closed on 01/31/95, 04/10/95, and 02/07/96, respectively.

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Solid and Liquid Clean-up Wastes

Closure activities generated wastes that have been characterized on the basis of process knowledge, knowledge of the waste spill, and/or analysis, as appropriate. The wastes generated could contain any listed or characteristically hazardous waste that was stored in the area (Stor-1).

X-760 Chemical Engineering Facility (760)

The X-760 is the chemical engineering facility in which bench-and pilot-scale studies are conducted in support of the X-710 activities. In essence, the X-760 Facility provides space for large-scale investigations that cannot be conducted in the X-710.

Acetone Still Bottoms/Solvents

In the mid 1980s, a pilot scale study was conducted in the facility to determine the feasibility of acetone distillation in uranium-bearing wastes. Waste acetone used in the study was from decontamination and maintenance operations in the cascade process. The study, which investigated the possibility of separating acetone from radionuclides and other contaminants, generated spent solvent-containing still bottoms that are characterized though process knowledge as ignitable (D001) spent solvent (F003) hazardous waste (760-1). Analysis has confirmed that the still bottoms are ignitable (D001) hazardous wastes and also found that the still bottoms contain chromium (D007) and lead (D008), believed to have resulted from the cleaning of metal parts, solder, and chrome-plated parts. Excess spent acetone from the study is also characterized through process knowledge as an ignitable (D001) spent solvent (F003) hazardous waste (760-1).

UF_6 Analyzer Still Bottoms

In the late 1980s, a bench-scale study was performed to determine the feasibility of ethanol distillation in uranium-bearing wastes. Waste ethanol used in the study was from the UF_6 gas analyzers in the cascade process. The study generated still bottoms (760-3) that contain ethanol and are characterized as ignitable (D001) hazardous wastes through process knowledge.

Sodium

PORTS conducted a pilot-scale treatability study in the early 1980s to assess the feasibility of treating PCBs with sodium metal. As a result of the study, waste sodium metal (760-4) was generated and is characterized as a reactive hazardous waste (D003) through process knowledge.

X-770 Mechanical Testing Facility (770)

The X-770 mechanical testing facility, which has been closed for several years, was used as a test loop for investigating technological improvements for the cascade process equipment.

Mercury Waste

Mercury waste, elemental mercury (770-1A), and mercury contaminated debris (770-1B) were generated from the clean-up of mercury diffusion pumps. Mercury waste was also generated when brass fittings on manometers corroded and failed. This waste was identified as a hazardous waste through process knowledge because it contained mercury (D009). The historical waste stream, 770-1, is being maintained until the waste is properly treated and disposed.

X-1000 ADMINISTRATION BUILDING (1000)

The X-1000 administration building is an office building for plant management. It also contains areas for document storage and reproduction, video tape production capabilities, and locker and shower facilities for the plant security force.

Oil

Waste oil (1000-1) is collected when maintenance is performed on the hydraulic elevator and on the air-conditioning and ventilation equipment. These waste oils are characterized as hazardous wastes based on process knowledge because they may contain benzene (D018).

X-7725 Container Storage Unit (7725)

This building was used for the assembly and/or reassembly of centrifuges for the gas centrifuge enrichment plant, which was shut down in 1985. The facility is currently used for storage of hazardous waste.

Oil/Debris

The wastes associated with centrifuge activities that are stored at PORTS include waste oils and oil spill debris (7725-1A and 7725-1B, respectively) which are characterized as hazardous wastes because analysis has shown they contain cadmium (D006) and, based on process knowledge, may also contain benzene (D018).

Solid and Liquid Cleanup

Waste generated at this facility will be the result of clean-up activities associated with leaks or spills of stored wastes (7725-2). These clean-up residues will be characterized through process knowledge based on the waste being cleaned up.

Waste Sampling Equipment

Waste sampling operations occur on a continuing basis for the purpose of waste verification in accordance with the waste analysis plan. These operations also demonstrate compliance with the waste acceptance criteria of the various disposal sites utilized. The sampling will generate empty sample containers and used COLIWASAs. These glass containers and COLIWASAs (7725-3) are containerized and managed as hazardous waste. Identification codes are assigned based on the wastes sampled.

Offsite Treatment Residuals (Ash)

PORTS anticipates that it will send hazardous waste offsite for treatment prior to final disposal. Further, PORTS anticipates it will be required to manage treatment residuals returned to PORTS in the interim prior to their final disposal.

Ash

After incineration, any residues will be returned to PORTS for storage prior to ultimate offsite disposal. Incinerator residue (Ash-1) will be characterized based on knowledge of the characterization of the wastes prior to incineration and based on analytical results received from the incinerator laboratory. Other treatment residues that should occur will be treated in a similar manner and are included in this waste stream.

C-1A Containerized Waste [3745-50-44(C)(1)(b)]

Hazardous waste storage areas are entirely surrounded by containment systems that meet the requirements of 3745-55-75(B). Accordingly, the requirements of 3745-50-44(C)(1)(b) are not applicable to PORTS.

C-2 Waste Analysis Plan [3745-50-44(A)(3), 3745-54-13(B) & (C), 3745-59-07]

The waste analysis plan is detailed in Table C-2 and has been written for wastes that are generated at PORTS. The waste analysis plan includes the name of the waste stream, the parameters that are analyzed, frequency of analysis, and the rationale that governs each of the decisions in the plan. The waste analysis plan is applicable to wastes which are stored in container storage units in the X-326 and the X-7725.

C-2A Parameters and Rationale [3745-54-13(B)(1)]

The parameters and rationale for waste analysis are based on the waste characterizations made by PORTS, which are in Section C-1, and are listed in the waste analysis plan in Table C-2. Analytical parameters identified in Table C-2 have been selected to perform three functions:

- To confirm PORTS waste characterizations as necessary for container storage.
- To confirm that sufficient information exists to comply with the Land Disposal Restrictions for wastes to be shipped offsite to a TSD Facility.
- To confirm that treatment residues resulting from the treatment of PORTS wastes received from offsite are identified correctly and determine whether such residues require further treatment before they may be land disposed.

In accordance with DOE management practices, wastes suspected to contain accountable elevated concentrations of enriched uranium are tested at each generating source for uranium. In addition, DOE policy requires that all wastes generated at PORTS that are commercially treated or disposed of be free of any radionuclide that was added as a result of PORTS operations. All of the hazardous wastes generated by DOE at PORTS are currently assumed to include radioactive material from DOE operations and must be stored onsite as mixed (hazardous and radioactive) waste until radioactivity release criteria have been established. In addition, wastes determined to be mixed wastes will be managed at PORTS or another DOE Facility until approved treatment and disposal methods for mixed wastes are available.

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C-2B Test Methods [3745-54-13(B)(2)]

Hazardous wastes are analyzed for the contaminants identified in the Ohio Administrative Code 3745-51-24, Table 1. Test methods used for waste analysis are from the latest revision of the approved methods annotated in "Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods," U.S. EPA Publication SW-846 (incorporated by reference in rule 3745-50-11 of the Administrative Code), or other EPA-approved methods. PORTS has a detailed laboratory approval program that includes review and approval of the QA program maintained by each laboratory.

C-2C Sampling Methods [3745-54-13(B)(3), 3745-51, Appendix I]

Hazardous wastes are generated at or near the work areas in amounts of 55 gallons or less and are moved to 90-day storage areas or the hazardous waste storage units in the X-326 or X-7725 by the generators. Wastes are typically sampled prior to transport to a permitted container storage unit and may also be sampled for verification in the unloading area at the X-7725 or X-326 container storage units.

Numerous sampling techniques are used in collecting representative samples of hazardous wastes. The technique used will depend on the physical nature of the waste, the container from which the sample is taken, and other physical constraints. A discussion of methods appropriate for different waste types and physical states is provided in the following sections.

Liquids and Slurries

A COLIWASA is a device used to sample contained liquids and slurries. A COLIWASA is an open tube of nominal length that can be lowered into a container, allowed to fill as it is lowered, then sealed at the bottom when the desired depth is reached thus obtaining a "core" sample. This provides a representative sample of layered or homogeneous materials. The COLIWASA may be a closed tube within a tube or an open tube with an external plug at its base and is usually made of glass.

Sludges, Loosely Consolidated Sediments, and Other Solids

A hand corer "back saver" is a device that consists of a thin-walled tube with a tapered nosepiece and a weighted "T" handle to facilitate driving the corer and any necessary extensions

into sludges, sediments, or solids. The thin-walled tube has a check valve at its upper end to prevent washout during retrieval of a sludge through an overlying water layer. The corer is introduced into the sludge or loosely consolidated sediment and then forced into the waste with a smooth continuous motion. After the corer is withdrawn, the nosepiece is removed and the sample is transferred to an appropriate container. This technique provides an undisturbed sample of the waste in question. A COLIWASA or an auger may also be used to sample sludges as an alternative to a corer.

Sample collection with a scoop or shovel provides a disturbed grab sample. Generally, these tools are used in collecting samples of the uppermost material. To obtain a sample, a scoop is simply inserted into the sludge or loosely consolidated material, removed with the sample, and then the sample is transferred to an appropriate container. When using a scoop or shovel, it is often desirable to remove the uppermost 1 to 2 inches of the waste and collect an unexposed sample.

A drum thief can be used to sample granular or other dry, loosely consolidated materials. The thief consists of two concentric metallic tubes (one tube inside the other) with elongated holes cut along the length of both tubes. The outer tube is fitted with a pointed, solid metallic end to facilitate penetration into the material. The sample is collected by forcing the thief into the material when the holes of the tubes are not aligned. When the pointed end of the thief reaches the bottom of the drum, the inner tube is twisted until the holes in both tubes are aligned allowing the material to enter the thief. When the thief is filled, the inner tube is again twisted in order to retain the sample. The sample is then transferred to an appropriate container.

Rags, Protective Equipment, and Other Miscellaneous Wastes

When sampling contaminated items such as rags, protective equipment (respirator cartridges, coveralls, etc.), and other miscellaneous wastes, it must be determined if the waste can be homogenized into a uniform or nearly uniform mass. If the waste can be homogenized, a grab sample is collected utilizing appropriate sampling equipment as described above for sludges, loosely consolidated sediments or other solids. Generally, homogenization of this type of waste cannot be accomplished and therefore, the sampling is aimed at retrieving the portion of the waste that exhibits the highest degree of contamination which provides for conservative hazardous waste determinations. Representative sampling of non-homogeneous waste such as rags, wipes, and personal protective equipment is particularly difficult. Samples of this type of waste will consist of small pieces of the material cut from several sections of larger pieces. The smaller pieces will be

cut from the visibly soiled areas of the larger pieces. Samples will be obtained from as deep in the container as practical. An additional sampling method is to collect a core sample by compressing the waste and then using a hole saw attached to a drill to collect the sample.

C-2D Frequency of Analyses [3745-54-13(B)(4)]

Verification analysis of waste streams is performed on a periodic basis as specified in Table C-2. These analytical requirements are applicable to all waste streams sent to the X-326 and X-7725 container storage units. Residues that are generated from activities being performed on existing waste streams, such as sludges remaining after decanting liquids, are not subject to the waste analysis plan, because the waste that the residue originated from was already subject to the waste analysis plan, as designated in Table C-2. Except for waste unused chemicals, a discrete number of containers from each waste stream will be sampled. The containers will be randomly selected, and sampling will be timed to extend throughout the year. Ten percent of each waste stream will be physically sampled; twenty percent will be visually inspected. The number of containers sampled will be derived from an estimated annual generation rate based on the volume generated during the preceding twelve months. The type and frequency of sampling may be increased, as necessary, for wastes for which variability is a concern. An example of when such an increase could be necessary would be when raw materials change and when major maintenance or an unplanned shutdown occurs, particularly when such changes might affect the waste streams produced.

PORTS may utilize analytical testing done under other regulatory mandated programs to supplement or replace the analytical requirements of the waste analysis plan. Analyses of waste streams generated from those DOE facilities not leased by USEC are performed as specified in the waste analysis plan. These analyses are performed in order to characterize wastes in accordance with OAC 3745-51-31 through 33. Process knowledge and data from environmental restoration activities are used to characterize waste related to those activities.

Waste Unused Chemicals

Processes used at PORTS that are identified in OAC 3745-51-33 produce listed hazardous wastes (e.g., SW-1). Additionally, waste unused products may be characteristically hazardous per 3745-51-21 through 24. These wastes may be further characterized as necessary per 3745-52-11

and are then managed accordingly; however, waste unused chemicals will predominantly be characterized based on MSDS information and the knowledge of how they are generated.

C-2E Additional Requirements for Waste Generated Offsite [3745-54-13(C)]

Currently, PORTS does not accept any mixed waste for treatment, storage, or disposal from off-site locations. However, PORTS will be accepting residues from treatment processes applied to PORTS generated wastes. The residues from these treatment processes will be mixed wastes and may consist of any grouping from the PORTS listed waste codes (Table C-1).

The amount of treatment residue to be returned to PORTS is dependent on the volume reduction achieved by the treatment process. PORTS is currently anticipating that all of its liquid mixed wastes meeting the TSCA Waste Acceptance Criteria of the Department of Energy TSCA Incinerator in Oak Ridge, Tennessee will be shipped for treatment in order to achieve volume reduction. An annual burn plan is formulated for the Oak Ridge, Tennessee facility. PORTS contributes annually a predetermined percentage of the mixed waste liquids to be burned. The total amount of treatment residuals returned to PORTS shall be an amount that is no more than that which is directly proportional to the actual percentage of the mixed wastes that PORTS contributed. For example, if PORTS contributes one-third of the liquid mixed wastes to be incinerated, the residues returned should equal approximately one third of the total residuals generated. The incineration of liquid mixed wastes will result in significant volume reductions and minimal treatment residuals to be returned to PORTS, while treatments for other PORTS generated wastes may only result in minimal volume reductions of treatment residues prior to their return to PORTS.

The amount of treatment residues to be returned is also dependent on the volume reduction effectiveness of the treatment method. For example, the incineration of liquids will result in minimal treatment residues, while the treatment of solids or sludges will result in only a small decrease in mass. The ash content for liquid hazardous waste typically ranges from 0.1% to 0.5%. However, the total ash from the incineration of liquids can be higher depending on the level of total solids in the waste.

The TSCA liquid mixed wastes that are shipped to the Department of Energy TSCA Incinerator in Oak Ridge, Tennessee for treatment will be commingled with the wastes from other DOE sites. The existing incineration process, process configuration, and storage of post process residuals does not allow for dedicated batching or batch segregation from individual DOE sites.

The resulting residuals from this treatment process potentially contain any combination of the coded wastes contained in Table C-1 of the application. All commingled treatment residues will be sampled and analyzed by the off-site processor and the results will be forwarded to PORTS for review and approval prior to shipping.

PORTS anticipates utilizing all of its assigned burn time at the Department of Energy TSCA incinerator at Oak Ridge, Tennessee. Annual targeted amounts may fluctuate as operational factors at the incinerator and generation rates at PORTS are taken into consideration.

Treatment residues from off-site treatment processes will be characterized based on the analytical results by the off-site processor prior to shipping. The results of these analyses will be forwarded to PORTS where they will be reviewed to determine if the treatment residues should be returned to PORTS. PORTS will perform fingerprint sampling and analysis on all incoming shipments of waste treatment residues for constituents based on knowledge of the waste sent off-site for treatment. The frequency will be consistent with that described in Section C-2d of the application. Test methods used are as specified in the latest revision of the approved methods in the U.S. EPA Publication SW-846, "Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods," (incorporated by reference in rule 3745-50-11 of the Administrative Code), or other EPA approved methods. PORTS has a detailed laboratory approval program that includes review and approval of the Quality Assurance Program of the contracted laboratories.

PORTS will conduct the following additional activities for incoming shipments of treatment residues received from a treatment, storage or disposal (TSD) facility.

1. If the shipment is in drums, PORTS will count and weigh the drums to ensure they match the number and weight on the manifest.
2. If the shipment is in bulk waste boxes, PORTS will count and weigh the boxes to ensure that the weight matches (within 10%) the manifested weight.
3. For all containers, PORTS will inspect the containers to ensure there are no leaks, major dents, or other structural defects. If such defects are found, PORTS will immediately repack the container.
4. Prior to all return shipments, the TSD facility will sample containers of treatment residue, as detailed in "Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods" (EPA SW-846), then affix chain of custody seals to ensure that the container has not been tampered with or had any material added to or removed from the container. The chain of custody seal will have a unique number assigned to it that will be reported on the manifest.

5. The following paperwork will be reviewed before PORTS signs the manifest accepting treatment residues from any treatment process for storage:
    - Hazardous waste manifests.
    - LDR notification stating whether the residue meets treatment standards or not.
    - Lab analysis results received from the treatment, storage or disposal facility confirming the LDR determination.
    - Back-up lab analysis, performed by PORTS, that confirms any other hazardous designations attached to the waste (i.e., because of treatment, heavy metals may have concentrated in the waste, thus causing the residue to become a TCLP characteristic hazardous waste).

6. PORTS will ensure that labeling of the drums is correct, i.e., that there are appropriate hazardous waste labels, radioactive labels, etc.
7. The paperwork, referenced in Paragraph 5 above, will be maintained in a file with all of the original shipping manifests and Request for Disposal forms. This file will provide for matching of documentation of waste that has been shipped off-site to the documentation of the proportion of waste that is returned as residues. The file will be for a specifically defined period of time and will collect all documentation for off-site shipments and residues returned during that period. This documentation will become a part of the operating record.
8. If a significant discrepancy is found (e.g., number of drums does not match the manifest, weight of the bulk waste containers is not within 10 percent of the manifested waste, chain of custody seals do not match or are broken, etc.), PORTS will accept the wastes and will contact the appropriate TSD facility personnel to resolve the discrepancy. PORTS waste management authorities responsible for the operation of the container storage units will determine whether a waste shipment can be accepted.
9. If PORTS accepts the wastes and the discrepancy is not resolved in 15 days, PORTS will immediately submit a letter to the director describing the discrepancy and all attempts to resolve it, as well as a copy of the manifest and/or shipping paper at issue. PORTS will notify in writing the Director of the Ohio EPA and the Environmental Background Investigation Unit of the Ohio Attorney General's Office prior to receiving for storage any residual waste generated by any person other than DOE.

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C-2F Additional Requirements for Facilities Handling Ignitable, Reactive or Incompatible Wastes [3745-54-13(B)(6), 3745-54-17]

Specific information regarding waste types stored at PORTS is provided in Section C-1. Ignitable, reactive and/or incompatible wastes are stored as described in Section D-1a(3). Additional requirements apply to the storage of ignitable, reactive, or incompatible wastes. The special precautions taken for these wastes are described in Sections D-1 and F-5 of this application, and are only summarized in this section.

In general, PORTS prevents the mixing of incompatible wastes in containers by only accumulating wastes from the same waste stream. Similarly, containers of wastes are only stored with other wastes of the same type wherever possible. Where it is necessary to store a variety of waste types in the same container (e.g., lab packs) or containers of different waste types in proximity to each other, the waste types are carefully reviewed by PORTS waste management personnel responsible for the operation of the storage areas to ensure compatibility and appropriate container storage configurations. This review involves investigation of the processes generating the wastes, researching of references including, but not limited to the latest editions of EPA manual No. 600/2-80-076, "A Method for Determining the Compatibility of Hazardous Waste," "Lange's Handbook of Chemistry," "Bretherick's Handbook of Reactive Chemical Hazards," "The Merck Index," "Handbook of Chemistry and Physics," "Hazardous Chemicals Desk Reference," "Dangerous Properties of Industrial Materials," 40 CFR 264 Appendix V, and other appropriate documents. Compatibility testing with very small amounts of wastes may be performed in the PORTS laboratory facilities. Compatibility testing will be limited to simple mixing procedures conducted under controlled conditions.

Special precautions are required for the management of ignitable or reactive wastes. Ignitable wastes are separated and protected from sources of ignition or reaction including but not limited to open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, or mechanical), spontaneous ignition (i.e., from heat-producing chemical reactions), and radiant heat. "No Smoking" signs are conspicuously placed where there is a hazard from ignitable or reactive wastes.

C-3 Waste Analysis Requirements Pertaining to Land Disposal Restrictions [3745-54-13(A)(1), 3745-59-07]

Land Disposal Restrictions (LDRs) apply to hazardous wastes that require treatment prior to being land disposed. Land disposal includes but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, salt bed formation, underground mine or cave, or concrete disposal vault. Waste-specific prohibitions were promulgated as solvent wastes, dioxin-containing wastes, first-third, second-third, and third-third wastes. PORTS does not operate any of the land disposal facilities described above.

Wastes identified or listed as hazardous for which EPA has not promulgated a prohibition or treatment standard are not subject to LDRs. Treatment standards are either concentration based or technology based. Concentration based treatment standards are based on either Constituent Concentrations in Waste Extract (CCWE) or Constituent Concentration in the Waste (CCW). Technology based treatment standards are based on the Best Demonstrated Available Technology (BDAT).

C-3A Waste Characterization [3745-54-13(A)(1), 3745-59-07]

Each hazardous waste generated by and/or stored at PORTS is discussed in Section C-1 and summarized in Table C-1. Table C-1 notes whether the waste was characterized by analytical knowledge and/or process knowledge. Corresponding analytical results are provided in Appendix C-1. PORTS conservatively assumes that all hazardous wastes generated require treatment prior to land disposal until they are proven to meet treatment standards through analysis as described in Section C-2.

C-3A(1) Waste Characteristics: Solvent Wastes and Dioxin Containing Wastes: [3745-54-13(A)(1), 3745-59-07 (A), 3745-59-30, 3745-59-31]

The solvent wastes generated and managed at PORTS with EPA Hazardous Waste Nos. F001, F002, F003, F004, and F005 are prohibited from land disposal unless they are treated according to the treatment standards contained in OAC 3745-59-40 to 3745-59-44.

Some of the F001 through F005 wastes generated from uranium processing become contaminated with radionuclides. These wastes must be stored onsite as mixed wastes until approved treatment and disposal methods are available.

Laboratory operations at PORTS may generate waste unused chemicals including 2,4,5-TP (silvex), pentachlorophenol; 2,3,4,6-tetrachlorophenol; 2,4,5-trichlorophenol; 2,4,6-trichlorophenol, 2,4,5-T, 2,3,4,5-tetrachlorophenol, 2,4,5-trichlorophenol, and 2,4,6-trichlorophenol which can be identified as F027 hazardous wastes based on a knowledge of how they are generated. F027 hazardous wastes are prohibited from land disposal unless they are treated according to the treatment standards in OAC 3745-59-40 through 44. F020 through F023, F026, and F028 are dioxin-containing wastes and are not generated at PORTS.

C-3A(2) Waste Characteristics: First Third Wastes with Treatment Standards: [3745-59-33(A) Through (E), 3745-59-07(A), 3745-59-41 Through 3745-59-43]

The first third list was developed to establish treatment standards for at least one-third of all listed hazardous wastes by August 8, 1988. The wastes for which standards were generated on August 8, 1988, became the first third list although they addressed less than one-third of all listed wastes. The process waste list that is known as the first third is a list of certain waste streams that are primarily derived from the "K" list of specific waste streams. PORTS does not utilize any process listed under OAC 3745-51-32 and therefore does not produce any waste that is regulated under that portion of the first third prohibition.

However, included in the first third list of prohibited wastes is waste produced from the F006 non-specific waste source. F006 non-wastewater wastes have been generated at PORTS; the F006 waste will be treated as a restricted waste until analytical data are available to determine that the wastes meet the applicable treatment standards. The treatment standards applicable to this waste are prescribed in OAC 3745-59-41 and 3745-59-43.

As allowed under OAC 3745-54-07, process knowledge will be the primary determination of whether a waste stream is subject to regulation under the first third prohibition. However, PORTS conservatively assumes that all hazardous wastes generated require treatment prior to land disposal until they are proven to meet treatment standards through analysis as described in Section C-2. Analytical data will be provided as required to offsite, commercial TSD facilities.

C-3A(3) Waste Characteristics: Second Third Wastes with Treatment Standards: [3745-59-34(A) Through (G), 3745-59-34 (I), 3745-59-41 Through 3745-59-43]

The second third list was developed to assure that treatment standards would be in place for at least two-thirds of all listed hazardous wastes by June 8, 1989. The wastes for which standards were established on June 8, 1989, became the second third list although they addressed less than two-thirds of all listed wastes. All second third wastes generated at PORTS are non-wastewaters. Second third hazardous wastes generated at PORTS currently include spent cyanide plating bath solution and waste unused chemicals. Second third wastes generated at PORTS will be characterized based on the processes and materials used in generating the wastes.

PORTS conservatively assumes that all hazardous wastes generated require treatment prior to land disposal until they are proven to meet treatment standards through analysis as described in Section C-2. The second third wastes at PORTS will be treated as restricted wastes until analytical data are available to determine differently.

C-3A(4) Waste Characteristics: Third Third Wastes With Treatment Standards: [3745-59-35]

The third third list was developed to establish treatment standards for all remaining listed hazardous wastes by May 8, 1990. Third third wastes generated at PORTS will be characterized based on the processes and materials used in generating the wastes. PORTS also manages hazardous wastes listed in OAC 7345-59-40 that are mixed wastes. These wastes are prohibited from land disposal effective May 8, 1992.

C-3B Notification and Certification Requirements: [3745-59-07]

The following sections present procedures that PORTS follows for preparing and maintaining applicable notifications and certifications for generators. Further, PORTS anticipates shipping hazardous waste offsite for incineration and having the associated treatment residuals returned to PORTS for further management. The procedure for preparing and maintaining applicable notifications and certifications for wastes to be further managed are also detailed in the following sections.

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C-3B(1) Retention of Generator Notices and Certifications [3745-59-07(A)]

PORTS has identified the wastes generated at the facility that are restricted from land disposal in the *Site Treatment Plan for Mixed Wastes*, as required by the Federal Facilities Compliance Act and the Ohio EPA Director's Findings and Orders. Further, as detailed in the waste analysis plan (Section C-2) all waste streams at PORTS except for unused laboratory and non-laboratory commercial products will be analyzed on a periodic basis. In addition, PORTS will be shipping hazardous wastes for treatment to, and receiving the associated treatment residues from Oak Ridge, Tennessee and other TSD Facilities. Therefore, PORTS must re-review and maintain all notices and certification submitted by the original generator (PORTS) prior to acceptance and storage of this residue as part of the requirements of this section.

The generator of this waste is required to notify the PORTS storage facility in writing that the wastes being sent to the facility are subject to LDRs. At a minimum, this written notice will include the following information with each shipment of waste:

- U.S. EPA Hazardous Waste Number(s).
- The corresponding treatment standards and all applicable prohibitions set forth in OAC 3745-59-32.
- The manifest number associated with the shipment of waste.
- Waste analysis data as available.

For treatment residues returned to PORTS that PORTS determines could be land disposed without further treatment, each shipment of waste will be accompanied by a written notification and certification to the disposal facility. The written notification will contain the information detailed previously. The certification will be signed by an authorized representative and state the following:

> "I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in Rules 3745-59-40 through 3745-59-44 of the Administrative Code and all applicable prohibitions set forth in Rule 3745-59-32 of the Administrative Code or Section 3004(D) of RCRA. I believe that the information I submitted is true,

accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment."

PORTS will maintain information, in addition to what is provided in Appendix C-1, that was utilized to determine if the waste was subject to land disposal regulations onsite in the operating record. This information could include MSDS, process information, analytical testing, or other supporting data.

PORTS will maintain copies of all notices, certifications, demonstrations, waste analysis data, and other documentation as a part of this subsection in the operating record for at least 5 years after the waste that is the subject of the documentation was sent to an onsite or offsite treatment, storage, or disposal facility. PORTS understands that the 5 year period is automatically extended during the course of any unresolved enforcement action regarding the regulated activity or as requested by the director.

C-3B(2) Notification and Certification of Wastes to be Further Managed [3745-59-07(B)(6)]

Many of the hazardous wastes generated at PORTS are required under the LDRs to meet specific treatment standards or are required to be treated in a specified manner. Wastes are subject to further regulation if it is determined that the waste belongs to one of several categories. The categories are as follows:

- F001 through F005 spent solvents and sludges.
- F020, F023, and F026 through F028 dioxin-containing wastes.
- First third listed wastes.
- Second third listed wastes.
- Third third listed wastes.

PORTS sends hazardous wastes offsite for treatment and anticipates shipment of wastes offsite for final disposal. Therefore, as required under this section, PORTS will ensure the receiving facilities will be notified that they are receiving a hazardous waste that is subject to further regulation, in accordance with OAC 3745-59-07(a)(1). This is accomplished by utilizing a form that is provided by the disposal facility or by PORTS. The completed form identifies the U.S. EPA

hazardous waste identification number, the corresponding treatment standards and applicable prohibitions, the manifest number associated with the waste shipment, and the waste analysis data where available. The information regarding applicable treatment standards will include those treatment standards for waste F001 through F005, and F035. Treatment standards for all other restricted wastes will either be included or be referenced by including on the notification the following information:

- The applicable wastewater or non-wastewater designation.
- The applicable subdivisions within a waste code based on waste-specific criteria (e.g., D003 reactive cyanides).
- The regulation(s) where the applicable standards appear.

Where the applicable treatment standards are expressed as specified technologies, the applicable five-letter treatment code (e.g., Incin, Wetox) will also be listed.

Copies of all TSD facility notifications will be maintained in the operating record files at PORTS for a minimum of 5 years.

If it is determined that hazardous wastes from PORTS can be land disposed without further treatment, PORTS will submit to the treatment, storage, or land disposal facility a notice of certification stating that the waste meets the applicable treatment standards set forth in OAC 3745-59-40 through 3745-59-44 and the applicable prohibition levels set forth in OAC 3745-59-32. This will be accomplished by utilizing a form that is provided by the disposal facility or by PORTS. The completed form identifies the U.S. EPA hazardous waste identification number, the corresponding treatment standards and applicable prohibitions, the manifest number associated with the waste shipment, and the waste analysis data where available. The information regarding applicable treatment standards will include those treatment standards for wastes F001 through F005, F035, and the California listed wastes. Treatment standards for all other restricted wastes will either be included or be referenced by including on the notification the following information:

- The applicable wastewater or non-wastewater designation.
- The applicable subdivisions within a waste code based on waste specific-specific criteria (e.g., D003 reactive cyanides).
- The regulation(s) where the applicable standards appear.

Where the applicable treatment standards are expressed as specified technologies, the applicable five-letter treatment code (e.g., Incin, Wetox) will also be listed.

The certification statement shall be signed by a representative that is authorized by U.S. DOE for this purpose. The certification statement will read as follows:

> "I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in rules 3745-59-40 through 3745-59-44 of the Administrative Code and all applicable prohibitions set forth in rule 3745-59-32 of the Administrative Code or Section 3004(d) of RCRA. I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment."

Copies of the certification and TSD notification will be maintained in the operating record at PORTS for a minimum of 5 years.

Current U.S. DOE policy requires that all wastes generated at PORTS that are commercially treated or disposed of be free of any radionuclide that was added as a result of PORTS operations. Consequently, all of the hazardous wastes generated at PORTS are currently assumed to include radioactive material from DOE operations and are stored onsite as mixed (hazardous and radioactive) waste. In addition, wastes determined to be mixed wastes are managed at PORTS or another DOE facility until approved treatment and disposal methods for mixed wastes are available. If sufficient documentation is developed to demonstrate that a waste contains no added radioactive constituents, the waste will be shipped offsite to a commercial treatment, storage, disposal, or recycling facility.

The storage of mixed waste will extend beyond 1 year, as allowed by the Federal Facilities Compliance Act and the Director's Findings and Orders in accordance with the *Site Treatment Plan for Mixed Wastes*. PORTS will make every effort to remove the waste from storage for shipment to treatment and/or disposal facilities, in a timely manner, as these options become available. The *Site Treatment Plan for Mixed Wastes* has been developed and approved by the Ohio EPA, and is updated annually. The *Site Treatment Plan* accounts for the mixed waste that will require storage for longer than one year and establishes milestones for dispositioning the waste.

PORTS conservatively assumes that all hazardous wastes generated require treatment prior to land disposal until they are proven to meet treatment standards through analysis as described in Section C-2. All waste analysis data will be maintained in the facility operating record for a minimum of 5 years.

From time to time, PORTS will manage a restricted hazardous waste subsequent to the point of generation that will be excluded from the definition of waste or hazardous waste or exempt from regulation under Chapters 3745-50 to 3745-69 of the Administrative Code. These wastes or hazardous wastes are excluded or exempted under OAC 3745-51-02 to 3745-51-06. In order to comply with OAC 3745-59-07(a)(5), a one-time notice-to-file will be placed in the facility operating record. The notice-to-file will state the generation, subsequent exclusion from the definition of waste or hazardous waste or exemption from regulation under OAC chapters 3745-50 to 3745-69, and the disposition of the waste. An example of such an exclusion is a point source discharge from industrial wastewater treatment [OAC 3745-51-04 (a)(2)].

Examples of restricted wastes that will be further managed under the one-time notice-to-file are as follows:

- Solvent-contaminated groundwaters that will be managed at the X-622, X-622T, X-623, and X-624 water treatment facilities permitted by a National Pollutant Discharge Elimination System (NPDES) permit under the Clean Water Act. The groundwater will be processed through activated carbon treatment columns to remove solvents that contaminate the groundwater. The water will be discharged through an NPDES permitted discharge point. The carbon, when spent, will be managed as a hazardous waste.
- Decontamination and cleaning solutions and corrosive solutions (EPA Waste Code D002) will be managed at the X-705 Uranium Recovery and Decontamination facility. Two NPDES-permitted wastewater treatment units will neutralize the solutions and/or remove heavy metals (e.g., chromium or lead) from the solutions. The treated effluent is discharged through an NPDES permitted discharge point. Sludges generated by the treatment processes are managed as a hazardous waste.

All one-time notices-to-file will be maintained in the facility operating record for a minimum of 5 years.

PORTS has onsite laboratory facilities that use an extensive variety of laboratory chemicals. Additionally, a limited number of laboratory grade chemicals are utilized in the process or maintenance areas for specialized purposes. Small quantity commercial products are also used throughout the plant site. Periodically, there is a collection of these chemicals or products from throughout PORTS due to the chemicals no longer being used or the shelf life of the product has been exceeded. Many of these products will be included in Appendix II of OAC 3745-59-42. These wastes will often be packaged for disposal in a "labpack."

Regarding labpacks, compliance with OAC 3745-59-07(A)(8) and (9) will be demonstrated by entering a one-time notice-to-file into the operating record that states that chemicals listed under and OAC 3745-59-42 Appendix II are properly packaged. Manifests and certification statements will be forwarded with the waste shipments to the TSD facility. The certification statements will contain the wording as stated in OAC 3745-59-07(a)(7), as appropriate, and will be signed by a person authorized by the U.S. DOE to perform that function.

Copies of the notice-to-file and the certification statement will be maintained in the facility operating record for a minimum of 5 years.

PORTS is not a small quantity generator; therefore, OAC 3745-59-07(A)(8) does not apply.

C-3C Additional Requirements Pertaining Storage of Restricted Wastes [3745-59-50]

C-3C(1) Restricted Wastes Stored in Containers: [3745-59-50(A)(2)(a)]

All containers of restricted wastes are labeled or marked with, at a minimum, the words "Hazardous Waste", the accumulation start date, and the identity of the container contents. Example labels are shown in Figures D-4 through D-5. The identity of the container contents is given by the container identification numbers and/or bar code labels which are also applied to the containers for tracking purposes. Other labels and markings are applied as applicable and required.

C-3C(2) Storage of Liquid PCB Wastes [3745-59-50(F)]

Pursuant to OAC 3745-59-50(F), the owner/operator of a facility storing liquid hazardous wastes containing concentrations of PCBs greater than or equal to 50 ppm, must demonstrate that the facility meets the requirements of 40 CFR 761.65(B).

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PORTS stores liquid hazardous wastes containing PCBs in concentrations greater than or equal to 50 ppm in the storage units in X-7725 and X-326. These storage units are completely enclosed and have been constructed with an adequate floor which has a continuous 6 inch high perimeter curb with the exception of areas 4A and P in X-7725 and the X-326 unit. The containment volume of all storage areas are equal to at least two times the internal volume of the largest PCB container or 25 percent of total internal volume of all PCB articles and PCB containers. There are no drain valves, floor drains, expansion joints, sewer lines, or other openings that would permit liquids to flow from the storage area. The floors and curbing have been constructed of continuous smooth and impervious materials to prevent or minimize penetration of PCBs. Existing expansion joints in the floor are sealed with an impervious flexible sealing compound.

Certain mixed wastes with Toxic Substance Control Act (TSCA) regulated PCBs are stored in five-inch polybottles in areas 4A and P in X-7725 and in X-326 with one inch to one and a half inch curbing. These storage arrangements are necessary to avoid a potential nuclear criticality incident and are allowed under a DOE-EPA TSCA Federal Facilities Compliance Agreement.

A nuclear criticality incident is an uncontrolled self sustained chain reaction in a fissionable material. At PORTS, the fissionable material is the U-235 isotope of uranium. A nuclear criticality accident releases an intense, lethal burst of radiation and generates highly radioactive fission products. All nuclear facilities use strict, very formal control measures mandated by the DOE or the Nuclear Regulatory Commission (NRC) to prevent such accidents.

The control of storage geometry is commonly used to assure safety. Special geometries are carefully designed to make a criticality accident very unlikely. These configurations usually involve small cylinders and thin slabs that allow neutrons to escape rather than initiating fission. Wastes from fissile material areas must be assumed to contain unsafe amounts of fissionable material, and such wastes are necessarily stored in controlled geometries.

Fissionable wastes are usually stored in 5-inch internal diameter "polybottles" or cans with controlled geometries. These special containers are placed in carefully designed storage arrays, where geometry minimizes interaction from neutrons in adjacent containers. Credible accident scenarios are analyzed and controls are implemented to assure that spillage cannot create a nuclear safety hazard. Dike heights are limited so that a "slab" of spilled material cannot assume an unfavorable geometry. The fissionable materials processed at the Portsmouth Site dictate a maximum dike height of 1.0 to 1.5 Inches, depending upon the materials and the storage geometries.

The arrangement of each storage area is rigidly maintained through a formal system of inspection and configuration control. The nuclear safety standards employed are those required by DOE, which are based upon the nationally accepted standards of the American Nuclear Society.

DOE signed a Federal Facilities Compliance Agreement (FFCA) with the U.S. Environmental Protection Agency on February 20, 1992, that recognizes the criticality concerns and the use of 5-inch polybottles for PCBs in waste from high uranium assay areas. Additionally, EPA is pursuing a proposed rulemaking that would authorize exceptions for storage requirements due to this criticality concern. Neither the X-7725 Unit nor the X-326 Unit are located below the 100-year flood elevation. The entire PORTS Site is located above the 100-year flood elevation, as discussed in Section B-3 of this application.

All non-radioactive restricted waste containing greater than 50 ppm PCBs that are accumulated for storage in the X-7725 container storage unit will be removed for disposal or for treatment within one year of the date these wastes are first placed into storage. The Federal Facilities Compliance Agreement signed by PORTS, DOE, and EPA on February 20, 1992, authorizes DOE to store radioactive PCB waste longer than 1 year due to lack of disposal capacity.

C-3D Exemptions from and Extensions to Land Disposal Restrictions

The storage of mixed waste will extend beyond 1 year, as allowed by the Federal Facilities Compliance Act and the Director's Findings and Orders in accordance with the *Site Treatment Plan for Mixed Wastes*. PORTS will make every effort to remove the waste from storage for shipment to treatment and/or disposal facilities, in a timely manner, as these options become available. The *Site Treatment Plan for Mixed Wastes* has been developed and approved by the Ohio EPA, and is updated annually. The *Site Treatment Plan* accounts for the mixed waste that will require storage for longer than one year and establishes milestones for dispositioning the waste.

Table C-1
Summary of Generated Waste Streams

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Laboratory Off-Specification Chemicals (SW-1, SW-1A, with metals, and SW-1B, without metals)	D001	Various Ignitables	L	Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST
	D002	Acids/Bases	L	Process knowledge	DEACT and meet 268.48 standards
	D003	Various Reactives	S,L,G	Process knowledge	DEACT
	D004	Arsenic	S,L	Process knowledge	5.0 mg/l EP
	D005	Barium	S,L	Process knowledge	100 mg/l TCLP
	D006	Cadmium	S,L	Process knowledge	1.0 mg/l TCLP
	D007	Chromium	S,L	Process knowledge	5.0 mg/l TCLP
	D008	Lead	S,L	Process knowledge	5.0 mg/l TCLP
	D009	Mercury	S,L	Process knowledge	IMERC; or RMERC
	D010	Selenium	S,L	Process knowledge	5.7 mg/l TCLP
	D011	Silver	S,L	Process knowledge	5.0 mg/l TCLP
	D012	Endrin	S,L	Process knowledge	0.13 and meet 268.48 standards
	D013	Lindane	S,L	Process knowledge	0.66 and meet 268.48 standards
	D014	Methoxychlor	S,L	Process knowledge	0.18 and meet 268.48 standards
	D015	Toxaphene	S,L	Process knowledge	2.6 and meet 268.48 standards

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	D016	2,4-D	S,L	Process knowledge	10 and meet 268.48 standards
	D017	2,4,5-TP (Silver)	S,L	Process knowledge	7.9 and meet 268.48 standards
	D018	Benzene	S,L	Process knowledge	10 and meet 268.48 standards
	D019	Carbon Tetrachloride	S,L	Process knowledge	6.0 and meet 268.48 standards
	D020	Chlordane	S,L	Process knowledge	0.26 and meet 268.48 standards
	D021	Chlorobenzene	S,L	Process knowledge	6.0 and meet 268.48 standards
	D023	o-Cresol	S,L	Process knowledge	5.6 and meet 268.48 standards
	D024	m-Cresol	S,L	Process knowledge	5.6 and meet 268.48 standards
	D025	p-Cresol	S,L	Process knowledge	5.6 and meet 268.48 standards
	D026	Cresol	S,L	Process knowledge	11.2 and meet 268.48 standards
	D027	1,4-Dichlorobenzene	S,L	Process knowledge	6.0 and meet 268.48 standards
	D028	1,2-Dichloroethane	S,L	Process knowledge	6.0 and meet 268.48 standards
	D029	1,1-Dichloroethylene	S,L	Process knowledge	6.0 and meet 268.48 standards

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Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	D030	2,4-Dinitrotoluene	S,L	Process knowledge	140 and meet 268.48 standards
	D031	Heptachlor (and its epoxide)	S,L	Process knowledge	0.066 and meet 268.48 standards
	D032	Hexachlorobenzene	S,L	Process knowledge	10 and meet 268.48 standards
	D033	Hexachlorobutadiene	S,L	Process knowledge	5.6 and meet 268.48 standards
	D034	Hexachloroethane	S,L	Process knowledge	30 and meet 268.48 standards
	D035	Methyl ethyl ketone	S,L	Process knowledge	36 and meet 268.48 standards
	D036	Nitrobenzene	S,L	Process knowledge	14 and meet 268.48 standards
	D037	Pentachlorophenol	S,L	Process knowledge	7.4 and meet 268.48 standards
	D038	Pyridine	S,L	Process knowledge	16 and meet 268.48 standards
	D039	Tetrachloroethylene	S,L	Process knowledge	6.0 and meet 268.48 standards
	D040	Trichloroethylene	S,L	Process knowledge	6.0 and meet 268.48 standards
	D041	2,4,5-Trichlorophenol	S,L	Process knowledge	7.4 and meet 268.48 standards
	D042	2,4,6-Trichlorophenol	S,L	Process knowledge	7.4 and meet 268.48 standards

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	P001	Warfarin & salts, when present at concentrations greater than 0.3%	S,L	Process knowledge	CMBST
	P003	Arcolein	S,L	Process knowledge	CMBST
	P004	Aldrin	S,L	Process knowledge	0.066
	P005	Allyl alcohol	S,L	Process knowledge	CMBST
	P008	4-Aminopyridine	S,L	Process knowledge	INCIN
	P010	Arsenic acid H_3AsO_4	S,L	Process knowledge	5.0 mg/l TCLP
	P011	Arsenic oxide As_2O_5	S,L	Process knowledge	5.0 mg/l TCLP
	P012	Arsenic oxide As_2O_3	S,L	Process knowledge	5.0 mg/l TCLP
	P013	Barium cyanide	S,L	Process knowledge	7.6 mg/l TCLP
	P015	Beryllium	S,L	Process knowledge	RMETL; or RTHRM
	P016	Dichloromethyl ether	S,L	Process knowledge	INCIN
	P018	Brucine	S,L	Process knowledge	INCIN
	P020	Dinoseb	S,L	Process knowledge	2.5
	P021	Calcium cyanide	S,L	Process knowledge	590
	P022	Carbon disulfide	S,L	Process knowledge	4.8 mg/l TCLP
	P023	Chloroacetaldehyde	S,L	Process knowledge	INCIN
	P024	p-Chloroanaline	S,L	Process knowledge	16
	P028	Benzyl chloride	S,L	Process knowledge	INCIN
	P029	Copper cyanide	S,L	Process knowledge	590

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	P030	Cyanides (soluble CN salts) not otherwise specified	S,L	Process knowledge	590
	P031	Cyanogen	S,L	Process knowledge	CHOXD; WETOX; or INCIN
	P033	Cyanogen chloride	S,L	Process knowledge	CHOXD; WETOX; or INCIN
	P037	Dieldrin	S,L	Process knowledge	0.13
	P038	Diethylarsine	S,L	Process knowledge	5.0 mg/l TCLP
	P041	Diethyl-p-nitrophenyl phosphate	S,L	Process knowledge	CMBST
	P042	Epinephrine	S,L	Process knowledge	INCIN
	P046	alpha, alpha-Dimethyl-phenethylamine	S,L	Process knowledge	INCIN
	P047	4,6-Dinitro-o-cresol & salts	S,L	Process knowledge	INCIN
	P048	2,4-Dinitrophenol	S,L	Process knowledge	160
	P050	Endosulfan	S,L	Process knowledge	0.066
	P051	Endrin & metabolites	S,L	Process knowledge	0.13
	P056	Fluorine	G	Process knowledge	ADGAS FB NEUTR
	P058	Acetic acid, fluoro-, sodium salt	S,L	Process knowledge	INCIN
	P059	Heptachlor	S,L	Process knowledge	0.066
	P060	Isodrin	S,L	Process knowledge	0.066
	P063	Hydrogen cyanide	S,L	Process knowledge	590
	P064	Methyl isocyanate	S,L	Process knowledge	INCIN

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	P068	Hydrazine, methyl-	S,L	Process knowledge	CHOXD; CHRED; OR CMBST
	P070	Aldicarb	S,L	Process knowledge	INCIN
	P071	Methyl parathion	S,L	Process knowledge	4.6
	P072	alpha-Naphthylthiourea	S,L	Process knowledge	INCIN
	P073	Nickel carbonyl	S,G	Process knowledge	5.0 mg/l TCLP
	P074	Nickel cyanide	S,L	Process knowledge	5.0 mg/l TCLP
	P075	Nicotine & salts	S,L	Process knowledge	INCIN
	P076	Nitric oxide	G	Process knowledge	ADGAS
	P077	p-Nitroanaline	S,L	Process knowledge	28
	P078	Nitrogen dioxide	G	Process knowledge	ADGAS
	P082	N-nitrosodimethylamine	S,L	Process knowledge	2.3
	P087	Osmium tetroxide	S,L	Process knowledge	RMETL; or RTHRM
	P089	Parathion	S,L	Process knowledge	4.6
	P093	Phenylthiourea	S,L	Process knowledge	INCIN
	P095	Phosgene	G	Process knowledge	INCIN
	P098	Potassium cyanide	S,L	Process knowledge	590
	P099	Potassium silver cyanide	S,L	Process knowledge	0.30 mg/l TCLP
	P104	Silver cyanides	S,L	Process knowledge	0.30 mg/l TCLP
	P105	Sodium azide	S,L	Process knowledge	CHOXD; CHRED; or CMBST

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	P106	Sodium cyanide	S,L	Process knowledge	590
	P108	Strychnine & salts	S,L	Process knowledge	INCIN
	P110	Tetraethyl lead	S,L	Process knowledge	0.37 mg/l TCLP
	P111	Diphosphoric acid, tetraethyl ester	S,L	Process knowledge	CMBST
	P113	Thallic oxide	S,L	Process knowledge	RTHRM; or STABL
	P114	Thallium selenite	S,L	Process knowledge	0.16 mg/l TCLP
	P115	Thallium sulfate	S,L	Process knowledge	RTHRM; or STABL
	P116	Hydrazine-carbothioamide	S,L	Process knowledge	INCIN
	P119	Ammonium vanadate	S,L	Process knowledge	STABL
	P120	Vanadium pentoxide	S,L	Process knowledge	STABL
	P121	Zinc cyanide	S,L	Process knowledge	590
	P123	Toxaphene	S,L	Process knowledge	2.6
	U001	Acetaldehyde (Phenylacetaldehyde)	L	Process knowledge	CMBST
	U002	Acetone	L	Process knowledge	160
	U003	Acetonitrile	S,L	Process knowledge	INCIN
	U004	Acetophenone	S,L	Process knowledge	9.7
	U006	Acetyl chloride	S,L	Process knowledge	INCIN
	U007	Acrylamide	S,L	Process knowledge	INCIN
	U008	Acrylic acid	S,L	Process knowledge	CMBST
	U009	Acrylonitrile	S,L	Process knowledge	84
	U012	Aniline	S,L	Process knowledge	14

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	U017	Benzene (dichloromethyl-)	S,L	Process knowledge	INCIN
	U018	Benz(a)anthracene	S,L	Process knowledge	3.4
	U019	Benzene	S,L	Process knowledge	10
	U020	Benzenesulfonic acid chloride	S,L	Process knowledge	INCIN
	U021	Benzidine	S,L	Process knowledge	INCIN
	U022	Benzo(a)pyrene	S,L	Process knowledge	3.4
	U023	Benzotrichloride	S,L	Process knowledge	CHOXD; CHRED; or CMBST
	U026	Chlornaphazm	S,L	Process knowledge	INCIN
	U028	Diethylhexyl phthalate	S,L	Process knowledge	28
	U029	Bromoethane	S,L	Process knowledge	15
	U030	4-Bromophenyl phenyl ether	S,L	Process knowledge	15
	U031	n-Butyl alcohol	L	Process knowledge	2.6
	U032	Calcium chromate	S,L	Process knowledge	0.86 mg/l TCLP
	U033	Carbon oxyfluoride	S,L	Process knowledge	INCIN
	U034	Chloral	S,L	Process knowledge	INCIN
	U036	Chlordane, alpha & gamma isomers	S,L	Process knowledge	0.26
	U037	Chlorobenzene	S,L	Process knowledge	6.0
	U039	p-Chloro-m-cresol	S,L	Process knowledge	14

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	U041	Epichlorohydrin	S,L	Process knowledge	INCIN
	U042	2-Chloroethyl vinyl ether	S,L	Process knowledge	INCIN
	U043	Vinyl chloride	S,L	Process knowledge	6.0
	U044	Chloroform	S,L	Process knowledge	6.0
	U045	Chloromethane	S,L	Process knowledge	30
	U046	Chloromethyl methyl ether	S,L	Process knowledge	INCIN
	U047	beta-Chloronaphthalene	S,L	Process knowledge	5.6
	U048	o-Chlorophenol	S,L	Process knowledge	5.7
	U050	Chrysene	S,L	Process knowledge	3.4
	U051	Creosote	S,L	Process knowledge	0.37 mg/l TCLP
	U052	Cresol (Cresylic acid)	S,L	Process knowledge	11.2
	U055	Cumene	L	Process knowledge	CMBST
	U056	Cyclohexane	L	Process knowledge	CMBST
	U057	Cyclohexanone	L	Process knowledge	0.75 mg/l TCLP
	U060	DDD	S,L	Process knowledge	0.087
	U061	DDT	S,L	Process knowledge	0.087
	U063	Dibenzo(a,h)pyrene	S,L	Process knowledge	8.2
	U064	Dibenzo(a,i)pyrene	S,L	Process knowledge	CMBST
	U066	Propane, 1,2-dibromo-3-chloro-	S,L	Process knowledge	15
	U067	Ethylene dibromide	S,L	Process knowledge	15

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	U068	Dibromomethane	S,L	Process knowledge	15
	U069	Dibutyl phthalate	S,L	Process knowledge	28
	U070	1,2-Dichlorobenzene	S,L	Process knowledge	6.0
	U071	1,3-Dichlorobenzene	S,L	Process knowledge	6.0
	U072	1,4-Dichlorobenzene	S,L	Process knowledge	6.0
	U073	3,3-Dichlorobenzidine	S,L	Process knowledge	INCIN
	U074	2-Butene, 1,4-dichloro-	S,L	Process knowledge	INCIN
	U075	Dichlorodifluoro-methane	S,L	Process knowledge	7.2
	U076	1,1-Dichloroethane	S,L	Process knowledge	6.0
	U077	1,2-Dichloroethane	S,L	Process knowledge	6.0
	U078	1,1-Dichloroethylene	S,L	Process knowledge	6.0
	U079	1,2-Dichloroethylene	S,L	Process knowledge	30
	U080	Methylene chloride	S,L	Process knowledge	30
	U081	2,4-Dichlorophenol	S,L	Process knowledge	14
	U082	2,6-Dichlorophenol	S,L	Process knowledge	14
	U083	1,2-Dichloropropene	S,L	Process knowledge	18
	U084	1,3-Dichloropropene	S,L	Process knowledge	18
	U086	Hydrazine, 1,2-diethyl-	S,L	Process knowledge	CHOXD; CHRED; or CMBST
	U088	Diethyl phthalate	S,L	Process knowledge	28
	U092	Dimethylamine	L	Process knowledge	INCIN

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	U094	Benz(a)anthracene, 7,12-dimethyl	S,L	Process knowledge	CMBST
	U096	Dimethylbenzyl-hydroperoxide	S,L	Process knowledge	CHOXD; CHRED; or CMBST
	U101	2,4-Dimethylphenol	S,L	Process knowledge	14
	U102	Dimethyl phthalate	S,L	Process knowledge	28
	U105	2,4-Dinitrotoluene	S,L	Process knowledge	140
	U106	2,6-Dinitrotoluene	S,L	Process knowledge	28
	U107	Di-n-octyl phthalate	D,L	Process knowledge	28
	U108	1,4-Dioxane	S,L	Process knowledge	CMBST
	U109	1,2-Diphenylhydrazine	S,L	Process knowledge	CHOXD; CHRED; or CMBST
	U110	Dipropylamine	L	Process knowledge	INCIN
	U112	Ethyl acetate	L	Process knowledge	33
	U113	Ethyl acrylate	L	Process knowledge	CMBST
	U117	Ethyl ether	L	Process knowledge	160
	U118	Ethyl methacrylate	S,L	Process knowledge	160
	U120	Fluoranthene	S,L	Process knowledge	3.4
	U121	Trichlorofluoromethane	S,L	Process knowledge	30
	U122	Formaldehyde	S,L	Process knowledge	CMBST
	U123	Formic acid	S,L	Process knowledge	CMBST
	U126	Glycidylaldehyde	S,L	Process knowledge	CMBST
	U127	Hexachlorobenzene	S,L	Process knowledge	10
	U128	Hexachlorobutadiene	S,L	Process knowledge	5.6

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	U129	Lindane	S,L	Process knowledge	0.066
	U130	Hexachlorocyclo-pentadiene	S,L	Process knowledge	2.4
	U131	Hexachloroethane	S,L	Process knowledge	30
	U133	Hydrazine	S,L	Process knowledge	CHOXD; CHRED; or CMBST
	U134	Hydrofluoric acid	S,L	Process knowledge	ADGAS; FB NEUTR; or NEUTR
	U135	Hydrogen sulfide	S,L	Process knowledge	CHOXD; CHRED; or CMBST
	U137	Indeno(1,2,3-cd)pyrene	S,L	Process knowledge	3.4
	U138	Methyl iodide	S,L	Process knowledge	65
	U140	Isobutyl alcohol	S,L	Process knowledge	170
	U141	1,3-Benzodioxide	S,L	Process knowledge	2.6
	U142	Kepone	S,L	Process knowledge	0.13
	U144	Lead acetate	S,L	Process knowledge	0.37 mg/l TCLP
	U145	Lead phosphate	S,L	Process knowledge	0.37 mg/l TCLP
	U146	Lead subacetate	S,L	Process knowledge	0.37 mg/l TCLP
	U147	Maleic anhydride	S,L	Process knowledge	CMBST
	U149	Malonotritrile	S,L	Process knowledge	INCIN
	U150	Melphalan	S,L	Process knowledge	INCIN
	U151	Mercury	S,L	Process knowledge	0.025 mg/l TCLP
	U152	Methacrylonitrile	S,L	Process knowledge	84

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	U153	Methanethiol	S,L	Process knowledge	INCIN
	U154	Methanol	L	Process knowledge	0.75 mg/l TCLP
	U159	Mehtyl ethyl ketone	S,L	Process knowledge	36
	U160	Methyl ethyl ketone peroxide	S,L	Process knowledge	CHOXD; CHRED; or CMBST
	U161	Methyl isobutyl ketone	L	Process knowledge	33
	U162	Methyl methacrylate	S,L	Process knowledge	160
	U165	Napthalene	S,L	Process knowledge	5.6
	U169	Nitrobenzene	S,L	Process knowledge	14
	U170	p-Nitrophenol	S,L	Process knowledge	29
	U171	2-Nitropropane	S,L	Process knowledge	INCIN
	U182	Paraldehyde	S,L	Process knowledge	CMBST
	U183	Pentachlorobenzene	S,L	Process knowledge	10
	U184	Pentachloroethane	S,L	Process knowledge	INCIN
	U185	Pentachloronitro-benzene	S,L	Process knowledge	4.8
	U188	Phenol	S,L	Process knowledge	6.2
	U190	Phthalic anhydride	S,L	Process knowledge	28
	U196	Pyridine	S,L	Process knowledge	16
	U197	p-Benzoquinone	S,L	Process knowledge	CMBST
	U201	Resorcinol	S,L	Process knowledge	CMBST
	U202	Saccharin & salts	S,L	Process knowledge	INCIN
	U204	Selenious acid	S,L	Process knowledge	0.16 mg/l TCLP

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	U205	Selenium sulfide SeS_2	S,L	Process knowledge	0.16 mg/l TCLP
	U207	1,2,3,4-Tetrachlorobenzene	S,L	Process knowledge	14
	U208	1,1,1,2-Tetrachloroethane	S,L	Process knowledge	6.0
	U209	1,1,2,2-Tetrachloroethane	S,L	Process knowledge	6.0
	U210	Tetrachloroethylene	S,L	Process knowledge	6.0
	U211	Carbon tetrachloride	S,L	Process knowledge	6.0
	U213	Tetrahydrofuran	L	Process knowledge	CMBST
	U214	Thallium acetate	S,L	Process knowledge	RTHRM; or STABL
	U215	Thallium carbonate	S,L	Process knowledge	RTHRM; or STABL
	U216	Thallium chloride	S,L	Process knowledge	RTHRM; or STABL
	U217	Thallium nitrate	S,L	Process knowledge	RTHRM; or STABL
	U218	Thioacetamide	S,L	Process knowledge	INCIN
	U219	Thiourea	S,L	Process knowledge	INCIN
	U220	Toluene	S,L	Process knowledge	10
	U223	Toluene diisocyanate	S,L	Process knowledge	CMBST
	U225	Bromoform	S,L	Process knowledge	15
	U226	1,1,1-Trichloroethane	S,L	Process knowledge	6.0
	U227	1,1,2-Trichloroethane	S,L	Process knowledge	6.0
	U228	Trichloroethylene	S,L	Process knowledge	6.0
	U234	1,3,5-Trinitrobenzene	S,L	Process knowledge	INCIN

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	U235	Tris(2,3-dibromo-propyl) phosphate	S,L	Process knowledge	.01
	U236	Trypan blue	S,L	Process knowledge	INCIN
	U238	Ethyl carbamate (urethane)	S,L	Process knowledge	INCIN
	U239	Xylene	L	Process knowledge	30
	U240	2,4-D, salts & esters	S,L	Process knowledge	INCIN
	U243	Hexachloropropene	S,L	Process knowledge	30
	U246	Cyanogen bromide (CN)Br	S,L	Process knowledge	CHOXD; WETOX; or INCIN
	U247	Methoxychlor	S,L	Process knowledge	.018
	U248	Warfarin & salts when present at concentrations of 0.3% or less	S,L	Process knowledge	CMBST
	U328	Benzenamine, 2-methyl	S,L	Process knowledge	INCIN; or thermal destruction
	U353	Benzenamine, 4-methyl	S,L	Process knowledge	INCIN; or thermal destruction
	U359	Ethylene glycol monoethyl ether	S,L	Process knowledge	CMBST

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	F027	2,4,5-TP (Silvex) Pentachlorophenol 2,3,4,6-Tetrachloro-phenol 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol 2,4,5-T,2,3,4,5-Tetra chlorophenol 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol	S,L	Process knowledge	7.4
Rags, gloves, wipes, absorbent material, etc. (SW-2)	D004	Arsenic	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D006	Cadmium	S	Analytical, Process knowledge	1.0 mg/l TCLP
	D007	Chromium	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D009	Mercury	S	Analytical, Process knowledge	IMERC; or RMERC
	D011	Silver	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D018	Benzene	S	Analytical, Process knowledge	10 and meet 268.48 standards
	D022	Chloroform	S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D026	Cresol	S	Analytical, Process knowledge	11.2 and meet 268.48 standards
	D035	Methyl ethyl ketone	S	Analytical, Process knowledge	36 and meet 268.48 standards
	D038	Pyridine	S	Analytical, Process knowledge	16 and meet 268.48 standards

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	D039	Tetrachloroethylene	S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D040	Trichloroethylene	S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	F001	Tetrachloroethylene	S	Process knowledge	6.0
	F001	1,1,1-Trichloroethane	S	Process knowledge	6.0
	F001	Trichloroethylene	S	Process knowledge	6.0
	F002	Tetrachloroethylene	S	Process knowledge	6.0
	F002	Trichloroethylene	S	Process knowledge	6.0
	F004	Cresylic acid	S	Process knowledge	11.2
	F005	Toluene	S	Process knowledge	10
	F005	Methyl ethyl ketone	S	Process knowledge	36
Floor Sweepings (SW-3)	D006	Cadmium	S	Analytical	1.0 mg/l TCLP
	D007	Chromium	S	Analytical	5.0 mg/l TCLP
	D008	Lead	S	Analytical	5.0 mg/l TCLP
	D009	Mercury	S	Analytical	IMERC; or RMERC
	D010	Selenium	S	Analytical	5.7 mg/l TCLP
Mixed Batteries (SW-4)	D002	Sulfuric acid	S,L	Process knowledge	DEACT and meet 268.48 standards
	D003	Various Reactives	S,L	Analytical, Process knowledge	DEACT
	D006	Cadmium	S,L	Process knowledge	1.0 mg/l TCLP
	D007	Chromium	S,L	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	S,L	Process knowledge	5.0 mg/l TCLP
Lithium Batteries (SW-4A)	D003	Various Reactives	S	Process knowledge	DEACT

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	D007	Chromium	S	Analytical	5.0 mg/l TCLP
Mercury Batteries (SW-4B)	D009	Mercury	S	Process knowledge	0.20 mg/l TCLP
Spent and/or Broken Lead Acid Batteries (SW-4C)	D002	Sulfuric acid	S,L	Analytical, Process knowledge	DEACT and meet 268.48 standards
	D008	Lead	S,L	Analytical, Process knowledge	5.0 mg/l TCLP
Nickel Cadmium Batteries (SW-4D)	D006	Cadmium	S	Analytical, Process knowledge	1.0 mg/l TCLP
Light Bulb Mixtures (SW-5)	D006	Cadmium	S	Analytical, Manufacturers Information	1.0 mg/l TCLP
	D008	Lead	S	Analytical, Manufacturers Information	5.0 mg/l TCLP
	D009	Mercury	S	Analytical, Manufacturers Information	IMERC; or RMERC
Fluorescent Light Bulbs (SW-5A)	D008	Lead	S	Analytical, Process knowledge	5.0 mg/l TCLP
Mercury Vapor Bulbs (SW-5B)	D009	Mercury	S	Analytical, Process knowledge	0.20 mg/l TCLP
High Pressure Sodium Bulbs/Other incandescent (SW-5C)	D008	Lead	S	Analytical, Process knowledge	5.0 mg/l TCLP
Antifreeze (SW-6)	D010	Selenium	L	Analytical	5.7 mg/l TCLP
Gas cylinders (SW-7)	D001	Acetylene, hydrogen fluoride, chlorine trifluoride	G	Manufacturer's Information	DEACT
	D003	Cyanide	G	Manufacturer's Information	DEACT
	P063	Cyanide	G	Manufacturer's Information	590

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Aerosol cans (SW-8)	D001	Various Ignitables	L	Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST
	D007	Chromium	L	Process knowledge	5.0 mg/l TCLP
	D008	Lead	L	Process knowledge	5.0 mg/l TCLP
	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards
	D021	Chlorobenzene	L	Process knowledge	6.0 and meet 268.48 standards
	D022	Chloroform	L	Process knowledge	6.0 and meet 268.48 standards
	D035	Methyl ethyl ketone	L	Process knowledge	36 and meet 268.48 standards
	D039	Tetrachlorethylene	L	Process knowledge	6.0 and meet 268.48 standards
	D040	Trichloroethylene	L	Process knowledge	6.0 and meet 268.48 standards
Diesel fuel, gasoline, and kerosene (SW-9)	D001	Various Ignitables	L	Analytical, Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST
	D007	Chromium	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D018	Benzene	L	Analytical, Process knowledge	10 and meet 268.48 standards
RCW/RHW system waste (SW-10)	D007	Chromium	S	Analytical	5.0 mg/l TCLP

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Non-laboratory off-specification chemicals (SW-11, SW-11A, with metals, and SW-11B, without metals)	D001	Various Ignitables	L	Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST
	D002	Various Corrosives	L	Process knowledge	DEACT and meet 268.48 standards
	D004	Arsenic	S,L	Process knowledge	5.0 mg/l TCLP
	D005	Barium	S,L	Process knowledge	100 mg/l TCLP
	D006	Cadmium	S,L	Process knowledge	1.0 mg/l TCLP
	D007	Chromium	S,L	Process knowledge	5.0 mg/l TCLP
	D008	Lead	S,L	Process knowledge	5.0 mg/l TCLP
	D009	Mercury	S,L	Process knowledge	IMERC; or RMERC; or AMLGM
	D010	Selenium	S,L	Process knowledge	1.0 or 5.7 mg/l TCLP
	D011	Silver	S,L	Process knowledge	5.0 mg/l TCLP
	D012	Endrin	S,L	Process knowledge	0.13 and meet 268.48 standards
	D013	Lindane	S,L	Process knowledge	0.066 and meet 268.48 standards
	D014	Methoxychlor	S,L	Process knowledge	0.18 and meet 268.48 standards
	D015	Toxaphene	S,L	Process knowledge	2.6 and meet 268.48 standards
	D018	Benzene	S,L	Process knowledge	10 and meet 268.48 standards
	D019	Carbon tetrachloride	S,L	Process knowledge	6.0 and meet 268.48 standards

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	D020	Chlordane	S,L	Process knowledge	0.26 and meet 268.48 standards
	D021	Chlorobenzene	S,L	Process knowledge	6.0 and meet 268.48 standards
	D022	Chloroform	S,L	Process knowledge	6.0 and meet 268.48 standards
	D026	Cresol	S,L	Process knowledge	11.2 and meet 268.48 standards
	D027	1,4-Dichlorobenzene	S,L	Process knowledge	6.0 and meet 268.48 standards
	D028	1,2-Dichloroethane	S,L	Process knowledge	6.0 and meet 268.48 standards
	D029	1,1-Dichloroethylene	S,L	Process knowledge	6.0 and meet 268.48 standards
	D030	2,4-Dinitrotoluene	S,L	Process knowledge	140 and meet 268.48 standards
	D031	Heptachlor (and its epoxide)	S,L	Process knowledge	0.066 and meet 268.48 standards
	D032	Hexachlorobenzene	S,L	Process knowledge	10 and meet 268.48 standards
	D033	Hexachlorobutadiene	S,L	Process knowledge	5.6 and meet 268.48 standards
	D034	Hexachloroethane	S,L	Process knowledge	30 and meet 268.48 standards
	D035	Methyl ethyl ketone	S,L	Process knowledge	36 and meet 268.48 standards

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	D036	Nitrobenzene	S,L	Process knowledge	14 and meet 268.48 standards
	D038	Pyridine	S,L	Process knowledge	16 and meet 268.48 standards
	D039	Tetrachloroethylene	S,L	Process knowledge	6.0 and meet 268.48 standards
	D040	Trichloroethylene	S,L	Process knowledge	6.0 and meet 268.48 standards
	D043	Vinyl chloride	S,L	Process knowledge	6.0 and meet 268.48 standards
	P029	Copper cyanide	S	Process knowledge	590
	P056	Fluorine	G	Process knowledge	ADGAS FB NEUTR
	P063	Hydrogen cyanide	G	Process knowledge	590
	P104	Silver cyanide	S	Process knowledge	0.30 m.g/l TCLP
	P108	Strychnine & salts	S	Process knowledge	INCIN
	U019	Benzene	L	Process knowledge	10
	U036	Chlordane	S	Process knowledge	0.26
	U069	Dibutyl phthalate	L	Process knowledge	28
	U077	1,2-Dichloroethane	L	Process knowledge	6.0
	U107	Di-n-octyl phthalate	L	Process knowledge	28
	U134	Hydrofluoric acid	L	Process knowledge	ADGAS FB NEUTR; or NEUTR
	U151	Mercury	L	Process knowledge	0.025 mg/l TCLP; or AMLGM
	U159	Methyl ethyl ketone	L	Process knowledge	36

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Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	U211	Carbon tetrachloride	L	Process knowledge	6.0
	U220	Toluene	L	Process knowledge	10
	U226	1,1,1-Trichloroethane	L	Process knowledge	6.0
	U228	Trichloroethylene	L	Process knowledge	6.0
	U239	Xylene	L	Process knowledge	30
	U240	2,4-D	S	Process knowledge	10
Flushing solution (SW-12)	D002	Sulfamic acid	L	Analytical, Process knowledge	DEACT and meet 268.48 standards
	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
Circuit boards and miscellaneous equipment components (SW-13)	D006	Cadmium	S	Analytical, Process knowledge	1.0 mg/l TCLP
	D008	Lead	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D011	Silver	S	Analytical, Process knowledge	5.0 mg/l TCLP
Solid cleanup & spill residue (SW-14A)	All Codes	Varies	L,S	Analytical, Process knowledge	(reference 40 CFR 268.40)
Liquid cleanup & spill residue (SW-14B)	All Codes	Varies	L	Analytical, Process knowledge	(reference 40 CFR 268.40)
Glass media (SW-16)	D006	Cadmium	S	Analytical, Process knowledge	1.0 mg/l TCLP
	D008	Lead	S	Analytical, Process knowledge	5.0 mg/l TCLP
Metal shavings (SW-17)	D006	Cadmium	S	Analytical, Process knowledge	1.0 mg/l TCLP
	D008	Lead	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D018	Benzene	S	Analytical, Process knowledge	10 and meets 268.48 standards
Brick,concrete and masonary wastes (SW-18)	All Codes	Varies	S	Analytical, Process knowledge	(reference 40 CFR 268.40)

Table C-1 (continued)

Site Wide (SW)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Miscellaneous Burnable Debris (SW-19)	All Codes	Varies	S	Analytical, Process knowledge	(reference 40 CFR 268.40)
Soil from non-ER activities (SW-20)	All Codes	Varies	S	Analytical, Process knowledge	(reference 40 CFR 268.40)
Contaminated water from non-ER projects (SW-21)	All Codes	Varies	S	Analytical, Process knowledge	(reference 40 CFR 268.40)
Sludges from Groundwater, Decontamination Water, Surface Water, etc. (SW-22)	All Codes	Varies	S	Analytical, Process knowledge	(reference 40 CFR 268.40)
Sludges from Oils or Other Organic Liquids (SW-23)	All Codes	Varies	S	Analytical, Process knowledge	(reference 40 CFR 268.40)
Environmental Restoration (ER)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Groundwater and related water (ER-1)*	F001	1,1,1-Trichloroethane, Trichloroethylene	L	Process knowledge	6.0
	D040	Trichloroethylene	L	Analytical	6.0 and meet 268.48 standards
PPE, miscellaneous debris (ER-2)*	F001	1,1,1-Trichloroethane, Trichloroethylene	S	Process knowledge	6.0
Soils (ER-3)*	F001	Trichloroethylene, 1,1,1-Trichloroethane	S	Analytical, Process knowledge	6.0
*Includes environmental media that may contain hazardous wastes					
Oil (ER-4A)	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards

Table C-1 (continued)

Environmental Restoration (ER)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Oil debris (ER-4B)	D018	Benzene	S	Process knowledge	10 and meet 268.48 standards
Carbon sludge (ER-5A)	D018	Benzene	L,S	Analytical, Process knowledge	10 and meet 268.48 standards
	D019	Carbon tetrachloride	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D022	Chloroform	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D028	1,2-Dichloroethane	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D029	1,1-Dichloroethylene	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D040	Trichloroethylene	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	F001	1,1,1-Trichloroethane, Trichloroethylene	L,S	Analytical, Process knowledge	6.0
Spent treatment filters (ER-5B)	D018	Benzene	L,S	Analytical, Process knowledge	10 and meet 268.48 standards
	D019	Carbon tetrachloride	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D022	Chloroform	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D028	1,2-Dichloroethane	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D029	1,1-Dichloroethylene	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards

Table C-1 (continued)

Environmental Restoration (ER)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	D040	Trichloroethylene	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	F001	1,1,1-Trichloroethane, Trichloroethylene	L,S	Analytical, Process knowledge	6.0
Neat Trichloroethylene (TCE) (ER-6)	D018	Benzene	L,S	Analytical, Process knowledge	10 and meet 268.48 standards
	D019	Carbon tetrachloride	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D022	Chloroform	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D028	1,2-Dichloroethane	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D029	1,1-Dichloroethylene	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D040	Trichloroethylene	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	F001	1,1,1-Trichloroethane, Trichloroethylene	L,S	Process knowledge	6.0
	F001	Carbon tetrachloride	L,S	Process knowledge	6.0
Surface water (ER-7)	All Codes	Varies	L	Analytical, Process knowledge	(reference 40 CFR 268.40)
Decontamination water (ER-8)	All Codes	Varies	L	Analytical, Process knowledge	(reference 40 CFR 268.40)
Brick, concrete and masonary wastes (ER-9)	All Codes	Varies	S	Analytical, Process knowledge	(reference 40 CFR 268.40)

Table C-1 (continued)

Environmental Restoration (ER)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Floor sweepings, vacuum dust, etc. (ER-10)	All Codes	Varies	S	Analytical, Process knowledge	(reference 40 CFR 268.40)
X-100 Administration Building (100)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Office machine repair solvents (100-1)	D001	Isopropyl alcohol	L,S	Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST
	D040	Trichloroethylene	L,S	Process knowledge	6.0 and meet 268.48 standards
	F002	Trichloroethylene, 1,1,1-Trichloroethane	L,S	Process knowledge	6.0
Printing solvents waste (100-2)	D001	Methylene chloride, Ethanol	L,S	Analytical, Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST
	D007	Chromium	L,S	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	L,S	Analytical, Process knowledge	5.0 mg/l TCLP
	D039	Tetrachloroethylene	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D040	Trichloroethylene	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	F002	Trichloroethylene, 1,1,1-Trichloroethane	L,S	Process knowledge	6.0
Blue print solutions (100-3)	D002	Ammonia	L	Process knowledge	DEACT and meet 268.48 standards
Oil (100-4)	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards

Table C-1 (continued)

X-100 Administration Building (100)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Flammable solvents (100-5)	D001	Ethanol, Naptha	L	Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST
	D001	Hydrocarbons	L	Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST
Film/microfilm (100-6)	D011	Silver	S	Process knowledge	5.0 mg/l TCLP
Photoreceptors (100-7)	D008	Lead	S	Analytical	5.0 mg/l TCLP
Silver recovery cartridges (100-9)	D011	Silver	S	Process knowledge	5.0 mg/l TCLP
X-101 Hospital (101)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Silver solution and related material (101-2)	D011	Silver	L	Process knowledge	5.0 mg/l TCLP
X-104A Indoor Firing Range (104)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Cleaning solution (104-1)	D008	Lead	L	Analytical	5.0 mg/l TCLP
Lead dust/debris, filters, PPE (104-2)	D004	Arsenic	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D006	Cadmium	S	Analytical, Process knowledge	1.0 mg/l TCLP
	D007	Chromium	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D009	Mercury	S	Analytical, Process knowledge	IMERC; or RMERC

Table C-1 (continued)

X-104A Indoor Firing Range (104)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	D031	Heptachlor	S	Analytical, Process knowledge	0.066 and meet 268.48 standards
Lead bullets (104-3)	D008	Lead	S	Process knowledge	5.0 mg/l TCLP
X-326, X-330, X-333 Cascade Process Buildings (Cascade)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Gas analyzer waste (Cascade-1)	D001	Ethanol	L	Analytical, Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST
	D002	Nitric acid, Boric acid, Ammonium citrate	L	Analytical, process knowledge	DEACT and meet 268.48 standards
Solvent (Cascade-2)	F001	1,1,1-Trichloroethane, Trichloroethylene, Carbon tetrachloride, Tetrachloroethylene	S	Process knowledge	6.0
	F001	Methylene chloride	L	Process knowledge	30.0
	F002	Freon 113	S	Process knowledge	30.0
	F003	Xylene	S	Process knowledge	30.0
	F003	Acetone	S	Process knowledge	160.0
	F005	Methyl ethyl ketone	S	Process knowledge	36 and meet 268.48 standards
	F005	Toluene	S	Analytical, process knowledge	10 and meet 268.48 standards

Table C-1 (continued)

X-326, X-330, X-333 Cascade Process Buildings (Cascade)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	D001	Xylene, toluene, methyl ethyl ketone	L	Analytical, Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST
	D010	Selenium	L	Analytical, Process knowledge	5.7 mg/l TCLP
	D019	Carbon tetrachloride	L	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D035	Methyl ethyl ketone	L	Analytical, Process knowledge	36 and meet 268.48 standards
	D039	Tetrachloroethylene	L	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D040	Trichloroethylene	L	Analytical, Process knowledge	6.0 and meet 268.48 standards
Decontamination waste solutions (Cascade-3)	D002	Nitric Acid	L	Analytical, Process knowledge	DEACT and meet 268.48 standards
	D004	Arsenic	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D005	Barium	L	Analytical, Process knowledge	100 mg/l TCLP
	D006	Cadmium	L	Analytical, Process knowledge	1.0 mg/l TCLP
	D007	Chromium	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D009	Mercury	L	Analytical, Process knowledge	IMERC; or RMERC
	D010	Selenium	L	Analytical, Process knowledge	5.7 mg/l TCLP
	D011	Silver	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D018	Benzene	L	Analytical, Process knowledge	10 and meet 268.48 standards
Oil/solvent (Cascade-4)	D001	Benzene	L	Process knowledge	DEACT and meet 268.48 standards

Table C-1 (continued)

X-326, X-330, X-333 Cascade Process Buildings (Cascade)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	D007	Chromium	L	Process knowledge	5.0 mg/l TCLP
	D008	Lead	L	Process knowledge	5.0 mg/l TCLP
	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards
	F001	1,1,1-Trichloroethane	L	Process knowledge	6.0
Oil (Cascade-5)	D006	Cadmium	L	Analytical, Process knowledge	1.0 mg/l TCLP
	D007	Chromium	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D009	Mercury	L	Analytical, Process knowledge	IMERC; or RMERC; or AMLGM
	D018	Benzene	L	Analytical, Process knowledge	10 and meet 268.48 standards
Decontamination waste solids (Cascade-6)	D004	Arsenic	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D005	Barium	S	Analytical, Process knowledge	100 mg/l TCLP
	D006	Cadmium	S	Analytical, Process knowledge	1.0 mg/l TCLP
	D007	Chromium	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D009	Mercury	S	Analytical, Process knowledge	IMERC; or RMERC
	D010	Selenium	S	Analytical, Process knowledge	5.7 mg/l TCLP
	D011	Silver	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D018	Benzene	S	Analytical, Process knowledge	10 and meet 268.48 standards
	D035	Methyl ethyl ketone	S	Analytical, Process knowledge	36 and meet 268.48 standards

Table C-1 (continued)

X-326, X-330, X-333 Cascade Process Buildings (Cascade)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	D040	Trichloroethylene	S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	F001	Trichloroethylene, 1,1,1-Trichloroethane	S	Process knowledge	6
	F002	Freon 113	S	Process knowledge	30
	F003	Xylene	S	Process knowledge	30
	F003	Acetone	S	Process knowledge	160
	F005	Methyl ethyl ketone	S	Process knowledge	36
	F005	Toluene	S	Process knowledge	10
Mercury and debris (Cascade-7)	D009	Mercury	L,S	Process knowledge	IMERC; or RMERC; or AMLGM
Elemental (metallic) mercury (Cascade-7A)	D009	Mercury	L,S	Process knowledge	IMERC; or RMERC; or AMLGM
Mercury contaminated solids and debris (Cascade-7B)	D009	Mercury	S	Process knowledge	IMERC; or RMERC; or AMLGM
X-ray solutions (Cascade-8)	D002	Acidic solution	L	Process knowledge	DEACT and meet 268.48 standards
Trap Material (Cascade-10)	D004	Arsenic	S	Analytical	5 mg/l TCLP
	D006	Cadmium	S	Analytical	1 mg/l TCLP
	D007	Chromium	S	Analytical	5 mg/l TCLP
	D008	Lead	S	Analytical	5 mg/l TCLP
	D009	Mercury	S	Analytical	IMREC ro RMREC

Table C-1 (continued)

X-342 Feed Vaporization and Fluorine Generation Facility (342)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Generator scrap and debris (342-1)	D004	Arsenic	S	Analytical	5.0 mg/l TCLP
Generator solutions (Decon) (342-2)	D004	Arsenic	L	Process knowledge	5.0 mg/l TCLP
Generator sludge (342-3)	D004	Arsenic	S,L	Analytical	5.0 mg/l TCLP
X-343 Feed Vaporization Sampling Facility (343)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Parts cleaning solution (343-2)	D008	Lead	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D018	Benzene	S	Process knowledge	10 and meet 268.48 standards
X-344 UF_6 Sampling and Shipping Facility (344)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Oil (344-1A)	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards
Filters and oil debris (344-1B)	D018	Benzene	S	Process knowledge	10 and meet 268.48 standards
Solvent (344-2)	D001	Ethanol	L	Analytical, Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST
	D006	Cadmium	L	Analytical, Process knowledge	1.0 mg/l TCLP
	F001	Freon 113	L	Process knowledge	30.0
Decontamination solutions (344-5)	D006	Cadmium	L	Analytical, Process knowledge	1.0 mg/l TCLP
	D018	Benzene	L	Analytical, Process knowledge	10 and meet 268.48 standards

Table C-1 (continued)

X-530, X-533 Electrical Switch Yards (Switch)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Lead cable (Switch-1)	D008	Lead	S	Process knowledge	5.0 mg/l TCLP
Oil (Switch-2)	D008	Lead	L	Analytical	5.0 mg/l TCLP
	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards
Switches (Switch-3)	D009	Mercury	S,L	Process knowledge	IMERC; or RMERC
X-600 Steam Plant (600)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Solvent (600-1)	F001	1,1,1-Trichloroethane	L	Process knowledge	6.0
Oil (600-2)	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards
PPE and related solids (600-3)	D004	Arsenic	S	Analytical	5.0 mg/l TCLP
X-600B Steam Plant Shop Building (600B)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Parts cleaning solutions (600B-2)	All Codes	Varies	L	Analytical, Process knowledge	(reference 40 CFR 268.40)
X-608 Raw Water Pump House (608)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Mercury cleanup materials (608-1)	D009	Mercury	S	Process knowledge	IMERC; or RMERC
Oil (608-2)	D009	Mercury	L	Process knowledge	IMERC; or RMERC

Table C-1 (continued)

X-608 Raw Water Pump House (608)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards
Mercury, oil, water and sand (608-3)	D009	Mercury	L	Analytical	IMERC; or RMERC
X-611 Water Treatment Facility (611)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Oil and filters (611-1)	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards
	F001	1,1,1-Trichloroethane	L	Process knowledge	6.0 and meet 268.48 standards
	F001	Trichloroethylene	L	Process knowledge	6.0 and meet 268.48 standards
Mercury (611-2)	D009	Mercury	S	Analytical	IMERC; or RMERC
X-616 Liquid Effluent Treatment Facility (616)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Oil and filters (616-1)	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards
Soil/sludge (616-2)	D007	Chromium	S	Analytical, Process knowledge	5.0 mg/l TCLP
Filter cloth and PPE (616-3)	D007	Chromium	S	Analytical, Process knowledge	5.0 mg/l TCLP

Table C-1 (continued)

X-626, X-630, X-633, and X-6000 Pump House and Cooling Towers (Pump)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Mercury spill cleanup (Pump-1)	D009	Mercury	S	Process knowledge	IMERC; or RMERC
Cooling tower curtains (Pump-2)	D007	Chromium	S	Analytical	5.0 mg/l TCLP
Oil (Pump-3)	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards
	F001	1,1,1-Trichloroethane	L	Process knowledge	6
X-700 Converter Maintenance and Chemical Cleaning Building (700)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Chromic acid tank closure waste (700-1)	F006	Cadmium	S	Process knowledge	0.19 mg/l TCLP
	F006	Chromium	S	Process knowledge	0.86 mg/l TCLP
	F006	Lead	S	Process knowledge	0.37 mg/l TCLP
	D004	Arsenic	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D005	Barium	S	Analytical, Process knowledge	100 mg/l TCLP
	D006	Cadmium	S	Analytical, Process knowledge	1.0 mg/l TCLP
	D007	Chromium	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	S	Analytical, Process knowledge	5.0 mg/l TCLP
Cleaning tank solution (700-2)	F001	Trichloroethylene	L	Process knowledge	6.0
	D040	Trichloroethylene	L	Analytical, Process knowledge	6.0 and meet 268.48 standards
Cleanup debris (700-3)	F001	Trichloroethylene	S	Process knowledge	6.0
	D040	Trichloroethylene	S	Analytical, Process knowledge	6.0 and meet 268.48 standards
Carbon sludge (700-4)	F001	Trichloroethylene	S,L	Process knowledge	6

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Table C-1 (continued)

X-700 Converter Maintenance and Chemical Cleaning Building (700)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	D040	Trichloroethylene	S,L	Process knowledge	6.0 and meet 268.48 standards
Neutralization pit sludge (700-5)	F001	Trichloroethylene	S,L	Process knowledge	6
	D040	Trichloroethylene	S,L	Analytical, Process knowledge	6.0 and meet 268.48 standards
Fuels or oil with water (700-6)	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D018	Benzene	L	Analytical, Process knowledge	10 and meet 268.48 standards
Caustic solutions (700-7)	D002	Sodium hydroxide	L	Analytical, Process knowledge	DEACT and meet 268.48 standards
	D00X	Metals	L	Analytical, Process knowledge	(reference 40 CFR 268.40)
Nickel stripping solution (700-8)	D002	Nitric acid	L	Process knowledge	DEACT and meet 268.48 standards
Solvents (700-9)	F001, F002	Trichloroethylene	L	Process knowledge	6.0
	F001, F002	Methylene chloride	L	Process knowledge	30
	F003	Methanol	L	Process knowledge	NA
	D001	Methanol	L	Analytical, Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST
	D040	Trichloroethylene	L	Analytical, Process knowledge	6.0 and meet 268.48 standards
Oil (700-10)	D018	Benzene	L	Analytical, Process knowledge	10 and meet 268.48 standards
	D007	Chromium	L	Analytical, Process knowledge	5.0 mg/l TCLP

Table C-1 (continued)

X-700 Converter Maintenance and Chemical Cleaning Building (700)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
HEPA filters (700-11)	D009	Mercury	S	Process knowledge	IMERC; or RMERC
Tank residue (700-12)	F001	Trichloroethylene	S	Process knowledge	6
	D040	Trichloroethylene	S	Process knowledge	6.0 and meet 268.48 standards
Maintenance					
Oil (700-13)	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards
Mercury canisters (700-14)	D009	Mercury	S	Process knowledge	IMERC; or RMERC; or AMLGM
X-705 Decontamination Building (705)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Alkaline solutions (705-1)	D002	Sodium hydroxide	L	Process knowledge	DEACT and meet 268.48standards
	D006	Cadmium	L	Process knowledge	1.0 mg/l TCLP
	D008	Lead	L	Process knowledge	5.0 mg/l TCLP
	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards
Heavy metal sludge (705-2)	D006	Cadmium	S	Analytical, Process knowledge	1.0 mg/l TCLP
	D008	Lead	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D009	Mercury	S	Analytical, Process knowledge	IMERC; or RMERC
Microfiltration sludge & filters (705-3)	D006	Cadmium	S	Analytical, Process knowledge	1.0 mg/l TCLP
	D008	Lead	S	Analytical, Process knowledge	5.0 mg/l TCLP

Table C-1 (continued)

X-705 Decontamination Building (705)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Oil/solvents (705-4)	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards
	D040	Trichloroethylene	L	Process knowledge	6.0 and meet 268.48 standards
	F001	Trichloroethylene, 1,1,1-Trichloroethane	L	Process knowledge	6.0
Uranium recovery solvent (705-5)	D002	Nitric acid	L	Analytical, Process knowledge	DEACT and meet 268.48 standards
	D006	Cadmium	L	Analytical, Process knowledge	1.0 mg/l TCLP
	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D009	Mercury	L	Analytical, Process knowledge	IMERC; or RMERC
Ion exchange resin (705-7)	D009	Mercury	S	Analytical	IMERC; or RMERC; or AMLGM
Mercury waste (705-8)	D009	Mercury	S	Process knowledge	IMERC; or RMERC; or AMLGM
Bag filters (705-9)	D006	Cadmium	S	Process knowledge	1.0 mg/l TCLP
	D008	Lead	S	Process knowledge	5.0 mg/l TCLP
	D018	Benzene	S	Process knowledge	10 and meet 268.48 standards
Incinerator ash (705-10)	D004	Arsenic	S	Process knowledge	5.0 mg/l TCLP
	D005	Barium	S	Process knowledge	100 mg/l TCLP
	D006	Cadmium	S	Process knowledge	1.0 mg/l TCLP
	D007	Chromium	S	Process knowledge	5.0 mg/l TCLP
	D008	Lead	S	Process knowledge	5.0 mg/l TCLP
	D010	Selenium	S	Process knowledge	5.7 mg/l TCLP

Table C-1 (continued)

X-705 Decontamination Building (705)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	D011	Silver	S	Process knowledge	5.0 mg/l TCLP
	D040	Trichloroethylene	S	Process knowledge	6.0 and meet 268.48 standards
	F001	Trichloroethylene	S	Process knowledge	6
Filter table gunk (705-11)	D009	Mercury	S	Analytical	IMERC; or RMERC; or AMLGM
Laboratory Waste (705-12)	D001	Ethanol	L	Analytical, Process knowledge	REACT and meet 268.48 standards; or RORGS; or CMBST
	D002	Acids	L	Analytical, Process knowledge	DEACT and meet 268.48 standards
	D022	Chloroform	L	Analytical, Process knowledge	6.0 and meet 268.48 standards
	F003	Methanol	L	Process knowledge	NA
Oil & grease filter cake (705-15)	D006	Cadmium	S	Process knowledge	1.0 mg/l TCLP
	D007	Chromium	S	Process knowledge	5.0 mg/l TCLP
	D008	Lead	S	Process knowledge	5.0 mg/l TCLP
	D018	Benzene	S	Process knowledge	10 and meet 268.48 standards
Grease (705-16)	D008	Lead	S	Analytical, Process knowledge	5.0 mg/l TCLP
	D018	Benzene	S	Analytical, Process knowledge	10 and meet 268.48 standards

Table C-1 (continued)

X-710 Technical Services Building (710)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Oil/solvents (710-1)	D001	Oil, Benzene	L	Analytical, Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST
	D007	Chromium	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D018	Benzene	L	Analytical, Process knowledge	10 and meet 268.48 standards
	D040	Trichloroethylene	L	Analytical, Process knowledge	6.0 and meet 268.48 standards
	F001, F002	Trichloroethylene, 1,1,1-Trichloroethane	L	Analytical, Process knowledge	6
	F005	Benzene, carbon disulfide	L	Analytical, Process knowledge	respectively 10, NA
Acids/bases (710-2, 710-2A, acidic, and 710-2B, basic)	D002	Hydrochloric, sulfuric, phosphoric, and nitric acids, sodium hydroxide	L	Analytical, Process knowledge	DEACT and meet 268.48 standards
	D004	Arsenic	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D005	Barium	L	Analytical, Process knowledge	100 mg/l TCLP
	D006	Cadmium	L	Analytical, Process knowledge	1.0 mg/l TCLP
	D007	Chromium	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D009	Mercury	L	Analytical, Process knowledge	IMERC; or RMERC
	D010	Selenium	L	Analytical, Process knowledge	5.7 mg/l TCLP
	D011	Silver	L	Analytical, Process knowledge	5.0 mg/l TCLP

Table C-1 (continued)

X-710 Technical Services Building (710)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Solvents (710-3)	D001	Acetone, Xylene, Toluene, Methanol, Propanol, Hexane, Ethyl ether	L	Analytical, Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST
	D004	Arsenic	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D005	Barium	L	Analytical, Process knowledge	100 mg/l TCLP
	D006	Cadmium	L	Analytical, Process knowledge	1.0 mg/l TCLP
	D007	Chromium	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D009	Mercury	L	Analytical, Process knowledge	IMERC; or RMERC
	D010	Selenium	L	Analytical, Process knowledge	5.7 mg/l TCLP
	D011	Silver	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D018	Benzene	L	Analytical, Process knowledge	10 and meet 268.84 standards
	D022	Chloroform	L	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D035	Methyl ethyl ketone	L	Analytical, Process knowledge	36 and meet 268.48 standards
	D038	Pyridine	L	Analytical, Process knowledge	16 and meet 268.48 standards
	D040	Trichloroethylene	L	Analytical, Process knowledge	6.0 and meet 268.48 standards
	F001, F002	1,1,1-Trichloroethane, Trichloroethylene	L	Analytical, Process knowledge	6.0 and meet 268.48 standards

Table C-1 (continued)

X-710 Technical Services Building (710)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	F002	Freon 113	L	Analytical, Process knowledge	30 and meet 268.48 standards
	F003	Xylene	L	Analytical, Process knowledge	30 and meet 268.48 standards
	F003	Acetone	L	Analytical, Process knowledge	160 and meet 268.48 standards
	F003	Methanol	L	Analytical, Process knowledge	NA
	F003	Ethyl ether	L	Analytical, Process knowledge	160 and meet 268.48 standards
	F005	Toluene	L	Analytical, Process knowledge	10 and meet 268.48 standards
Cyanide bearing solutions (710-5)	D003	Cyanide	L	Process knowledge	DEACT
	D008	Lead	L	Process knowledge	5.0 mg/l TCLP
	D010	Selenium	L	Process knowledge	5.7 mg/l TCLP
Machine coolant (710-6)	D004	Arsenic	L	Process knowledge	5.0 mg/l TCLP
Mercuric nitrate/mercuric sulfate solutions (710-7)	D002	Nitric acid	L	Process knowledge	DEACT and meet 268.48 standards
	D009	Mercury	L	Analytical	0.20 mg/l TCLP
Waste acetone (710-8)	F003	Acetone	L	Analytical	160
Arsenic trioxide solution (710-9)	D002	Nitric acid	L	Process knowledge	DEACT and meet 268.48 standards
	D004	Arsenic	L	Process knowledge	5.0 mg/l TCLP
Rags, wipes, and laboratory refuse (710-10)	D00X	Metal/solvents	S	Analytical, Process knowledge	(reference 40 CFR 268.40)
	F001, F002	Methylene chloride	S	Process knowledge	30
	F002	Freon 113	S	Process knowledge	30

Table C-1 (continued)

X-710 Technical Services Building (710)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	F005	Carbon disulfide	S	Process knowledge	30
X-720 Maintenance and Stores Building (720)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Instrument Shop					
Oil (720-1)	D005	Barium	L	Analytical, Process knowledge	100 mg/l TCLP
	D006	Cadmium	L	Analytical, Process knowledge	1.0 mg/l TCLP
	D007	Chromium	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D018	Benzene	L	Analytical, Process knowledge	10 and meet 268.48 standards
Silver solder slag (720-2)	D011	Silver	L,S	Process knowledge	5.0 mg/l TCLP
Mercury (720-3)	D009	Mercury	L,S	Analytical	IMERC; or RMERC; or AMLGM
Solvent (720-4)	F001, F002	1,1,1-Trichloroethane	L	Process knowledge	6.0
Plating solution (720-5)	D002	Acid	L	Process knowledge	DEACT and meet 268.48 standards
Cyanide plating solutions (720-6)	D003	Copper cyanide	L	Process knowledge	DEACT and meet 268.48 standards
	D007	Chromium	L	Process knowledge	5.0 mg/l TCLP
	D011	Silver	L	Process knowledge	5.0 mg/l TCLP
	F007	Cyanide	L	Process knowledge	590
Cleaning solutions (720-7)	D001	Isopropyl alcohol, ethanol	L	Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST

Table C-1 (continued)

X-720 Maintenance and Stores Building (720)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
	D006	Cadmium	L	Analytical	1.0 mg/l TCLP
	D007	Chromium	L	Analytical	5.0 mg/l TCLP
	D008	Lead	L	Analytical	5.0 mg/l TCLP
	D009	Mercury	L	Analytical	0.20 mg/l TCLP
	D018	Benzene	L	Analytical	10 and meet 268.48 standards
	F001	1,1,1-Trichloroethane	L	Process knowledge	6.0
Oil/solvents (720-8)	D006	Cadmium	L	Analytical, Process knowledge	1.0 mg/l TCLP
	D007	Chromium	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D009	Mercury	L	Analytical, Process knowledge	IMERC; or RMERC; or AMLGM
	D010	Selenium	L	Analytical, Process knowledge	5.7 mg/l TCLP
	D018	Benzene	L	Analytical, Process knowledge	10 and meet 268.48 standards
	F001	1,1,1-Trichloroethane	L	Analytical, Process knowledge	6.0
Seal Shop					
Acetone (720-10)	D001	Acetone	L	Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST
	D006	Cadmium	L	Process knowledge	1.0 mg/l TCLP
	D007	Chromium	L	Process knowledge	5.0 mg/l TCLP
	D008	Lead	L	Process knowledge	5.0 mg/l TCLP
	F003	Acetone	L	Process knowledge	160

Table C-1 (continued)

X-720 Maintenance and Stores Building (720)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Kerosene and oil (720-11)	D001	Kerosene	L	Process knowledge	DEACT
	D007	Chromium	L	Process knowledge	5.0 mg/l TCLP
	D008	Lead	L	Process knowledge	5.0 mg/l TCLP
	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards
Compressor Shop					
Spent Solvents (720-12)	F002	1,1,1-Trichloroethane	L	Process knowledge	6.0
Degreaser sludge (720-13)	D018	Benzene	S,L	Process knowledge	10 and meet 268.48 standards
	F001	1,1,1-Trichloroethane	S,L	Process knowledge	6.0
Machine Shop					
Machine coolant/oil (720-15)	D006	Cadmium	L	Analytical, Process knowledge	1.0 mg/l TCLP
	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D018	Benzene	L	Analytical, Process knowledge	10 and meet 268.48 standards
Oil (720-16)	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards
Grinding sludge (720-17)	D006	Cadmium	S	Process knowledge	1.0 mg/l TCLP
	D008	Lead	S	Process knowledge	5.0 mg/l TCLP
Electric Shop					
Spent solvent (720-19)	D001	Xylene	L	Analytical, Process knowledge	DEACT
	F003	Xylene	L	Analytical, Process knowledge	30

Table C-1 (continued)

X-720 Maintenance and Stores Building (720)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Oil/test solution (720-20)	D001	Isopropyl alcohol, methyl ethyl ketone, pyridine, methanol, toluene	L,S	Analytical, Process knowledge	DEACT
	D018	Benzene	L,S	Analytical, Process knowledge	10 and meet 268.48 standards
	D022	Chloroform	L,S	Analytical, Process knowledge	6.0 and meet 268.48 standards
	D035	Methyl ethyl ketone	L,S	Analytical, Process knowledge	36 and meet 268.48 standards
	D038	Pyridine	L,S	Analytical, Process knowledge	16 and meet 268.48 standards
	F003	Methanol	L,S	Process knowledge	NA
	F005	Methyl ethyl ketone, Pyridine, Benzene, Toluene	L,S	Process knowledge	respectively 36, 16, 10, 10
Hydrostatic Test Shop					
Lead Seals (720-21)	D008	Lead	S	Process knowledge	5.0 mg/l TCLP
Silver plating compound (720-22)	D011	Silver	S	Process knowledge	5.0 mg/l TCLP
Motor Shop					
Waste kerosene & oil (720-23)	D001	Kerosene, oil	L	Process knowledge	DEACT
	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards
	F001	Trichloroethylene	L	Process knowledge	6.0
	F003	Xylene	L	Process knowledge	30

Table C-1 (continued)

X-720 Maintenance and Stores Building (720)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Motor cleaning solution (720-24)	D006	Cadmium	L	Analytical	1.0 mg/l TCLP
	D008	Lead	L	Analytical	5.0 gm/l TCLP
Paint Shop					
Booth water (720-26)	D006	Cadmium	L	Analytical, Process knowledge	1.0 mg/l TCLP
	D007	Chromium	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D035	Methyl ethyl ketone	L	Analytical, Process knowledge	36 and meet 268.48 standards
	F005	Toluene	L	Process knowledge	10
Cement dust (720-27)	D007	Chromium	S	Process knowledge	5.0 mg/l TCLP
	D008	Lead	S	Process knowledge	5.0 mg/l TCLP
Paints and thinners (720-28)	D001	Solvents	L	Analytical, Process knowledge	DEACT
	D006	Cadmium	L	Analytical, Process knowledge	1.0 mg/l TCLP
	D007	Chromium	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D035	Methyl ethyl ketone	L	Analytical, Process knowledge	36 and meet 268.48 standards
	F002	Methylene chloride	L	Process knowledge	30
	F003	Xylene, methanol, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone	L	Process knowledge	respectively 30, NA, 33, 2.6, NA
	F005	Methyl ethyl ketone, toluene	L	Process knowledge	respectively 36, 10

Table C-1 (continued)

X-720 Maintenance and Stores Building (720)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Latex paint (720-28B)	D008	Lead	L	Analytical	5.0 mg/l TCLP
Paint sludge and solids (720-29)	D006	Cadmium	S	Process knowledge	1.0 mg/l TCLP
	D007	Chromium	S	Process knowledge	5.0 mg/l TCLP
	D008	Lead	S	Process knowledge	5.0 mg/l TCLP
	D035	Methyl ethyl ketone	S	Process knowledge	36 and meet 268.48 standards
	F005	Toluene	S	Process knowledge	10
Valve Shop					
Oil (720-31)	D006	Cadmium	L	Analytical, Process knowledge	1.0 mg/l TCLP
	D009	Mercury	L	Analytical, Process knowledge	0.20 mg/l TCLP
	D018	Benzene	L	Analytical, Process knowledge	10 and meet 268.48 standards
	F001	1,1,1-Trichloroethane	L	Analytical, Process knowledge	6.0
Refrigeration Shop					
Parts cleaning solution (720-34)	D002	Acid	L	Analytical	DEACT and meet 268.48 standards
	D004-11	Metals	L	Analytical	(reference 40 CFR 268.40)
Mixed acids (720-35)	D002	Various acids	L	Analytical, Process knowledge	DEACT and meet 268.48 standards

Table C-1 (continued)

X-750 Garage (750)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Oil (750-1)	D001	Xylene, methyl ethyl ketone	L	Analytical, Process knowledge	DEACT
	D006	Cadmium	L	Analytical, Process knowledge	1.0 mg/l TCLP
	D007	Chromium	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D018	Benzene	L	Analytical, Process knowledge	10 and meet 268.48 standards
	D026	Cresylic acid	L	Analytical, Process knowledge	11.2 and meet 268.48 standards
	D035	Methyl ethyl ketone	L	Analytical, Process knowledge	36 and meet 268.48 standards
	D039	Tetrachloroethylene	L	Analytical, Process knowledge	6.0 and meet 268.48 standards
	F001	1,1,1-Trichloroethane, Tetrachloroethylene	L	Process knowledge	6.0
	F003	Xylene	L	Process knowledge	30
	F004	Cresylic acid	L	Process knowledge	11.2
	F005	Methyl ethyl ketone	L	Process knowledge	36
Filters (750-2)	D018	Benzene	S	Process knowledge	10 and meet 268.48 standards

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Table C-1 (continued)

X-750 Garage (750)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Solvents (750-3)	D001	Methyl ethyl ketone, xylene	L	Analytical, Process knowledge	DEACT
	D018	Benzene	L	Analytical, Process knowledge	10 and meet 268.48 standards
	D035	Methyl ethyl ketone	L	Analytical, Process knowledge	36 and meet 268.48 standards
	D040	Trichloroethylene	L	Analytical, Process knowledge	6.0 and meet 268.48 standards
	F001	1,1,1-Trichloroethane, tetrachloroethylene, trichloroethylene	L	Analytical, Process knowledge	6.0
	F003	Xylene	L	Analytical, Process knowledge	30
	F005	Methyl ethyl ketone	L	Analytical, Process knowledge	36
Gasoline/Diesel Fuel (750-4)	D001	Various ignitables	L	Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST
	D007	Chromium	L	Analytical	5.0 mg/l TCLP
	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards
Antifreeze (750-5)	D010	Selenium	L	Analytical	5.7 mg/l TCLP

Table C-1 (continued)

X-752, X-744G(R), X-744G(U) Hazardous Waste Storage Buildings (Stor)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Solid and liquid cleanup wastes (Stor-1)	All are possible	Varies	S,L	Knowledge of waste spill	(reference 40 CFR 268.40)
X-760 Chemical Engineering Building (760)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Acetone still bottoms, solvents (760-1)	D001	Acetone	L	Analytical, Process knowledge	DEACT
	D007	Chromium	L	Analytical, Process knowledge	5.0 mg/l TCLP
	D008	Lead	L	Analytical, Process knowledge	5.0 mg/l TCLP
	F003	Acetone	L	Analytical, Process knowledge	160
UF_6 analyzer still bottoms (760-3)	D001	Ethanol	L	Process knowledge	DEACT and meet 268.48 standards; or RORGS; or CMBST
Sodium (760-4)	D003	Sodium metal	L	Process knowledge	DEACT
X-770 Mechanical Testing Facility (770)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Mercury waste (770-1)	D009	Mercury	S	Process knowledge	IMERC; or RMERC
Elemental (metallic) mercury (770-1A)	D009	Mercury	L	Process knowledge	IMERC; or RMERC
Mercury solids (770-1B)	D009	Mercury	S	Process knowledge	IMERC; or RMERC
X-1000 Administration Building (1000)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Oil (1000-1)	D018	Benzene	L	Process knowledge	10 and meet 268.48 standards

Table C-1 (continued)

X-7725 Container Storage Unit (7725)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Oil (7725-1A)	D006	Cadmium	L	Analytical, Process knowledge	1.0 mg/l TCLP
	D018	Benzene	L	Analytical, Process knowledge	10 and meet 268.48 standards
Oil/debris (7725-1B)	D006	Cadmium	S	Analytical, Process knowledge	1.0 mg/l TCLP
	D018	Benzene	S	Analytical, Process knowledge	10 and meet 268.48 standards
Solid and liquid cleanup (7725-2)	All are possible	Varies	S,L	Knowledge of waste spilled, analytical knowledge	(reference 40 CFR 268.40)
Waste sampling equipment (7725-3)	All are possible	Varies	S	Knowledge of waste sampled, analytical knowledge	(reference 40 CFR 268.40)
Off-Site Treatment Residuals (Ash)					
Waste Stream and Identification Number	Waste Codes	Primary Constituents	Physical Form	Basis for Characterization	Treatment Standards for Hazardous Waste[1]
Ash (Ash-1)	To be deter-mined	Varies	S	Analytical, Process knowledge	(reference 40 CFR 268.40)

[1] Concentration in mg/kg unless noted as "mg/l TCLP"; or Technology Code.
L = Liquid
S = Solid
G = Gas

Table C-2
Waste Analysis Plan

WASTE STREAM TYPE AND IDENTIFICATION NUMBER	PARAMETERS	FREQUENCY OF ANALYSIS (Annual)	RATIONALE[a]
Decontamination water, purge water and well development water ER-1	Visual Inspection	20% of containers.	Verification of waste description
	pH Selected Volatile Organic Carbon (VOC) compound determination Trichloroethylene 1,1,1-Trichloroethane	10% of containers.	Selected monitoring wells are sampled on a quarterly basis. Contaminant concentrations based on groundwater sampling results. Hazardous waste derived from listed waste in OAC 3745-50-31 (40 CFR 261.31). Parameters represent positive results from Appendix VIII analyses. Treatment required to meet regulatory limits in OAC 3745-50-31 (40 CFR 268.41).
	Chemical composition and waste properties	As required for TSD acceptance.	Determine chemical concentrations and waste properties for disposal
Closure wastes/ cleanup wastes 700-1 ER-9 ER-10 SW-14A SW-14B SW-17 SW-18 SW-19	Visual Inspection	20% of containers.	Verification of waste description
	TC test for metals TC test for organic constituents	In accordance with approved closure plan.	Determine hazardous characteristics
	VOC determination F001-F005 solvents	In accordance with approved closure plan	Determine waste constituents
	Chemical composition and waste properties	As required for TSD acceptance.	Treatment required to meet regulatory limits in OAC 3745-50-31 (40 CFR 268.41)

Table C-2 (continued)

WASTE STREAM TYPE AND IDENTIFICATION NUMBER	PARAMETERS	FREQUENCY OF ANALYSIS (Annual)	RATIONALE[a]
Drill cuttings (soil) ER-3	Visual Inspection	20% of containers.	Verification of waste description
	TC test for metals	Samples collected during well/bore hole installation.	Determine hazardous characteristics
	VOC determination Trichloroethylene 1,1,1-Trichloroethane	Samples collected during well/bore hole installation	Hazardous waste derived from listed waste in OAC 3745-50-31 (40 CFR 261.31).If any VOC analyte exceeds regulatory values in OAC 3745-59-41 and 43 (40 CFR 268.41 and 284.43). Treatment required to meet regulatory limits in OAC 3745-59-41 (40 CFR 268.41).
	Chemical composition and waste properties	As required for TSD acceptance.	Determine chemical concentrations and waste properties for disposal
			Land disposal if all VOC analytes are less than regulatory values in OAC 3745-59-41 and 43 (40 CFR 268.41 and 268.43).
Contaminated debris (rags, PPE, etc.) ER-2	Visual Inspection	20% of containers.	Verification of waste description.
	Chemical composition and waste properties	As required for TSD acceptance.	Wastes are PPE and rags used during well installation and sampling. Contaminants are based on groundwater sampling results.
	VOC determination Trichloroethylene 1,1,1-Trichloroethane Refridgerant-113	As required for TSD acceptance.	Hazardous waste derived from listed waste in OAC 3745-50-31 (40 CFR 261.31). If any VOC analyte exceeds regulatory values in OAC 3745-59-41 and 43 (40 CFR 268.41 and 284.43). Treatment required to meet regulatory limits in OAC 3745-59-41 (40 CFR 268.41).
(All groundwater related wastes[b])	Uranium Technetium		Determination of radioactive constituents. OAC 3745-59-41 and 43 (40 CFR 261.31).
Discarded light bulbs SW-5 SW-5A SW-5B SW-5C	Visual Inspection	20% of containers.	Verify waste description.
	Test for metals Mercury Lead	Process changes.	Verify waste description.
	Chemical composition and waste properties	As required for TSD acceptance.	Determine component concentrations for disposal.
	Uranium Technetium		Determine radioactive constituents.

Table C-2 (continued)

WASTE STREAM TYPE AND IDENTIFICATION NUMBER	PARAMETERS	FREQUENCY OF ANALYSIS (Annual)	RATIONALE[a]
Metallic mercury wastes and clean-up debris Cascade-7 Cascade-7A Cascade-7B Pump-1 Switch-3 608-1 608-3 611-2 700-11 705-8 720-3 770-1 770-1A 770-1B 700-14 710-7	Visual Inspection Test for metals Mercury Chemical composition and waste properties Uranium Technetium	20% of containers. 10% of containers. As required for TSD acceptance.	Verify waste description. Determine component concentrations for disposal. Determine radioactive constituents.
Process and machine coolants SW-6 SW-10 720-15 710-6 750-5	Visual Inspection pH Test for metals. Test for organic constituents Chemical composition and waste properties Uranium Technetium	20% of containers. 10% of containers. 10% of containers. As required for TSD acceptance.	Verify waste description. Verify waste description. Container and waste compatibility. Determine component concentrations for disposal. Determine radioactive constituents.
Nonhalogenated solvents Cascade-2 SW-8 SW-9 343-1 344-2 700-9 705-5 710-3 710-8 720-10 720-19 750-3 750-4 760-1	Visual Inspection Flash Point Test for metals Test for organic constituents Selected VOC determination Mineral spirits Naphtha Acetone Benzene iso-Butyl alcohol n-Butyl alcohol Methyl ethyl ketone Methyl isobutyl ketone Cresylic acid Chemical composition and waste properties Uranium Technetium	20% of containers. 10% of containers. 10% of containers. As required for TSD acceptance.	Verification of waste description. Verify waste description. Determine hazardous characteristics of waste and proper waste segregation. Determine component concentration for disposal. Determine radioactive constituents.

Table C-2 (continued)

WASTE STREAM TYPE AND IDENTIFICATION NUMBER	PARAMETERS	FREQUENCY OF ANALYSIS (Annual)	RATIONALE[a]
Halogenated solvents ER-6 344-2 600-1 700-2 700-9 710-3 720-4 720-12 750-3	Visual Inspection	20% of containers.	Verification of waste description.
	Flash Point	10% of containers.	Determine hazardous characteristics and proper waste segregation.
	Selected VOC determination Trichloroethylene 1,1,1-trichloroethane Refridgerant-113	10% of containers.	Determine waste constituents.
	Test for metals	10% of containers.	Determine component concentration for disposal.
	Chemical composition and waste properties	As required for TSD acceptance.	
	Uranium Technetium		Determine radioactive constituents.
Granular activated carbon filters ER-5A ER-5B 700-4	Visual Inspection	20% of containers.	Verify waste description.
	Selected VOC determination Trichloroethylene 1,1,1-Trichloroethane	10% of containers.	Verify waste description.
	Test for metals TC test for organic compounds Benzene	10% of containers.	Verify waste description and proper waste segregation.
	Chemical composition and waste properties	As required for TSD acceptance.	Determine component concentrations for disposal.
	Uranium Technetium		Determination of radioactive constituents.
Chemical cleaning and decontamination solutions Cascade-3 700-7 700-8 705-1	Visual Inspection	20% of containers.	Verify waste description.
	pH Test for metals Test for organic constituents	10% of containers. 10% of containers.	Verify waste description. Determine characteristics of waste. Proper waste segregation.
	Chemical composition and waste properties	As required for TSD acceptance.	Determine component concentrations for disposal.
	Uranium Technetium		Determine radioactive constituents.
Cleaning compounds SW-12 720-7 720-24	Visual Inspection	20% of containers.	Verify waste description.
	pH Test for metals	10% of containers.	Verify waste description and proper segregation of wastes.
	Chemical composition and waste properties	As required for TSD acceptance.	Determine component concentrations for disposal.
	Uranium Technetium		Determination of radioactive constituents.

Table C-2 (continued)

WASTE STREAM TYPE AND IDENTIFICATION NUMBER	PARAMETERS	FREQUENCY OF ANALYSIS (Annual)	RATIONALE[a]
Contaminated debris (rags, wipes, floor sweepings, waste brass, canvas cooling tower curtain, bag filters, incinerator ash, filter cake, glass beads, metal shavings, wood, rubber and decontaminated waste solids) Ash-1 705-9 Cascade-6 705-10 Pump-2 705-11 Stor-1 710-10 SW-2 720-2 SW-3 720-17 SW-16 7725-1B 342-1 7725-2 616-2 7725-3 700-3 700-5 705-2 705-3 705-7	Visual Inspection Test for metals Test for organic compounds Selected VOC determination 1,1,1-Trichloroethane Acetone Methyl ethyl ketone Toluene Xylene Cresylic acid Chemical composition and waste properties Uranium Technetium	20% of containers. As required for TSD acceptance.	Verify waste description. Verify waste description and proper waste segregation. Determine component concentration for disposal. Determine radioactive constituents.
Degreasing operations 700-12 720-13 705-16	Visual Inspection Test for metals Test for organic compounds Selected VOC determination 1,1,1-Trichloroethane Acetone Refridgerant-113 Toluene Xylene Cresylic acid Chemical composition and waste properties Uranium Technetium	20% of containers. 10% of containers. As required for TSD acceptance.	Verify waste description. Verify waste description and proper segregation of wastes. Determine component concentrations for disposal. Determine radioactive constituents.
Gas Cylinders SW-7	Acetylene Chlorine Trifluoride Hydrogen Cyanide		Reuse. Treatment by technology specified in OAC 3745-59-42 (40 CFR 268.42) and to standards specified in OAC 3745-59-41 to 43 (40 CFR 268.41 to 268.43).

Table C-2 (continued)

WASTE STREAM TYPE AND IDENTIFICATION NUMBER	PARAMETERS	FREQUENCY OF ANALYSIS (Annual)	RATIONALE[a]
Etching wastes SW-13	Visual Inspection	20% of containers.	Verify waste description.
	Test for metals Test for organic compounds Corrosivity Ferric chloride solution pH	10% of containers. 10% of containers.	Verify waste description. Proper segregation of wastes. Knowledge of materials used in process areas, MSDS. Verify waste description. Proper segregation of wastes.
	Chemical composition and waste properties	As required for TSD acceptance.	Determine component concentrations for disposal.
	Flash point Ethyl alcohol solution Selected VOC determination Ethyl alcohol	10% of containers.	Listed hazardous waste per OAC 3745-50-33 (40 CFR 261.33). Treatment required to meet technology standards cited in OAC 3745-59-42 (40 CFR 268.42) for high TOC subcategory.
	Chemical composition and waste properties	As required for TSD acceptance.	
	Selected VOC determination 1,1,1-Trichloroethane Trichloroethylene Xylene	10% of containers.	
	Chemical composition and waste properties	As required for TSD acceptance.	
	Uranium Technetium		Determination of radioactive constituents.
Electrical test wastes 720-20	Visual Inspection	20% of containers.	Verify waste description.
	Flash point Test for metals Test for organic materials Selected VOC Determination Chloroform Methanol	10% of containers.	Verify waste description. Proper waste segregation.
	Chemical composition and waste properties	As required for TSD acceptance.	Determine waste properties and chemical concentration for disposal.
	Uranium Technetium		Determination of radioactive constituents.

Table C-2 (continued)

WASTE STREAM TYPE AND IDENTIFICATION NUMBER	PARAMETERS	FREQUENCY OF ANALYSIS (Annual)	RATIONALE[a]
Vent sampling wastes[c] Ethanol solution Cascade-1 760-3	Visual Inspection	20% of containers.	Verify waste description.
	Uranium Technetium		Determine radioactive constituents.
	pH Flash point Test for metals Test for organic compounds	10% of containers.	Verify waste description. Proper segregation of wastes.
	Selected VOC determination Ethanol	10% of containers.	Verify waste description.
	Chemical composition and waste properties	As required for TSD acceptance.	Verify waste description. Proper waste segregation
Indicator solution Cascade-1	Visual Inspection	20% of containers.	
	pH test for metals test for organic compounds	10% of containers.	
Trap Material Cascade-10	No additional visual inspection		Health and safety concerns
	Uranium Technetium Test for metals	10% of containers	Verify waste description.
Discarded laboratory chemicals and industrial products SW-1 SW-1A SW-1B	Visual Inspection	All containers.	Verify waste description.
	Characteristic compounds or solutions	Not analyzed.	Knowledge of materials based on containers labels and/or MSDS.
SW-11 SW-11A SW-11B 705-12 720-22	Compounds listed in OAC 3745-51-33(E) and (F) [40 CFR 261.33(e) and (f)]	Not analyzed.	Knowledge of materials based on containers labels and/or MSDS.
Lead related debris Switch-1 104-1 104-2 104-3 720-21	Visual Inspection	20% of containers.	Verify waste description.
	pH Test for metals Lead	10% of containers with liquids.	Proper waste segregation.
	Chemical composition and waste properties	10% of containers.	Determine chemical concentrations and waste properties.
	Uranium Technetium	As required for TSD acceptance.	Determination of radioactive constituents.

Table C-2 (continued)

WASTE STREAM TYPE AND IDENTIFICATION NUMBER	PARAMETERS	FREQUENCY OF ANALYSIS (Annual)	RATIONALE[a]
Oil/solvent Cascade-4 Cascade-5 ER-4A ER-4B Pump-3 Switch-2 100-4 344-1A 344-1B 600-2 608-2 611-1 616-1 700-10 700-13 705-4 705-15 710-1 720-1 720-8 720-11 720-16 720-23 720-31 750-1 750-2 7725-1 7725-1A	Visual Inspection	20% of containers.	Verify waste description.
	Flash point Test for metals Cadmium Chromium Lead	10% of containers.	Verify waste description. Proper waste segregation.
	Test for organic compounds	10% of containers.	Verify waste description. Proper waste segregation.
	Selected VOC determination Acetone Carbon Tetrachoride Methyl ethyl ketone Methylene chloride Mineral spirits Tetrachloroethylene Toluene Trichloroethylene 1,1,1-Trichloroethane Trichlorofluoromethane Xylene Cresylic acid		
	Chemical composition and waste properties	As required for TSD acceptance.	Determine component concentrations for disposal.
	Uranium Technetium		Determination of radioactive constituents.
Paint related materials 720-26 720-27 720-28 720-28B 720-29	Visual Inspection	20% of containers.	Verify waste description.
	Flash point Test for metals Lead Test for organic compounds	10% of containers.	Verify waste description. Proper waste segregation.
	Selected VOC determination Acetone iso-Butyl alcohol n-Butyl alcohol Methanol Methyl ethyl ketone Methyl iso-butyl ketone Mineral spirits Naphtha Toluene Trichloroethylene Xylene	10% of containers.	Verify waste description.
	Chemical composition and waste properties	As required for TSD acceptance.	Determine component concentrations for disposal.
	Uranium Technetium		Determine radioactive constituents.

Table C-2 (continued)

WASTE STREAM TYPE AND IDENTIFICATION NUMBER	PARAMETERS	FREQUENCY OF ANALYSIS (Annual)	RATIONALE[a]
Personal protective equipment 600-3 616-3	Visual Inspection	20% of containers.	Verify waste description.
	Test for metals Arsenic Test for organic compounds	10% of containers.	Verify waste description. Proper waste segregation.
	Selected VOC determination 1,1,1-Trichloroethane Trichloroethylene		
	Chemical composition and waste properties	As required for TSD acceptance.	Determine properties and composition for disposal.
	Uranium Technetium		Determine radioactive constituents.
Photographic solutions (includes x-ray development) 100-3 100-6 101-2 Cascade-8	Visual Inspection	20% of containers.	Verify waste description.
	pH Test for metals Metals determination Silver	10% of containers.	Verify waste description.
	Chemical composition and waste properties	As required for TSD acceptance.	Determine waste properties and composition for disposal.
Batteries SW-4 SW-4A SW-4B SW-4C SW-4D	Visual Inspection	20% of containers.	Verify waste description.
	pH Test for metals Cadmium Lead	As necessary.	Verify waste description. Proper waste segregation.
Plating wastes 720-5 720-6 710-5	Visual Inspection	20% of containers.	Verify waste description.
	pH Test for metals Cyanide	10% of containers.	Knowledge of materials used in process areas; product MSDS. Proper waste segregation.
	Chemical composition and waste properties.	As required for TSD acceptance.	Determine component concentrations for disposal.
	Discarded materials Copper cyanide Silver cyanide Sodium cyanide	All containers.	Verify waste description. Knowledge of materials used in process areas; product MSDS. Proper waste segregation.
	Uranium Technetium		Determine radioactive constituents.
Waste Sodium 760-4	Visual Inspection	20% of containers.	Verify waste description.
	Reactive hazardous waste sodium		Verify waste description. Proper waste segregation.

Table C-2 (continued)

WASTE STREAM TYPE AND IDENTIFICATION NUMBER	PARAMETERS	FREQUENCY OF ANALYSIS (Annual)	RATIONALE[a]
Printing wastes 100-1 100-2 100-5	Visual Inspection Flash point Test for metals Test for organic materials Selected VOC determination Naphtha 1,1,1-Trichloroethane Chemical composition and waste properties	20% of containers. 10% of containers. 10% of containers. 	Verify waste description. Verify waste description. Proper waste segregation. Determine component concentration for disposal.
Cleaning solution 343-2 344-5 600B-2 720-34	Visual Inspection pH Flash Point Test for Metals Test for Organic Materials Chemical Composition and Waste Properties	20% of containers 10% of containers 	Verify waste description Verify waste description Proper waste segregation Determine component concentration for disposal
Spent chemicals and products 710-2 710-2A 710-2B 710-9 720-35	Visual Inspection pH Test for metals Test for organic materials Chemical composition	20% of containers 10% of containers 	Verify waste description Verify waste description Proper waste segregation Determine component concentration for disposal
Soil from Non-ER Activiites SW-20	Visual Inspection Test for metals Test for organic materials Chemical composition	20% of containers 10% of containers 	Verify waste description Verify waste description Proper waste segregation Determine component concentration for disposal
Office Machine Waste 100-7	Visual Inspection Chemical composition and waste properties	20% of containers Not analyzed	Verify waste description Knowledge of materials based on manufacturers information, MSDS, and process knowledge
Silver Recovery Solids 100-9	Visual Inspection Test for metals Chemical composition and waste properties	20% of containers 10% of containers 	Verify waste description Verify waste description Proper waste segregation Determine component concentration for disposal

Table C-2 (continued)

WASTE STREAM TYPE AND IDENTIFICATION NUMBER	PARAMETERS	FREQUENCY OF ANALYSIS (Annual)	RATIONALE[a]
Rinsewaters, decon waters, Wastewater (miscellaneous) ER-7 ER-8 SW-21 342-2 342-3 700-6	Visual Inspection	20% of containers.	Verify waste description.
	pH Test for metals Arsenic Cadmium Chromium Lead Test for organic compounds	10% of containers.	Verify waste description. Proper waste segregation.
	Chemical composition and waste properties.	As required for TSD acceptance.	Determine waste properties and component concentrations for disposal.
	Uranium Technetium		Determine radioactive constituents.

a The rationale correlates to the purpose or reason that specific parameters are analyzed.

b All hazardous wastes that are generated in areas where it can be reasonably be expected to be in contact with radioactive materials will be analyzed for those constituents. If contact with radioactive constituents is not expected, the waste will be spot checked for those constituents.

c This waste stream is generated from sampling the purge vents and recovery vents associated with the gaseous diffusion process. As a result, this waste stream will be managed as a mixed (hazardous and radioactive) waste prior to receiving analytical data.

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Section D
Containers

D-1 Containers

D-1A Containers With Free Liquids [3745-55-75]

The physical form of the wastes that are managed in the hazardous waste storage units was described in Section C-1. In general, the waste form can be described as either solid, liquid or sludge. For the purpose of storage unit design and construction, all RCRA storage areas within X-7725 and X-326 meet the requirements for storage of containers with free liquids. Thus, all wastes are stored within a secondary containment system. All floors are sealed with a coating which is impervious to attack by all wastes listed in Section C and the base is free of cracks or gaps.

D-1A(1) Description of Containers [3745-55-71, 3745-55-72]

Information describing the containers used to store waste at the facility is provided in Table D-1. This information includes the dimensions and useable volume, type, material of construction, DOT or other specification, and the approximate number of each type of container on hand.

Most containers used in the storage areas are new. When possible, to minimize waste, polyethylene 10-liter polybottles, 20-gallon labpacks, and 55-gallon polyethylene drums are reused for waste storage after being emptied. Prior to their reuse, however, they are cleaned, decontaminated, and visually inspected to ensure no residue from past use remains.

All containers are labeled or marked with, at a minimum, the words "hazardous waste", the accumulation start date, and the identity of the container contents. Example labels are shown in Figures D-4 and D-5. Container identification numbers and/or bar code labels are applied to the containers for identification and tracking purposes. Other labels and markings are applied as applicable and required.

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D-1A(2) Container Management Practices [3745-55-73]

Container Information

As discussed in Section C-1, waste generators use process knowledge and standard operating guidelines to select the proper container and ensure material compatibility. PORTS uses various sizes of bottles, pails, cans, drums, and boxes which may be made of steel, stainless steel, glass, or polyethylene. Wastes are typically placed in appropriate DOT specification drums or other containers listed in Table D-1. Corrosive liquids are generally stored in polyethylene drums. Polyethylene liners are used in metal containers for waste solids which may tend to corrode drums over extended periods of storage (e.g., radioactive hazardous sludge from wastewater treatment processes). Storage of waste in compatible five gallon containers is practical to ensure nuclear criticality safety. Glass containers of various sizes are used to contain discarded commercial chemicals packaged by the manufacturer/supplier.

In the unlikely event that an orphaned container is found onsite, the contents are analyzed to determine proper container compatibility and possible recontainerization of the wastes. Orphaned containers are isolated from other containers in the staging area until their contents are determined and compatibility issues resolved.

In addition, procedures are in place requiring the review of new processes, modification to existing processes, emergency response actions generating waste, or repackaging of existing waste containers. These procedures require review of the container selection by qualified personnel to ensure the proper containerization of these waste streams. The generator of a hazardous or mixed waste is responsible for ensuring the waste container is marked with the words "hazardous waste", the accumulation start date and the identity of the container contents. All containers are kept closed while in the container storage units except when it becomes necessary to sample the container for analytical purposes or during corrective actions. Additional information concerning container selection is provided in Section C.

Movement of Containers

A waste generator at PORTS begins the process for disposal of wastes by filling out the generator portion of the request for disposal (RFD) form which bears a unique identifying number. This number is also placed on the waste container(s). Several versions of the form have been used, and the most recent version is shown in Figure D-6. The generator portion of the form

identifies the generator, the waste materials type and form, the type of waste container, accumulation start date and labels affixed to the container.

Upon receipt of the RFD, qualified personnel review the information provided by the generator for completeness, approve the waste for transportation, and designate the storage location of the waste. If there are deficiencies regarding incomplete information or other questions about the waste, the generator is contacted to obtain resolution to all deficiencies and questions prior to approving the waste for transportation to the storage facility. Following approval, the RFD is returned to the generator for transportation of the waste to the designated storage facility.

After receiving approval, the waste is transported to the designated storage facility according to procedures designed to minimize potential spills or releases. Upon arrival at the storage facility, qualified personnel will inspect the waste containers for container integrity, check the container identification numbers against the approved RFD, off-load and weigh the containers, and place the waste containers in the appropriate storage area or in the staging area if further sampling is required. The qualified personnel will sign the RFD as having received the waste. In addition, the container is identified with a container identification number and/or a bar code label for use in inventory control. Completed RFD forms are distributed to the waste generator, the container storage unit, and to the operating record.

Waste container movements within the container storage units are accomplished with a barrel truck, polybottle cart, forklift, barrel lift, a forklift with a barrel attachment, or on a pallet (up to 4 drums per pallet) with a forklift. The choice of conveyance is based on the minimization of potential spills or releases. Containers may also be moved by overhead cranes or movable gantry cranes utilizing barrel hooks or lifters within an individual storage area. Containers are kept in an upright position except as necessary during repackaging operations. Ramps over diking are provided to ensure the integrity of the dikes is maintained, and to facilitate the safest movement of containers.

Container Inspection

Inspection of waste containers occurs when the container is received in the staging area and prior to transport to its storage area. All containers within storage areas and staging areas within the container storage units are inspected at least weekly. Daily inspections are conducted in areas of loading and unloading operations. Results of the inspections, as well as any required corrective actions, are recorded on an inspection log sheet and filed in the operating record. Corrective actions may include the transfer of the waste to a container in good condition or

overpacking the defective container into a larger container in good condition. Corrective actions for defective containers are taken as soon as possible and always initiated within 24 hours of discovery. See Section F for additional information.

Management Practices

Adequate aisle space is maintained between adjacent double rows of waste containers to allow visual container inspections, necessary emergency response actions, and conduct of routine operations. Geometrically subcritical containers (i.e., containers with diameters less than six inches) in X-326 storage areas and X-7725 areas P and 4a will have a minimum of 18 inches between containers. Single drums with high uranium content in these areas will have a minimum aisle space of 22 inches between containers. The minimum aisle space between single or double rows of all containers is 28 inches. Typical arrangements are shown in Appendix D-1 [Drawings DX761-997-A and X-7725-970-S]. Maximum stack height of various containers and materials are given in Table D-2. These stacking heights are designed to ensure container integrity.

The maximum number of containers of each type expected to be stored is given in Tables D-3 and D-4. The maximum storage volumes are 133,540 gallons and 5,456,142 gallons for X-326 and X-7725 respectively. These volumes are discussed in more detail in Section D-1A(3)(c).

D-1A(3) Secondary Containment Systems Design and Operation [3745-50-44(C)(1)(a), 3745-55-75(A) and (D)]

Figures D-1 through D-3 provide plan views of the container storage area. Design and profile drawings for each of these areas are contained in Appendix D-1. For the X-326 Storage Unit, drawing number DX-761-997-A illustrates the following information:

- location and horizontal extent of each storage area.
- plan view of limits of containment systems and access ramps for each area.
- profile details of typical dike and access ramp details.

As the floor of the X-326 Storage Unit is essentially level, no elevation (profile), drawing of the floor is provided.

For the X-7725 Storage Unit, drawings X-7725-971-S through X7725-973-S present typical plan and profile details regarding containment system aspects such as curbing; access ramps; repair of floors, expansion/control joints, cracks; and other pertinent details. Drawings X-7725-974-S through X-7725-997-S provide the following details for each of the 22 areas within building X-7725:

- key plan for each area.
- plan view of limits of containment system and access doors and ramps for each area.
- floor coating details.
- floor penetration isolation details.

As the two levels of the X-7725 Storage Unit are essentially flat, no elevation (profile) drawings of the floors are provided.

Flammable wastes are stored in areas H, M, and P in building X-7725, shown in Figure D-1, and in the X-326 unit. Incompatible wastes could be stored in all areas if separated by a dike, wall, berm, or other device such as a polyspill pallet. Containers having these wastes will also be located a minimum of one aisle width away from each other and will not be stored in the same row. For example, cyanide wastes are not stored in the same row of containers with any container having a waste with a pH less than six. Sodium wastes are stored in containers filled with organic liquids such as kerosene. Additional segregation is provided by the use of spill containment pallets for most liquid waste containers.

D-1A(3)(a) Requirements for the Base or Liner to Contain Liquids [3745-55-75(B)(1)]

The base structure of both the X-7725 and the X-326 Container Storage Units are constructed from concrete and are free of cracks and gaps. Rough or spalled areas of the floor have been repaired with a polymer modified Portland cement. Cracks in the floor have been sealed with a modified methacrylate crack healer/penetrating sealer, or an epoxy injection adhesive as appropriate for the number and size of the cracks. Expansion joint gaps have been filled with a polyurethane elastomeric sealant. Control joint gaps have been filled with a flexible epoxy control joint sealer/adhesive. Typical construction details regarding this work are provided in Appendix D-1, drawing numbers X-7725-971-S through X-7725-973-S. The concrete floor would be expected to have a permeability in the range of 1×10^{-7} cm/sec with this treatment. To further ensure the base is capable of containing any liquids which may accumulate and to enhance compatibility of the base with the stored waste, the concrete surfaces in all storage areas have been sealed with a chemically resistant sealant. This sealant is compatible with all waste types listed in Section C. The Tennant Company 4700 series coating was used to seal storage areas on the first floor of X-7725. The Starglaze sealant, made by the Carboline Company, was used on the level IV storage areas in X-7725. Tennant 122 was used in the X-326 storage areas.

The floor of the X-326 Building consists of a six-inch concrete slab reinforced with 6 x 6 welded wire fabric (drawing DX761-997-A, Appendix D-1). The slab was placed over an engineered fill of at least one foot in depth. Design allowable floor loading is 550 pounds per square foot (psf) with a calculated 3.0 factor of safety. The maximum expected loading for the unit is 165 psf based on 85 gallon drums stacked one high.

The floor of the X-7725 consists of a concrete slab varying in thickness from 6 inches to 17 inches reinforced with #4 tempered steel on 15-inch outside centers each way. The slab is underlain by a compacted granular fill of at least two feet thick. Design allowable floor loading varies for both levels I and IV of the X-7725 Unit. The design loadings for level I have a calculated 2.5 factor of safety and the design loadings for level IV have a calculated 1.7 factor of safety. Minimum design loading values are 675 psf for level I and 200 psf for level IV. The maximum expected loading for level I is 653 psf based upon a worst case loading of 4' x 4' x 6' boxes stacked four high. The maximum expected loading for level IV is 128 psf based on 55 gallon drums stacked one high.

D-1A(3)(b) Containment System Drainage [3745-50-44(C)(1)(a)(ii), 3745-55-75(B)(2)]

The containers in X-7725 and X-326 container storage areas are elevated to protect them from contact with any accumulated liquids resulting from potential leaks or spills. The containers will be elevated through the use of containment pallets, wooden or metal pallets, metal rails, metal shelving (for laboratory chemicals) or polybottle holders. Typical storage arrangements are shown in Appendix D-1 [drawings DX-761-997-A and X-7725-970-S].

D-1A(3)(c) Containment System Capacity [3745-50-44(C)(1)(a)(iii), 3746-55-75(B)(3)]

The containment capacity provided for the storage areas in the X-7725 and the X-326 storage units, is adequate to contain 10 percent of the total waste volume stored and 25 percent where TSCA wastes are stored. Specifically, the X-326 container storage unit has a design capacity of 133,540 gallons and a containment capacity of 13,452 gallons or 10.1 percent. The X-7725 container storage unit has a design capacity of 5,456,142 gallons and a containment capacity of 711,450 gallons or 13.0 percent. Containment capacities and the maximum storage capacity of each storage area in the container storage units and supporting calculations, including area, volume and displacement volume, are provided in Table D-5. Detailed drawings are shown

in Appendix D-1 [drawings DX-761-997-A and X-7725-971-S through X-7725-997-S]. These drawings provide information on the layout of the container storage units; including containment systems dimensions, typical container arrangements, structures which reduce containment volume, and diking dimensions.

D-1A(3)(d) Control of Run-on [3745-50-44(C)(1)(a)(iv), 3745-55-75(B)(4)]

Both the X-326 and X-7725 container storage areas are totally enclosed within buildings. Roof and wall design features, which provide protection from precipitation, are shown in Appendix D-1 [drawings X-326-13-A, X-326-23-A, X-7725-0011-C, and X-7725-0601A]. Thus, no provisions for run-on control are required. Further, totally enclosed secondary containment devices are in use at both X-326 and X-7725. Therefore, no capacity for run-on need be provided by the secondary containment systems.

Surface water flow in the area of the container storage units is shown in Section B (Figures B-3 through B-6). Thunderstorms are common from April to August and locally heavy rains may accompany these storms. The 24-hour totals of 2.2, 2.8, 3.1, 3.6, 4.0 and 4.3 inches of rain can be expected every 2, 5, 10, 25, 50, and 100 years, respectively. The stormwater drainage system design is sufficient to handle this run-off. Thus, no flooding (run-on) is anticipated to occur with design storm events of 100 years or less.

D-1A(3)(e) Removal of Liquids from Containment System [3745-50-44(C)(1)(a)(v), 3745-55-75 (B)(5)]

All the storage areas are completely enclosed. Exclusive of roof leaks and fire water sprinkler system leaks handled under separate procedures, any liquid present within the secondary containment systems would be from spilled or leaked hazardous waste. Since the storage areas are inspected weekly, any leak or spill would be discovered in a timely manner eliminating the potential for overflow of the containment system.

Should a leak or spill occur, various procedures are followed depending on the quantity of waste released. Small releases are removed by mops, absorbents, and shovels; the residue is placed in containers; treated as a hazardous waste and analyzed if required. For larger releases, initial removal of the material would be through the use of electric powered industrial wet/dry barrel vacuum, electric drum pumps, and/or air powered diaphragm pumps. Then absorbents or mops are used as required for removal. All recovered material would be recontainerized in containers

listed in Table D-1, treated as a hazardous waste, and analyzed, as required. The Contingency Plan, (Section G) will be implemented if there is a threat to human health or the environment. All powered equipment used for emergency response purposes in the storage units for flammable materials meet the Class 1 - Division 1 codes of the NFPA fire prevention standards.

Other non-leaking containers in the area of a spill should not come in contact with the spilled material since they are elevated. Containers which do contact the spilled material would be lifted with a barrel lift or a crane and barrel hooks, and cleaned. Clean-up material is handled as hazardous waste as noted previously.

D-1B Containers Without Free Liquids [3745-50-44(C)(1)]

All hazardous wastes in the container storage units are stored within the containment system described in D-1A(3)(c).

D-2 Tank Systems Through D-8 Miscellaneous Units

PORTS is not applying for an operating permit for a tank system, a waste pile system, a surface impoundment, an incinerator, a landfill, or any other type of land treatment system to treat, store or dispose hazardous waste.

Table D-1
Container Information

Volume	Type	Material	Dimensions[1]	Specification	Thickness	Approx. No. Containers on-hand (000)
110 Gal.	Drum	Steel	30"id, 41"ih	49 cfr 178 Subpart d	16 gauge	4.5
85 Gal.	Drum	Steel	26"id, 36.375"ih	49 cfr 178 Subpart d	16 gauge	2.6
55 Gal.	Drum	Steel Steel ss[2] ple[3]	22.5", 35" ih 22.5"id, 35"ih 22.5"id, 35"ih 22.5"id, 35"ih	HM181,1A2 DOT17c,h,e DOT17c,e DOT34	16 16 & 18 gauge	5 20. 1. 5.
1,2,13, 30 Gal.	Drum	ple	18.5"id, 29.75"oh (typical, 30 gal.)	DOT34	.1875"	2.
30 Gal.	Drum	Steel ple	18.25"id, 29"oh 18.5"id 31.875"oh	DOT17h DOT34	.18"	5. 2.
20 Gal.	Drum	ple	21.25"id, 17.5"oh	49cfr 178 Subpart d	.1875"	2.
5 Gal.	Pail	Steel ple	11.25"id, 13"oh	DOT17c,e DOT34	0.2"	2. 1.
10 Liter (2.64 Gal.)	Bottle	ple	5"id, 50"ih	Drawing no.: DX-761-2340-M	.195"	2.
1.70 Gal.	Can	Tin	5"id *15"ih	Drawing No.: DX-761-2331-M	.010" Head .015" Body	0.5
83.7 Cu. Ft.	Box	Steel	4' X 4' X 6'	Drawing No.: DX-761-2265-M liner-10mil ple	12 Gauge	0.5
96 Cu. Ft.	Box	Steel	4' X 4' X 6'	49 cfr Subpart d	12 Gauge	0.2
275 Cu. Ft.	Box	Steel	6' X 6' X 8'	Drawing No.: DX-761-2286-M	12 Gauge	0.2
Various	Cylinder	Steel	Various	49 cfr 178 Subpart c	Various	0.01
Various	Bulk	Stainless Steel	Various	49 cfr 178 Subpart h	Various	0.01
Various	Bottle	Glass	Various	N/A	Various	40

1) id-inside diameter, od-outside diameter, ih-inside height, oh-outside (overall) height.
2) ss-stainless steel
3) ple - polyethylene

Table D-2
Maximum Container Stacking Heights

Material	Container Type	Stacking Height	Aisle Space
Solids	110 gallon drums	2 high	28"
Solids	85 gallon drums	2 high	28"
Overpacked solids	85 gallon drums	2 high	28"
Solids[1]	55 gallon drums	3 high	28"
Liquids	55 gallon drums	1 high	28"
Solids	30 gallon drums	3 high	28"
Liquids	1,2,13,30 gal. drums	1 high	28"
Liquids	20 gallon labpacks	5 high	28"
Liquids	5 gallon containers	1 high	28"
Liquids	10 liter polybottles	1 high	28"
Solids	5" cans	1 high	28"
Solids	4' x 4' x 6' boxes	4 high	28"
Solids	6' x 6' x 8' boxes	2 high	28"
Chemicals	laboratory bottles	1 layer per shelf	
Gas	cylinder	1 high	28"
Liquids	bulk containers	1 high	28"

NOTE:

1. Top level of stack is banded (non NCS wastes).

Table D-3
Maximum Number of Containers, X-326 Unit

Container Volume	Maximum Number
85 gallon	1,570
55 gallon	2,400
30 gallon	2,450
20 gallon	2,450
5 gallon	2,450
2.47 gallon (polybottle)	3,000
1.7 gallon	3,000

Table D-4
Maximum Number of Containers, X-7725 Unit

Container Volume	Maximum Number
110 gallon	45,000
85 gallon	60,000
55 gallon	99,000
30 gallon	100,000
20 gallon	100,000
13 gallon	4,500
2 gallon	4,500
1 gallon	4,500
5 gallon	10,000
10 liter	10,000
1.7 gallon	10,000
83.7 cu. ft.	3,400
96 cu. ft.	3,400
275 cu. ft.	750
glass bottles	50,000
cardboard boxes	20,000
gas cylinders	1,000

Table D-5
X-7725 Container Storage Unit - Secondary Containment Calculations

Basis for Calculations

Curb Height:

Area M has 8-inch high curbs.
Area 4A and P have 1-inch high curbs.
All other areas have 6-inch high curbs.

Container Displacement

Curb height = 6 inches
Displacement Volume for Containers:

Drums on metal pallet	= 8 gallons displaced
Drums on wooden pallet	= 13.72 gallons displaced
Drums on polyspill pallet	= 19.95 gallons displaced

Therefore, worst case displacement volume is for four 55-gallon drums on a polyspill pallet. This displacement volume will be used in containment calculations for all areas except Areas A, P, M, and 4A. Containment calculations for area A are based on the storage of 1600 4' X 4 'X 6' boxes in this area. 600 of these boxes may also contain PCBs and require a minimum containment volume of 25%. The displacement volume of a 4' X 4' x 6' box is 5.05 cubic feet.

Area Requirement

The area requirement for a polyspill pallet and the required minimum aisle space of 28 inches is:

polyspill pallet = 49.5 in. X 49.5 in.	= 2450.25 sq. in.
	= 17.02 sq. ft
aisle space = 49.5 in. X 28. In.	= 1386 sq. in.
	= 9.63 sq. ft.
Total area required = 9.63 + 17.02	= 26.65 sq. ft.

able D-5 (continued)

X-7725 Storage Area 4A

Area bounded by column lines B4-C8 &23-27
Drawing X-7725-966-S Revision I

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
254.50	67.33	17135.49

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramps:	1.00	24.00	1.67	40.08	0.04
	1.00	21.25	1.67	35.49	0.04
	6.00	4.00	3.33	79.92	0.04
c. Curb	1.00	36.33	18.50	672.11	0.08
Offsets:	1.00	24.00	1.67	40.08	0.08
	1.00	25.17	4.50	113.27	0.08
	1.00	5.00	4.00	20.00	0.08
	1.00	4.50	8.25	37.13	0.08
	1.00	99.38	4.50	447.21	0.08
	1.00	13.63	41.92	571.37	0.08
	1.00	7.00	11.33	79.31	0.08
	1.00	25.00	7.67	191.75	0.08
	1.00	27.50	3.33	91.58	0.08
	1.00	16.50	14.33	236.45	0.08
	1.00	2.33	3.50	8.16	0.08
d. Misc:	1.00	1.25	1.25	1.56	0.08
	1.00	1.50	2.75	4.13	0.08
e. Column Piers:	6.00	2.50	3.50	52.50	0.08

3.	Net usable floor area (sf):	14413.42
4.	Pallet area required =	51.48 sf
5.	Curb height - 1 inch =	0.083 feet
6.	Maximum number of pallets =	279.98
7.	Maximum volume stored =	61595.81 gallons 8234.73 cubic feet
8.	Net containment volume =	1196.31 cubic feet 8948.43 gallons
9.	Total pallet displacement volume =	2781.17 gallons 371.81 cubic feet
10.	Actual containment volume =	10106.23 gallons 824.5 cubic feet
11.	Containment volume required =	6159.58 gallons 823.47 cubic feet

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Table D-5 (continued)

X-7725 Storage Area 4B — Area bounded by column lines A9-A8 & Drawing X-7725-983-S Revision 1

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
27.92	233.83	6528.53
27.92	66.65	1860.87

Additions - total usable floor space (sf) & additional volumes (cf)

	Number	Width	Length	Area	Height
	1.00	9.75	7.67	74.78	0.50
	1.00	10.00	12.00	120.00	0.50

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramps:	1.00	10.00	7.67	76.70	0.25
	2.00	12.00	10.00	240.00	0.25
c. Curb	1.00	17.67	6.25	110.44	0.50
Offsets:	1.00	12.67	10.00	126.70	0.50
	1.00	0.67	4.33	2.90	0.50
	1.00	5.83	31.44	183.30	0.50
	1.00	1.17	7.50	8.77	0.50
	1.00	3.42	20.17	68.98	0.50
	1.00	4.00	5.33	21.32	0.50
	1.00	1.00	17.00	17.00	0.50
	1.00	3.25	17.33	56.32	0.50
	1.00	3.50	8.67	30.35	0.50
	1.00	5.50	73.00	401.50	0.50
	1.00	4.00	31.67	126.68	0.50
	1.00	4.00	22.17	88.68	0.50
	1.00	0.67	4.33	2.90	0.50
d. Column Piers:	none			0.00	
e. Misc:	none			0.00	

3. Net usable floor area (sf): 7021.65
4. Maximum no. of pallets (net usable floor area/26.65 sf/polypallets) 263.48
5. Poly-pallet volume displacement: 703.48 cubic feet
6. Net containment volume with 6-inch curb: 3510.82 cubic feet
7. Actual containment volume available: 2807.34 cubic feet
8. Maximum stored volume = # pallets*3(stacking hgt)*4(drums per pallet)
   *55 gallons per drum = 173894.41 gallons
   23247.92 cubic feet
9. Containment volume required = 2324.79 cubic feet

able D-5 (continued)

X-7725 Storage Area 4C

Area bounded by column lines A8-A3 &
Drawing X-7725-984-S Revision 1

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
98.17	72.17	7084.93

Additions - total usable floor space (sf) & additional volumes (cf)

	Number	Width	Length	Area	Height
	1.00	4.67	5.83	27.23	0.50

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramps:	none			0.00	
c. Curb	1.00	3.67	3.33	12.22	0.50
Offsets:	1.00	40.00	42.50	1700.00	0.50
	1.00	4.00	11.00	44.00	0.50
	1.00	3.00	4.96	14.88	0.50
	1.00	4.83	3.58	17.29	0.50
d. Column	none			0.00	
e. Misc:	1.00	3.58	5.33	19.08	0.50

3. Net usable floor area (sf): 5304.68
4. Maximum no. of pallets (net usable floor area/26.65 sf/polypallets) 199.05
5. Poly-pallet volume displacement: 531.46 cubic feet
   Net containment volume with 6-inch curb: 2652.34 cubic feet
   Actual containment volume available: 2120.88 cubic feet
8. Maximum stored volume = # pallets*3(stacking hgt)*4(drums per pallet)
   *55 gallons per drum = 131372.97 gallons
   17563.23 cubic feet
9. Containment volume required = 1756.32 cubic feet

SUBMISSION DATE: February 21, 2000

Table D-5 (continued)

X-7725 Storage Area 4E

Area bounded by column lines A8-A3 &
Drawing X-7725-985-S Revision 1

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
95.17	62.67	5964.30

Additions - total usable floor space (sf) & additional volumes (cf)

	Number	Width	Length	Area	Height
	1.00	10.67	3.33	35.53	0.50

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramps:	none			0.00	
c. Curb	1.00	4.96	3.67	18.20	0.50
Offsets:	1.00	28.75	39.75	1142.81	0.50
	1.00	1.25	2.33	2.91	0.50
d. Misc:	2.00	3.33	4.42	29.44	0.50
e. Column Piers:	none			0.00	

3. Net usable floor area (sf): 4806.47
4. Maximum no. of pallets (net usable floor area/26.65 sf/polypallets) 180.36
5. Poly-pallet volume displacement: 481.55 cubic feet
6. Net containment volume with 6-inch curb: 2403.24 cubic feet
7. Actual containment volume available: 1921.69 cubic feet
8. Maximum stored volume = # pallets*3(stacking hgt)*4(drums per pallet)
   *55 gallons per drum = 119034.52 gallons
   15913.71 cubic feet
9. Containment volume required = 1591.37 cubic feet

able D-5 (continued)

X-7725 Storage Area A

Area Bounded by Column Lines C8-C9 &
Drawing X-7725-976-S Revision 1
Drawing D-7725-977-S Revision 1

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
289.67	191.00	55326.97

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramps:	1.00	10.00	8.00	80.00	0.25
	4.00	10.00	10.00	400.00	0.25
	1.00	10.00	9.08	90.80	0.25
	1.00	10.00	8.67	86.70	0.25
c. Curb	1.00	4.58	55.29	253.23	0.50
Offsets:	1.00	8.58	4.96	42.56	0.50
	1.00	4.58	156.72	717.78	0.50
	1.00	1.25	20.25	25.31	0.50
	1.00	4.42	22.42	99.10	0.50
	1.00	10.00	25.25	252.50	0.50
	1.00	17.17	105.42	1810.06	0.50
	1.00	31.34	20.58	644.98	0.50
	1.00	0.08	6.00	0.48	0.50
	1.00	31.34	12.08	378.59	0.50
	1.00	41.34	10.67	441.10	0.50
	1.00	7.00	83.67	585.69	0.50
	1.00	1.92	37.54	72.08	0.50
	1.00	7.00	7.42	51.94	0.50
	1.00	1.92	24.21	46.48	0.50
	1.00	7.00	36.08	252.56	0.50
	1.00	8.92	13.33	118.90	0.50
	1.00	7.50	25.58	191.85	0.50
	1.00	1.25	8.67	10.84	0.50
	1.00	11.25	11.50	129.38	0.50
	1.00	13.17	28.25	372.05	0.50
	1.00	163.25	10.00	1632.50	0.50
d. Column	1.00	2.00	3.00	6.00	0.50
Piers:	2.00	3.00	3.00	18.00	0.50
	3.00	3.50	3.50	36.75	0.50
	1.00	3.50	1.75	6.13	0.50
e. Misc:	2.00	2.67	2.67	14.26	0.50
	1.00	7.83	9.17	71.80	0.50
	1.00	5.83	7.33	42.73	0.50
	1.00	4.83	4.00	19.32	0.50
	8.00	3.00	0.67	16.08	0.50
	1.00	6.33	6.67	42.22	0.50
	1.00	6.33	9.83	62.22	0.50
	1.00	6.83	6.67	45.56	0.50
	1.00	6.83	5.83	39.82	0.50
	1.00	6.33	5.00	31.65	0.50
	1.00	7.83	5.67	44.40	0.50
	1.00	4.33	4.33	18.75	0.50

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Table D-5 (continued)

3.	Net usable floor area (sf):	46023.84
4.	Total net containment volume with 6-inch curb (cubic feet):	23011.92
5.	4' X 4' x 6' box displacement	
	1600 boxes stacked 4 high = 400 boxes on floor	
	400 boxes x (5.05 cf displaced/box) =	2020 cubic feet
6.	Actual containment volume available:	20991.92 cubic feet
		157019.56 gallons
7.	Required containment volume for 1600 boxes:	
	total volume stored=	133920.00 cubic feet
	=	1001855.52 gallons
	1000 boxes x (83.7 cf/box) x 10% =	8370 Cubic feet
	567 boxes x (83.7 Cf/box) x 25% =	12555 Cubic feet
	total required volume =	20925 cubic feet
		156519 gallons

Table D-5 (continued)

X-7725 Storage Area B

Area bounded by column lines A9-C8 &
Drawing X-7725-974-S Revision 0

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
82.67	328.67	27171.15

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramps:	2.00	9.00	10.00	180.00	0.25
	1.00	8.17	10.00	81.70	0.25
c. Curb	1.00	1.67	69.25	115.65	0.50
Offsets:	1.00	4.00	80.67	322.68	0.50
	1.00	2.00	22.17	44.34	0.50
	1.00	5.67	5.67	32.15	0.50
	1.00	29.33	31.25	916.56	0.50
	1.00	15.58	22.58	351.80	0.50
	1.00	1.92	9.67	18.57	0.50
	1.00	5.25	10.00	52.50	0.50
d. Column	7.00	3.00	6.00	126.00	0.50
Piers:	1.00	3.00	5.33	15.99	0.50
	1.00	2.00	2.00	4.00	0.50
e. Misc:	2.00	4.67	6.00	56.04	0.50
	1.00	2.50	2.54	6.35	0.50
	3.00	1.67	4.00	20.04	0.50

3. Net usable floor area (sf): 24826.79
4. Maximum no. of pallets (net usable floor area/26.65 sf/polypallets) 931.59
5. Poly-pallet volume displacement: 2487.34 cubic feet
6. Net containment volume with 6-inch curb: 12413.39 cubic feet
7. Actual containment volume available: 9926.05 cubic feet
8. Maximum stored volume:
   Number pallets x 4 drums/pallet x 55 gallons/drum x 3 stacking height =
   614847.26 gallons
   82198.83 cubic feet
9. Containment volume required = 8219.88 cubic feet

SUBMISSION DATE: February 21, 2000

Table D-5 (continued)

X-7725 Storage Area C

Area bounded by column lines A3-A8 & Drawing X-7725-9981-S Revision 1

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
103.67	277.17	28734.21

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	1.00	0.67	79.33	53.15	0.50
b. Ramps:	1.00	10.00	16.67	166.70	0.25
	1.00	10.00	14.00	140.00	0.25
c. Curb	1.00	4.42	20.17	89.15	0.50
Offsets:	1.00	1.67	18.00	30.06	0.50
	1.00	7.75	69.00	534.75	0.50
	1.00	1.48	14.00	20.72	0.50
	1.00	7.75	46.33	359.06	0.50
	1.00	9.67	21.92	211.97	0.50
	1.00	5.33	4.96	26.44	0.50
	1.00	9.67	24.25	234.50	0.50
	1.00	11.42	11.00	125.62	0.50
	1.00	4.17	31.33	130.65	0.50
	1.00	4.17	32.00	133.44	0.50
	1.00	5.33	6.75	35.98	0.50
	1.00	3.33	42.42	141.26	0.50
	1.00	6.33	16.83	106.53	0.50
	1.00	3.33	23.50	78.25	0.50
	1.00	2.17	21.33	46.29	0.50
	1.00	4.83	21.33	103.02	0.50
	1.00	6.33	5.33	33.74	0.50
	1.00	4.75	26.08	123.88	0.50
d. Column	3.00	3.00	3.00	27.00	0.50
Piers:	4.00	2.00	2.00	16.00	0.50
	1.00	2.17	2.00	4.34	0.50
	7.00	3.00	6.00	126.00	0.50
	1.00	4.00	2.00	8.00	0.50
	1.00	3.00	9.00	27.00	0.50
	1.00	3.58	9.67	34.62	0.50
	2.00	3.08	2.08	12.81	0.50
	1.00	2.00	3.33	6.66	0.50
	1.00	3.33	2.33	7.76	0.50
	1.00	5.33	3.58	19.08	0.50
e. Misc:	1.00	4.67	5.33	24.89	0.50
	5.00	2.83	2.83	40.04	0.50
	1.00	4.33	5.67	24.55	0.50
	1.00	3.33	0.67	2.23	0.50
	1.00	2.67	6.00	16.02	0.50

able D-5 (continued)

3.	Net usable floor area (sf):	25412.05
4.	Maximum no. of pallets (net usable floor area/26.65 sf/polypallets)	953.55
5.	Poly-pallet volume displacement:	2545.97 cubic feet
6.	Net containment volume with 6-inch curb:	12706.025 cubic feet
7.	Actual containment volume available:	10160.05 cubic feet
8.	Maximum stored volume:	
	Number pallets x 4 drums/pallet x 55 gallons/drum x 3 stacking height =	629341.67 gallons
		84136.59 cubic feet
9.	Containment volume required =	8413.66 cubic feet

SUBMISSION DATE: February 21, 2000

Table D-5 (continued)

X-7725 Storage Area D

Area bounded by column lines B6-C1 &
Drawing X-7725-986-S Revision 1

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
48.83	86.25	4211.59

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramps:	2.00	8.00	10.00	160.00	0.25
c. Curb	1.00	8.67	15.75	136.55	0.50
Offsets:	1.00	6.92	9.33	64.56	0.50
	1.00	10.00	14.33	143.30	0.50
	1.00	5.67	13.67	77.51	0.50
d. Column	1.00	3.00	3.00	9.00	0.50
Piers:	1.00	2.00	2.00	4.00	0.50
	2.00	2.00	2.17	8.68	0.50
e. Misc:	none			0.00	

3. Net usable floor area (sf): 3607.98
4. Maximum no. of pallets (net usable floor area/26.65 sf/polypallets) 135.38
5. Poly-pallet volume displacement: 361.48 cubic feet
6. Net containment volume with 6-inch curb: 1803.99 cubic feet
7. Actual containment volume available: 1442.51 cubic feet
8. Maximum stored volume:
   Number pallets x 4 drums/pallet x 55 gallons/drum x 3 stacking height =
   89353.41 gallons
   11945.64 cubic feet
9. Containment volume required = 1194.56 cubic feet

ıble D-5 (continued)

X-7725 Storage Area E & F

Area bounded by column lines B5-C8.6 &
Drawing X-7725-987-S Revision 1
Drawing X-7725-988-S Revision 1

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
131.67	238.50	31403.30

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramps:	1.00	13.33	10.00	133.30	0.25
	1.00	6.67	10.00	66.70	0.25
	3.00	8.00	10.00	240.00	0.25
c. Curb	1.00	6.33	16.33	103.37	0.50
Offsets:	1.00	13.33	42.83	570.92	0.50
	1.00	39.17	12.67	496.28	0.50
	1.00	0.33	55.83	18.42	0.50
	1.00	0.33	17.00	5.61	0.50
	1.00	4.00	15.00	60.00	0.50
	1.00	0.33	17.92	5.91	0.50
	1.00	3.50	5.00	17.50	0.50
	1.00	0.33	39.00	12.87	0.50
	1.00	5.67	9.25	52.45	0.50
	1.00	5.67	17.75	100.64	0.50
	1.00	3.00	8.33	24.99	0.50
	1.00	19.33	8.00	154.64	0.50
	1.00	9.33	8.00	74.64	0.50
	1.00	9.33	80.67	752.65	0.50
	1.00	3.42	2.67	9.13	0.50
	1.00	7.00	16.25	113.75	0.50
	1.00	10.67	14.75	157.38	0.50
	1.00	29.00	38.17	1106.93	0.50
	1.00	28.25	2.33	65.82	0.50
d. Column	2.00	2.33	3.00	13.98	0.50
Piers:	1.00	2.33	9.00	20.97	0.50
	5.00	3.00	9.00	135.00	0.50
	6.00	3.00	6.00	108.00	0.50
	10.00	2.00	2.00	40.00	0.50
	2.00	3.00	3.00	18.00	0.50
	1.00	2.00	1.75	3.50	0.50
e. Misc:	1.00	2.83	9.00	25.47	0.50
	1.00	4.83	4.17	20.14	0.50
	1.00	4.67	9.00	42.03	0.50
	2.00	3.83	3.33	25.51	0.50
	1.00	12.50	10.33	129.13	0.50
	1.00	3.67	9.00	33.03	0.50
	1.00	2.00	3.67	7.34	0.50
	1.00	3.00	3.67	11.01	0.50

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Table D-5 (continued)

3.	Net usable floor area (sf):	26426.27
4.	Maximum no. of pallets (net usable floor area/26.65 sf/polypallets)	991.60
5.	Poly-pallet volume displacement:	2647.58 cubic feet
6.	Net containment volume with 6-inch curb:	13213.135 cubic feet
7.	Actual containment volume available:	10565.55 cubic feet
8.	Maximum stored volume:	
	Number pallets x 4 drums/pallet x 55 gallons/drum x 3 stacking height =	654459.20 gallons
		87494.55 cubic feet
9.	Containment volume required =	8749.45 cubic feet

able D-5 (continued)

X-7725 Storage Area G

Area Bounded by Column Lines A9-B8 &
Drawing X-7725-975-S Revision 0

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
122.67	158.00	19381.86

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramps:	1.00	10.00	10.00	100.00	0.25
	1.00	8.67	10.00	86.70	0.25
c. Curb	1.00	27.33	19.33	528.29	0.50
Offsets:	1.00	7.33	5.50	40.31	0.50
	1.00	5.83	6.33	36.90	0.50
	1.00	16.33	1.33	21.72	0.50
	1.00	4.83	0.33	1.59	0.50
	1.00	6.58	6.67	43.89	0.50
	1.00	1.33	3.00	3.99	0.50
	1.00	0.33	6.87	2.27	0.50
	1.00	5.33	3.00	15.99	0.50
	1.00	6.42	5.42	34.80	0.50
	1.00	11.08	11.33	125.54	0.50
	1.00	42.17	6.83	288.02	0.50
	1.00	3.33	2.50	8.33	0.50
	1.00	2.50	2.00	5.00	0.50
d. Column	4.00	2.00	2.00	16.00	0.50
Piers:	3.00	2.33	2.33	16.29	0.50
	2.00	9.00	3.00	54.00	0.50
	1.00	5.33	3.00	15.99	0.50
	1.00	5.42	3.00	16.26	0.50
	1.00	9.00	2.33	20.97	0.50
	1.00	3.50	3.50	12.25	0.50
	1.00	4.50	3.00	13.50	0.50
	3.00	1.33	2.00	7.98	0.50
e. Misc:	1.00	6.00	6.00	36.00	0.50
	1.00	6.33	4.00	25.32	0.50
	1.00	0.42	0.83	0.35	0.50

3. Net usable floor area (sf): 17815.15
4. Maximum no. of pallets (net usable floor area/26.65 sf/polypallets) 668.49
5. Poly-pallet volume displacement: 1784.86 cubic feet
6. Net containment volume with 6-inch curb: 8907.57 cubic feet
7. Actual containment volume available: 7122.71 cubic feet
8. Maximum stored volume:
   Number pallets x 4 drums/pallet x 55 gallons/drum x 3 stacking height =
   441200.73 gallons
   58984.05 cubic feet
9. Containment volume required = 5898.41 cubic feet

SUBMISSION DATE: February 21, 2000

Table D-5 (continued)

X-7725 Storage Area H

Area Bounded by Column Lines C1-C5 & 44-48
Drawing X-7725-960-S Revision 0

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
80.46	74.42	5987.83

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramps:	1.00	8.67	10.00	86.70	0.25
	1.00	14.25	10.00	142.50	0.25
c. Curb	1.00	1.63	3.33	5.43	0.50
Offsets:	1.00	3.67	13.00	47.71	0.50
	1.00	12.96	14.92	193.36	0.50
	1.00	1.63	46.08	75.11	0.50
	1.00	4.63	9.12	42.23	0.50
	1.00	1.63	7.21	11.75	0.50
d. Misc:	1.00	1.25	1.25	1.56	0.50
e. Column Piers:	2.00	2.00	2.00	8.00	0.50

3. Net usable floor area (sf): 5373.48
4. Maximum no. of pallets (net usable floor area/26.65 sf/polypallets) 201.63
5. Poly-pallet volume displacement: 538.36 cubic feet
6. Net containment volume with 6-inch curb: 2686.74 cubic feet
7. Actual containment volume available: 2148.38 cubic feet
8. Maximum stored volume:
   Number pallets x 4 drums/pallet x 55 gallons/drum x 3 stacking height =
   133076.84 gallons
   17791.02 cubic feet
9. Containment volume required = 1779.10 cubic feet

able D-5 (continued)

X-7725 Storage Area J

Area Bounded by Column Lines B6-C1 &
Drawing X-7725-989-S Revision 1

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
77.92	57.58	4486.63

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramps:	1.00	14.00	10.00	140.00	0.25
	1.00	6.42	2.33	14.96	0.50
	1.00	6.42	10.00	64.20	0.25
	1.00	12.67	10.00	126.70	0.25
c. Curb	1.00	5.50	18.58	102.19	0.50
Offsets:	1.00	3.17	3.17	10.05	0.50
	1.00	1.83	22.00	40.26	0.50
	1.00	4.67	20.17	94.19	0.50
	1.00	0.33	33.46	11.04	0.50
	1.00	4.00	7.29	29.16	0.50
d. Column Piers:	2.00	2.00	1.50	6.00	0.50

3. Net usable floor area (sf): 3847.88
4. Maximum no. of pallets (net usable floor area/26.65 sf/polypallets) 144.39
   Poly-pallet volume displacement: 385.51 cubic feet
5. Net containment volume with 6-inch curb: 1923.94 cubic feet
7. Actual containment volume available: 1538.43 cubic feet
8. Maximum stored volume:
   Number pallets x 4 drums/pallet x 55 gallons/drum x 3 stacking height =
   95294.60 gallons
   12739.92 cubic feet
9. Containment volume required = 1273.99 cubic feet

SUBMISSION DATE: February 21, 2000

Table D-5 (continued)

X-7725 Storage Area K

Area Bounded by Column Lines B8-C2 &
Drawing X-7725-990-S Revision 1

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
124.33	57.75	7180.06

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramps:	1.00	10.00	13.33	133.30	0.25
	1.00	10.00	12.67	126.70	0.25
c. Curb	1.00	11.00	14.00	154.00	0.50
Offsets:	2.00	2.25	3.33	14.99	0.50
	1.00	5.33	30.58	162.99	0.50
	1.00	17.00	37.83	643.11	0.50
	1.00	4.67	43.25	201.98	0.50
	1.00	0.67	1.67	1.12	0.50
	1.00	1.17	1.67	1.95	0.50
	1.00	1.67	10.92	18.24	0.50
	1.00	19.92	72.08	1435.83	0.50
	1.00	1.75	4.67	8.17	0.50
	1.00	6.33	13.92	88.11	0.50
d. Column Piers:	1.00	2.00	2.00	4.00	0.50
e. Misc:	1.00	5.00	6.17	30.85	0.50
	1.00	4.00	7.67	30.68	0.50

3. Net usable floor area (sf): 4124.03
4. Maximum no. of pallets (net usable floor area/26.65 sf/polypallets) 154.75
5. Poly-pallet volume displacement: 413.18 cubic feet
6. Net containment volume with 6-inch curb: 2062.01 cubic feet
7. Actual containment volume available: 1648.83 cubic feet
8. Maximum stored volume:
   Number pallets x 4 drums/pallet x 55 gallons/drum x 3 stacking height =
   102133.69 gallons
   13654.24 cubic feet
9. Containment volume required = 1365.42 cubic feet

ıble D-5 (continued)

X-7725 Storage Area L

Area Bounded by Column Lines C2-C5 &
Drawing X-7725-991-S Revision 1

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
54.58	103.33	5639.75

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramps:	1.00	10.00	10.00	100.00	0.25
	1.00	8.00	10.00	80.00	0.25
c. Curb	1.00	4.66	11.00	51.26	0.50
Offsets:	1.00	3.33	12.67	42.19	0.50
	1.00	5.00	10.83	54.15	0.50
	1.00	4.00	5.00	20.00	0.50
	1.00	4.00	5.83	23.32	0.50
	1.00	6.00	31.16	186.96	0.50
	1.00	6.00	19.67	118.02	0.50
d. Column	1.00	2.00	2.00	4.00	0.50
Piers:	1.00	3.08	6.00	18.48	0.50
	1.00	1.33	2.00	2.66	0.50
e. Misc:	1.00	6.33	12.33	78.05	0.50
	1.00	9.00	10.00	90.00	0.50

Net usable floor area (sf): 4770.66

Maximum no. of pallets (net usable floor area/26.65 sf/polypallets) 179.01

5. Poly-pallet volume displacement: 477.96 cubic feet
6. Net containment volume with 6-inch curb: 2385.33 cubic feet
7. Actual containment volume available: 1907.37 cubic feet
8. Maximum stored volume:
   Number pallets x 4 drums/pallet x 55 gallons/drum x 3 stacking height =
   118147.71 gallons
   15795.15 cubic feet
9. Containment volume required = 1579.51 cubic feet

SUBMISSION DATE: February 21, 2000

Table D-5 (continued)

X-7725 Storage Area M1

Area Bounded by Column Lines D9-E4 &
Drawing X-7725-993-S Revision 1

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
31.50	76.75	2417.63

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramps:	1.00	8.00	10.00	80.00	0.25
c. Curb	1.00	4.33	8.58	37.15	0.50
Offsets:	1.00	0.33	17.17	5.67	0.50
	1.00	8.00	11.00	88.00	0.50
	1.00	8.67	15.42	133.69	0.50
	3.00	2.67	5.33	42.69	0.50
d. Column Piers:	none			0.00	
e. Misc:	none			0.00	

3. Net usable floor area (sf): 2030.42
4. Maximum no. of pallets (net usable floor area/26.65 sf/polypallets) 76.19
5. Poly-pallet volume displacement: 203.42 cubic feet
6. Net containment volume with 6-inch curb: 1015.21 cubic feet
7. Actual containment volume available: 811.79 cubic feet
8. Maximum stored volume:
   Number pallets x 4 drums/pallet x 55 gallons/drum x 3 stacking height =
   50284.39 gallons
   6722.51 cubic feet
9. Containment volume required = 672.25 cubic feet

able D-5 (continued)

X-7725 Storage Area M

Area Bounded by Column Lines D9-E4 & 36-38
Drawing X-7725-961-S Revision 1

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
35.42	79.92	2830.77

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramps:	1.00	8.67	13.33	115.57	0.33
c. Stepovers:	1.00	6.25	4.29	26.81	0.67
	2.00	3.63	0.92	6.68	0.33
	1.00	3.63	2.33	8.46	0.67
d. Curb	1.00	17.75	3.50	62.13	0.67
Offsets:	1.00	3.83	5.50	21.06	0.67
	1.00	2.33	3.83	8.92	0.67
	2.00	2.33	4.00	18.64	0.67
	1.00	2.17	2.00	4.34	0.67
	1.00	13.67	8.00	109.36	0.67
	1.00	13.08	1.67	21.84	0.67
	2.00	2.33	3.33	15.52	0.67
	1.00	2.33	16.17	37.68	0.67
e. Misc:	1.00	1.25	1.25	1.56	0.67

Net usable floor area (sf): 2372.19

Maximum no. of pallets (net usable floor area/26.65 sf/polypallets) 89.01

5. Poly-pallet volume displacement: 316.89 cubic feet
6. Net containment volume with 6-inch curb: 1581.46 cubic feet
7. Actual containment volume available: 1264.57 cubic feet
8. Maximum stored volume:
   Number pallets x 4 drums/pallet x 55 gallons/drum x 3 stacking height =
   58748.46 gallons
   7854.07 cubic feet
9. Containment volume required = 785.41 cubic feet

SUBMISSION DATE: February 21, 2000

Table D-5 (continued)

X-7725 Storage Area N1

Area Bounded by Column Lines A8-A9 & Drawing X-7725-997-S Revision 2

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
30.75	379.83	11679.77

Additions - total usable floor space area (sf) & additional volumes (cf)

	Number	Width	Length	Area	Height
	1.00	11.42	11.17	127.56	0.50
	1.00	6.33	6.67	42.22	0.50

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramps:	1.00	11.42	10.00	114.20	0.25
	1.00	8.67	10.00	86.70	0.25
	1.00	6.67	10.00	66.70	0.25
	1.00	14.00	10.00	140.00	0.25
	1.00	8.00	10.00	80.00	0.25
	1.00	12.67	16.67	211.21	0.25
	1.00	17.75	10.00	177.50	0.25
c. Curb	1.00	5.67	34.75	197.03	0.50
Offsets:	1.00	2.92	63.25	184.69	0.50
	1.00	0.67	4.75	3.18	0.50
	1.00	0.67	10.67	7.15	0.50
	1.00	4.75	4.96	23.56	0.50
	1.00	3.00	7.17	21.51	0.50
	1.00	2.83	9.50	26.88	0.50
	1.00	4.00	11.42	45.68	0.50
	1.00	2.50	13.67	34.18	0.50
	1.00	2.50	3.33	8.33	0.50
	1.00	2.25	2.00	4.50	0.50
	1.00	10.17	12.21	124.18	0.50
	1.00	5.92	4.96	29.36	0.50
	1.00	6.08	8.17	49.67	0.50
	1.00	4.92	10.75	52.89	0.50
	1.00	6.25	7.50	46.88	0.50
	1.00	5.92	22.67	134.21	0.50
	1.00	6.92	4.96	34.32	0.50
d. Column Piers:	1.00	2.25	6.00	13.50	0.50
e. Misc:	1.00	2.92	41.88	122.29	0.50
	1.00	2.92	15.17	44.30	0.50
	1.00	1.25	4.67	5.84	0.50
	1.00	2.92	47.58	138.93	0.50
	1.00	3.25	51.42	167.12	0.50
	1.00	2.92	20.83	60.82	0.50
	1.00	2.25	10.17	22.88	0.50
	1.00	2.25	39.33	88.49	0.50

ıble D-5 (continued)

3.	Net usable floor area (sf):	9250.86
4.	Maximum no. of pallets (net usable floor area/26.65 sf/polypallets)	347.12
5.	Poly-pallet volume displacement:	926.82 cubic feet
6.	Net containment volume with 6-inch curb:	4625.43 cubic feet
7.	Actual containment volume available:	3698.61 cubic feet
8.	Maximum stored volume:	
	Number pallets x 4 drums/pallet x 55 gallons/drum x 3 stacking height =	229101.99 gallons
		30628.61 cubic feet
9.	Containment volume required =	3062.86 cubic feet

SUBMISSION DATE: February 21, 2000

Table D-5 (continued)

X-7725 Storage Area N

Area Bounded by Column Lines A8-B5 &
Drawing X-7725-996-S Revision 1

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
102.00	172.00	17544.00

Additions - total usable floor space area (sf) & additional volumes (cf)

	Number	Width	Length	Area	Height
	1.00	1.67	2.50	4.17	0.50
	1.00	3.00	28.58	85.74	0.50
	1.00	6.67	27.75	185.09	0.50
	1.00	15.33	12.33	189.02	0.50

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramp:	1.00	9.00	10.00	90.00	0.25
	1.00	6.67	10.00	66.70	0.25
	1.00	8.00	10.00	80.00	0.25
	1.00	10.00	10.00	100.00	0.25
	1.00	18.00	10.00	180.00	0.25
	1.00	15.58	10.00	155.80	0.25
c. Curb	1.00	13.25	11.25	149.06	0.50
Offsets:	1.00	6.50	7.75	50.38	0.50
	1.00	4.67	2.42	11.30	0.50
	1.00	4.33	7.00	30.31	0.50
	1.00	9.92	20.92	207.53	0.50
	1.00	6.42	41.25	264.83	0.50
	1.00	4.17	4.83	20.14	0.50
	1.00	0.67	10.17	6.81	0.50
d. Column	2.00	2.00	2.00	8.00	0.50
Piers:	6.00	2.83	2.83	48.05	0.50
	2.00	3.00	3.00	18.00	0.50
	1.00	3.00	9.50	28.50	0.50
	1.00	3.00	6.00	18.00	0.50
e. Misc:	1.00	1.33	15.58	20.72	0.50
	1.00	2.33	2.92	6.80	0.50

3. Net usable floor area (sf): 16447.09
4. Maximum no. of pallets (net usable floor area/26.65 sf/polypallets) 617.15
5. Poly-pallet volume displacement: 1647.80 cubic feet
6. Net containment volume with 6-inch curb: 8223.54 cubic feet
7. Actual containment volume available: 6575.74 cubic feet
8. Maximum stored volume:
   Number pallets x 4 drums/pallet x 55 gallons/drum x 3 stacking height =
   407320.12 gallons
   54454.56 cubic feet
9. Containment volume required = 5445.46 cubic feet

ıble D-5 (continued)

X-7725 Storage Area P1

Area Bounded by Column Lines A3-A8 &
Drawing X-7725-980-S Revision 0

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
102.25	58.50	5981.63

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:					
	none			0.00	
b. Ramp:	1.00	12.67	10.00	126.70	0.25
	1.00	13.67	10.00	136.70	0.25
c. Curb	1.00	21.08	5.33	112.36	0.50
Offsets:	1.00	20.67	19.25	397.90	0.50
	1.00	24.50	3.83	93.84	0.50
	1.00	4.50	6.33	28.49	0.50
	1.00	5.00	9.08	45.40	0.50
	1.00	5.00	26.50	132.50	0.50
	1.00	5.33	8.67	46.21	0.50
	1.00	13.67	0.58	7.93	0.50
	1.00	47.50	0.33	15.68	0.50
d. Column Piers:	1.00	3.00	6.00	18.00	0.50
e. Misc:	1.00	0.92	3.63	3.34	0.50
	2.00	4.33	7.33	63.48	0.50
	1.00	5.42	10.58	57.34	0.50

3. Net usable floor area (sf): 4695.78
4. Maximum no. of pallets (net usable floor area/26.65 sf/polypallets) 176.20
5. Poly-pallet volume displacement: 470.46 cubic feet
6. Net containment volume with 6-inch curb: 2347.89 cubic feet
7. Actual containment volume available: 1877.43 cubic feet
8. Maximum stored volume:
   Number pallets x 4 drums/pallet x 55 gallons/drum x 3 stacking height =
   116293.12 gallons
   15547.21 cubic feet
9. Containment volume required = 1554.72 cubic feet

SUBMISSION DATE: February 21, 2000

Table D-5 (continued)

X-7725 Storage Area P3

Area Bounded by Column Lines A4-A8 &
Drawing X-7725-995-S Revision 1

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
31.33	78.00	2443.74

Additions - total usable floor space area (sf) & additional volumes (cf)

	Number	Width	Length	Area	Height
	1.00	0.83	26.33	21.85	0.50

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramp:	none			0.00	
c. Curb	1.00	2.08	8.33	17.33	0.50
Offsets:					
d. Column	none			0.00	
Piers:					
e. Misc:	none			0.00	

3. Net usable floor area (sf): 2448.27
4. Maximum no. of pallets (net usable floor area/26.65 sf/polypallets) 91.87
5. Poly-pallet volume displacement: 245.29 cubic feet
6. Net containment volume with 6-inch curb: 1224.13 cubic feet
7. Actual containment volume available: 978.85 cubic feet
8. Maximum stored volume:
   Number pallets x 4 drums/pallet x 55 gallons/drum x 3 stacking height =
   60632.52 gallons
   8105.95 cubic feet
9. Containment volume required = 810.60 cubic feet

able D-5 (continued)

X-7725 Storage Area P

Area Bounded by Column Lines A3-A8 & 42-45
Drawing X-7725-964-S Revision 2

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
54.00	97.54	5267.16

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramp:	1.00	8.00	3.33	26.64	0.02
c. Curb	1.00	16.83	5.05	84.99	0.03
Offsets:	1.00	9.50	1.38	13.11	0.03
	1.00	6.67	6.21	41.42	0.03
	1.00	12.42	1.38	17.14	0.03
	1.00	2.88	4.67	13.45	0.03
	1.00	16.83	8.33	140.19	0.03
d. Column Piers:	2.00	3.00	3.00	18.00	0.03
e. Misc:	1.00	1.25	1.25	1.56	0.03

3. Net usable floor area (sf): 4910.65
4. Pallet area required = 54.48 sf
5. Curb height = 1 inch = 0.083 feet
6. Maximum number of pallets = 49.00
   Maximum volume stored = 10780.00 gallons
   1441.18 Cubic feet
8. Net containment volume: 407.58 cubic feet
   3048.72 gallons
9. Total pallet displacement volume = 11.45 gallons
   1.53 cubic feet
10. Actual containment volume: 406.05 cubic feet
11. Containment volume required = 1078.00 gallons
    144.12 cubic feet

SUBMISSION DATE: February 21, 2000

Table D-5 (continued)

X-7725 Storage Area Q

Area Bounded by Column Lines A8-B7 &
Drawing X-7725-992-S Revision 1

1. Gross building dimension (ft) within curb - gross floor area

Width	Length	Area
58.83	118.00	6941.94

2. Deductions - total unusable floor space area (sf) & displacement volume

	Number	Width	Length	Area	Height
a. Walls:	none			0.00	
b. Ramp:	1.00	6.42	10.00	64.20	0.25
	1.00	6.67	10.00	66.70	0.25
c. Curb	1.00	2.33	6.42	14.93	0.50
Offsets:	1.00	5.17	63.50	328.30	0.50
	1.00	4.67	4.67	21.81	0.50
	1.00	5.00	8.00	40.00	0.50
	1.00	0.33	29.04	9.58	0.50
	1.00	4.00	4.96	19.84	0.50
d. Column	2.00	1.50	2.00	6.00	0.50
Piers:	1.00	2.00	3.25	6.50	0.50
e. Misc:	2.00	2.83	3.33	18.85	0.50

3. Net usable floor area (sf): 6345.21
4. Maximum no. of pallets (net usable floor area/26.65 sf/polypallets) 238.09
5. Poly-pallet volume displacement: 635.71 cubic feet
6. Net containment volume with 6-inch curb: 3172.60 cubic feet
7. Actual containment volume available: 2536.89 cubic feet
8. Maximum stored volume:
   Number pallets x 4 drums/pallet x 55 gallons/drum x 3 stacking height =
   157142.07 gallons
   21008.30 cubic feet
9. Containment volume required = 2100.83 cubic feet

Table D-6
Summary of Containment Area Information For X-7725

AREA	MAXIMUM STORED	REQUIRED CONTAINMENT	ACTUAL CONTAINMENT	% CONTAINMENT PROVIDED
A	133920.00	20510.69	20991.92	15.6749
B	82198.83	8219.88	9926.05	12.0756
C	84136.59	8413.66	10160.05	12.0756
D	11945.64	1194.56	1442.51	12.0756
EF	87494.55	8749.45	10565.55	12.0756
G	58984.05	5898.41	7122.71	12.0756
H	17791.02	1779.10	2148.38	12.0756
J	12739.92	1273.99	1538.43	12.0756
K	13654.24	1365.42	1648.83	12.0756
L	15795.15	1579.51	1907.37	12.0756
M	7854.07	785.41	1264.57	16.1008
M1	6722.51	672.25	811.79	12.0756
N	54454.56	5445.46	6575.74	12.0756
N1	30628.61	3062.86	3698.61	12.0756
P	1441.18	144.12	406.05	28.1748
P1	15547.21	1554.72	1877.43	12.0756
P3	8105.95	810.60	978.85	12.0757
Q	21008.30	2100.83	2536.89	12.0756
4A	8234.73	823.47	824.50	10.01
4B	23247.92	2324.79	2807.34	12.0756
4C	17563.23	1756.32	2120.88	12.0757
4E	15913.71	1591.37	1921.69	12.0757

MAXIMUM VOLUME STORED = 729381.97 CUBIC FEET
= 5456141.80 GALLONS

Table D-7
X-326 Containment Capacity Calculations

AREA DESIGNATION	1	2	3	4	5	WEST L	EAST L
TOTAL SQUARE FEET	968	3082	1400	3082	2552	11876	8928
AREA DEDUCTIONS	18	24	12	24	24	64	284
AVAILABLE SQUARE FEET	950	3058	1388	3058	2528	11812	8644
PALLET AREA REQUIRED	51.48	51.48	51.48	51.48	51.48	51.48	51.48
MAXIMUM NUMBER PALLETS	18	59	26	59	49	229	167
MAXIMUM GALLONS STORED	3960	12980	5720	12980	10780	50380	36740
CONTAINMENT GALLONS REQUIRED	396	1298	572	1298	1078	5038	3674
GROSS VOLUME IN GALLONS	589	1895.96	860.56	1895.96	1567.36	7323.44	5359.28
GALLON REDUCTION FOR PALLETS	179.10	587.05	258.7	587.05	487.55	2278.55	1661.65
AVAILABLE CONTAINMENT GALLONS	409.9	1308.91	601.86	1308.9	1079.81	5044.89	3697.63
CONTAINMENT CAPACITY PERCENT OF MAXIMUM VOLUME STORED	10.4 %	10.0 %	10.5 %	10.0 %	10.0 %	10.0 %	10.0 %

THEREFORE, THE CONTAINMENT CAPACITY MEETS THE REQUIREMENTS OF 40 CFR 270.15(a)(3).

MAXIMUM VOLUME STORED
- 17853 CUBIC FEET
- 33540 GALLONS

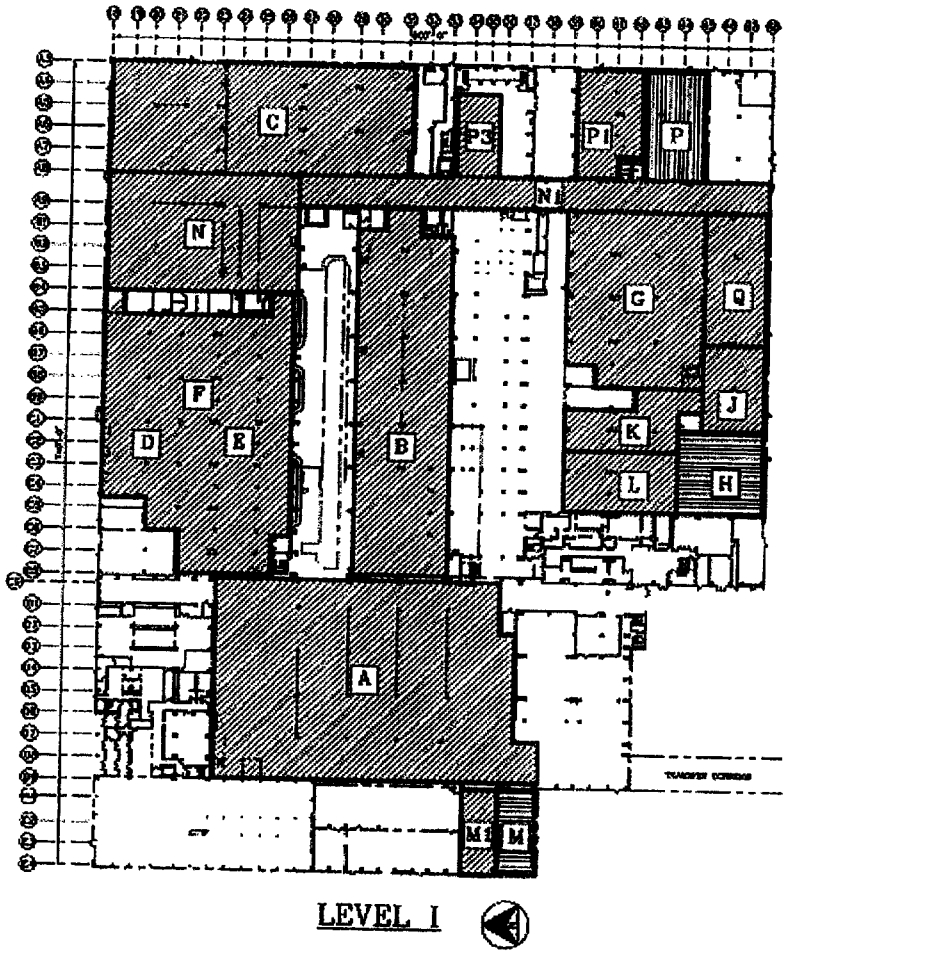


Figure D-1. X-7725 Building Layout - Level I

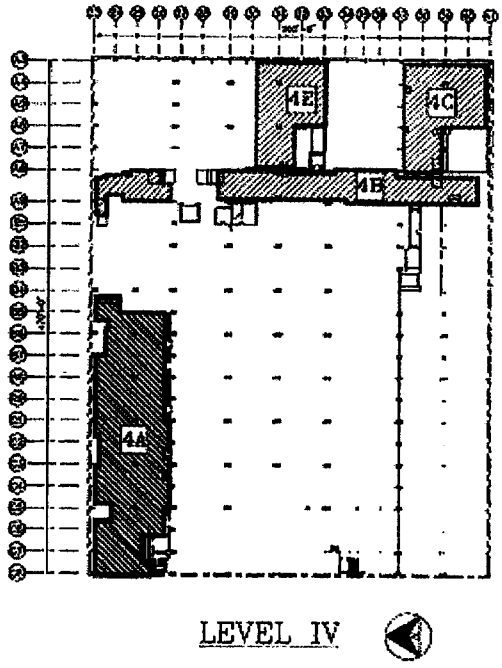
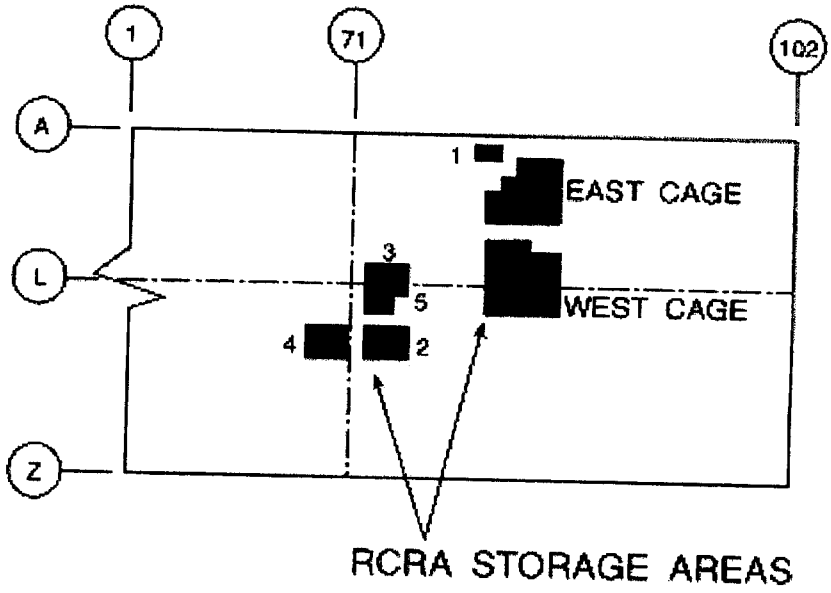


Figure D-2. X-7725 Building Layout - Level IV



X-326 BUILDING

FLOOR PLAN

RCRA STORAGE AREAS

SCALE: NONE

Figure D-3. X-326 Building Floor Plan

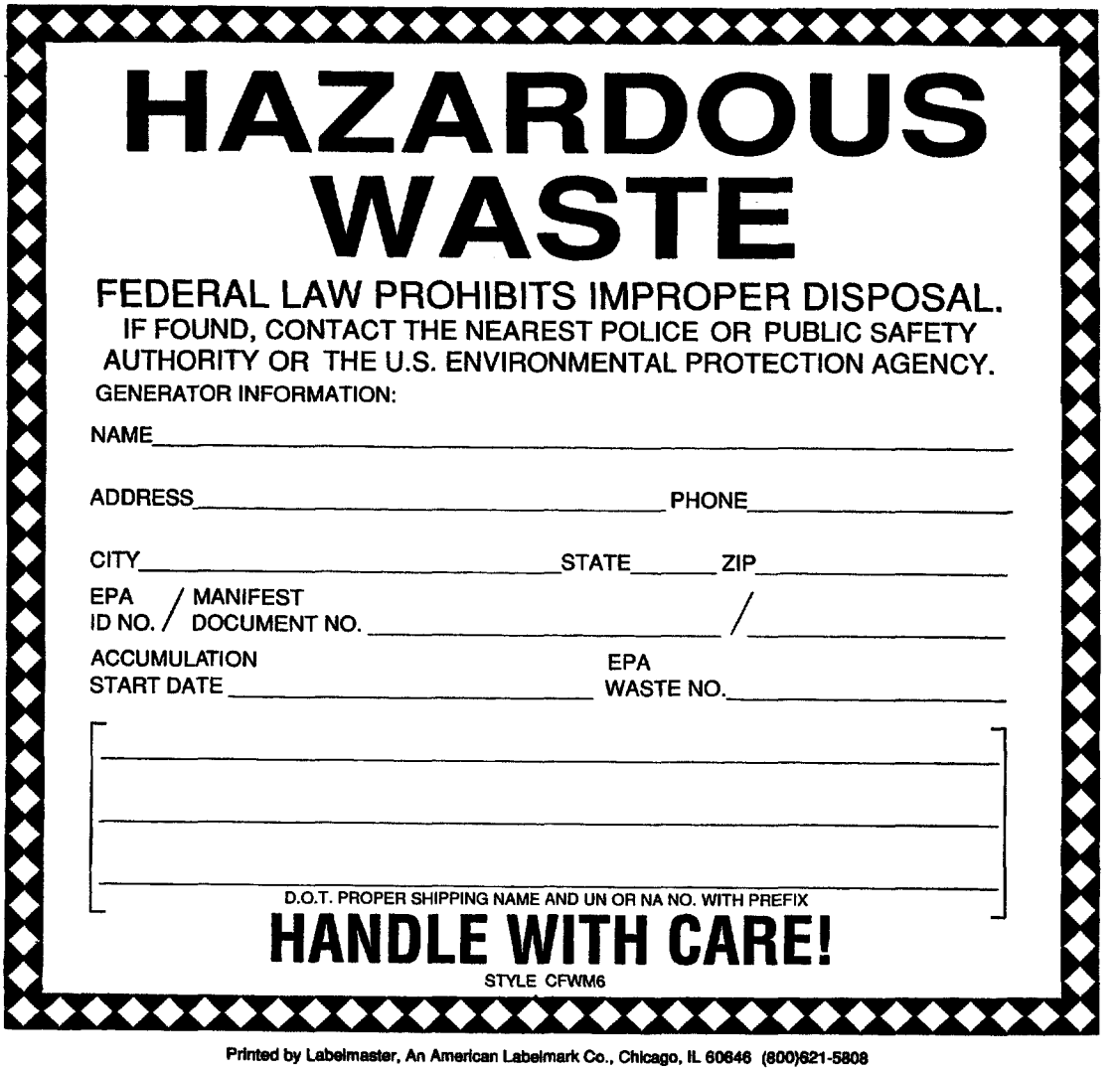


Figure D-4. Hazardous Waste Label

A-2807 (6-94) Rev.

WASTE INFORMATION LABEL

-- USE BLACK INK ONLY --

GENERATOR: _____

CONTENTS: _____

_____

RFD #: _____

PCB START DATE: ____ / ____ / _____

PCB STORAGE DATE: ____ / ____ / _____

WEIGHT: _____

Figure D-5. Waste Information Label

SUBMISSION DATE: February 21, 2000

REQUEST FOR DISPOSAL

DATE: mm/dd/yyyy hh:mm:ss
yyyy-T-xxx
RFD Number xxxxx

GENERATOR SECTION: ONLY ONE CONTAINER TYPE & WASTE TYPE PER RFD.

1. Waste Location:	2. Number of Containers:
3. Waste Origin (bldg/facility):	4. Owner: [ ] USEC [ ] DOE USEC Number:
5. Activity Generating Waste:	
6. Container Size (e.g. 55-gallon, 10L polybottle):	7. Container Material (e.g. steel, plastic):
8. Physical State of Waste: [ ] Solid [ ] Liquid [ ] Gas	
9. Waste Description - fully describe waste, include all known chemicals/constituents present in waste	
Accountable Container Numbers (e.g. Polybottles, F-Cans):	
	Material Code (if applicable):
10. Is this Waste Radioactively Contaminated? [ ] Yes [ ] No	
Attach supporting documentation. Check one: [ ] HP Survey [ ] Analytical [ ] Process Knowledge	
If radioactive, indicate U-235 mass and concentration per container: Mass: Conc.:	
11. Accumulation Start Date for RCRA Waste:	
12. Date Container First Placed into Use for PCB Waste >= 50 or from a source >= 50 ppm:	
13. Date Removed from Service for PCB Equipment:	
14. PCB Concentration:	
Generator Comments: Name: Date:	

Name: Cost Center:	Badge Number: Mail Stop:	Date: Phone:

WASTE MANAGEMENT SECTION:

15. Field Services Approval:	16. Date RFD Form Received:
17. Container Labels: [ ] USEC [ ] DOE [ ] Hazardous [ ] PCB M1 [ ] PCB<50 [ ] Radioactive [ ] Fissile	
[ ] Used Oil [ ] Asbestos [ ] Non-Regulated [ ] Other (Specify):	

18. Waste Category:	19. Waste Stream ID Number:	20. Waste Type:

21. EPA Waste Number(s):	22. Sampling Requested: [ ] Yes [ ] No
23. Unrestricted Release: [ ] Yes [ ] No	24. Criteria Used: [ ] Survey [ ] Area of Generation
25. If RFD is Voided, State Reason:	HANDLING CODE FOR STORAGE
26. Special Instructions: Name:	S01 Date:
27. Deliver to: [ ] X-7725 [ ] X-326L [ ] X-7745RN [ ] X-7745RS [ ] XT-847 [ ] X-705 [ ] Other:	

DOE Facility Approval:	Location:	Date:

WASTE TRANSPORTER/WASTE MANAGEMENT SECTION:

28. A. Facility Delivered To:	Container Number	Gross Wt.
Transporter's Initials/Date:		
B. Facility Delivered To:		
Transporter's Initials/Date:		
29. Storage Location:		
Operator's Name/Date:		

Figure D-6. Example Request for Disposal Form

Section E

Groundwater Monitoring

This section is not applicable because groundwater monitoring is not required for the permitted container storage units at PORTS.

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Section F
Procedures to Prevent Hazards

F-1 Security [3745-54-14, 3745-50-44]

F-1A Security Procedures and Equipment [3745-54-14, 3745-50-44]

Security procedures and equipment at PORTS that prevent the unknowing entry and minimize the possibility for unauthorized entry of persons or livestock onto the active portion of the facility are discussed below.

F-1A(1) 24-Hour Surveillance System [3745-54-14]

Security at PORTS is maintained by a staff of trained security guards. Routine patrols of the main complex provide continuous surveillance of the entire facility, including the container storage units. All security guards are equipped with two-way radios and have direct communications with other PORTS plant protection personnel (i.e., fire department, plant shift superintendents, and the plant communications center).

F-1A(2) Barrier and Means to Control Entry [3745-54-14]

PORTS is a controlled access facility surrounded by a seven foot high chain-link fence, complete with three strand barbed wire and angled top stanchions, gates, and numerous other features that contribute to the safety and security of the facility.

The two container storage units for the PORTS site are located in the X-326 Building and the X-7725 Building. The X-326 Building is in the west central portion of the site and the X-7725 Building is located in the southwestern portion of the site. Both container storage units are located within the plant security fence.

Employees are required to show identification badges to security guards when entering all gates. Visitors and contractors entering the plant must sign a log sheet and/or obtain proper passes.

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F-1A(3) Warning Signs [3745-54-14]

Signs bearing the legend "Danger-Unauthorized Personnel Keep Out" are posted at each entrance to the hazardous waste storage units and are visible from all angles of approach. The signs are written in English and are legible from a distance of twenty-five feet. Existing signs with a legend other than "Danger - Unauthorized Personnel Keep Out" may be used if the legend on the sign indicates that only authorized personnel are allowed to enter and that entry into the active portion can be dangerous.

F-2 Inspection Schedule [3745-50-44, 3745-54-15]

F-2A General Inspection Requirements [3745-50-44, 3745-54-15, 3745-54-73]

The X-7725 and X-326 Storage Units are inspected to detect conditions that may be causing or may lead to the release of hazardous waste constituents to the environment or a threat to human health. Inspection frequencies, items inspected, and types of potential problems that are to be reviewed during inspections are listed in Table F-1. Problems identified during the inspections are documented and corrected on a schedule that ensures the problem does not lead to an environmental or human health hazard. The inspection record will include, at a minimum, the date and time of the inspection, name of the inspector, a notation of the observations made, and the date and nature of any repairs or other remedial actions. Completed inspection checklists, or inspection summaries, are filed in the operating record in accordance with Section J of the permit application. The inspection records are retained a minimum of 3 years from the date of the inspection.

F-2A(1) Types of Problems [3745-54-15]

Equipment items inspected, types of potential problems checked, and inspection frequencies are tabulated in Table F-1, Inspection Schedule.

F-2A(2) Frequency of Inspections [3745-54-15]

The X-7725 and X-326 Storage Units, which contain multiple areas, are inspected by designated facility personnel on a weekly basis (within 7 days of the previous inspection). See Table F-1. Loading/unloading areas are inspected on a daily basis by designated facility personnel when in use. See Table F-1. Problems identified during routine inspections and corrective actions taken to correct the problems are documented on the inspection checklists. Corrective actions are initiated within 24 hours of discovery. Imminent hazards are addressed with immediate remedial action. Multiple areas within the storage units may be inspected on the same day; however, each inspection is required to be started and closed daily. Each checklist will include the information specified in F-2A General Inspection Requirements.

Emergency equipment inspections are conducted on a periodic basis in accordance with Table F-1. The frequency of inspections is based on the rate of possible deterioration of equipment and the probability of an environmental or human health incident if the deterioration malfunction or operator error goes undetected between inspections.

F-2B Specific Process Inspection Requirements [3745-50-44, 3745-54-15]

F-2B(1) Containers [3745-55-74]

Waste containers are inspected weekly during the container storage area inspections conducted by designated facility personnel. The items inspected and types of potential problems checked for are listed in Table F-1.

F-2C Remedial Action [3745-54-15]

If inspections reveal that non-emergency maintenance is needed, the maintenance will be completed as soon as possible to minimize further damage and reduce the need for emergency repairs. If a problem is imminent or has already occurred during the course of an inspection or at any time between inspections, remedial actions will be taken immediately. Plant personnel will notify the appropriate authorities and initiate remedial actions. In the event of an emergency involving the release of hazardous constituents to the environment, the contingency plan will be implemented.

F-3 Waiver of Preparedness and Prevention Requirements [3745-50- 44]

PORTS does not request a waiver of preparedness and prevention requirements. Requirements of this Subpart are addressed in Sections D, F, and G of this application.

F-3A Equipment Requirements [3745-54-32]

F-3A(1) Internal Communications [3745-54-32]

The X-326 Storage Unit and the X-7725 Storage Unit are equipped with internal and external fire alarm systems that, when activated, provide for immediate response of emergency personnel. Personnel have immediate access to this alarm at all times. Emergency response services are provided by onsite emergency responders.

Sprinklers are located in the ceiling of the X-326 and X-7725 units and will activate in the event of a fire. The sprinkler system also activates the fire alarm systems described above.

The fire alarm box can be activated at any time and will provide for immediate response by emergency personnel.

An internal voice public address system is available in the X-7725 Storage Unit and building horns are available in the X-326 Storage Unit. Hand held two-way radios are used by waste handling personnel during all waste transport activities and can be utilized to notify emergency personnel. Telephones are also available for emergency use. PORTS maintains an internal emergency telephone number (911) to contact the onsite emergency responders. The telephones designated for use in the storage units are checked weekly to ensure that they are operable (Table F-1). See Section G for more information.

F-3A(2) External Communications [3745-54-32]

Telephones are located at X-326 and X-7725 Storage Units for emergency use. The telephones designated for use in the storage units are checked weekly to ensure that they are operable (Table F-1). PORTS maintains an internal emergency telephone number (911) to contact the onsite emergency responders. Upon notification, appropriate personnel will respond. External

emergency response agencies can be contacted by the onsite emergency personnel, if necessary. See Section G for more information.

F-3A(3) Emergency Equipment [3745-54-32]

Portable fire extinguishers, fire control equipment, spill control equipment, and decontamination equipment are available for use in the storage units.

The Fire Department is fully equipped with emergency response equipment and maintains a supply of fire extinguishing media. All equipment is maintained as necessary to ensure proper operation in the event of an emergency (Table F-1). See Section G for more information.

F-3A(4) Water for Fire Control [3745-54-32]

PORTS has an on-site water supply of adequate volume and pressure for fire control at the container storage units. A regular schedule for inspections and testing of the fire water supply systems can be found in Table F-1.

Fire hydrants are located in the immediate vicinity of the X-326 Storage Unit and the X-7725 Storage Unit. See Section G for more information.

F-3B Aisle Space Requirement [3745-54-35]

Adequate aisle space is maintained to allow for the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment. Specific aisle space specifications are presented in Section D-1A(2).

F-4 Prevention Procedures, Structures and Equipment [3745-50-44]

Procedures, structures, and equipment used at the storage units to prevent hazards in unloading operations, run-off from hazardous waste handling areas to other areas of the facility or environment, contamination of water supplies, mitigate effects of equipment failure and power outages, and the undue exposure of personnel to hazardous waste are described in the following sections.

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F-4A Unloading Operations [3745-50-44]

Containerized hazardous wastes are transported by trained personnel to hazardous waste storage units by a method of transport that minimizes the potential for spills or releases of hazardous waste constituents. Transportation methods include, but are not limited to, a barrel truck, multi-position transfer cart, forklift, or barrel lift. A spill control kit is available on each vehicle for use in mitigating the effects of spills or leakage. Operations are normally conducted from 0730 hours to 1600 hours, Monday through Friday.

Equipment used in loading/unloading operations includes, but is not limited to, cranes, barrel lifts, forklifts (both with and without special barrel attachments), barrel hooks and clamps, hand carts, and platform lifts. All equipment is inspected daily, when in use (Table F-1). Ramps are used to facilitate the safe movement of containers into diked areas.

F-4B Runoff [3745-50-44]

Both storage units are located within enclosed buildings. All activities within the storage units are within diked areas. Any liquids resulting from container leakage or spills will be contained within the diked area.

An overall site drainage map, located in Section B, depicts paths of potential runoff from the X-326 Storage Unit and the X-7725 Storage Unit.

F-4C Water Supplies [3745-50-44]

Hazardous wastes stored at the X-326 Storage Unit and the X7725 Storage Unit are contained in DOT-approved containers and other containers as specified in Section D, Table D-1. Secondary containment for all wastes is provided by concrete or metal dikes and sealed concrete floors. Groundwater contamination is prevented by eliminating the discharge of hazardous materials onto the unprotected ground.

F-4D Equipment and Power Failure [3745-50-44]

No special equipment requiring external electrical power is needed at the storage units for normal operations. Emergency lighting is installed in both storage units and is maintained and inspected (Table F-1). Personnel will cease activities involving waste loading, unloading, or transfers until power is resumed.

Replacement material-handling equipment is readily available from other departments for use until repairs can be accomplished or permanent replacements procured. Facility equipment has either a redundant system, such as two separate exhaust systems, or has emergency backup power. The plant shift superintendent is informed of any unusual outages that last longer than 24 hours.

F-4E Personal Protection Equipment [3745-50-44]

Personal protective equipment is available in the storage units to all personnel, and proper use of the protective equipment is addressed by procedures available in each department involved in hazardous waste handling. These procedures and proposed changes are reviewed by industrial hygienists to ensure that the proper personal protective equipment has been specified.

Personal protection and required safety gear for the safe handling of hazardous wastes are addressed in the hazardous waste handling training program, as well as in procedures for the storage units. Personnel wear protective coveralls, safety shoes, safety glasses, gloves (type dependent on waste handled), and, if necessary, a respirator, as specified in procedures or for special cases as determined by supervision in consultation with industrial hygiene personnel. Hazardous chemical data and material safety data sheets are used to gather information on the characteristics of chemical components of the waste, including toxicity, ignitability, reactivity, corrosivity, route of exposure and other hazard information. See Section G for available response equipment. See Section H for a description of employee training.

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F-5 Prevention of Reaction of Ignitable, Reactive and Incompatible Wastes [3745-50-44, 3745-54-17]

F-5A Precautions to Prevent Ignition or Reaction of Ignitable or Reactive Wastes [3745-54-17]

Wastes stored at the X-326 and the X-7725 Storage Units are segregated according to the characteristics of the various wastes to prevent heat-producing chemical reactions. In areas where ignitable or reactive wastes are stored, "No Smoking or Open Flames" signs are prominently displayed.

Segregation of incompatible wastes is accomplished through the use of walls, dikes, or other effective methods for maintaining physical separation. See Section D-1 for more information.

F-5B General Precautions for Handling Ignitable or Reactive Wastes and Mixing of Incompatible Wastes [3745-50-44, 3745-54-17]

Segregation of wastes and the use of containers (as specified in Section D) minimizes the possibility of fire, explosion or unplanned sudden or non-sudden release of hazardous wastes caused by the incompatibility of the material with waste residues.

Ignitable waste storage areas are monitored for fumes and explosive gases with the exceptions of Area H in the X-7725 and X-326 storage unit. Area H of the X-7725 contains flow through ventilation only. In X-326, small quantities of ignitable wastes are stored in flammable cabinets which are regulated under NFPA standards. Containers are covered and stored in areas where adequate climate controls are available. Procedures for packaging and handling of laboratory waste chemicals are implemented by qualified commercial contractors or facility personnel.

Waste storage units are managed by trained waste handlers. Waste segregation is an integral part of the design and operation of the waste storage units. These units include features such as diking and containment systems and segregation by waste category, which prevent mixing of ignitable, reactive, and/or incompatible materials. Containers within these units are sealed and stored in appropriate areas and meet labeling and spacing requirements. The waste storage units have climate controls, as required. Explosion-proof tools and other safety devices are used in these units to ensure safe, environmentally sound handling of wastes.

F-5C Management of Ignitable or Reactive Wastes in Containers [3745-54-17]

Specific container management practices are presented in Section D.

F-5D Management of Incompatible Waste in Containers [3745-50-44, 3745-55-77]

Specific container management practices are presented in Section D.

Table F-1
Inspection Schedule

Inspection or Equipment	Element of Inspection	Frequency
Container Storage Unit Inspections		
"Danger Unauthorized Personnel Keep Out," or equivalent, signs posted	missing or damaged signs	Weekly
Dikes	broken/cracked dikes or ramps	Weekly
Floors	cracked floor coating; spills, leaks, stains or other evidence of hazardous waste released	Weekly
Container Labeling (hazardous waste identification label)	damaged or missing labels, improper or incomplete information	Weekly
Container Integrity	corrosion, leaks, bulges, missing bungs, dents which jeopardize structural integrity	Weekly
Secondary Containment for liquid hazardous waste	absence of secondary containment for liquid hazardous waste	Weekly
Personal Protective Equipment	inadequate materials available, inventory not replaced	Weekly
Spill Control Equipment	inadequate materials available, inventory not replaced	Weekly
Aisle Space	aisle space blocked by containers or equipment	Weekly
Telephone system	power failure, equipment malfunction	Weekly
Loading/Unloading Areas		
Operating Equipment	malfunction, safety lights, horns, brakes	Daily, when in use
Container Integrity	corrosion, leaks, bulges, missing bungs, dents which jeopardize structural integrity	Daily, when in use
Container Labeling (hazardous waste identification label)	damaged or missing labels, improper or incomplete information	Daily, when in use
Dikes	broken/cracked dikes or ramps	Daily, when in use
Floors	cracked floor coating; spills, leaks, stains or other evidence of hazardous waste released	Daily, when in use
Building Inspections and Surveys		
Fire Prevention Inspection	housekeeping, fire hazards, blocked fire lanes and/or fire doors, access to equipment, etc.	Semi-annually

Table F-1 (continued)

Inspection or Equipment	Element of Inspection	Frequency
Fire Protection Engineering Surveys	risk evaluations, detailed hazard assessment	Annually
Automatic Sprinkler Systems		
Visual Inspection of wet pipe sprinkler and dry pipe sprinkler (risers only)	control valve status, gauge pressure, system hardware and associated equipment	Monthly
Main drainflow	flow test	Annually
Inspector's test valve	flow and alarm test	Annually
Trip test of dry pipe system	functional test	Annually
Operational inspection of sprinkler control valves	cycle valves	Annually
Fire Alarm Systems		
Manual pull stations	operational test	Annually
X-7725 evacuation buttons	operational test	Annually
Water Supply Systems		
Electric fire pump	operational test	Monthly
Diesel fire pump	operational test and battery test	Monthly
Diesel pump fuel supply level	check amount, refill as needed	Quarterly
Automatic starting test	operational test	Annual
Water flow test (underground piping)	hydraulic gradient	Every three (3) years
Hydrants	damage; flush	Annually
Capacity test (pumps)	functional test	Annually
Underground valves	cycle valves	Annually
Water storage tanks (exterior)	damage or leaks	Annually
Portable Fire Extinguishers		
Visual Inspection	operational test	Monthly
Carbon dioxide extinguisher hose	Continuity test	Annual

Table F-1 (continued)

Inspection or Equipment	Element of Inspection	Frequency
Container hydrostatic test	per manufacturer's instructions	per manufacturer's instructions
Building Equipment and Facilities		
Standpipe systems	damage	Annually
Hose rollers	damage	Annually
Mobile Fire Apparatus		
Routine inspections and test	road test, equipment operational test, inventory	Weekly
Fire pump capacity test	functional test	Annually
Pumper truck hoses	hydrostatic test	Annually

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ACRONYMS

DOE	UNITED STATES DEPARTMENT OF ENERGY
OAC	OHIO ADMINISTRATIVE CODE
PORTS	PORTSMOUTH GASEOUS DIFFUSION PLANT
RCRA	RESOURCE CONSERVATION AND RECOVERY ACT
USEC	UNITED STATES ENRICHMENT CORPORATION

SECTION G - RCRA HAZARDOUS WASTE CONTINGENCY PLAN

[OAC 3745-50-44 (A)(7), 3745-54-50 through 56]

Overview and Purpose of Plan

This Contingency Plan describes the actions facility personnel will take in response to fire, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents, mixed waste or mixed waste constituents to air, soil, or surface water. To fulfill this purpose, the plan will be implemented immediately whenever one or more of these occurrences could threaten human health or the environment.

This document, as Section G of the Portsmouth Gaseous Diffusion Plant (PORTS) Part B Permit Application, is being provided as a stand-alone document which amends the facility's emergency plan (Portsmouth Emergency Plan) as allowed for in OAC 3745-54-52 (b) and 40 CFR 264.52 (B). While the Portsmouth Emergency Plan integrates the plant's planning processes into a single document designed to mitigate the consequences of an emergency, this Contingency Plan stands alone for response to hazardous waste incidents.

This Hazardous Waste Contingency Plan contains the following elements:

- Designation and responsibilities of personnel who are to act as emergency coordinators,
- Implementation procedures for instructions on how and when the plan will be followed,
- Descriptions of both plant internal and external alarms and notification systems,
- Assessment methods and control actions should an emergency occur,
- Location, description and capabilities of emergency equipment at the facility,
- Agreements with USEC and with local authorities and medical centers, for providing emergency management and fire protection,
- Details of evacuation plans, and
- Record keeping and incident reports

Philosophy

At PORTS, the shared philosophy on emergencies is to prepare and maintain emergency plans dedicated to principles of personnel safety, environmental protection and safe equipment operation. Consequently, the response measures provided within this plan are designed to provide maximum protection for both onsite and offsite personnel, limit damage to facilities and equipment, limit adverse impacts on the environment and minimize impacts on site operations and security. The following PORTS philosophy indicates our commitment to personnel safety and the protection of the environment.

"The emergency philosophy of the Portsmouth Gaseous Diffusion Plant (PORTS) is to provide and maintain emergency plans that are dedicated to the following principles; in order, personal safety, environmental protection, and safe equipment operation." Contamination control issues and environmental protection concerns are to be addressed by emergency responders following the identification, recovery and condition assessment/treatment of ill or injured personnel.

This policy shall be applied and enforced comprehensively; however, provision must be made for deviations during emergency operations -- thus allowing the Emergency Coordinator to be in a position to make decisions based upon circumstances found at the time of an emergency.

Copies of Contingency Plan [OAC 3745-54-53]

Although not listed on the Part B Permit Application checklist, this section is required by the referenced regulations. A copy of the Contingency Plan and all revisions are provided to all applicable departments at PORTS. These include: custodians of hazardous waste storage units, the United States Enrichment Corporation (USEC) Emergency Preparedness Department, the USEC Fire Department, the USEC Police Department and the USEC Plant Shift Superintendent's office.

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USEC, as part of an agreement to provide emergency management and fire protection sevice, obtains Letters of Agreement (LOAs) with offsite emergency planning and/or response organizations that have agreed to assist in the event of an emergency at PORTS. The Department of Energy (DOE)/Bechtel Jacobs Company LLC provides copies of the RCRA contingency plan to these organization as well as other interested stakeholders. This combined distribution list includes the following:

Scioto County

Southern Ohio Medical Center
Post 73, Ohio State Highway Patrol
Scioto County Sheriff
Valley Local Schools
Scioto County Emergency Mgmt. Agency
Scioto County Local Emergency Planning Committee

Pike County

Pike Community Hospital
Pike County Sheriff
Pike County Emerg. Medical Service (6)
Scioto Township Fire Department
Beaver Fire Department
Piketon/Seal Volunteer Fire Department
Elm Grove Volunteer Fire Department
Stockdale Fire Department
Vern Riffe Joint Vocational School
USEC
Pike County Fire Fighters Association
Pike County Local Emerg. Plng. Com.
Pike Forest Fire Department
Waverly Fire Department
Benton Township Volunteer Fire Department
Jackson Township Volunteer Fire Department
Camp Creek Fire Department
Pebble Township Vol. Fire Department
Waverly High School
Pike County Schools

Ross County

Adena Regional Medical Center Hospital

Others

Ohio Environmental Protection Agency (3)
United States Environmental Protection Agency
United States Department of Energy
Ohio Emergency Management Agency (OEMA)

Amendment of Contingency Plan [OAC 3745-54-54]

When the Contingency Plan is revised PORTS provides documentation to U.S. Department of Energy (DOE), and regulatory agencies, and all departments and organizations currently on the above plan distribution list. The plans are sent by certified return receipt mail to the offsite emergency planning and/or response organizations. The correspondence for distribution of a revised Contingency Plan includes an offer to familiarize the receiving organization with the changes in the plan.

G-1 General Information [OAC 3745-54-52]

The container storage units at PORTS are owned by DOE and are co-operated by DOE and Bechtel Jacobs Company LLC . The address for the facility is:

U.S. Department of Energy
Portsmouth Gaseous Diffusion Plant
3930 US 23 South
Piketon, OH 45661

The mailing address for all correspondence is:

Department of Energy
Portsmouth Site Office
Attention: Melda J. Rafferty
P.O. Box 700
Piketon, OH 45661

The primary contact for hazardous waste storage activities at PORTS is:

Bechtel Jacobs Company LLC
Attention: Jim King, PORTS Manager of Projects
Environmental Management and Enrichment Facilities
P.O. Box 900
Piketon, OH 45661

The U.S. EPA Identification Number for DOE Operations at the Portsmouth Gaseous Diffusion Plant is:

OH7890008983

The Uranium Enrichment process and support facilities at PORTS are leased and operated by USEC. Emergency Response Services are available to Bechtel Jacobs Company LLC from USEC through a service agreement incorporated into the lease.

Location and Site Plan

PORTS is located near Piketon, in Pike County, Ohio, approximately 70 miles south of Columbus, on 3,714.01 federally-owned acres. The plant is two miles east of the Scioto River and one-half mile east of U.S. Route 23. The plant site consists of industrial facilities, including process buildings, several electrical switchyards, cylinder storage areas, cooling towers, a steam plant, a water treatment plant, a sewage disposal plant and pollution abatement facility, service and maintenance buildings and facilities for administrative, medical, fire and security activities. (See Figure G-1.)

PORTS is a Uranium Processing Facility with an end product being enriched uranium, used to produce fuel for the nuclear power industry. Obtaining the end product requires the use of numerous hazardous chemicals.

Employment at this facility is approximately 2,500.

Figure G-1 presents a layout of plantsite and shows the location of the X-326 and X-7725 Container Storage Units, the location of onsite Emergency Response Facilities, and roads and entrances inside the facility. The evacuation plans and routes are presented in Section G-7 of this Contingency Plan. USEC provides emergency response and fire protection services for the container storage units through a service agreement incorporated into the lease.

Local Specifications

Although not required by either the State or Federal Regulations, the following 6 Subsections provide a description of the facilities locale. Demographics and meteorological information give an oversight of where the facility is located and how it compares to other industrial facilities. This is followed by brief summaries of the detailed information which is required by regulations.

Demographics

Pike County is one of Ohio's most sparsely populated counties, encompassing an area of approximately 444 square miles. Most of the population which would be affected in an emergency is located to the west and south of the facility. To the west is one nursing home, a small trailer park and several residences located on Wakefield-Mound Road. Residences are also located along Big Run and Bailey Chapel Roads to the south and southeast.

Meteorology

Pike County's mean annual temperature is 52.5 degrees, ranging from an average of 22.4 degrees in January to 73 degrees in July. Precipitation averages 42.43 inches yearly. The county has a growing season of 163 days.

Planning Areas

For the purpose of planning and response, two-mile and five-mile planning areas have been established for the areas immediately surrounding the plant which could be affected by releases of hazardous substances and toxic chemicals, hazardous waste or hazardous waste constituents, mixed waste or mixed waste constituents.

These areas are the two-mile immediate notification area (INA), within a two-mile radius of the plant, and the five-mile Emergency Planning Area, within a five-mile radius. Both of these areas extend out from the center of the plant. If a protective action is recommended, a public warning system alerts persons residing within the immediate notification area to seek shelter and tune to an Emergency Broadcast Station (EBS) for further information. The Emergency Planning Area which extends out from the boundary of the two-mile area is subdivided into sections to aid in planning and response actions. (See Figure G-2.)

Topographical features within the planning areas include the Scioto River two miles to the west and numerous wooded hills. Sensitive facilities located within the planning areas include a nursing home, a number of schools and an electric utility.

No schools are located within the immediate notification area. However, county school buses frequently travel all roads within this area as well as the Emergency Planning Area. Four schools are located within the Emergency Planning Area:

Vern Riffe Joint Vocational School on State Route 32, Piketon Junior High at Zahn's Corner, Piketon High School and the Pike Community Action Head Start Day Care, both located in Piketon.

Since PORTS is not a nuclear reactor site, emergency planning requiring an "ingestion exposure pathway" has not been considered. Such accidents would involve sequences of successive failures more severe than those postulated during the design of this plant. The Ohio Emergency Management Agency, the Pike County Emergency Management Agency, DOE, and the PORTS Emergency Management Department have determined that emergency planning is only necessary to a five-mile radius of the plant.

Land Use

A number of businesses are located west of the facility, just inside the immediate notification area. To the south and east is an area of wooded hills with scattered homes in the valleys. Land use on the western boundary of the Emergency Planning Area is primarily agricultural, with scattered farmhouses and outbuildings amid the fields. The area north of PORTS includes residential and commercial development as well as an area of undeveloped woods and farmland.

Transportation Routes

A north-south transportation corridor containing both the Norfolk Southern Railroad and U.S. Route 23 is located approximately one-half mile west of the facility. State Route 32, an east-west highway, is located to the north of the facility outside the immediate notification area.

Hazardous Waste Storage

Buildings described in this plan are depicted on Figure G-1. DOE operates two Resource Conservation and Recovery Act (RCRA) hazardous waste storage units:

- X-326 Container Storage Unit
- X-7725 Container Storage Unit

X-326 Container Storage Unit

The X-326 Storage Unit is located in the central part of the DOE Facility. The X-326 Building has been in use since 1956. The structure is 2,230 feet long, 552 feet wide, 62 feet high and contains 58 acres of floor space. The X-326

Building is totally enclosed with a built up roof, transite walls and concrete floors. There are six areas of the building, totaling approximately 31,888 square feet, designated for the storage of hazardous waste. The storage areas are located on the first floor towards the south end of the building.

The X-326 Storage Unit is intended for the storage of high assay uranium-bearing hazardous and/or polychlorinated biphenyl wastes until further processing for uranium recovery or treatment through a permitted process is obtained. The wastes will include aqueous laboratory solutions, spent laboratory solvents and decontamination solutions from other buildings on plantsite. All containers will be constructed to Department of Transportation (DOT) specifications where available. All storage areas will have appropriate containment structures and will comply with regulatory design requirements for storing wastes.

Near the X-326 Facility the Minford Clay is approximately 12 to 32 feet thick and the Minford Silt is approximately 10 to 16 feet thick. The Gallia formation is estimated to be approximately 3 to 7 feet thick.

The X-326 Storage Unit was designed and intended for the storage of high assay uranium bearing wastes until further processing for uranium recovery or treatment through a permitted process, such as a National Pollutant Discharge Elimination System-permitted discharge. The wastes that may be stored in the X-326 Storage Unit include aqueous laboratory solutions, spent laboratory solvents, and decontamination solutions from several other buildings on the plantsite.

Wastes stored in the X-326 Storage Unit may include:
D001 - Ignitables
D002 - Corrosive (acid and alkaline)
D004-D043 - TC Characteristic
F001, F002
F003, F005
Radioactive RCRA Wastes
Toxic Substance Control Act/RCRA Mixed Wastes
Radioactive/Toxic Substance Control Act/RCRA Mixed Wastes

The wastes are stored in a variety of containers, but are usually stored in DOT approved 55-gallon drums or 5-inch diameter/10-liter polyethylene bottles. Other containers as listed in Table D-2 of Section D of this application may also be used. The containers are stored on steel supports or are placed into support sleeves which are raised above the floor to prevent contact with potentially inadvertent standing liquid introduced into the area.

The X-326 Storage Unit is located in the south end on the first floor of the X-326 Process Building. Figure D-3 shows the floor plan for the X-326 Storage Unit. The X-326 Building is totally enclosed with a built-up roof, transite walls and concrete floors. Although heat is generated from the diffusion process, temperature is moderated with the use of large fans for ventilating the building. The area around the building is sloped to direct run-on and run-off water to the PORTS storm sewer system.

Approximately 31,888 square feet of the X-326 is designated as storage space and will be used as required until final closure is initiated.

Five waste areas in the X-326 Building are delineated for storage: Areas 1, 2, 3, 4, 5 and the "L" Cage (the "L" Cage consists of both the east cage and the west cage). Storage area floors for 1, 2, 3, 4 and 5 were cleaned, sealed, primed and finished with a urethane-based sealant in 1992. The "L" Cage area was cleaned, any existing concrete cracks (these are "cosmetic" cracks in the surface of the concrete and not significant structural faults) sealed with a sealant (Silka Pronto 19 or equivalent), and recoated with one coat of urethane sealant (Tennant No. 122). All storage areas are surrounded by a 1" x 1" x 1/8" angle iron dike set in a chemically resistant elastomeric sealant. The floors are 0.8 feet thick and constructed out of concrete.

X-7725 Container Storage Unit

The X-7725 Storage Unit was originally designed and intended for the Gaseous Centrifuge Enrichment Plant (GCEP). After the GCEP was canceled, the X-7725 Building was selected to be upgraded to a RCRA-permitted hazardous waste storage warehouse since it has a large area of floor space kept under climate-controlled conditions and can meet applicable Part 264 RCRA standards. The building consists of five floors with 20 acres of total floor

space, approximately 9 acres of which are suitable for waste storage. There are areas for receiving and storing materials, testing and inspection of parts, and manufacturing/assembly of machines. Consequently, the building is divided into a number of rooms, staging areas, open bays, and offices.

The area immediately surrounding the building has been graded to prevent run-on of rainwater. The X-7725 Building has built-up roofing over rigid insulation and metal decking. Room and bay ceiling heights range from 11 feet to 75 feet. Each level of the roof is designed to direct rainwater drainage to metal down-spouts, which discharge to a storm sewer. The flooring is constructed of reinforced concrete slabs varying from 6 to 17 inches thick. The entire building is climate-controlled. Heat is provided by recirculating heating water and cooling by chilled water systems.

The waste that may be stored in the X-7725 RCRA unit are the following: product and process waste designated as RCRA types F, P and U, RCRA characteristic wastes, "mixed wastes" (both radioactive and hazardous wastes) and combinations of the above wastes. The majority of the wastes stored in the X-7725 Building are from environmental restoration activities and non-halogenated solvents and/or radioactive wastes from laboratories, decontamination solutions, and a variety of plant processes and clean-up operations. The remainder of the wastes are from a variety of diffusion process activities and are primarily toxic due to metal and solvent constituents.

The wastes are primarily stored in new DOT approved 55-gallon drums, 5 inch diameter/10 liter polyethylene bottle, or 4'x4'x6' boxes. Containers are elevated during storage to prevent contact with potentially inadvertent standing liquid introduced into the area.

RCRA storage areas located on the first and fourth floor of the X-7725 Building have been modified to accommodate mixed waste storage. The modifications involved:

- Diking to an appropriate curb height,
- Sealing floor cracks/joints,
- Making special provisions for nuclear criticality safety where required,
- Upgrading the electrical, fire protection, and HVAC systems,
- Coating with an "impervious" sealant,
- and providing vehicle and pedestrian ramps.

All storage areas of the X-7725 Building have dikes to ensure an adequate containment capacity of 10% of the total waste volume stored and 25% of the total where Toxic Substance Control Act wastes are stored. The floor of the X-7725 Building is free of cracks and gaps. Rough or spalled areas of the floor are repaired with a polymer-modified portland cement. Cracks in the floor are sealed with a modified-methacrylate cracks/healer/penetrating sealer or an epoxy injection adhesive as appropriate for the number and size of the cracks. Expansion joint gaps are filled with a polyurethane elastomeric sealant. Control joint gaps are filled with a flexible epoxy control joint sealer/adhesive. To further ensure the base is capable of containing any liquids which may accumulate, the floors in all storage areas are sealed with a chemically resistant sealant before any wastes are stored in these areas.

The Sunbury Shale is present beneath the X-7725 Building along the eastern margin of Quadrant III. However, to the west of the building the Sunbury is not present. Beneath the Gallia, the Sunbury Shale where present, acts as a barrier to the vertical flow of groundwater thereby inhibiting the contamination of the Berea. The lower vertical boundary is the Bedford Shale which lies beneath the Berea. The unit is composed primarily of shale and also limits the downward flow of groundwater.

Near the X-7725 Facility, the Minford Clay is approximately 12 to 32 feet thick and the Minford Silt is approximately 10 to 16 feet thick. Both the clay and silt thin to the west-northwest. The Gallia Formation is estimated to be approximately 3 to 7 feet thick. The Sunbury Shale forms the upper bedrock surface at an average depth of 20 feet.

The groundwater flow directions in the area of X-7725 in the Gallia and the Berea aquifers were analyzed using water levels measured on December 12, 1988. The flow directions in both units are consistent with a general northwestern hydraulic gradient.

G-2 Emergency Coordinators [OAC 3745-54-52 (D), 3745-54-55]

The primary contact as Emergency Coordinator is Don J. Wilkes. However, at PORTS alternates are referred to as Plant Shift Superintendents, who are on duty 24-hours a day and serve as Emergency Coordinator while on duty. The Plant Shift Superintendent is a USEC employee and serves as an alternate through an agreement between Bechtel Jacobs Company LLC and USEC. A Plant Shift Superintendent is on duty 24 hours a day. When the Plant Shift Superintendent responds to an incident scene and takes charge, he becomes the Incident Commander. The Plant Shift Superintendent is the on-site expert in emergency response procedures and has the responsibility of notifying the proper authorities for assistance. The responsibilities of the incident commander, as well as the notification procedures, are stated in this contingency plan. The Incident Commander has full authorization to commit all necessary resources to alleviate the emergency. Additionally, individuals have been identified by the primary contact that will respond if additional personnel are needed.

In the event of an emergency, the telephone number that will reach the on-duty Plant Shift Superintendent from an offsite phone is (740) 897-3025. If the caller is onsite, he/she would call the Plant Shift Superintendent at extension 3025. Onsite personnel can notify emergency responders by calling the plant emergency extension, 911.

The Plant Shift Superintendent is delegated the responsibility by PORTS management, to supervise site emergency response activities on all shifts. The Plant Shift Superintendent is authorized to make protective action recommendations for both onsite personnel and offsite populations.

The PORTS Emergency Response Organization (ERO) is staffed with trained personnel with expertise in responding to emergency situations. The Emergency Response Organization is at the service of the Plant Shift Superintendent when acting as the Incident Commander.

United States Enrichment Corporation Plant Shift Superintendents and Assistant Plant Shift Superintendents provide coverage at PORTS. The names of the Emergency Coordinators are shown in Table G-1.

G-3 Implementation [OAC 3745-54-51(B), 3745-54-56(A), 3745-54-56(D)]

The Contingency Plan is to be implemented immediately whenever a condition arises that may threaten human health or the environment as a result or potential result of the involvement of hazardous wastes. These conditions include unplanned sudden or non-sudden releases, fires, or explosions.

Any person discovering an emergency involving hazardous waste onsite should immediately implement the Contingency Plan by alerting the Plant Shift Superintendent/Incident Commander and the Plant Emergency Response Organization. Methods used to alert the Plant Shift Superintendent and thereby implement the plan include:

1. Radio to X-300 Plant Shift Superintendent; or,
2. Dial 911 on any phone and report to answering party;
3. Pick up red emergency phone (in selected areas); or,
4. Dial 3025 for the Plant Shift Superintendent.
5. Pull fire alarm box. Remain near the alarm box, if possible, until the Plant Shift Superintendent/Incident Commander or Fire Department arrives; then provide details.
6. Dispatch someone to summon assistance.

After implementing the Contingency Plan, the person discovering the emergency should do whatever can safely be done to minimize the impact of the emergency, including but not limited to performing local evacuation, equipment shutdown or valving isolation, and performing necessary first-aid, if appropriate.

This Contingency Plan will be implemented in the following situations:

1. Fire and/or explosion

   A. A fire causes the release of toxic fumes, hazardous waste or hazardous waste constituents, mixed waste or mixed waste constituents.

   B. A fire spreads and could possibly ignite materials at other locations onsite, thus releasing hazardous waste or hazardous waste constituents, mixed waste or mixed waste constituents or could cause heat induced explosions, thus releasing hazardous contaminants.

   C. Use of water or water and chemical fire suppressant could result in contaminated runoff.

2. Spills or release of hazardous waste or hazardous waste constituents, mixed waste or mixed waste constituents.

   A. The spill could result in the release of flammable liquids or vapors, thus causing a fire or gas explosion hazard.

   B. The spill could cause the release of toxic liquids or fumes.

   C. The spill can be contained onsite, but the potential exists for groundwater contamination.

   D. The spill cannot be contained onsite, resulting in offsite soil contamination and/or ground or surface water pollution.

Regardless of the unit involved or source of hazardous waste or hazardous waste constituents, mixed waste or mixed waste constituents or any release posing an imminent danger to human health or the environment will result in plan implementation. If the Plant Shift Superintendent/Incident Commander determines that the facility has had a release, fire, or explosion which could threaten human health, or the environment, outside the facility, he will report his findings as follows:

1. To local authorities if an evacuation offsite is requested, and must be available for their consultation

2. To government officials or the National Response Center (using 800/424-8802) and include:

   A. Name and phone number of reporter;
   B. Name and address of facility;
   C. Time and type of incident;
   D. Name and quantity of material(s) involved, to the extent known;
   E. The extent of injuries, if any; and
   F. The possible hazards to human health, or the environment, outside the facility.

3. To Ohio Emergency Response Team @ 800/282-9378.

G-4 Emergency Response Procedures [OAC 3745-54-52 (A)]

The PORTS USEC Emergency Response Organization is prepared to respond by agreement to emergencies involving DOE facilities or requiring DOE assistance. The Emergency Response Organization is responsible for taking immediate mitigative and corrective actions to minimize the consequences of an incident to workers, public health and safety, and the environment.

The Emergency Response Organization is staffed with trained personnel who are required to participate in formal training, drills and exercises and respond if notified of an incident. The incident type and severity dictate the level of Emergency Response Organization activation.

The Emergency Response Organization has the following specific functions and responsibilities depending on the incident and level of response needed to mitigate the problem: event categorization, determination of emergency class, notification, provision of protective action recommendations, management and decision making, control of onsite emergency activities, consequence assessment, protective actions, medical support, public information, activation and coordination of onsite response resources, security, communications, administrative support and coordination and liaison with offsite support and response organizations.

Field Response

The Plant Shift Superintendent is delegated the responsibility by PORTS Environmental Management & Enrichment Facilities Site Manager to supervise site emergency response activities on all shifts. The Plant Shift Superintendent is authorized to make protective action recommendations for both onsite personnel and offsite populations.

The Incident Command System (ICS) is used by PORTS response for managing an incident at the scene. The Incident Command System provides a standard system for responding to all types of incidents. The two major functions of the Incident Command System are safety and efficiency. The system consists of personnel, facilities, equipment, communications and procedures operating within an organized structure to accomplish control of the incident.

When the Plant Shift Superintendent responds to the incident scene and takes charge, the Plant Shift Superintendent becomes the Incident Commander. The Incident Commander establishes a command post at a safe distance away from the incident scene in an upwind direction. All requested field response units report to the command post and receive directions from the Incident Commander for response actions.

All emergency personnel should be provided with as much information as possible, concerning the nature and hazards of the incident they are responding to. This information should include wind direction and speed, possible location of the Command Post, and any areas to avoid. Any changes in the conditions at the incident scene must be passed quickly to all responders.

The Plant Shift Superintendent/Incident Commander is located in the X-300 Plant Control Facility (PCF) which serves as the 24-hour point of contact for all emergency notifications. The Plant Shift Superintendent/Incident Commander:

- Provides continuous site-wide emergency direction;
- Directs the effort to respond to an incident;
- Assesses the incident and makes initial categorization/classification;
- Alerts and mobilizes sufficient response forces, including technical assistance, to respond to the requirements of the emergency;
- Directs plant or facility shutdown if necessary in accordance with existing plans and procedures; and
- Ensures communications with the Emergency Operations Center (EOC), when appropriate.
- Emergency responders who routinely report to the Command Post include:

    - Plant Shift Superintendent/Incident Commander
    - Response Safety Officer
    - Police Force
    - Local Emergency Director
    - Fire Department

The following organizations are called on by the Incident Commander, when necessary:

- Environmental Compliance
- Health Physics

- Industrial Hygiene
- Nuclear Safety
- Maintenance
- Waste Management
- Medical
- Utilities
- Facility Operations

In addition, offsite Emergency Response Organizations are available to assist the onsite Emergency Response Organization when needed.

Emergency Operations Center

When the Emergency Operations Center becomes operational, overall command and control of the PORTS Site Emergency Response is transferred to the Crisis Manager, allowing the Incident Commander to focus on conditions and mitigation at the emergency scene. The Emergency Operations Center is located in the X-1020 Building and becomes the primary facility for coordinating onsite response and mitigation and offsite interface activities. The Emergency Operations Center is composed of an emergency information center where members of Senior Management and advisors operate, coordinate activities and communicate with onsite and offsite personnel; a Crisis Management Room (CMR) where the Crisis Management Team (CMT) is stationed to follow events and direct actions; a Technical Support Room (TSR) where the TSR Coordinator advises and directs the activities of the technical support group; a Plant Shift Superintendent radio room where a back-up Plant Shift Superintendent monitors and transmits information; a computer room which houses the information management system; A Hostage Negotiator's Room, where the Shift Commander coordinates the activities of the protective force; and a telephone operator's room. The emergency line of executive succession for the Crisis Manager's position is shown in the next section.

The Plant Shift Superintendent will activate the Emergency Operations Center in the event of any emergency classification: alert or site area emergency. The Emergency Operations Center may be activated at any classification level or when deemed necessary. The Plant Shift Superintendent or alternate or the Enrichment Plant Manager or alternate are authorized to activate the Emergency Operations Center. Alternate Emergency Operations Centers include the X-300 Plant Control Facility and the Mobile Communications Vehicle. Emergency Operations Center service is by an agreement between USEC and Bechtel Jacobs Company LLC.

Emergency Line of Executive Succession

In the event of a significant emergency at PORTS, emergency executive succession of command shall be in the order listed below. If none of the management listed are available in the plant, the Plant Shift Superintendent shall assume command as well as fulfill his responsibilities as Incident Commander. The Plant Shift Superintendent will be relieved of the executive command duties by the first person to arrive as identified from the list below. PORTS does not consider those named on the list of "Emergency Line of Executive Succession" to be Emergency Coordinators. The Plant Shift Superintendent/Incident Commander continues his obligations for oversight of the emergency response.

Morris Brown, General Manager
Pat Musser, Enrichment Plant Manager
Sandy Fout, Operations Manager
John Oppy, Plant Shift Superintendent Manager

G-4A Notification [OAC 3745-54-56 (A)]

This section describes the methods used for notifying PORTS Emergency Response Forces, other plant personnel and appropriate Local, State and Federal Agencies in time of an emergency.

Notification refers to required communication within mandated time frames and according to a predetermined sequence, of general information on the nature and severity of an emergency event. Notification is different from reporting because it must occur without delay for the purpose of alerting or activating, rather than informing. Notification requirements vary according to reported event level and may continue to change depending upon preliminary classification, ongoing assessments, full classification and any changes in classification.

The Plant Shift Superintendent is responsible for categorizing an event as an emergency and assigning an emergency classification. The Plant Shift Superintendent is responsible for initial notifications in accordance with Federal and State Regulations. Subsequent notifications may be the responsibility of the Plant Shift Superintendent

in his role as Incident Commander or the Crisis Manager after the PORTS Emergency Operations Center becomes operational.

In any event, a prearranged format is used to ensure that the content of the notification message(s) includes the emergency classification, whether a hazardous substance and toxic chemical, hazardous waste or hazardous waste constituent, mixed waste or mixed waste constituent release is occurring or expected and identification of the response and/or protective actions taken or recommended.

Refer to "Emergency Notification Form," "Figure G-3". Predesignated offsite agencies are notified within 15 minutes of classification of an emergency.

Primary and Alternate Systems

Primary and alternate systems are in place for notifications to the Emergency Response Organization and offsite agencies. Periodic testing is conducted according to site Emergency Preparedness Implementing Procedures.

Notification of Onsite Personnel

Members of the PORTS Emergency Response Organization are notified of a need to respond to an emergency by a variety of ways including automatic alarms, pagers, radios, public address system and telephones.

Plant personnel not assigned to the Emergency Response Organization receive notification of an onsite emergency condition by one of eight different alarms followed by announcements over the plant's public address system. An example of plant alarms includes a continuous sounding alarm that means for plant personnel to evacuate a building and go to their assigned assembly area. To account for all plant personnel, the accountability alarm consists of seven (7) short blasts repeated three (3) times.

Notification of State and County Governments

Telephone notification is made to the Pike County 24-hour Contact Point and the Ohio Emergency Management Agency and the Ohio Environmental Protection Agency. When a site area emergency is declared, the notification to the county's 24-hour Contact Point will include a reminder that at the site area emergency classification the public warning system will be activated to notify the residents in the two-mile immediate notification area (INA).

The public warning system consists of five outdoor warning sirens, tone alert radio receivers, and the Emergency Broadcast System (EBS).

Notification of DOE Headquarters and DOE Oak Ridge Field Office

Notification to DOE Headquarters and the DOE Oak Ridge Field Office is made by telephone or verbal or facsimile messages.

Notification of Bechtel Jacobs Company LLC Corporate Personnel

Corporate personnel are notified of an emergency at PORTS by telephone or verbal or facsimile messages.

G-4B Identification of Hazardous Substances and Toxic Chemicals [OAC 3745-54-56(B)]

Upon arrival at the scene of an emergency, the Plant Shift Superintendent/Incident Commander will immediately make an assessment of the character, source, amount and extent of the release that has occurred. Resources such as storm sewer and water line drawings used to identify potential flow/contamination paths are shown in Figure G-4.

In the event of a release, fire, or explosion, the identification of hazardous substances and toxic chemicals, hazardous waste or hazardous waste constituents, mixed waste or mixed waste constituents in the X-326 and X-7725 Waste Storage Units would be accomplished by direct observation of the leaking container or by the container inventory system maintained by the Waste Management (WM) Division.

This system maintains an accountability for each container. The record for a container includes the generator data, analytical results and location in the storage unit. Because the wastes are segregated by compatibility and type, the

location of the emergency may identify the material. The accountability systems are updated as frequently as necessary (often daily) to maintain an accurate container inventory.

The container inventory system is computerized with backup of data in a filing system. The data for any given container can be accessed from a computer terminal within five (5) minutes. Communications with Waste Management would be by telephone or radio. Should power be interrupted, and the computer system become inoperable, the paper back-up filing system would be used. By the location of the incident, Waste Management personnel could locate the proper files which will reveal the contents of the containers involved. A third method of identification is the collection and analysis of samples. All sampling of air, soil, water, or pooled wastes will be performed in accordance with established standards, such as SW-846, ASTM, or others. All analyses will be performed in accordance with regulatory agency approved methods, such as SW-846 or in the case of radioactive contamination, PORTS USEC Production Support Division laboratory analytical methods.

G-4C Hazard Assessment [OAC 3745-54-56 (C)]

In the event of an emergency, the Plant Shift Superintendent/Incident Commander has at his disposal any and all personnel and resources to assist and/or advise in the assessment of the situation and its amelioration. The Plant Shift Superintendent/Incident Commander will base the assessment on all available information including process knowledge, material safety data sheets, models of air, surface water or groundwater flow patterns, and specific health based environmental criteria or limits which may be exceeded. Environmental surveillance air sample data, at a minimum, will be collected and evaluated. By utilization of this existing database and trained personnel, the Plant Shift Superintendent/Incident Commander will be able to assess both the direct and indirect effects potentially caused by the emergency. Personnel routinely available to the Plant Shift Superintendent/Incident Commander for advice and consultation include those with skills and experience in chemistry, biology, engineering, industrial hygiene, safety, regulatory compliance, process engineering and operations, health physics, medicine and other sciences. Key personnel are on call to respond to the Plant Shift Superintendent/Incident Commander at any time. If the appropriate personnel are not promptly available, the Plant Shift Superintendent/Incident Commander has been granted the authority by plant management to act on the available information and to utilize his best judgment. Existing plant emergency procedures, methods, and policies, with which the Plant Shift Superintendent/Incident Commander and the Shift Emergency Response Organization are routinely trained and exercised, provide the Plant Shift Superintendent/Incident Commander with the assistance to exercise his best judgement with confidence.

If the assessment of the emergency situation indicates that evacuation of plant personnel is required, the Plant Shift Superintendent/Incident Commander will notify the necessary personnel and area or building evacuation will be initiated. If it is determined that offsite populations must be evacuated, the Plant Shift Superintendent/Incident Commander will follow the guidelines as set forth in this contingency plan and local community response plans.

This Section also describes the protective actions developed to limit exposure of plant personnel and the public during an emergency at PORTS.

Protective Actions for Onsite Personnel

Protective actions for onsite personnel (including visitors and contractor personnel) includes alerting, assembly and accountability, evacuation, monitoring and decontamination.

Plans have been developed for protection and accountability of onsite personnel within 45 minutes (not to exceed 60), including identification of special conditions, locations of assembly areas and provisions for onsite sheltering-in-place. Upon notification of an emergency by the Plant Shift Superintendent, emergency response forces proceed to their response locations. Plant personnel not assigned an emergency response position and contractors proceed to a designated monitoring station or assembly point. Visitors remain with their escorts and are accounted for.

Evacuation of personnel is ordered by the Plant Shift Superintendent or Crisis Manager whenever it is determined that a threat to the safety of plant personnel exists. Directions on the specific evacuation routes are provided. The appropriate decision of an assembly point and evacuation route is determined based upon plant conditions, wind direction and weather.

Decontamination can be conducted by the Medical Department at an established decontamination area. Decontamination is conducted at the hospital or at an established area directed by the Plant Shift Superintendent.

Protective Response for the Public

The Plant Shift Superintendent or Crisis Manager (after activation of the Emergency Operations Center) is responsible for providing protective action recommendations to local officials as part of initial notifications and follow-up communications. These recommendations are based on assessment actions and a thorough understanding of the actual or potential plant conditions. These recommendations can follow the three broad pathways of exposure:

- Airborne radioactive exposure (inhalation)
- Food chain exposure (ingestion)
- Deposition exposure (external whole body).

Recommendations may address protective actions during the emergency, restorative actions following cessation of emergency conditions, and return to "normal" in the affected areas.

Emergency Exposure During Rescue and Recovery Operations

Controlling exposure to radiation during rescue and recovery actions is extremely complex. Multiple hazards and alternate methods are to be taken into account; prompt, sound judgment and flexibility of action are crucial to the success of any emergency actions. The risk of injury to those persons involved in the rescue and recovery activities should be minimized to the extent practical. The control of radiation exposures should be consistent with the immediate objectives of saving human life, protecting health and property, and recovering deceased victims.

Onsite Sheltering In-Place

Notification of a recommendation of sheltering-in-place is carried out by the Plant Shift Superintendent on the public address system and other available communication systems. Sheltering-in-place calls for employees to:

1. Go indoors immediately;
2. Close all windows and doors;
3. Turn off all sources of outdoor air (fans, air conditioners); and
4. Remain indoors and listen for additional information on the public address system.

Offsite Sheltering In-Place

The two-mile immediate notification area and five-mile Emergency Planning Area are established around PORTS to assist in notifying the public to shelter-in-place or to provide instructions for the public to evacuate the area.

When it is determined that sheltering-in-place is the recommended action for residents living within the immediate notification area, the Pike County Sheriff's Dispatcher or the Plant Shift Superintendent activates the public warning system. This system consists of five outdoor warning sirens, tone alert radio receivers and the area Emergency Broadcast System (EBS). The five electronic sirens can produce five different alerting tones as well as broadcast voice messages over the public address system. The activation of the warning system is a signal for the neighboring residents to go indoors, shelter-in-place and tune to the area Emergency Broadcast System radio and television stations for further instruction.

Evacuation of Local Populations

In case of a gradually developing emergency event or advance warning of a potential emergency event with significant risk if the public remains in place, Pike County officials may issue evacuation orders. This information is disseminated by using the public warning system. Any residents living outside the immediate notification area who are in the path of any hazardous substances and toxic chemicals plume will be warned by county emergency forces going door to door. Evacuation routes and emergency shelters, based upon the situation and assumptions, will be announced when the public warning system is activated.

SUBMISSION DATE: February 21, 2000

G-4D Control Procedures [OAC 3745-54-52 (A)]

General responsibilities of personnel and procedures to be taken in the event of fire, explosion or release of a hazardous substance and toxic chemical, hazardous waste or hazardous waste constituent, mixed waste or mixed waste constituent to air, land, or water are delineated in this Contingency Plan, which is distributed to all appropriate onsite emergency response departments and offsite response organizations. Each PORTS department has specific responsibilities and duties established in departmental procedures.

A summary of the Plant Shift Superintendent/Incident Commander minimum response to emergencies follows:

Because of the variety of potential hazards and conditions encountered, the most effective emergency control is supplied through prompt appropriate action. The action is initiated by the Plant Shift Superintendent. Certain duties and responsibilities of the Plant Shift Superintendent/Incident Commander are spelled out in various manuals and procedures. The duties and responsibilities listed hereunder are the minimum actions to be taken by the Plant Shift Superintendent/Incident Commander immediately following receipt of warnings or knowledge of emergency incidents. It is expected that the Plant Shift Superintendent/Incident Commander will make additional decisions during any incident in keeping with information available to him at the time and for occurrences peculiar to a particular incident not covered herein. The Plant Shift Superintendent/Incident Commander will arrange for suitable communications for all emergencies.

Each container storage unit has one individual designated as the local emergency director (LED). This person has responsibility in emergencies for the initial actions to protect the personnel within that building. These responsibilities include knowledge of processes and how to control them, access and evacuation routes, and overall security of that area.

Should the emergency occur in only a small area of the facility (e.g., one section of a building), the Plant Shift Superintendent/Incident Commander has the option of leaving the Command Post where initiated or moving it to a more controlled area. This Command Post becomes the focal point of emergency operations.

In order to facilitate the coordination of field activities during any major incident, the Plant Shift Superintendent/Incident Commander will, at the first opportunity, call in an additional Plant Shift Superintendent. Upon arrival, the additional Plant Shift Superintendent will assist as requested by the Plant Shift Superintendent/Incident Commander already on duty.

Warnings (All Types)

If the situation does not warrant plantsite evacuation:

A. Direct activation of the X-1020 Emergency Operations Center , including notifying the necessary Emergency Operations Center support personnel.

B. Implement applicable operating methods.

C. Maintain communications with the Emergency Operations Center.

If the situation warrants plantsite evacuation:

A. Direct notification to plant management to prepare for plantwide evacuation.

Critical Reaction

A. Request evacuated personnel to report to monitoring stations and await arrival of monitoring station directors - then assign monitoring station directors to occupied stations.

B. Notify the General Manager and activate the Emergency Operations Center.

C. Notify the Police Department to establish traffic control.

Fire on Plantsite

A. Arrange suitable communication with the local emergency director and the Command Post.

B. Coordinate and direct the activities of the various service groups through the supervision of those groups.

C. Request mutual aid from community fire departments, if required.

D. Determine the termination of the "state of emergency."

E. Cause the "all clear" signal to be broadcast over all plantsite radio networks and the plant public address systems.

Whenever it becomes apparent or it has been reported that an employee has been seriously exposed to a hazardous, toxic, and/or radioactive gas or aerosol, without proper respiratory protection, that employee should be treated in the same manner as a physically injured employee, (i.e., the employee should be transported to a medical facility immediately).

Whenever an employee is involved as above in a plant emergency, it will be the responsibility of the Plant Shift Superintendent/Incident Commander to expedite the employee's delivery to a medical facility. When plant medical facilities are not occupied by medical personnel, a doctor or a nurse should be contacted immediately. If necessary, the patient should be transported immediately to an offsite medical facility. The person in charge of the medical facility must be given the following information for each patient involved:

A. Type of material(s) to which employee was exposed.

B. Relative severity of exposure.

C. Patient symptoms observed.

D. Time of exposure and total time patient was exposed.

E. Treatment given - (if any).

In order to assure complete coverage, the Plant Emergency Response Organization (Fire Department, Police Department, Health Physics, E-squad, and other responding personnel) will be depended upon by the Plant Shift Superintendent/Incident Commander to be ever alert for potential patients and to advise the Plant Shift Superintendent/Incident Commander accordingly.

It will be the responsibility of the person in charge of the medical facility to determine the kind of treatment necessary and to expedite treatment to the patient.

The medical director will be responsible to assure adequate training of plant medical facility personnel and insure agreement for proper treatment at offsite hospitals.

G-4E Prevention of Recurrence or Spread of Fires, Explosions, or Releases [OAC 3745-54-56 (E)(F)]

During an emergency response at either the X-326 or X-7725 storage units the Plant Shift Superintendent/Incident Commander is required to order action deemed necessary to prevent the occurrence, recurrence or spread of fire, explosion or release of hazardous substances and toxic chemicals, hazardous waste or hazardous waste constituents, mixed waste or mixed waste constituents. These actions may include but are not limited to: removal of waste containers, environmental and health physics monitoring, and the sealing off of the building from the drainage system (preventing the runoff from entering the drainage system) for the purpose of containing hazardous and/or radioactive materials and surface runoff.

The West Drainage Ditch and the X-230K South Pond have emergency containment capacity and this capacity can be utilized if the Plant Shift Superintendent/Incident Commander deems necessary. Note: heavy precipitation, primarily rainfall episodes, can result in significant reduction of emergency effluent impoundment holding times.

The Plant Shift Superintendent/Incident Commander is also responsible for ensuring that monitoring for leaks, pressure or level buildup, gas generation, or rupture is provided if operations in the storage unit must be stopped. This monitoring may be carried out by direct observation, process knowledge, chemical analysis if necessary, and any other procedures deemed necessary.

G-4F Storage and Treatment of Released Material [OAC 3745-54-56(G)]

Immediately after the emergency, all intact waste containers (polybottles/drums) will be inspected for leaks, bulges, or any other indication that the container may have been compromised. If the container is in good condition, it will be moved to a temporary location where containment and weather protection are afforded.

If the container has been compromised, the remaining contents will be transferred to a new container and will be placed in the temporary location. Detailed steps for repacking are provided in Waste Management operating procedures. All labeling will be replaced as necessary.

In the event a spill or release of hazardous waste or hazardous substance and toxic chemical, hazardous waste or hazardous waste constituent, mixed waste or mixed waste constituent escapes the building and contaminates the soil, the following steps will be taken to assure that all soil containing hazardous constituents has been removed and containerized.

1. Soil showing visible contamination will be excavated immediately.

2. A statistically valid sampling plan that considers the soil type, properties of the spilled material, area affected, volume of the spill and other factors will be developed.

3. This sampling plan will guide the confirmatory sampling and any additional excavation.

4. Background will be determined by applying the sampling plan to a similar but unaffected area nearby.

5. Excavation will cease when the analyses show results less than the mean plus two sigma of the background.

Any recovered waste, contaminated water, or other contaminated material will be sampled, analyzed, characterized, and placed in containers as specified in Table D-1.

The temporary storage location will be located within an unaffected area of the following storage units, X-326 and X-7725, and be used until repairs are completed or a new permanent site is located. No new hazardous waste storage operations or activities, beyond recovery activities, will be initiated without obtaining prior DOE and regulatory agency approval.

In the event of a fire at any RCRA facility, the primary goal following the fire extinguishment is the containment of the contaminated runoff to the maximum extent possible. In order to attain that goal, the following steps will be taken:

1. As soon as possible after the notification of the fire is received, the Plant Shift Superintendent/Incident Commander will order the closure of the appropriate holding pond. For the X-326 Storage Unit, flow through the South Holding Pond and/or the West Drainage Ditch can be stopped by closing effluent control valves. It should be noted heavy precipitation, primarily rainfall episodes, could result in the significant reduction of effluent impoundment holding times.

2. If necessary, an earthen dam is to be constructed as near the facility as practical as soon as human resources and equipment are available. The purpose of this action is to minimize the spread of contamination and to provide extra containment runoff.

3. If additional containment capacity is required, available inflatable tanks, railroad tank cars, and tank trailers can provide an additional 120,000 gallons of capacity.

4. Following abatement of the emergency, all impounded runoff will be sampled to determine the concentration of contaminants in the water. All sampling and analysis will be in accordance with established SW-846 protocol.

5. If the runoff is determined to be hazardous, the runoff will be treated or disposed of in accordance with applicable RCRA regulations.

6. Following removal of the water from the containment areas, a soil sampling program will be initiated to determine if the soil has become contaminated.

G-4G Incompatible Wastes [OAC 3745-54-56(H)(1)]

Determinations of chemical characteristics and incompatibilities by the Plant Shift Superintendent/Incident Commander can be done with visual inspections, field sampling and by knowledge of the waste origination. The analytical procedures of the waste analysis plan and the waste management and segregation procedures of the storage units and their procedures to prevent hazards are also applicable to ensuring that there will be no incompatibility problems.

G-4H Post Emergency Equipment Maintenance [OAC 3745-54-56(H)(2) and (I)]

Following its use in an emergency or routine maintenance situation, all equipment is cleaned/decontaminated of hazardous substance and toxic chemical or residual excavated materials prior to being placed into storage for reuse as necessary. The purpose of the cleaning is twofold: 1) to maintain the equipment in usable condition; and 2) to prevent the spread of and/or unnecessary exposure to hazardous and/or radioactive materials.

Expendable supplies such as disposable personal protective equipment are inventoried and replaced as required as part of the decontamination activities. These decontamination activities are performed after the generated residues are containerized and sampled (as necessary) to ensure only compatible materials are stored together. The completion of the site cleanup is to include the maintenance of equipment and the replenishment of supplies, which will then be reported to the Administrator of Environmental Protection Agency (EPA) Region V, the Director of Ohio EPA and any other applicable state or local agency prior to the resumption of normal operations.

G-4I Container Spills and Leakage [OAC 3745-54-52(A)(E), 3745-55-71]

Spill control equipment shall be located and available in the hazardous waste storage units at all times. Waste Management operating procedures provide detailed steps for handling and replacing leaking containers.

The general procedure that is followed is:

1. The spill or leak is contained using an inert absorbent if it can be safely done by personnel detecting the spill or leak. Once the spill or leak is safely contained, clean-up activities shall begin immediately.

2. Chemical Operations personnel, Environmental Compliance personnel, the Plant Shift Superintendent/ Incident Commander, and, if necessary, emergency response personnel are notified to provide safe clean-up guidelines and equipment.

3. The contents of the drum will be transferred to a container as specified in Table D-1 or the drum and contents will be placed in an overpack drum as stated in the procedure.

Environmental Compliance will evaluate the occurrence against current regulations and determine the reporting requirements and, if necessary, draft appropriate notifications.

After the emergency has been abated, the transfer of additional hazardous wastes into the storage area will be discontinued until the area is properly cleaned. There is sufficient space in other onsite storage areas to accommodate this material for several weeks.

G-4J Tank Spills and Leakage [OAC 3745-55-93]

PORTS is not seeking a permit for any tanks; therefore, this section does not apply.

G-4K Surface Impoundment Spills and Leakage [OAC 3745-56-27]

PORTS is not seeking a permit for any surface impoundments; therefore, this section does not apply.

G-5 Emergency Equipment [OAC 3745-54-52(E)]

Fire Extinguishing Equipment

The closest fire department is operated by USEC. This fire department maintains a full time dedicated fire department, which includes three class A pumpers: 1 - with a 1250 gallons per minute (gpm) pump and 500 gallon booster tank; 1 - with a 1250 gpm pump and a 500 gallon booster tank and 1 - with a 1000 gpm pump and a 500 gallon booster tank; 1 - mini-pumper with 300 gpm pump and a 300 gallon booster tank, and a wheel drive heavy rescue vehicle, and two ambulances. The department has a truck; for carrying all types of miscellaneous emergency equipment. In addition, the department operates four pickup trucks. Each vehicle and its complement of equipment is checked at the start of each shift and a complete inventory is taken each week. This equipment and staff are housed in a modern, eight bay, brick building known as the X-1007 Fire Station. Included in the fire station is a modern, computerized alarm room.

There are two separate fire water distribution systems at PORTS. The high pressure fire water system services all sprinkler systems and the fire hydrants in the newer areas of the plant. It has a four hour fire flow of 16,000 gpm at 125 pounds per square inch (psi). The low pressure system is also known as the sanitary water system and services the fire hydrants in the older area of the plant. It has a four hour fire flow of 5,000 gpm at 75 psi. Fire hydrant spacing on both systems is nominally 300 feet. Both hazardous waste storage units have building sprinkler systems on the high pressure system. The fire hydrants in the area of X-326 are on the low pressure system and the hydrants around X-7725 are on the high pressure system. The PORTS Fire Department is located in Building X-1007, about 1,000 feet from both of the storage units.

Along with the fire protection systems at PORTS, each building has a set of portable fire extinguishers available. Each unit is inspected on a routine basis. NFPA Class A, B, C or combination extinguishers can be found in most areas and are generally located 75 feet apart or approximately one for each 1250 ft^2 of floor space per NFPA standards. These units are to be used for small fires (e.g. waste baskets, paper on desk) only, as general personnel are not trained to fight significant fires.

Emergency and Spill Control Equipment

The container storage units have an extensive array of emergency and spill control equipment available for routine and emergency use. All equipment is maintained on a preventative maintenance schedule as recommended by the manufacturer. The list of equipment is presented as Table G-2.

In addition to the emergency equipment, DOE/Bechtel Jacobs Company LLC has a wide variety of heavy equipment (lifting and earth moving) is available for use, in an emergency, by agreement with USEC.

Personal Protective Equipment

PORTS maintains a wide variety of personal protective equipment including respiratory protection; protective clothing, including chemical-resistant encapsulating suits; and self-contained breathing apparatus. The types of respiratory protection available include organic vapor half-face, full-face and, fresh air respirators; and the aforementioned self-contained breathing apparatus. Protective clothing includes cloth coveralls, aprons, shoes, boots, various types of gloves and headgear. The chemical-resistant encapsulating suits are maintained by the USEC Fire Department Personnel who receive special training in the use, testing and inspection of such equipment.

Emergency response personal protective equipment consisting of both Level A and Level B Equipment is assigned to and is either carried on fire vehicles or is stored in the X-1007 Fire Station.

Level A Equipment consisting of positive-pressure self-contained breathing apparatus, full-encapsulating chemical resistant suits with built-in gloves, steel shank boots, a hard hat and extra gloves are carried on the fire department emergency truck. Extra positive-pressure self-contained breathing apparatus and extra air bottles are also stored on this vehicle.

Level B Equipment is worn by all responding firemen and consists of complete fire turnout gear and self-contained breathing apparatus. Additional positive-pressure self-contained breathing apparatus is available on all fire apparatus except the two ambulances. These responders normally wear white cotton gloves under their regular work gloves, and have available to them plastic booties to wear over their boots, if such protection is needed.

Tyvec coveralls, cotton gloves, skull caps, respiratory protection, plastic booties, and extra air bottles are also carried on the emergency truck. An additional supply of these items are stored in supply cabinets in the X-1007 Fire Station.

Once the situation has been stabilized by the immediate response of the fire department and the potential hazards of fire and explosion have been reduced to an acceptable level, cleanup is completed by the USEC Chemical Operations Department with the Fire Department on standby. The personal protective equipment of the chemical operators is normally Level D and occasionally Level C. The level of protection is determined by the Industrial Hygienist after determining the nature of the material spilled, taking and evaluating instrument readings for that material, and consulting with the Plant Shift Superintendent/Incident Commander, fire captain and safety personnel so that all potential hazards are considered.

Internal Communications and Alarm Systems

PORTS emergency communications and alarms are established in a variety of methods. The most familiar and easily usable is the telephone. The dialing of the emergency number (911) will automatically connect the caller with the USEC Fire Department. The caller will be requested to describe the nature of the emergency and location and be told to remain, if possible, at the scene until emergency personnel arrive.

Another familiar alarm device is the fire alarm boxes located in virtually every building on plantsite. When tripped, the alarms will sound in the fire department. Personnel sounding the alarm should remain as close to the alarm box as is safely possible in order to guide emergency response personnel to the occurrence scene.

Other alarms include bells, whistles, and horns which sound in a variety of ways depending on the nature and extent of the emergency. For example, in the event of an emergency, a personnel accountability alarm may be sounded (seven rings on a bell, repeated three times) and/or, if an evacuation is necessary, a horn will sound with a continuous blast.

Emergency communications may also be accomplished by means of hand held two-way radios. A dedicated emergency frequency is assigned, and an alternate frequency may be utilized, if necessary. All personnel who may have use of a two-way radio are instructed as to its proper use.

External

The telephone is the primary means of external communication. Both hazardous waste storage units have telephones. The Plant Shift Superintendent, Fire Department and Police Department have radio capability to monitor and communicate directly with the area emergency responders. PORTS also has facsimile and electronic information transfer capability to communicate with those who have compatible equipment.

First Aid and Medical Equipment

PORTS has a staff of doctors and nurses who can administer the full range of first aid and stabilization techniques to injured or ill personnel. The PORTS Hospital has an emergency room, examination suites and 3 holding beds. It is staffed on day-shift Monday through Friday excluding holidays with up to two physicians on day-shift and at least one on call at all other times. The Fire Department maintains two fully equipped ambulances and all fire department personnel are certified Emergency Medical Technicians or Paramedics. These services are available through an agreement with USEC.

Decontamination Equipment

Emergency decontamination equipment for injured personnel and responder decontamination is carried on the plant emergency truck, ambulances, and fire apparatus. Additional equipment and neutralizing solutions are stored in the X-1007 Fire Station or the X-101 Hospital. This equipment generally consists of responder protective equipment, decontamination solutions, solution containment devices, and contaminated clothing storage bags.

Gross decontamination of responders is generally accomplished by using safety showers or sanitary showers in affected buildings, with decontamination solutions being stored in proper containers awaiting analysis or by decontamination with portable hoses and/or sprayers. Decontamination solutions can be collected in portable pools for proper analysis, treatment and disposal.

Heavy equipment may be decontaminated by use of water hoses, portable high pressure water or steam cleaners. Prior to this step, all gross contamination is brushed off of the affected surfaces, to limit the concentration in the decontamination solutions. Solutions and solids potentially contaminated with hazardous constituents are collected, sampled and properly disposed of following analytical data review.

G-6 Coordination Agreements [OAC 3745-54-37, 3745-54-52(C)]

An agreement with USEC provides the services of an onsite hospital, fire department, and police department. As the primary provider of emergency services to DOE/Bechtel Jacobs PORTS, USEC obtains and is responsible for updating mutual aid agreements with several surrounding communities for joint support for emergencies at PORTS or within the communities. Copies of the mutual aid agreements and other letters of understanding with the following agencies are attached.

Mutual Aid Fire Agreement

PIKETON-SEAL TOWNSHIP VOLUNTEER FIRE DEPARTMENT
BEAVER FIRE DEPARTMENT
BENTON TOWNSHIP VOLUNTEER FIRE DEPARTMENT
PEBBLE TOWNSHIP VOLUNTEER FIRE DEPARTMENT
CAMP CREEK VOLUNTEER FIRE DEPARTMENT
STOCKDALE FIRE DEPARTMENT
ELM GROVE FIRE DEPARTMENT
WAVERLY FIRE DEPARTMENT
JACKSON TOWNSHIP FIRE DEPARTMENT
SCIOTO TOWNSHIP VOLUNTEER FIRE DEPARTMENT
USEC FIRE DEPARTMENT
PIKE COUNTY FIRE FIREFIGHTERS ASSOCIATION
PIKE COUNTY SHERIFF'S DEPARTMENT

Hospitals (LOA)

PIKE COUNTY EMERGENCY MEDICAL SERVICE, WAVERLY, OHIO
PIKE COMMUNITY HOSPITAL, WAVERLY, OHIO
SOUTHERN OHIO MEDICAL CENTER, PORTSMOUTH, OHIO
ADENA REGIONAL MEDICAL CENTER, CHILLICOTHE, OHIO

Schools (LOA)

PIKE COUNTY SCHOOLS
VALLEY LOCAL SCHOOLS

The remoteness of the plant from local communities would delay their emergency personnel's response time to PORTS in the event of an emergency. Therefore, USEC will be the primary emergency authority.

The Site Emergency Plan for an emergency at PORTS includes participation of county emergency forces. The plan also provides site orientation and communication drills quarterly and classroom training exercises biennially. The PORTS initial responders are intimately familiar with the facility and will have assessed the hazards and support needs prior to the arrival of offsite aid. For these reasons, PORTS will have the lead on any onsite emergency response and all of the offsite aid will be supportive in nature. PORTS will direct the offsite support units so that all parties will understand their responsibilities.

In order to provide additional medical support for employees, contractors and visitors, USEC maintains Letters of Agreement (LOA) with three area hospitals. These letters indicate that the hospitals will accept PORTS patients for treatment. Additional emergency medical services are provided by a LOA with the county emergency medical service.

PORTS has designated and equipped a Joint Public Information Center (JPIC) to provide a single facility from which multi-organizational emergency public information can be coordinated and disseminated during emergencies at the plant which involve, or could involve, offsite emergency actions to protect the public.

The facility for the Joint Public Information Center is the Vern Riffe Joint Vocational School. Agreements are in place to support this effort. These agreements, Letters of Understanding, and copies of fire mutual aid agreements are provided in Attachment 1.

Due to the security required, special circumstances of the operations at this facility, and the possible nuclear contamination involved with any emergency at PORTS, it is assumed that outside contractors and Ohio EPA Response Teams will not be required to respond to emergencies occurring here. No agreements have been solicited from either contractors or Ohio EPA for this reason. Should Ohio EPA choose to attend drills or training sessions with local mutual aid organizations, arrangements can be made for their inclusion.

G-7 Evacuation Plan [OAC 3745-54-52(F)]

The Emergency Evacuation Organization for each building onsite will consist of a Local Emergency Director (LED) and as many assistant local emergency directors and/or Building Wardens as may be deemed necessary. Normally, the local emergency director will be the supervisor in charge of the area requiring evacuation. The number of personnel in the evacuation organization may be varied at the direction of the local emergency director or Plant Shift Superintendent/Incident Commander according to the following:

a. Size of building;

b. Number of employees and presence of physically-impaired employees;

c. Type and location of exit doors;

d. Emergencies requiring evacuation shall include, as a minimum:

   1. Explosions, fires, spills or releases of a volume of hazardous waste or hazardous waste constituent, mixed waste or mixed waste constituent sufficient to threaten human health in the vicinity

   2. Releases causing concentrations in the air to exceed the Threshold Limit Value (TLV) concentration

   3. Releases for which a rapid determination of contaminant concentrations cannot be made.

Evacuation Criteria

The authority for determining the necessity and scope of an evacuation is vested in the local emergency director who is on the scene. The Plant Shift Superintendent/Incident Commander may expand the scope of the evacuation. There are a number of specific events that require evacuation such as fires, release of process or toxic gas, explosions, pressure ruptures, and large spills. In any real or potential emergency the local emergency directors and the Plant Shift Superintendent/Incident Commander are to take the necessary actions to protect human life and provide for their safety and health.

Evacuation Alarm Signaling Systems

The signal for employees to evacuate any building on plantsite will be the continuous sounding of the emergency evacuation horns.

In case of emergencies requiring the evacuation of more than a single building such as a fire zone or the need for a complete plantwide evacuation, additional instructions will be issued over the plant public address system and other available means of communication.

Personnel who are in areas other than their own should follow the personnel who are assigned in that area. Personnel who are conducting meetings, in training classes, or who are acting as escorts for uncleared or cleared visitors shall be responsible for seeing to it that all these personnel evacuate the affected building/buildings per established evacuation procedures.

The Subcontract Technical Representative shall ensure that all contractor personnel are advised of evacuation procedures applicable to the areas in which they are to be working.

In order to prevent congestion near the exit doors and to provide clear passage for responding plant emergency service groups, personnel leaving the building will proceed promptly to pre-assigned assembly area(s) or to an assembly area that may be designated over the plant public address system.

Evacuation Routes

Each building has established evacuation procedures specific to that building. Upon hearing the continuous blast of a horn or ringing of a bell, all personnel are to promptly evacuate the building following designated routes. The evacuation routes are conspicuously posted on walls and doorways with evacuation direction(s) indicated by arrows. In those buildings where designated evacuation routes cannot be feasibly marked (e.g. Process Buildings), personnel are to evacuate via the nearest available exits.

The evacuation routes to assembly areas are dependent on wind direction and the location of an incident. Personnel are trained to note the wind direction and then to proceed to an upwind assembly area. See Figures G-5 and G-6.

X-326 Storage Unit

Exit Points - Scioto Avenue - Roto Gates

Evacuation Routes:

Primary

Persons evacuating through these emergency egress roto gates will proceed north on Scioto Avenue, turn left and proceed west on 17th Street and assemble at the X-109A, Monitoring Station #6.

Alternate

Persons evacuating through these emergency egress roto gates will proceed south on Scioto Avenue, turn right and proceed west on 2nd Street, turn left and proceed south on Falcon Avenue and assemble at the X-1007 Fire Station, Monitoring Station #7.

Exit Points - 15th Street - Roto Gates and X-111B Portal

Evacuation Routes:

Primary

Persons evacuating through these emergency egress roto gates will proceed west on 15th Street, turn right and proceed north on Scioto Avenue, turn left and proceed west on 17th Street and assemble at the X-109A, Monitoring Station #6.

Alternate

Persons evacuating through these emergency egress roto gates will proceed east on 15th Street, turn right and proceed south on Pike Avenue, turn left and proceed east on 11th Street and assemble at the X-106, Monitoring Station #2.

Exit Points - 5th Street- Roto Gates

Evacuation Routes:

Primary

Persons evacuating through these emergency egress roto gates will proceed east on 5th Street, turn left and proceed north on Pike Avenue, turn right and proceed east on 6th Street, turn left and proceed north on Mahoning Avenue, turn right and proceed east on 7th Street and assemble at the X-109C, Monitoring Station #1.

Alternate

Persons evacuating through these gates will proceed west on 5th Street, turn left and proceed south on Scioto Avenue, turn right and proceed west on 2nd Street, turn left and proceed south on Falcon Avenue and assemble at the X-1007 Fire Station, Monitoring Station #7.

Exit Points - Pike Avenue - Roto Gates and X-111A Portal

Evacuation Routes:

Primary

Persons evacuating from Emergency Roto Gates and X-111A Portal will proceed south on Pike Avenue; persons evacuating Emergency Roto Gates Pedestrian Gate-15 and Pedestrian Gate-13 will proceed north. They will then proceed east on 9th Street, turn right and proceed south on Mahoning Avenue, turn left and proceed east on 7th Street and assemble at X-109C, Monitoring Station #1.

Alternate

Persons evacuating from these Emergency Egress Roto Gates will proceed south on Pike Avenue, turn right and proceed east on 11th Street and assemble at the X-106, Monitoring Station #2.

Exit Points - Pike Avenue - Roto Gate

Evacuation Routes:

Primary

Persons evacuating from Emergency Egress Roto Gate Pedestrian Gate-7 will proceed north on Pike Avenue, persons evacuating from Emergency Egress Roto Gates will proceed south on Pike Avenue. They will then proceed east on 11th Street and assemble at the X-106, Monitoring Station #2.

Alternate

Persons evacuating from these Emergency Egress Roto Gates will proceed south on Pike Avenue, turn left and proceed east on 10th Street, turn right and proceed south on Mahoning Avenue, turn left and proceed east on 7th Street and assemble at the X-109C, Monitoring Station #1.

X-7725 Container Storage Unit

Exit Point - Plover Avenue

Evacuation Routes:

Primary

Persons evacuating through the west portion of X-7725 will proceed north on Plover Avenue and assemble at the X-1107 EV Portal (egress designated "W1" Figure G-6).

Alternate

Persons evacuating through the west portion of X-7725 will proceed south on Plover Avenue and assemble as far south on Plover Avenue as the security fence allows (Egress designated "W2" Figure G-6).

Exit Point - Stockton Street

Evacuation Routes:

Primary

Persons evacuating through the north portion of X-7725 will proceed north to Stockton Street, turn left and proceed west on Stockton Street and assemble at the X-1107 EV Portal (egress designated "N1" Figure G-6).

Alternate

Persons evacuating through the north portion of X-7725 will proceed north to Stockton Street, turn right and proceed east on Stockton Street, turn right and proceed south on Hawk Avenue, turn left and proceed east on Rush Street and assemble as far east on Rush Street as the security fence allows (egress designated "N2" Figure G-6).

Exit Point - Hawk Avenue

Evacuation Routes:

Primary

Persons evacuating through the east portion of X-7725 will proceed north on Hawk Avenue, turn left and proceed west on Stockton Street and assemble at the X-1107 EV Portal (egress designated "E1" Figure G-6).

Alternate

Persons evacuating through the east portion of X-7725 will proceed south on Hawk Avenue, turn left and proceed east on Rush Street and assemble as far east on rush street as the security fence allows (egress designated "E2" Figure G-6).

Exit Point - Rush Street

Evacuation Routes:

Primary

Persons evacuating through the south portion of X-7725 will proceed east on Rush Street, turn left and proceed north on Hawk Avenue, turn left and proceed west on Stockton Street and assemble at the X-1107 EV Portal (egress designated "S1" Figure G-6).

Alternate

Persons evacuating through the south portion of X-7725 will proceed east on Rush Street and assemble as far east as the security fence allows (egress designated "S2" Figure G-6).

G-8 Required Reports [OAC 3745-54-56(J)]

In the event of an emergency, all radio transmissions and telephone conversations with the Plant Shift Superintendent's office are automatically recorded. This provides a detailed, chronological description of the emergency and actions taken by response personnel. Within 15 days of the incident, PORTS will provide a written report on the occurrence to the Region V Administrator and the Director of Ohio Environmental Protection Agency through DOE. Copies will be included in the operating record. The report will include at a minimum:

1. Name, address, and telephone number of the owner or operator
2. Name, address, and telephone number of the facility;
3. Date, time, and type of incident (e.g., fire, explosion);
4. Name and quantity of material(s) involved;
5. The extent of injuries, if any;
6. An assessment of the actual or potential hazards to human health or the environment, where applicable;
7. Estimated quantity and disposition of recovered material that resulted from the occurrence.
8. Any other information as the director may require.

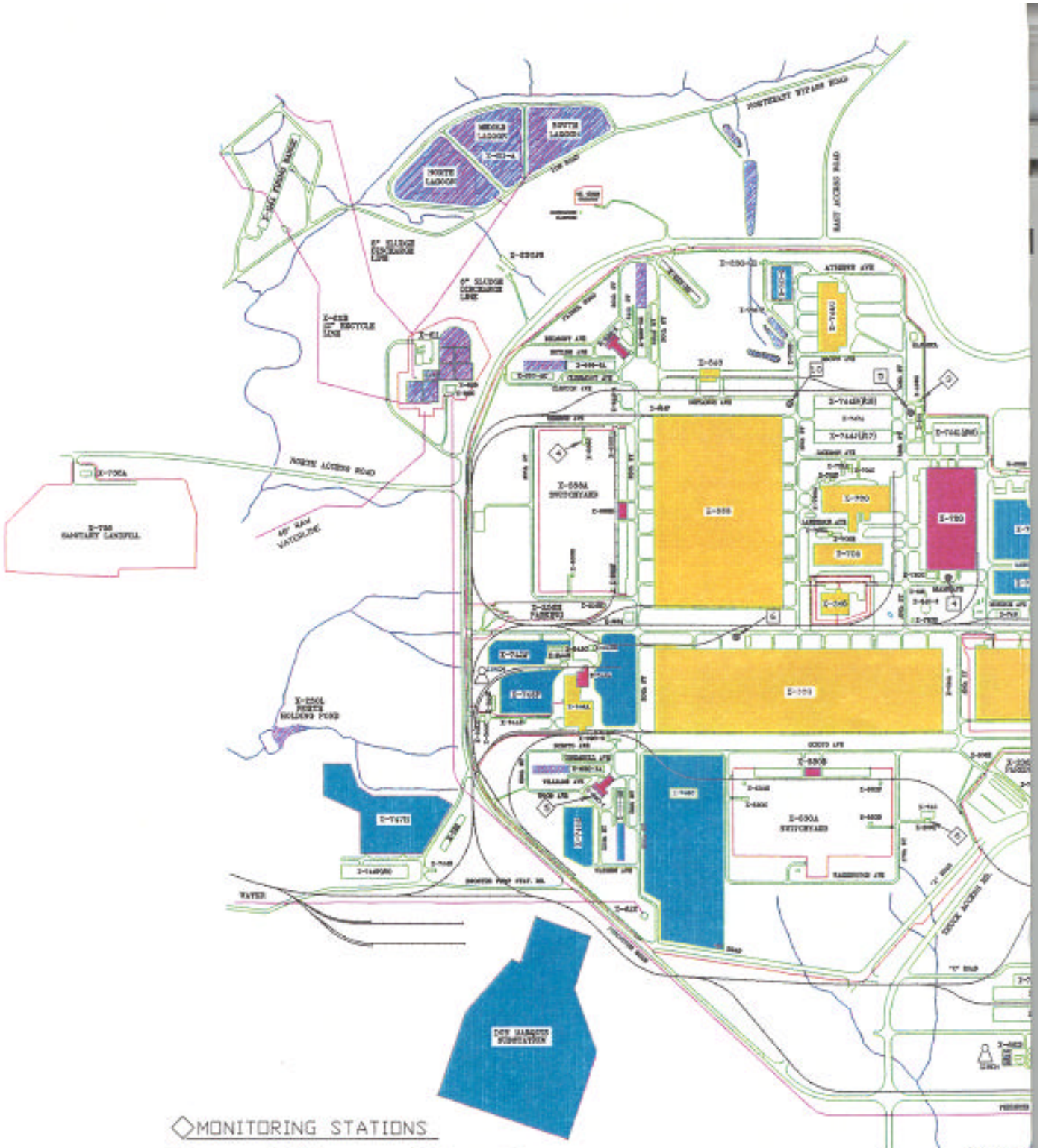
Table G-1
Portsmouth Gaseous Diffusion Plant Emergency Coordinators
(Plant Shift Superintendents)

NAME	ADDRESS	HOME TELEPHONE NUMBER	PAGER TELEPHONE NUMBER
PRIMARY CONTACT[1]			
Don J. Wilkes	156 Hanover Dr. Chillicothe, Ohio	(740) 779-3032	(740) 289-0304
PLANT SHIFT SUPERINTENDENTS (PSS)			
Keith Vanderpool	235 Bethany Dr. Wheelersburg, OH	(740) 574-5971	(740) 289-0925
Joseph B. Halcomb	5195 Oakland Blvd. Sciotoville, Ohio	(740) 776-3480	(740) 289-0732
Keith Williamson	152 Belleview Av. Chillicothe, Ohio	(740) 775-5212	(740) 289-0825
Rick Larson	572 Rocky Rd. Chillicothe, Ohio	(740) 775-1445	(740) 289-0069
Ron P. Crabtree	127 Clayburne Blvd. Chillicothe, Ohio	(740) 775-6774	(740) 289-0898
Kurt Sisler	2292 Huston Hollow-Candy Lucasville, Ohio	(740) 259-2602	(740) 289-0779
Steven W. May	6433 Fallen Timber Road Lucasville, Ohio	(740) 820-2568	(740) 289-0812

[1]After the Primary Contact, the Plant Shift Superintendent on duty at the time of an incident will be the Emergency Coordinator.

Table G-2 Site Emergency Equipment

EQUIPMENT DESCRIPTION	AMOUNT	LOCATION	PURPOSE
SPRINKLER SYSTEMS	≈80	X-326	CAPABLE OF CONTROLLING FIRES BY WATER FLOW
FIRE EXTINGUISHERS	≈350	X-326	FOR USE IN EXTINGUISHING CLASS A, B, OR C FIRES
BUILDING HORNS	>10	X-326	FOR ACTIVATING THE EMERGENCY RESPONSE ORGANIZATION, ALERTING EMPLOYEES TO RESPOND ACCORDING TO THE NATURE OF THE EMERGENCY
PLANT RADIO FREQUENCIES	5	X-326	ALLOWS TWO WAY COMMUNICATIONS BETWEEN EMPLOYEES, EMERGENCY RESPONSE ORGANIZATIONS, ETC.
COMMERCIAL TELEPHONES	>6	X-326	CAPABLE OF NOTIFYING ON-SITE EMPLOYEES AND OFF-SITE AGENCIES
TOWELS, MOPS, BUCKETS, ETC.	1	X-326	SPILL CLEAN-UP
DRUM PUMP	1	X-326	LIQUID WASTE TRANSFER
LARGE SPILL CABINET	1	X-326	FOR SPILL CONTROL MATERIALS (ABSORBENT, PPE, ETC.)
PH METER	1	X-7725	USED TO IDENTIFY PH OF MATERIAL
LARGE SPILL CART	4	X-7725	FOR MOVING SPILL CONTROL MATERIALS (ABSORBENT, PPE, ETC.)
SPRINKLER SYSTEMS	21	X-7725	CAPABLE OF CONTROLLING FIRES BY WATER FLOW
FIRE EXTINGUISHERS	≈200	X-7725	FOR USE IN EXTINGUISHING CLASS A, B, OR C FIRES
PUBLIC ADDRESS SYSTEM	1	X-7725	FOR ACTIVATING THE EMERGENCY RESPONSE ORGANIZATION, ALERTING EMPLOYEES TO RESPOND ACCORDING TO THE NATURE OF THE EMERGENCY
PLANT RADIO FREQUENCIES	5	X-7725	ALLOWS TWO-WAY COMMUNICATIONS BETWEEN EMPLOYEES, EMERGENCY RESPONSE ORGANIZATION, ETC.
COMMERCIAL TELEPHONES	>10	X-7725	CAPABLE OF NOTIFYING ON-SITE EMPLOYEES AND OFF-SITE AGENCIES
DRUM PUMPS	2	X-7725	LIQUID WASTE TRANSFER
SHOVELS, MOPS, BUCKETS, ETC.	1	X-7725	SPILL CLEAN-UP



◇MONITORING STATIONS

NO.	LOCATION	PHONE
1.	X-109C TRAILER SOUTHEAST OF X-100	2238
2.	X-106 TRT STATION	5956
3.	X-109B FRAME BUILDING EAST OF X-105	2535
4.	X-533H X-533 SWITCHYARD - EAST SIDE	4183
5.	X-630 PUMPHOUSE - INSIDE NORTH END	4165
6.	X-109A SOUTH OF X-530 SWITCHYARD	4122
7.	X-1007 FIRE STATION	5611
8.	X-1107EV PORTAL	3358

□COMMAND POSTS

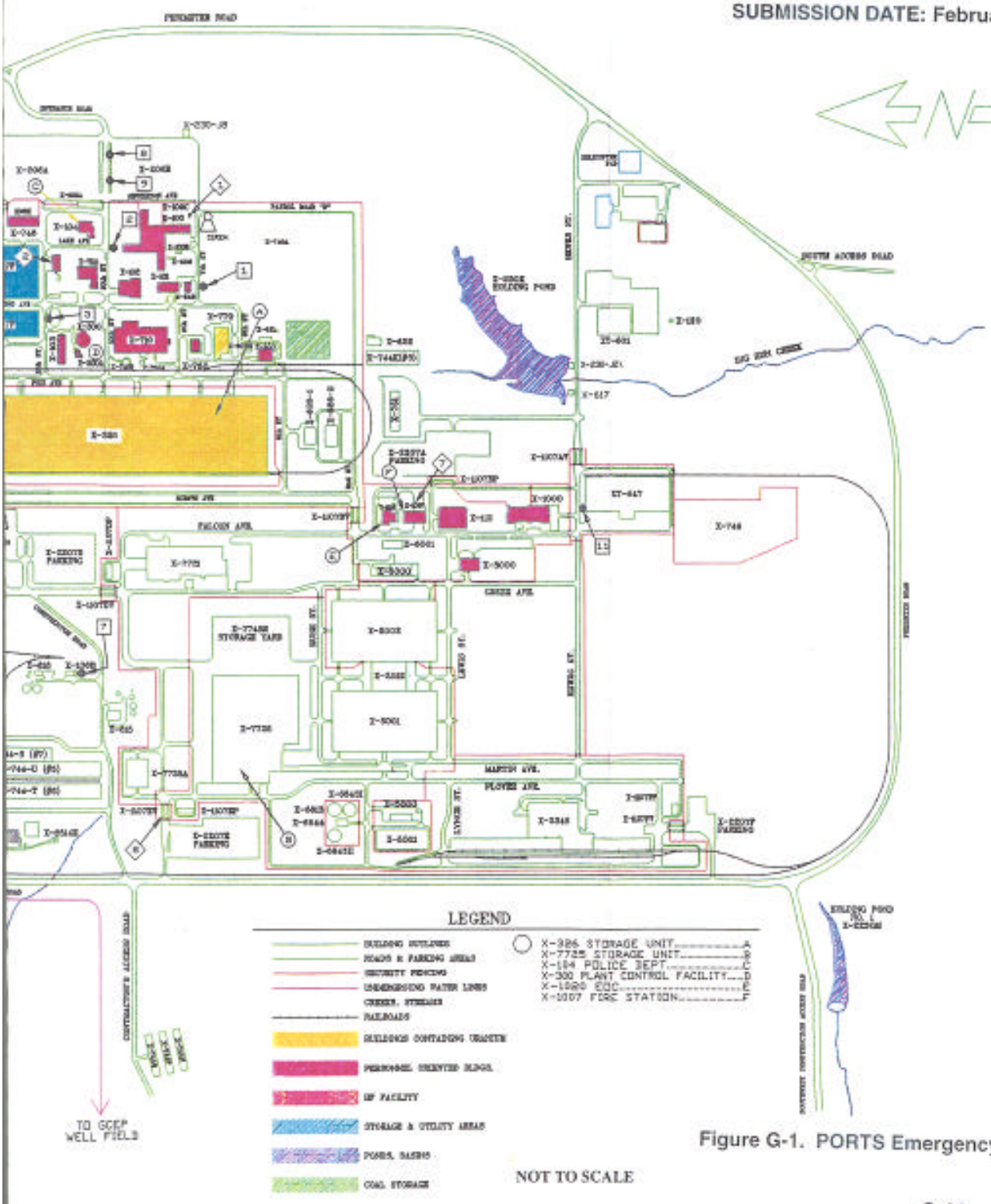
NO.	LOCATION	PHONE
1.	SOUTH OF X-540	3809
2.	NORTH OF X-100	2889
3.	NORTHEAST OF X-300	3280
4.	WEST OF X-720	4500
5.	NORTH OF X-105	4361
6.	BETWEEN X-330 AND X-333	3476
7.	SOUTH WALL OF X-1063	4743
★ 8.	X-2068 - NORTH SIDE	2651
★ 9.	X-2068 - NORTH SIDE	2650
10.	SOUTHEAST CORNER OF X-333	6179
11.	XT-847 NORTHWEST WALL	3898

★ THESE PHONES MUST BE TURNED ON BY POLICE DEPARTMENT AT X-104.

SIREN LOCATIONS

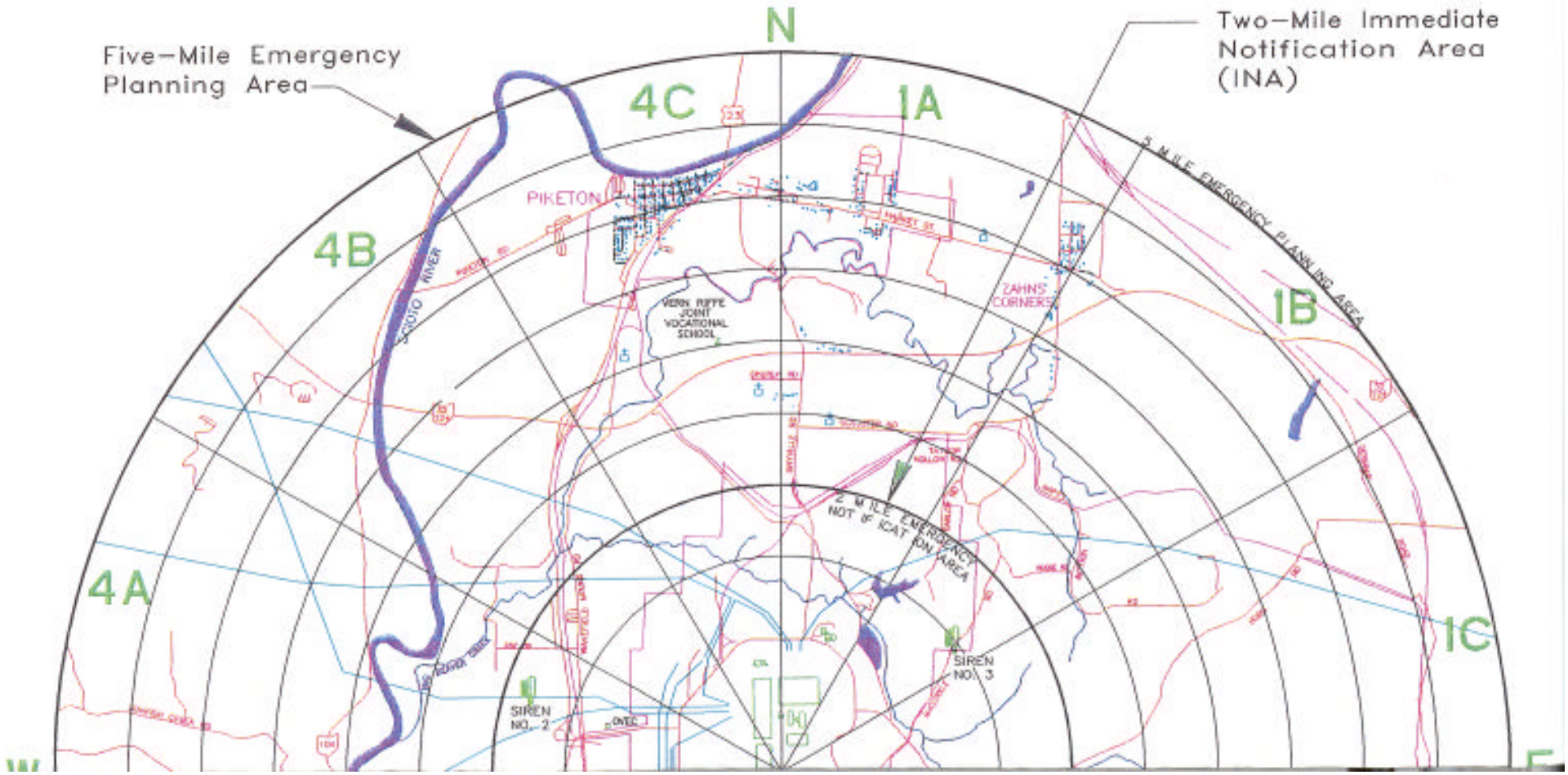
PORTSMOUTH GASEOUS DIFFUSION PLANT EMERGENCY RESPONSE FACILITIES

SUBMISSION DATE: February 21, 2000



NOT TO SCALE

Figure G-1. PORTS Emergency Response Facilities


Five-Mile Emergency Planning Area
Two-Mile Immediate Notification Area (INA)
N
4C
1A
4B
1B
4A
1C
W
E
PIKETON
SCIOTO RIVER
VERN RIFFE JOINT VOCATIONAL SCHOOL
ZAHNS CORNERS
5 MILE EMERGENCY PLANNING AREA
2 MILE EMERGENCY NOTIFICATION AREA
SIREN NO. 2
SIREN NO. 3

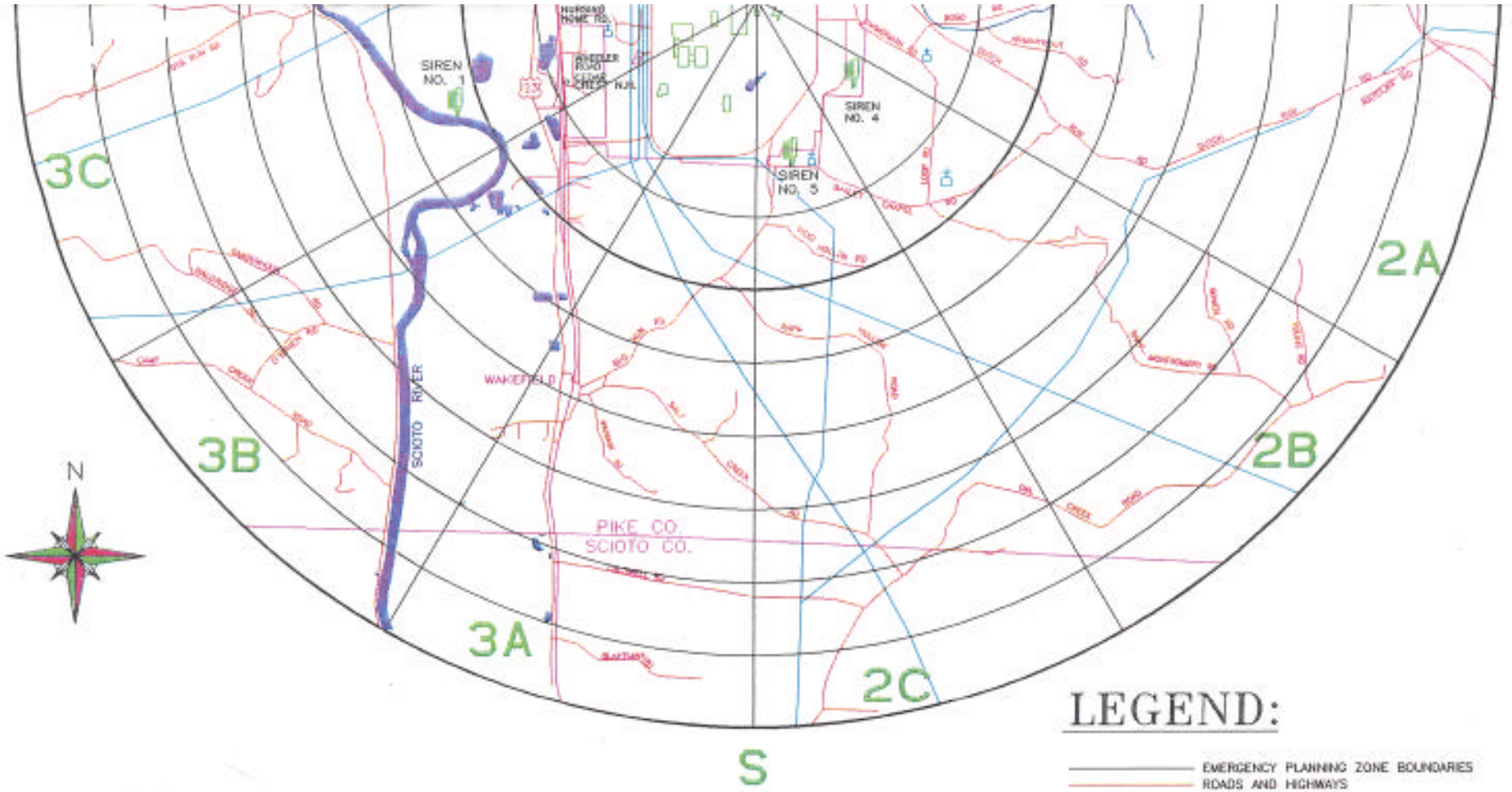


Figure G-2. PORTS Emergency Planning Map

SUBMISSION DATE: February 21, 2000

EMERGENCY NOTIFICATION FORM

A-3138 Front (12-28-99)

"This is the Portsmouth Gaseous Diffusion Plant, located in Piketon, Ohio, with: *(check one)* ☐ **an EMERGENCY notification** ☐ **a DRILL notification**

(Repeat Line)

*1. This is Emergency Notification Number:_____ Date: _____ Time: _____
(TIME NOTIFICATION APPROVED)

*2. Portsmouth Plant Communicator Name: _____ Phone Number: 740-897-3025 or 740-897-4019
(PRINT) *(circle one)*

*3. Emergency Classification: *(check one)*
a. ☐ ALERT
b. ☐ SITE AREA EMERGENCY
c. ☐ Terminated
d. ☐ Other: _____
Time Emergency Class. Declared/ Changed / Terminated: _____ *(circle one)*

*4. Event Description: _____

*5. Emergency Condition: *(check one)* a. ☐ Improving b. ☐ Stable c. ☐ Degrading d. ☐ Undetermined

*6. Plant Status: *(check one)* a. ☐ Operating b. ☐ Shutdown c. ☐ Being Shutdown

*7. OFF-SITE Protective Actions Recommended: *(check one)*
a. ☐ No protective actions recommended at this time.
b. ☐ Off-site sheltering recommended within 2-mile Immediate Notification Area.
c. ☐ Other: _____

*8. Public Warning Sirens: *(check one)*
a. ☐ Have not been activated
b. ☐ Have been activated (required for all Site Area Emergencies)
Time Sirens Activated: _____

*9. EAS Message played: *(check one)*
a. ☐ Message #1, No Actions Required
b. ☐ Message #2, Sheltering Required
c. ☐ Message #3, Evacuation
d. ☐ Message #4, All Clear
e. ☐ Message #5, Exercise/Drill
f. ☐ Message #6, Unintentional Siren
g. ☐ Message #7, Other:_____
Time Pike County Sheriff notified: _____

*10. Release Information: *(check one)*
a. ☐ No release has occurred, and NO potential for release exists
b. ☐ No release has occurred, however potential for release exists
c. ☐ Release is occurring: (circle one) Onsite only / Off-site
d. ☐ Release occurred, but has stopped
Time release started / stopped: _____

*11. Material Released: _____

12. Type of Release: *(check one)* a. ☐ Surface b. ☐ Water c. ☐ Air d. ☐ Other:_____

13. Estimate of Release Quantity: _____ Time/Duration of Release: _____

14. Meteorological Conditions at PORTS: Wind is from the _____ (N,SW,ESE, etc.) at _____ mph. Stability Class is _____

*15. Emergency Notification Information Approved by: _____ Date: _____ Time: _____
(circle one) CM/ PSS

***Items must be completed**

Figure G-3. Emergency Notification & Release Form

A-3138 Back (12-28-99) **EMERGENCY NOTIFICATION FORM**

Check Agency Notified:

Agency	Time	Person Contacted
1. ☐ Pike County Sheriff's Office: (740-947-2111)	_____	PCSO: _____
2. ☐ Ohio Emergency Management Agency State EOC (614-889-7150)	_____	OEMA: _____
3. ☐ DOE Oak Ridge Operations EOC, after state and local notifications: (423-576-1005)	_____	DOEOR: _____
4. ☐ NRC Operations Center, immediately after state and local notifications, But no later than 1-hour after emergency classification. (301-816-5100 or 301-951-0550 or 301-415-0550)	_____	NRC: _____
5. ☐ USEC, after state, local, and NRC notifications *but no later than 1-hour.*	_____	USEC: _____

Initial notification: Begin with first listed name on USEC Initial Notification List. Continue down listing until notification is made.
Follow-up notifications: USEC Corporate Operations Center (COC) (301-564-3442)

USEC Initial Notification Roster [Begin making contact by calling from the top of the list until a notification is made.]
PERSON CONTACTED: _____ **TIME:** _____

Name	Office Phone	Home Phone	Pager 1-800-759-7243	Cellular Phone
John Adams	(301) 564-3410	(301) 582-1736	PIN # 387-1294	(202) 253-2063
Brad McRee	(301) 564-3373	(301) 515-5037	PIN #135-4788	(240)601-3232
Bern Stapleton	(301) 564-3492	(301) 540-6126	PIN # 216-0673	None Listed
Jim Miller	(301) 564-3309	(410) 531-2613	PIN # 347-3002	(202) 253-0876
Jim Adkins	(301) 564-3417	(703) 642-1287	PIN # 570-6552	(301)938-2693
Wray Jordan	(301) 214-7932	(301) 662-6501	PIN # 471-2373	None Listed
Roger Gagne	(301) 564-3420	(301) 840-9189	PIN # 216-5846	None Listed

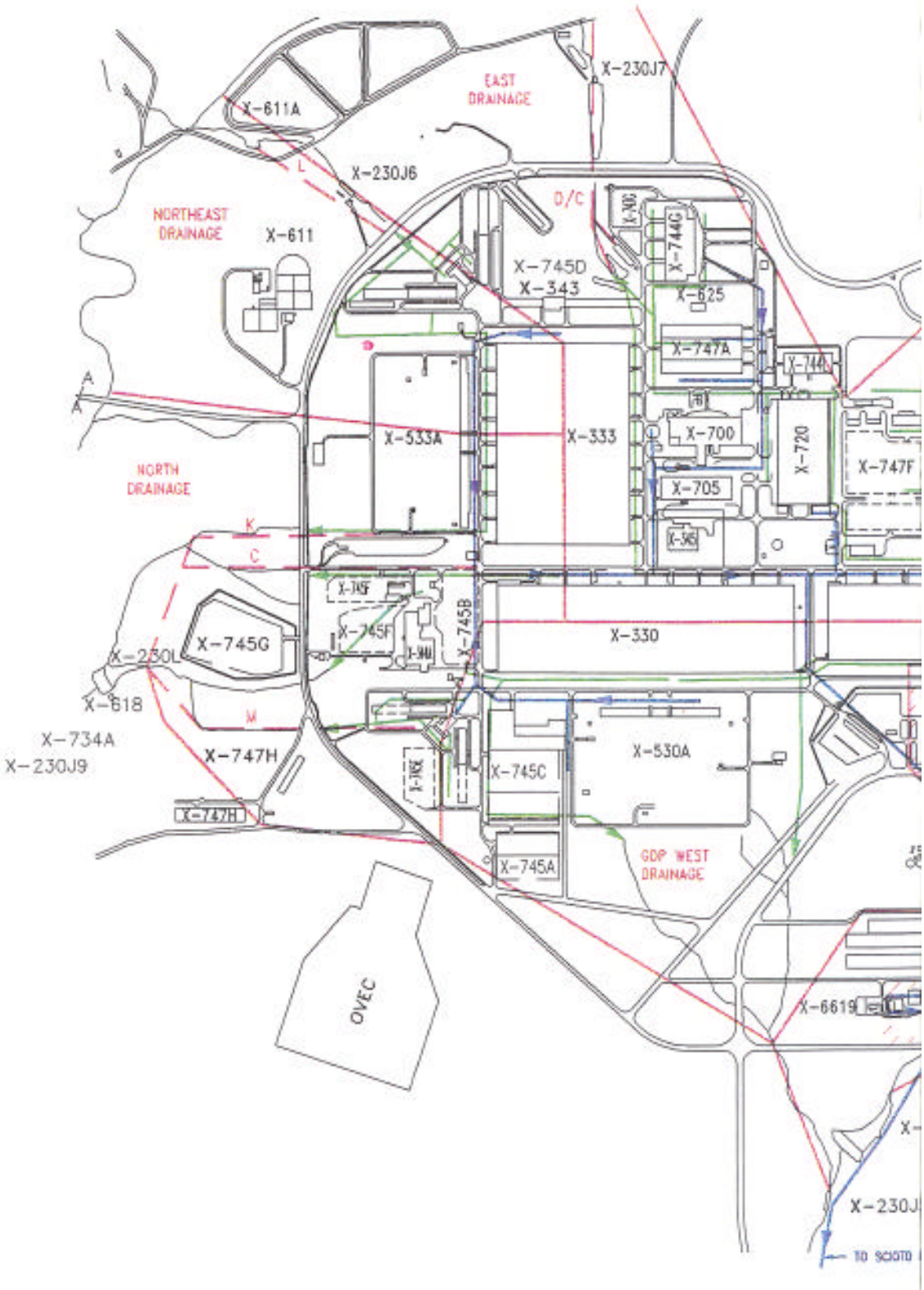
After initial notification is made, subsequent calls should be made to the USEC COC at (301) 564-3442. USEC COC Fax Number is (301) 564-3209.

NOTIFY AS REQUIRED

AGENCY	TELEPHONE	Contacted by FAX	Person Contacted	Time
If a hazardous or toxic release at PORTS has, or may affect Scioto County, notify:				
Scioto County LEPC and Scioto County EMA	(740) 354-7566 Fax (740) 355-8237	Yes: _____ No: _____		
If a release is in progress and has a direct impact on the environment outside the reservation boundary, notify:				
Ohio EPA	(800) 282-9378 Fax (614) 644-3250	Yes: _____ No: _____		
If a release of a chemical or toxic substance in excess of the reportable quantities established under CERCLA section 102.				
National Response Center	(800) 424-8802 Fax (202) 267-2165	Yes: _____ No: _____		
If the event results in a fatality or hospitalization to three (3) or more individuals onsite, notify:				
OSHA	(800) 321-6742 Fax (513) 841-4114	Yes: _____ No: _____		

NOTE: ALWAYS VERIFY AGENCY FAX NUMBER WITH CONTACT BEFORE TRANSMITTING INFORMATION.
COMMENTS:

Figure G-3 (cont.)


EAST DRAINAGE
X-230J7
X-611A
X-230J6
NORTHEAST DRAINAGE
X-611
D/C
X-744G
X-745D
X-343
X-625
X-747A
X-744
X-533A
X-333
X-700
X-720
X-747F
NORTH DRAINAGE
X-705
X-745F
X-745B
X-330
X-745G
X-230L
X-618
X-734A
X-230J9
X-747H
X-530A
X-745C
X-745A
GDP WEST DRAINAGE
OVEC
X-6619
X-230J
TO SCIOTO

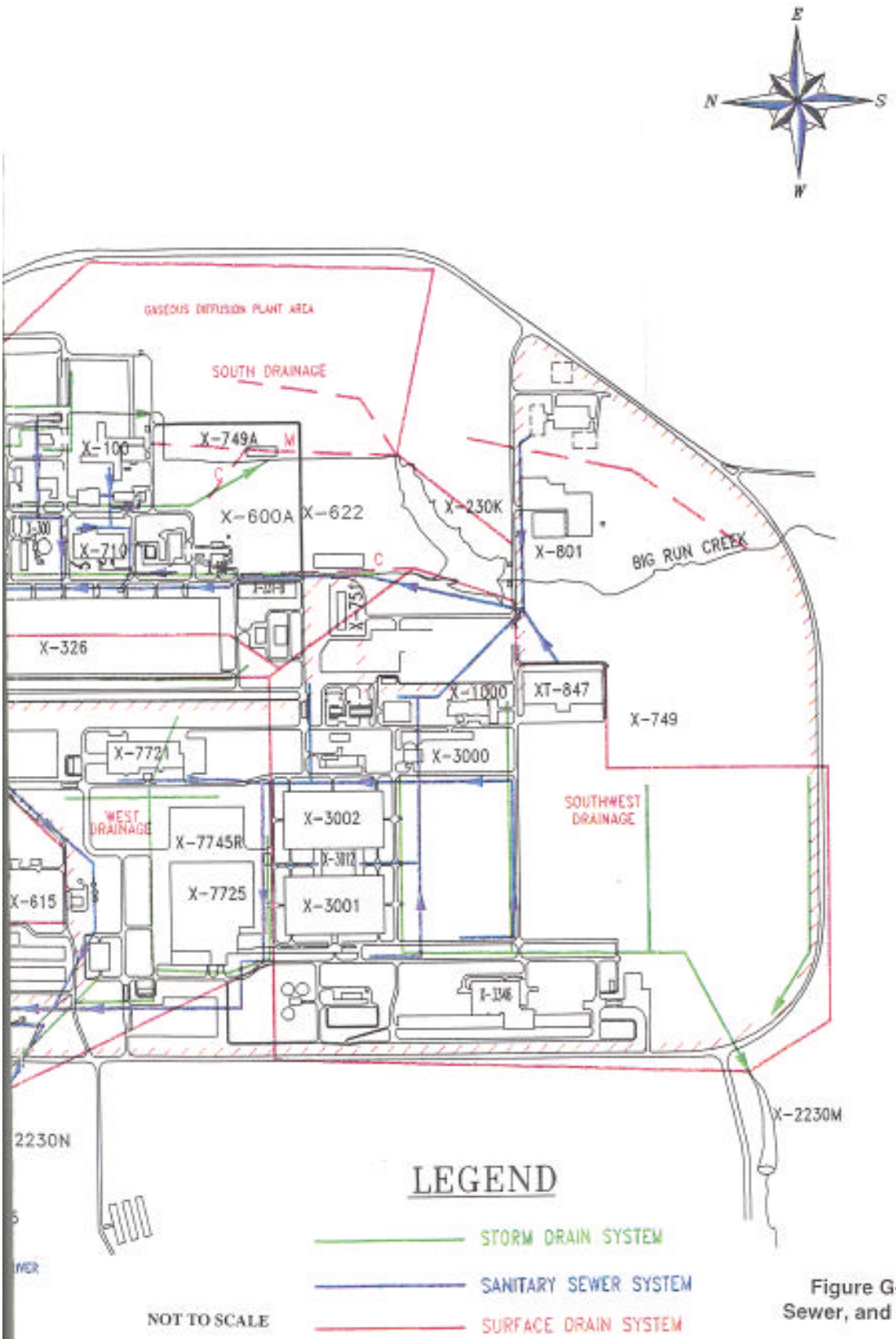
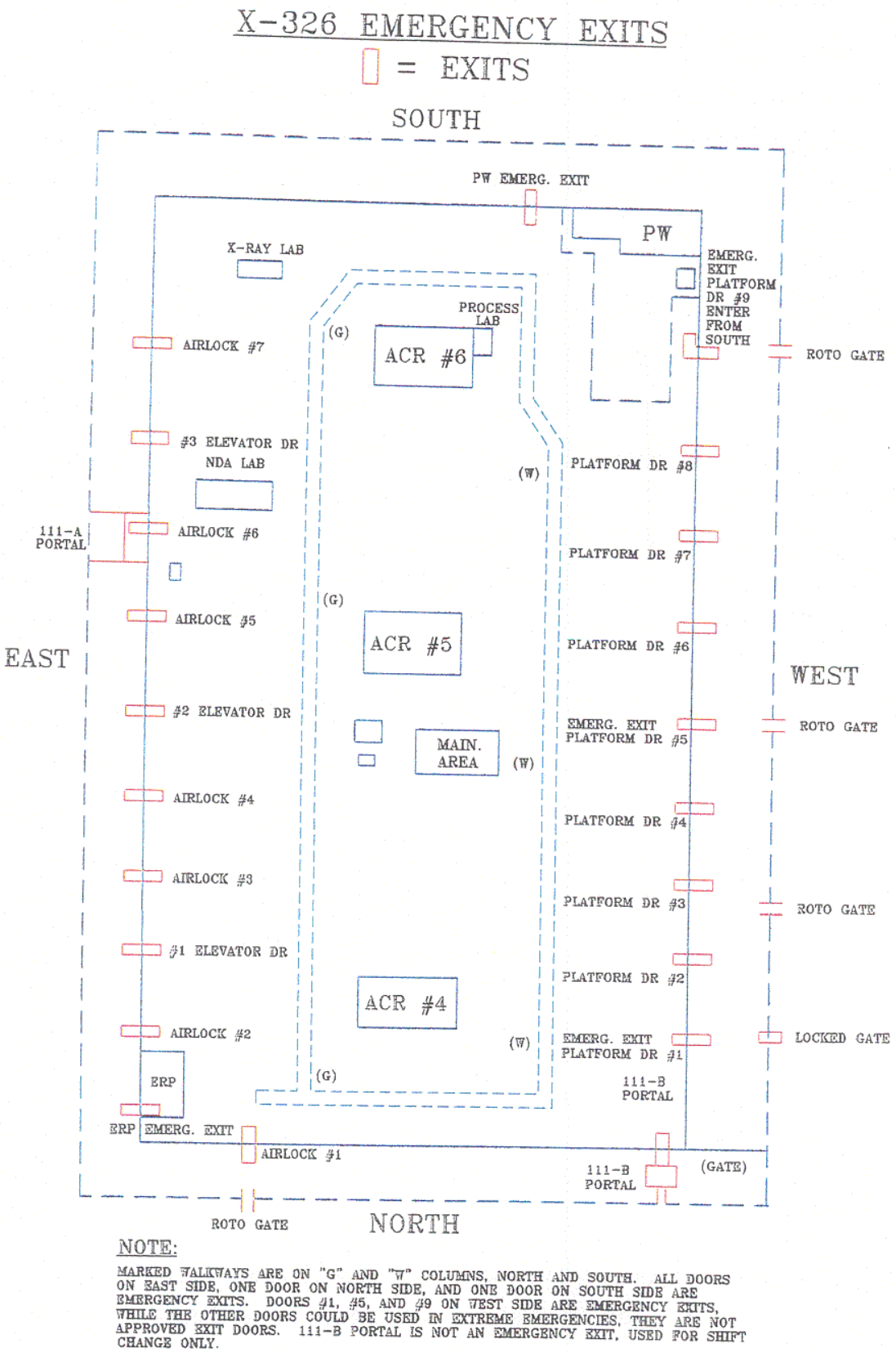


Figure G-4. Storm Drain, Sanitary Sewer, and Surface Drain Systems Map



NOTE:

MARKED WALKWAYS ARE ON "G" AND "W" COLUMNS, NORTH AND SOUTH. ALL DOORS ON EAST SIDE, ONE DOOR ON NORTH SIDE, AND ONE DOOR ON SOUTH SIDE ARE EMERGENCY EXITS. DOORS #1, #5, AND #9 ON WEST SIDE ARE EMERGENCY EXITS, WHILE THE OTHER DOORS COULD BE USED IN EXTREME EMERGENCIES, THEY ARE NOT APPROVED EXIT DOORS. 111-B PORTAL IS NOT AN EMERGENCY EXIT, USED FOR SHIFT CHANGE ONLY.

Figure G-5. X-326 Building Exits

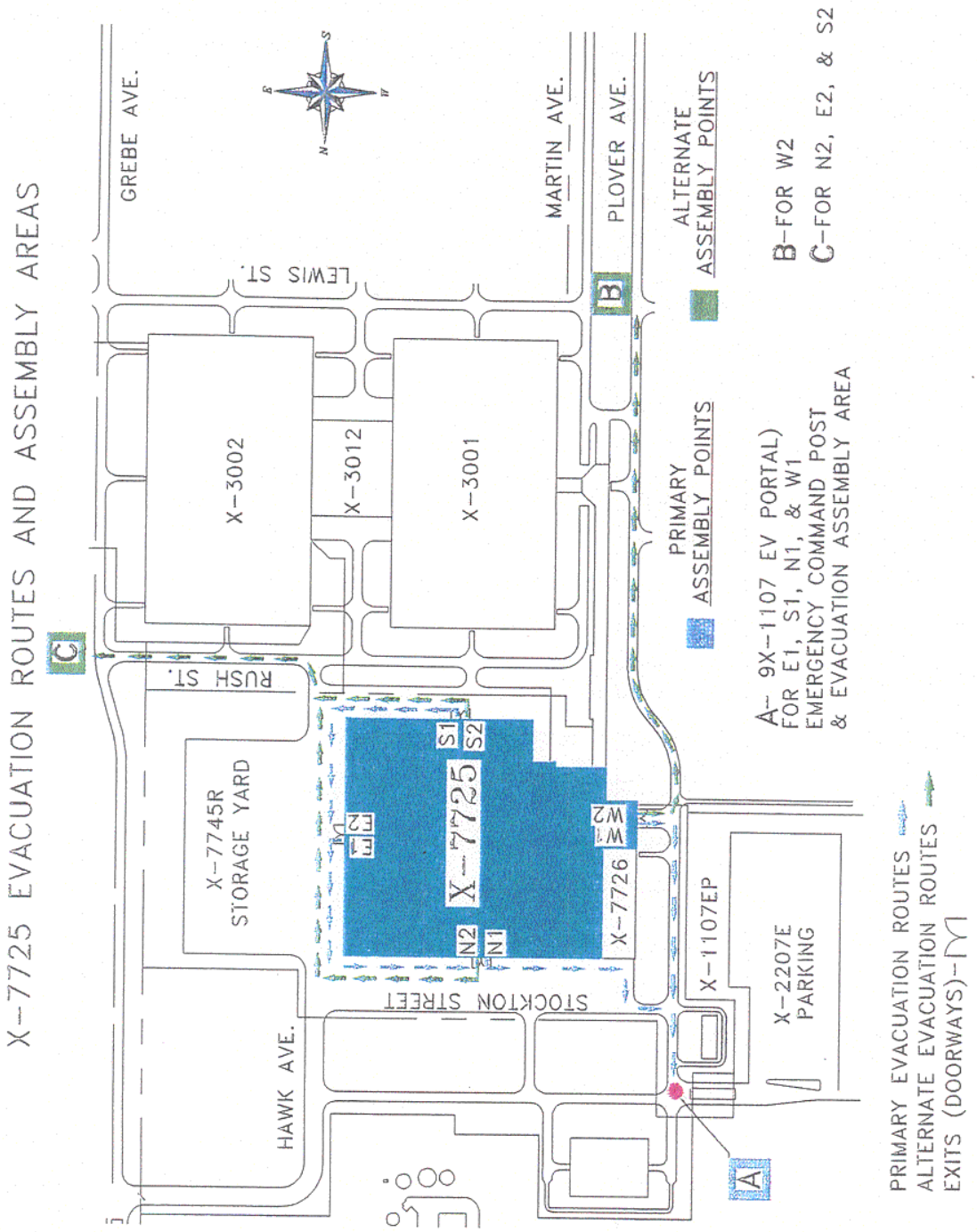


Figure G-6. X-7725 Evacuation Assembly Areas

Attachment 1

Emergency Agreements/Arrangements

Lockheed Martin Utility Services, Inc.
Portsmouth Gaseous Diffusion Plant
P.O. Box 628 MS 5000 Piketon, Ohio 45661
Telephone: (740) 897-2193

LOCKHEED MARTIN

April 6, 1999
POEF-170-99-065

Multiple Addressees

Transition to United States Enrichment Corporation

This letter is to inform you that on May 18, 1999, the United States Enrichment Corporation (USEC) will be the sole manager of the Portsmouth Gaseous Diffusion Plant's production facilities. As mutual aid agreements, letters of assistance, and memoranda of understanding are due for renewal, references to "Lockheed Martin Utility Services, Inc." will be changed to "USEC."

If you have any questions about this transition, please call me at 740-897-6122.

Sincerely,

Marty Redden, Manager
Emergency Management Group

Chief Harold Cooper
Pebble Township Fire Department
18794 State Route 772
Waverly, Ohio 45690

Chief Greg Holdren
Benton Township Fire Department
13553 State Route 124
Idaho, Ohio 45661

Chief Jack Harris
East Jackson Township Fire Department
16553 State Route 335
Beaver, Ohio 45613

Chief Carl Hines
Scioto Township Fire Department
2000 Wakefield Mound Road
Piketon, Ohio 45661

Chief Charlie Brunner
Stockdale Fire Department
Stockdale, Ohio 45683

Chief Randy Armbruster
Waverly Fire Department
316 Elizabeth Lane
Waverly, Ohio 45690

Chief Roger Overly
Beaver Fire Department
5540 State Route 335
Beaver, Ohio 45613

Mr. Jerry Wessel, Chief
Pike County Firefighter's Association
612 Giers Road
Waverly, Ohio 45690

Chief Bryan McDowell
Camp Creek Fire Department
101 Hungry Hollow Road
Lucasville, Ohio 45648

Chief Chuck Valentine
Waverly Squad #2
P. O. Box 364
Waverly, Ohio 45690

Chief Jason Fields
Beaver Squad #3
86 West Road
Beaver, Ohio 45613

Chief Beth Trent
Piketon Squad #4
219 Forsythe Street
Piketon, Ohio 45661

Chief Todd Brannan
Elm Grove Squad #5
9220 State Route 772
Piketon, Ohio 45661

Chief Darla Cooper
Pebble Township Squad #7
18794 State Route 772
Waverly, Ohio 45690

Chief Marion Massie
Benton Township Squad #8
545 Walls Road
Waverly, Ohio 45690

Chief Charles Leeth
Piketon Fire Department
Piketon, Ohio 45661

Chief Jeff Beekman
Elm Grove Fire Department
8349 State Route 772
Piketon, Ohio 45661

Lt. Robert Woodford
Ohio State Highway Patrol
Post 73
Lucasville, Ohio 45648

Sheriff Marty Donini
Scioto County Court House
602 Seventh Street
Portsmouth, Ohio 45662

Ms. Tracy Casto
Director of Emergency Services
Pike Community Hospital
100 Dawn Lane
Waverly, Ohio 45690

Chief Dick Lusk
Pike Forest
334 Lapperell
Latham, Ohio 45646

Ms. Peggy Landrum
Director of Emergency Services
Adena Regional Medical Center
272 Hospital Road
Chillicothe, Ohio 45601

Commander Thomas M. Zerba
Department of the Army
71st Ordnance Detachment
52nd Ordnance Group
Dayton, Ohio 45433

Mr. Donald Simonton, Director
Pike Cty. Emergency Management Agency
2577 Alma Omega Road
Waverly, Ohio 45690

Mr. Larry Travis
Pike County LEPC/Sheriff
108 East Second Street
Waverly, Ohio 45690

Ms. Kim Carver, Director
Scioto County EMA
Court House - Room #2
Portsmouth, Ohio 45662

Mr. Theodore Jackson
Special Agent in Charge
550 Main Street, Room 9023
Cincinnati, Ohio 45202

Mr. Rod Crane
President, Med Flight
2827 West Dublin Granville Road
Columbus, Ohio 43235

Mr. Roger McAllister
Scioto County LEPC
P. O. Box 45
Rarden, Ohio 45671

Mr. James Williams
Deputy Director Ohio EMA
2855 West Dublin Granville Road
Columbus, Ohio 43235

Dr. William Aurich
Director of Emergency Services
Southern Ohio Medical Center
1805 27th Street
Portsmouth, Ohio 45662

VERN RIFFE JOINT VOCATIONAL SCHOOL
JOINT PUBLIC INFORMATION CENTER

This Understanding, by and between the Superintendent, Vern Riffe Joint Vocation School, and the United States Enrichment Corporation (USEC) General Manager, Portsmouth Gaseous Diffusion Plant (PORTS), is to provide for the use of the Vern Riffe (Pike County) Joint Vocational School (School) as a Joint Public Information Center (JPIC), in cases of emergency at PORTS, or at such times when USEC is called upon by the Pike County Emergency Management Agency in situations of major non-plant emergencies to provide JPIC and other assistance as needed.

More specifically, this Understanding authorizes occupancy of the School by personnel representing USEC, United States Department of Energy (DOE), DOE contractors, Ohio Emergency Management Agency, and Pike County Emergency Management Agency, for use as a JPIC in such cases of emergency. The PORTS General Manager or representative shall determine whether such requirements exists and shall initiate notification of other participants as to activation of JPIC operations at the School during the emergency.

Activation of the JPIC shall include but not be limited to use of: Classrooms, learning centers, libraries, offices, cafeteria areas, restrooms, parking lots, and equipment such as public address systems, photocopiers, television systems, typewriters, computers, and telephones.

USEC supplies and maintains a storage cabinet at the School for its own telephones, television equipment, visual aids, signs, and other material.

Dedicated telephone lines and radio antennae have been installed, at no cost to the School, for JPIC use as needed.

The School will periodically furnish USEC with names and current telephone numbers of School administrators and custodial personnel in order to enable them to be promptly requested to open the School and assist in JPIC activities.

On a case-by-case basis, the undersigned will consult and determine whether or not the circumstance require that School be dismissed during the emergency.

11-15-99
Date

Rick Delaney
Rick Delaney
Vern Riffe Joint Vocational School

11/17/99
Date

J. Morris Brown
J. Morris Brown
General Manager, PORTS USEC

WAVERLY CITY SCHOOL DISTRICT
UNITED STATES ENRICHMENT CORPORATION
LETTER OF AGREEMENT FOR RECEPTION CENTERS

This Letter of Agreement, by and between the Superintendent, Waverly City School District, and the United States Enrichment Corporation (USEC), Portsmouth Gaseous Diffusion Plant (PORTS) General Manager, is to provide for the use of Waverly High School as reception center for USEC personnel.

More specifically, this Letter of Agreement authorizes occupancy of an area of each school by USEC, Department of Energy, their contractors and tenants in the event of an evacuation of the PORTS reservation. The area of the school to be utilized by USEC will be determined by school personnel at the time of occurrence. The Crisis Manager, or designated representative, will determine the necessity for utilizing the school as reception centers and is responsible for ensuring that school personnel are notified of the impending arrival of evacuated personnel from the PORTS reservation.

Euggie Robertson, Superintendent
Waverly City School District

11-4-99
Date

J Morris Brown, General Manager
Portsmouth Gaseous Diffusion Plant

11/9/99
Date

VALLEY LOCAL SCHOOL DISTRICT
UNITED STATES ENRICHMENT CORPORATION
LETTER OF AGREEMENT FOR RECEPTION CENTER

This Letter of Agreement, by and between the Superintendent, Valley Local School District, and the United States Enrichment Corporation (USEC), Portsmouth Gaseous Diffusion Plant (PORTS) General Manager, is to provide for the use of Valley High School as a reception center for USEC personnel.

More specifically, this Letter of Agreement authorizes occupancy of an area of the school by USEC, the Department of Energy, and their contractors and tenants in the event of an evacuation of the PORTS reservation. The area of the school to be utilized by USEC will be determined by school personnel at the time of occurrence. The Crisis Manager, or designated representative, will determine the necessity for utilizing the schools a reception center and is responsible for ensuring that school personnel are notified of the impending arrival of evacuated personnel from the PORTS reservation.

Doug Booth, Superintendent
Valley Local School District

11/5/89
Date

J. Morris Brown, General Manager
Portsmouth Gaseous Diffusion Plant

11/17/89
Date

PIKE COUNTY SCHOOLS
UNITED STATES ENRICHMENT CORPORATION
LETTER OF AGREEMENT FOR RECEPTION CENTERS

This Letter of Agreement, by and between the Superintendent, Pike County School District, and the United States Enrichment Corporation (USEC), Portsmouth Gaseous Diffusion Plant (PORTS) General Manager, is to provide for the use of Eastern High School and Western High School as reception centers for USEC personnel.

More specifically, this Letter of Agreement authorizes occupancy of an area of each school by USEC, DOE, and their contractors and tenants in the event of an evacuation of the PORTS reservation. The area of the school to be utilized by USEC will be determined by school personnel at the time of occurrence. The Crisis Manager, or designated representative, will determine the necessity for utilizing the schools as reception centers and is responsible for ensuring that school personnel are notified of the impending arrival of evacuated personnel from the PORTS reservation.

D. Ronda Frueauff, Superintendent
Pike County School District

11/10/99
Date

J. Morris Brown, General Manager
Portsmouth Gaseous Diffusion Plant

11/12/99
Date

LETTER OF UNDERSTANDING

Adena Regional Medical Center is willing to accept employees from the United States Enrichment Corporation, the Department of Energy, and their contractors and tenants for evaluation and treatment of injuries, radiation exposure, and effects of toxic agents.

Peggy Landrum
Director of Emergency Services

11/02/99
Date

LETTER OF UNDERSTANDING

Southern Ohio Medical Center is willing to accept employees from the United States Enrichment Corporation, the Department of Energy, and their contractors and tenants for evaluation and treatment of injuries, radiation exposure, and effects of toxic agents.

Randal M. Arnett
President and Chief Executive Officer

11.2.99
Date

LETTER OF UNDERSTANDING

Pike Community Hospital is willing to accept employees from the United States Enrichment Corporation, the Department of Energy, and their contractors and tenants for evaluation and treatment of injuries, radiation exposure, and effects of toxic agents.

Richard E. Sobota
President & CEO

11-9-99
Date

Pike County
Emergency Medical Services
2577 Alma Omega Road
Waverly, Ohio 45690
Tele: 740-947-7346 Fax: 740-947-7337

TO: MARTY REDDEN
UNITED STATES ENRICHMENT CORPORATION

FROM: DONALD SIMONTON, COORDINATOR
PIKE COUNTY EMERGENCY MEDICAL SERVICE

DATE: NOVEMBER 8, 1999

SUBJECT: CONTINUED MEDICAL SERVICE

****

THE PIKE COUNTY EMERGENCY MEDICAL SERVICE WILL CONTINUE TO PROVIDE MUTUAL AID SERVICE TO THE UNITED STATES ENRICHMENT CORPORATION, DEPARTMENT OF ENERGY AND THEIR CONTRACTORS AND TENANTS.

IT IS THE GOAL OF PIKE COUNTY E.M.S., TO BE AVAILABLE AND PROVIDE SERVICE TO THE BEST OF ITS ABILITY.

DONALD SIMONTON
COORDINATOR
PIKE COUNTY EMERGENCY MEDICAL SERVICES

USEC
A Global Energy Company

MEMO OF UNDERSTANDING
BETWEEN UNITED STATES ENRICHMENT CORPORATION (USEC) AND THE PIKE COUNTY SHERIFF'S DEPARTMENT

United States Enrichment Corporation (USEC) and the Pike County Sheriff's Department each recognize the benefit of providing mutual assistance and cooperation.

USEC is committed to loan special equipment, such as riot control gear, metal detectors, night vision devices, and similar items requested by the Sheriff. Additionally, USEC makes available a variety of training aids (films, slides, audio/visual equipment, and miscellaneous equipment) for the Sheriff's training needs. USEC is committed to provide available resources, information, and any assistance to the Pike County Sheriff on an as-needed basis.

Similarly, the Sheriff recognizes that periodically the USEC Security Department requires official law enforcement assistance from the Pike County Sheriff's Department. This is provided by means of manpower deployment during demonstrations or other crisis situations occurring at or near facilities operated by USEC. Presently, during "O" shift hours Monday through Friday, the Sheriff can commit three officers initially with an additional ten deputies summoned and dispatched within fifteen minutes. On non-"O" shift hours, weekends, and holidays, two officers can be dispatched immediately with ten additional personnel contacted within fifteen minutes. These officers will arrive with the necessary equipment (weapons, radios, etc.) and will be in uniform. It is recognized that personnel from the Sheriff's Department would serve as arresting officers when needed.

If a security situation were determined to be critical at USEC, the Sheriff would arrange for additional assistance (manpower and/or equipment) through the Buckeye State Sheriff's Association (BSSA). This organization could dispatch officers from surrounding counties to a central assembly point near plantsite. Exact numbers and response times will vary.

Should a situation at USEC require a helicopter response, the Sheriff would make arrangements in one of three ways: (1) The Ross County Sheriff would be contacted to arrange for deployment of a Department of National Resources helicopter based in Ross County. It is felt the earliest response time would be 45 minutes from time of notification. (2) The BSSA would be requested to dispatch a helicopter from the nearest available agency. Response times would vary. (3) The Sheriff would request assistance through the Ohio State Highway Patrol General Headquarters. A two-hour minimum response time should be expected.

This memo outlines the cooperative relationship between the Pike County Sheriff's Department and the USEC Security Department, and is recognized as an asset to each organization in the performance of its duties.

J. Morris Brown — 3/11/99
J. Morris Brown
General Manager
Date

Larry Travis — 3-10-99
Larry Travis
Sheriff, Pike County
Date

P.O. Box 800, Portsmouth, OH 45661
Telephone 740-897-2255 Fax 740-897-2644 http://www.usec.com
Offices in Livermore, CA Paducah, KY Portsmouth, OH Washington, DC

Date: March 31, 1998

To Whom It May Concern:

Pike County Firefighters Association has voted and given Lockheed Martin Utility Services permission to use the County repeater to communicate with the fire departments of the County.

154.010 Transmitter

154.430 Receiver

131.8 Channel Guard

Harold L Smith
President

Witness

AGREEMENT FOR MUTUAL AID FOR ADDITIONAL FIRE PROTECTION

9.60 RCC

Pursuant to the provisions of paragraphs 1, 4 and 5 of Section 505.44 and ~~717.02~~ of the Revised Code of Ohio, this agreement is entered into this 20th day of May, 19 98 by and between the:

COPY

Waverly Fire Department
Beaver Fire Department
Piketon-Seal Township Volunteer Fire Department
Elm Grove Fire Department
Camp Creek Volunteer Fire Department
Pebble Township Volunteer Fire Department
Benton Township Volunteer Fire Department
Jackson Township Fire Department
Scioto Township Volunteer Fire Department
Stockdale Fire Department
Brush Creek Township Volunteer Fire Department
Lockheed Martin Utility Services, Inc., Fire Department

All political subdivisions under the laws of Ohio, Witnesseth:

THAT, WHEREAS, the respective political subdivisions hereinabove named have certain fire fighting equipment and firemen to operate the same, but which, in emergencies, may be inadequate to afford full and complete protection to said respective subdivisions, their contractual obligees, the inhabitants thereof, and their respective properties, and,

WHEREAS, it is desirable that in case of such emergency said respective parties hereto may have the additional fire protection which may be afforded by the fire fighting equipment and personnel of others of the respective parties hereto as may the, in the opinion of the Chief of Officer in charge, of such other party or parties hereto as are called upon, IT IS HEREBY MUTUALLY AGREED BY ANL BETWEEN SAID PARTIES AS FOLLOWS, to wit:

1. That for the purpose of affording additional protection to themselves, their contractual obligees, and their inhabitants, the parties hereto do hereby mutually agree to interchange the service of fire departments, and the use of fire apparatus and other emergency equipment, and to that end, it is hereby agreed that they, or any one or more of them shall assist the party hereto primarily responsible and responding to any fire alarm or fire call or other emergency from any Chief or Officer in charge, or other duly constituted public official which is a party of this agreement, with its or their fire fighting equipment or other emergency vehicles and firemen, and shall render like services in combating fires or other emergencies as it renders to itself and its own inhabitants, provided, however, that at no time shall the party or parties upon which the request is made, be required to respond with more than one piece of fire apparatus upon first alarm, and provided further, that in no case shall the party hereto or any of its inhabitants, or contractual obligees, for failure to answer any fire call or other emergency, or for lack of speed in answering any such call, or for any inadequacy of equipment, negligent operation of equipment, failure to extinguish any fire, or for any cause whatsoever growing out of such use of said fire or other equipment and firemen; nor shall the party hereto, which such use of said fire or other equipment and firemen; nor shall the party hereto, which issued such call be liable in any manner or event for damages or loss of equipment or personnel suffered by the party or parties answering such call.

2. That for the purpose of this agreement, mutual aid is hereby defined as "The aid rendered by or between subdivisions of government owned and operated fire fighting or other emergency equipment and shall not include primary response to any alarm of fire or other emergency made by a subdivision legally responsible for such primary response."

3. This contract shall be made and remain in full force and effect for perpetuity, provided, however, that any party may terminate this contract upon thirty days notice, in writing, to all other

COPY

parties.

IN WITNESS WHEREOF, said respective political subdivisions parties hereto, have hereunto caused this agreement to be executed as provided by ordinance or resolution duly adopted for that purpose, a copy of which is hereto appended, this 20th day of May, 19 98.

City of Waverly, Ohio
Mayor
Chief

Village or Township of Piketon-Seal Township Volunteer Fire Department
Trustee
Chief

Village of Beaver, Ohio 45613
Mayor Trustee
Chief

Elm Grove Fire Department
Trustee
Chief

Township of Camp Creek
Trustee NOT APPLICABLE
Chief

Township of Pebble Township
Trustee
Chief

Township of Benton Township
Trustee
Chief

Township of Jackson Township
Trustee
Chief

Township of Scioto Township
Trustee
Chief

Stockdale Fire Department
BOARD MEMBER Trustee
Chief

Township of Brush Creek
Trustee NOT APPLICABLE
Chief NOT APPLICABLE

Lockheed Martin Utility Services, Inc.
for General Manager 12/14/97
Legal 5/20/98

cc: Records Management/EM - RC (17-AS8-ES0)

SUBMISSION DATE: February 21, 2000

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H-1C Training Director [3745-54-16] H-2

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H-3 Record keeping [3745-54-16] H-3

Section H
Personnel Training

H-1 Outline of Training [3745-54-16]

Hazardous waste personnel are trained to respond effectively to emergencies, as deemed appropriate to the job descriptions; to perform their duties in a way that ensures the facility's compliance with the requirements of the hazardous waste facility standards chapters; and to implement the contingency plan. Hazardous waste personnel are familiarized with emergency procedures, emergency equipment, and emergency systems. At a minimum, all personnel at the site are trained to recognize emergencies and respond effectively using the methods listed in Section G-3. Training is completed within six months of employment or assignment to a position that may involve contact with hazardous materials and/or wastes. After completion of initial training, personnel are required to complete refresher training at varying intervals, such as annual or biennial, depending on the type of training. Training consists of classroom instruction, on-the-job training, and required reading materials.

H-1A Job Title/Job Description [3745-54-16]

The job title and written job description for each position at the facility related to hazardous waste management and the name of each employee filling the positions related to hazardous waste management are maintained at the site.

H-1B Training Content, Frequency and Technique [3745-54-16]

The training program consists of classroom training, on-the-job training, and required reading materials. The content of the training program for hazardous waste personnel is comprised of hazardous waste management procedures, contingency plan implementation, emergency procedures, emergency equipment, and emergency systems, including, where applicable, procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment; key parameters for automatic waste feed cut-off systems; communications and alarm systems; response to fire or explosions; response to groundwater contamination incidents; and

shutdown of operations. Training to meet actual job tasks is accomplished through on-the-job training. The on-the-job training program is conducted by direct supervision or by qualified instructors. This training includes operational and job safety requirements specific to the actual job task. Refresher training is completed on an annual or biennial basis, depending on the type of training. On-the-job training is conducted as needed.

H-1C Training Director [3745-54-16]

The program is administered by the direct supervisors of hazardous waste personnel, or their designees, who are trained in hazardous waste management procedures. An annual review of the initial training is conducted by the direct supervisors of hazardous waste personnel to ensure that all hazardous waste personnel have completed the necessary training.

H-1D Relevance of Training to Job Position [3745-54-16]

The training requirements are tailored to individual job positions and are demonstrated by the completion of the on-the-job training program. Training requirements are reviewed annually, and the initial, refresher, and on-the-job training curricula are revised as necessary.

H-1E Training for Emergency Response [3745-54-16]

The training program is designed to ensure that hazardous waste personnel handle hazardous wastes safely, respond properly to emergency situations, and implement the contingency plan. The program trains hazardous waste personnel to maintain compliance under both normal operating conditions and emergency conditions.

H-2 Implementation of Training Programs [3745-54-16]

All hazardous waste personnel receive training, relevant to the position for which they are employed, by qualified personnel consistent with the regulatory requirements. Additionally, hazardous waste personnel receive OSHA mandated 24-hour training as described in 29 CFR 1910.120. All hazardous waste personnel must complete initial training within six months from their

date of assignment to a hazardous waste job. No employee assigned to perform a hazardous waste job will work unsupervised prior to completion of the training program.

H-3 Record keeping [3745-54-16]

Individual training records, the job titles for each position, job descriptions, names of employees, and a written description of the type and amount of both introductory and continuing training that will be given to each person filling a position related to hazardous waste management are maintained at the site. The training records for current hazardous waste personnel are maintained until closure of the facility and the training records for former hazardous waste employees are kept for at least three years from the date the employee last worked at the facility.

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I-1 Closure Plans [3745-50-44(A)(13)] I-1

I-2 Post-Closure Plan [3745-50-44, 3745-55-18] I-1

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Appendices

I-1 Closure Plan for the X-326 Unit ..... Volume 4

I-2 Closure Plan for the X-7725 Unit ..... Volume 4

Section I

Closure Plan, Post-Closure Plan, and Financial Requirements

I-1 Closure Plans [3745-50-44(A)(13)]

Closure plans for X-326 and X-7725 container storage units currently operating under the Resource Conservation and Recovery Act Part B Permit #04-57-0680, EPA ID No. OH7890008983, are included as Appendices I-1 and I-2, respectively. The director will be notified in writing at least forty-five days prior to the date on which final closure is expected to begin. Amendments to the closure plans may be submitted in a written permit change request anytime prior to the notification of closure of the container storage units. Section I-1a to I-1e of the RCRA Part B Permit Application Checklist are addressed in the respective closure plans in Appendix I.

I-2 Post-Closure Plans [3745-55-18]

Not applicable

I-3 to I-8

The information required by these sections of the RCRA Part B Checklist are addressed in the respective closure plans in Appendix I.

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J-1 Use of a Manifest System [3745-54-71, 3745-54-72 and 3745-54-76] J-1

J-2 Operating Record [3745-54-73 and 3745-54-74] J-1

Section J

Record keeping

J-1 Use of a Manifest System [3745-54-71, 3745-54-72 and 3745-54-76]

Currently PORTS does not accept any hazardous waste for treatment, storage or disposal from offsite locations. PORTS will accept treatment residues (i.e. incinerator ash) returned as a result of treatment of its wastes. PORTS will maintain a manifest tracking system for each incoming shipment. The following information will be verified before PORTS signs the manifest accepting the residue for storage:

- Information on the Hazardous Waste Manifest
- The quantity or type of hazardous waste designated on the manifest or shipping paper (i.e. for bulk waste, variations greater than 10% and for batch waste, any variation in the count)
- Evidence of tampering
- LDR Notification
- Treatment Standards
- Laboratory analysis confirming the LDR determination
- Back-up laboratory analysis that confirms any other hazardous designations attached to the waste (i.e. because of incineration, heavy metals may have concentrated in the waste, thus causing the residue to become a TCLP characteristic waste).

If a significant discrepancy is found (i.e. number of drums does not match the manifest, weight of bulk waste is not within 10% of weight on manifest, evidence of tampering is present, etc.), PORTS will contact appropriate personnel to resolve the discrepancy (i.e. by telephone). If the discrepancy is not resolved in 15 days, PORTS will immediately submit to the director a letter describing the discrepancy and all attempts to resolve it, as well as a copy of the manifest and/or shipping paper at issue.

J-2 Operating Record [3745-54-73 and 3745-54-74]

PORTS maintains a written operating record for all hazardous waste management activities at the permitted storage units, as required by 3745-54-73 and Appendix I, Record Keeping Instructions. The operating record contains the information, as it becomes available, regarding the

description, quantity, location and characteristics of the hazardous waste generated at the facility; records and results of waste analyses; the methods and dates of storage; the information required in the notice (except the manifest number) required by 3745-59-07; inspection logs; ground water monitoring data; summary reports and details of all incidents that require implementing the contingency plan; certification of a program to reduce the volume and toxicity of hazardous waste generated; and reports to regulatory agencies.

The information in the operating record will be maintained until closure of the hazardous wastes units at which time the information will be archived. The records and results of inspections required by 3745-54-15 (D) will be kept for at least three years from the date of inspection. The information in the operating record is available for inspection at all reasonable times.

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K-1 Other Federal Laws [3745-50-44] K-1

Section K
Other Federal Laws

K-1 Other Federal Laws [3745-50-44]

The PORTS site is subject to all applicable federal laws.

Clean Water Act

An NPDES permit (0IO00000), has been obtained for the site from the Ohio EPA. No discharges are associated with the container storage units.

Clean Air Act

All activities conducted in the container storage units are evaluated for compliance with the Clean Air Act on a case by case basis, and necessary permits are obtained from the Ohio EPA. No emissions are associated with the routine operations of the container storage units.

Fish and Wildlife Coordination Act

No body of water will be diverted or modified as a result of the operation of the container storage units, and therefore, the Fish and Wildlife Coordination Act is not applicable to this permit application.

Wild and Scenic Rivers Act

There will be no adverse effects on any wild or scenic rivers as a result of the operation of the container storage units, and therefore the Wild and Scenic Rivers Act is not applicable to this permit application.

Endangered Species Act

No endangered species will be jeopardized or have its critical habitat adversely affected as a result of the operation of the container storage units, and therefore, the Endangered Species Act is not applicable to this permit application.

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The National Historic Preservation Act of 1966

There will be no effect on any properties eligible to be listed on the National Register of Historic Places as a result of the operation of the container storage units, and therefore the National Historic Preservation Act of 1966 is not applicable to this permit application.

The Coastal Zone Management Act

The PORTS facility is not in a coastal zone, and therefore the Coastal Zone Management Act is not applicable to this permit application.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

PORTS is subject to NESHAP regulations (40 CFR 61). The U.S. EPA Region V has oversight responsibility and permitting authority for NESHAP regulations. All NESHAP related reports are sent to U.S. EPA Region V. NESHAP regulations on radionuclides limit doses to any member of the general public to 25 millirem (mrem) to the whole body and 75 mrem to the critical organ. Doses are calculated annually based on actual measured radionuclide concentrations.

Superfund Amendments and Reauthorization Act

Compliance with the Superfund Amendments and Reauthorization Act (SARA) regulations is coordinated with other environmental regulations, including RCRA, CAA, and CWA. Material inventories, material usage, waste inventories, waste treatment, waste shipments, and chemical releases are tracked for emergency release notifications and inclusion in the annual SARA reports submitted to the U.S. EPA and Ohio EPA. Environmental control specialists review the aforementioned data for technical accuracy.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires evaluation of environmental impacts for proposed activities at federal facilities and for activities funded with federal dollars. All activities conducted in the container storage units are evaluated in accordance with NEPA.

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L-2 Specific Part B Information Requirements for Equipment L-1

L-3 Specific Part B Information Requirements for Facilities that Store Hazardous Waste in Containers L-1

Section L

Organic Air Emissions

L-1 Specific Part B Information Requirements for Process Vents

The Portsmouth Gaseous Diffusion Plant (PORTS) does not have any equipment of the listed types that are used to recycle, recover, or reprocess hazardous wastes; therefore, PORTS does not have any equipment which is subject to Subpart AA.

L-2 Specific Part B Information Requirements for Equipment

PORTS does not have any equipment of the listed types which contains or contacts hazardous wastes containing at least 10 percent organics; therefore, PORTS does not have any equipment which is subject to Subpart BB.

L-3 Specific Part B Requirements for Facilities that Store Hazardous Waste in Containers

The container storage units are facilities used solely for the management of radioactive mixed waste in accordance with the applicable regulations under the authority of the Atomic Energy Act and the Nuclear Waste Policy Act; therefore, the units are not subject to Subpart CC requirements.

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M-1 Solid Waste Management Units [3745-50-44] M-1

Table

M-1 Solid Waste Management Units M-2

Section M
Solid Waste Management Units

M-1 Solid Waste Management Units [3745-50-44]

Solid Waste Management Units (SWMUs) located within the PORTS facility boundaries are listed in Table M-1.

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Table M-1
Solid Waste Management Units

UNIT NUMBER	UNIT TITLE
X-231A	OIL BIODEGRADATION PLOT
X-231B	OIL BIODEGRADATION PLOT
X-701BP	NORTHEAST OIL BIODEGRADATION PLOT
X-614A	SEWAGE LIFT STATION
X-614B	SEWAGE LIFT STATION
X-614D	SEWAGE LIFT STATION
X-614P	SEWAGE LIFT STATION
X-615	ABANDONED SANITARY SEWAGE TREATMENT PLANT
X-616	EFFLUENT CONTROL FACILITY/FORMER CHROMIUM SLUDGE LAGOONS
X-617	pH ADJUSTMENT
X-622T	CARBON FILTRATION UNIT
X-622	SOUTH GROUNDWATER TREATMENT FACILITY
X-623	NORTH GROUNDWATER TREATMENT FACILITY
X-624	GROUNDWATER TREATMENT FACILITY
X-625	GROUNDWATER TREATMENT FACILITY
X-626	RECIRCULATING WATER PUMP HOUSE AND COOLING TOWER
X-630	COOLING TOWER BASIN
X-630-1 X-630-2 X-630-2	RECIRCULATING WATER PUMP HOUSE, COOLING TOWER, AND ACID HANDLING STATION
X-633	RECIRCULATING WATER PUMP HOUSE AND COOLING TOWER
X-701E	NEUTRALIZATION FACILITY
X-230G	RCW SYSTEM
X-6614E	SEWAGE LIFT STATION
X-6614J	SEWAGE LIFT STATION
X-6619	SEWAGE TREATMENT FACILITY
	SANITARY SEWER SYSTEM

Table M-1 (continued)

UNIT NUMBER	UNIT TITLE
	STORM SEWER SYSTEM
X-103	AUXILIARY OFFICE BUILDING
X-104A	INDOOR FIRING RANGE
X-114A	FIRING RANGE
X-120	OLD TRAINING FACILITY SITE
X-326	PROCESS BUILDING
X-330	PROCESS BUILDING
X-333	PROCESS BUILDING
X-343	FEED VAPORIZATION AND SAMPLING FACILITY
X-344C X-344D	HF STORAGE FACILITY AND HF NEUTRALIZATION PIT
X-600 X-600A	COAL FIRED STEAM PLANT AND COAL STORAGE YARD
X-700	CHEMICAL CLEANING FACILITY (SOILS ONLY)
X-700 X-705	PROCESS WASTE LINE SOILS
X-700T	TCE/TCA OUTSIDE STORAGE TANK (SOILS ONLY)
X-701C	NEUTRALIZATION PIT (SOILS ONLY)
X-705	DECONTAMINATION BUILDING (SOILS ONLY)
X-705A X-705B	RADIOACTIVE WASTE INCINERATION /CONTAMINATED BURNABLES STORAGE LOT (SOILS ONLY)
X-710	TECHNICAL SERVICES BUILDING AND NEUTRALIZATION PIT (SOILS ONLY)
X-720	MAINTENANCE BUILDING (SOILS ONLY)
X-736	CONSTRUCTION SPOILS AREA
X-744Y X-744G	WASTE STORAGE YARD AND BULK STORAGE BUILDING (SOILS ONLY)
X-744W	SURPLUS AND SALVAGE WAREHOUSE
X-749	CONTAMINATED MATERIALS DISPOSAL FACILITY (SOILS ONLY)
X-751	MOBILE EQUIPMENT GARAGE

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Table M-1 (continued)

UNIT NUMBER	UNIT TITLE
X-760	PILOT INVESTIGATION BUILDING AND NEUTRALIZATION PIT (SOILS ONLY)
X-770	MECHANICAL TESTING FACILITY
X-3001	PROCESS BUILDING
X-3346	FEED AND WITHDRAWAL FACILITY
	BARREN AREA
	OLD NORTHWEST FIRING RANGE (RUBY HOLLOW)
	RAILROAD SPUR YARD STORAGE AREA
	TRANSFORMER CLEANING STORAGE PAD
X-530A X-530B X-530C X-530D X-530E X-530F X-530G	SWITCHYARD, SWITCH HOUSE, TEST AND REPAIR BUILDING, OIL HOUSE, VALVE HOUSE, AND GCEP OIL PUMPING STATION
X-533A X-533B X-533C X-533D X-533E X-533F X-533H	SWITCHYARD, SWITCH HOUSE, TEST AND REPAIR BUILDING, OIL HOUSE AND ASSOCIATED FRENCH DRAINS, VALVE HOUSES, AND GAS RECLAIMING CART GARAGE
X-747G	NORTHEAST CONTAMINATED MATERIAL STORAGE YARD (SOILS ONLY)
X-747F	MISCELLANEOUS MATERIALS STORAGE YARD
X-747H	NORTHWEST SURPLUS AND SCRAP YARD
	DON MARQUIS SUBSTATION (DRAINAGE COLLECTION PONDS) AND CONSTRUCTION SPOILS
X-326	CONTAINER STORAGE UNIT (L-CAGE)
X-326	PCB STORAGE UNIT
X-330	PCB STORAGE AREA
X-333	PCB STORAGE AREA
X-705B	CONTAMINATED BURNABLES STORAGE LOT
X-741	OIL DRUM STORAGE FACILITY

Table M-1 (continued)

UNIT NUMBER	UNIT TITLE
X-744G	UNRESTRICTED CONTAINER STORAGE UNIT
X-744G	RESTRICTED CONTAINER STORAGE UNIT
X-744P X-744N X-744Q	WAREHOUSES AND ASSOCIATED OLD CONSTRUCTION HEADQUARTERS
X-744S X-744T X-744U	WAREHOUSES
X-744RW	RETRIEVABLE WASTE STORAGE AREA
X-744Y	RAD WASTE STORAGE YARD
X-745B	ENRICHMENT PROCESS GAS YARD
X-745C	WEST CYLINDER STORAGE YARD
X-745E	NORTHWEST INTERNATIONAL PROCESS GAS YARD
X-745F	NORTH PROCESS GAS STOCKPILE YARD
X-752	HAZARDOUS WASTE STORAGE FACILITY
XT-847	WAREHOUSE
X-7725 X-7745R BFS FACILITY	RECYCLE & ASSEMBLY BUILDING, RECYCLE & ASSEMBLY STORAGE YARD, AND INITIAL CONSTRUCTION BULK FUEL STORAGE AREA (BULK FUEL STORAGE SWMU)
X-7725	CONTAINER STORAGE UNIT
X-7725	NON-HAZARDOUS WASTE CONTAINER STORAGE UNIT
X-7725R	STORAGE YARD
X-334	TRANSFORMER STORAGE AND CLEANING BUILDING
X-342A X-342B X-342C	FEED VAPORIZATION AND FLUORINE GENERATION BUILDING, FLUORINE STORAGE BUILDING, AND WASTE HF NEUTRALIZATION PIT
X-344 X-344A	URANIUM HEXAFLUORIDE SAMPLING FACILITY AND SETTLING TANK
X-344D	HF NEUTRALIZATION PIT
X-700CT	CHEMICAL AND PETROLEUM STORAGE CONTAINMENT TANKS

Table M-1 (continued)

UNIT NUMBER	UNIT TITLE
X-701C	NEUTRALIZATION PIT
X-701E	NEUTRALIZATION FACILITY
X-710	RADIOACTIVE WASTE PIT
X-720	NEUTRALIZATION PIT AND SOILS
X-740	WASTE OIL HANDLING FACILITY
X-750	MOBILE EQUIPMENT MAINTENANCE SHOP, FUEL STATION, AND WASTE OIL TANK
X-751	MOBILE EQUIPMENT GARAGE
X-760	NEUTRALIZATION PIT
	CHEMICAL AND PETROLEUM CONTAINMENT BASINS (EAST OF X-533A) AND EMERGENCY CONTAINMENT TANKS
	GCEP UNDERGROUND STORAGE TANKS
X-230J3	RUNOFF POND
X-230J3	WEST ENVIRONMENTAL SAMPLING BUILDING AND INTERMITTENT CONTAINMENT BASIN
X-230J5	WEST HOLDING POND AND OIL SEPARATION BASIN
X-230J6	NORTHEAST HOLDING POND, MONITORING STATION, AND SECONDARY OIL COLLECTION BASIN
X-230J7	EAST HOLDING POND AND OIL SEPARATION BASIN
X-230K	SOUTH HOLDING POND
X-611A	NORTH, MIDDLE, AND SOUTH LIME SLUDGE LAGOONS
X-611B	LIME SLUDGE LAGOON
X-621	COAL PILE RUNOFF TREATMENT FACILITY
X-701B	HOLDING POND, CONTAINMENT PONDS AND RETENTION SOILS
X-2230M	SOUTHWEST HOLDING POND, WASTE PILE AND X-617 pH ADJUSTMENT UNIT
X-2230N	WEST HOLDING POND NO. 2
X-734 X-734A X-734B	OLD SANITARY LANDFILL, CONSTRUCTION SPOILS LANDFILL, AND OLD CONSTRUCTION SPOILS LANDFILL
X-735	RCRA LANDFILL

Table M-1 (continued)

UNIT NUMBER	UNIT TITLE
X-735 AND X-735A	SANITARY LANDFILL AND LANDFILL UTILITY BUILDING
X-749 NORTH	HAZARDOUS WASTE LANDFILL
X-749 SOUTH	SOLID WASTE LANDFILL
X-749A	CLASSIFIED MATERIALS DISPOSAL UNIT
X-749B	PETER KIEWIT LANDFILL
	BIG RUN CREEK
	EAST DRAINAGE DITCH
	LITTLE BEAVER CREEK
	NORTH DRAINAGE DITCH, X-230L NORTH HOLDING POND, AND UNNAMED CONSTRUCTION FILL AREA
	NORTHEAST DRAINAGE DITCH
	WEST DRAINAGE DITCH
	5-UNIT GROUNDWATER PLUME
	7-UNIT GROUNDWATER AREA
	X-701B AREA GROUNDWATER AREA
	X-740 WASTE OIL HANDLING FACILITY (GROUNDWATER ONLY)
	X-749/X-120 GROUNDWATER PLUME

Section N

Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

U.S. Department of Energy
Owner and Operator

Site Manager _____ Date Signed 2/17/2000

Bechtel Jacobs Company LLC
Co-Operator

BY: _____ Manager of Projects _____ Date Signed 2/17/00

"The Department of Energy has signed this application for the permitted facility as "owner and operator" and Bechtel Jacobs Company LLC has signed as co-operator. The Department has determined that dual signatures best reflect the actual apportionment of responsibility under which the Department's RCRA responsibilities are for policy, programmatic, funding and scheduling decisions, as well as general oversight; and, the contractor's RCRA responsibilities for day-to-day operations, (in accordance with general directions given by DOE as part of its general oversight responsibility), including but not limited to, the following responsibilities: waste analysis and handling, monitoring, record keeping, reporting, and contingency planning. For purposes of the certification required by OAC 3745-50-42(D) the DOE and Bechtel Jacobs Company representatives certify, to the best of their knowledge and belief, the truth, accuracy and completeness of the application for their respective areas of responsibility."

Appendix E
PORTSMOUTH DOCUMENT RELEASE FORM
Page 1 of 1

Document Description (To Be Completed By Requester)

Document Number: DOE/OR/11-3037/20 ☑ Draft ☐ Final **Document Date:** Jan 2000
Document Title/Identifier: RCRA Part B Permit Renewal Application
Author(s) Name and Affiliation: EQ Midwest
Purpose of Release:

Technical Editor: _____
Signature/Date

COMMENTS:

Requester: **Date:**

PATENT, CLASSIFICATION, AND PUBLIC RELEASE REVIEWS
(To Be Completed By Classification and Technical Review Office)

Patent Review:
- ☑ Does not contain
- ☐ Contains Patentable/Proprietary information and/or has clearance patent information and can not be released.

Classification:
- ☑ Document is Unclassified
- ☐ Document is Classified

ADC: _____
Signature/Date

Public Release:
- ☐ Not approved for release
- ☐ Contains UCNI
- ☑ Approved for release
- ☑ Does not contain UCNI
- ☐ For internal use only

Remarks:

Classification and Technical Information Office: Henry H. Thomas 2/16/00
Signature/Date

Send to OSTI? ☐ Yes ☑ No

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Co./Dept.	Co.
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Fax # 3791	Fax #

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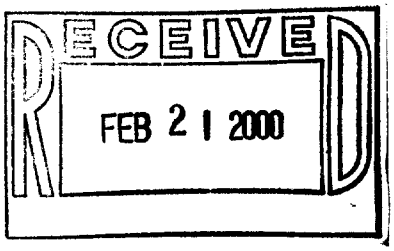
DOE/OR/11-3037/V2&D0

RCRA Part B Permit Renewal Application

**At the Portsmouth Gaseous Diffusion Plant,
Piketon, Ohio**

Volume 2. Appendix C-1 AND C-2

This document has received the appropriate
reviews for release to the public. Date: 02/15/00



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EQ MIDWEST

contributed to the preparation of this document and should not be considered an eligible contractor for its review.

DOE/OR/11-3037V2&D0

RCRA Part B Permit Renewal Application for the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio

Volume 2.

Appendix C-1 Documentation Supporting Characterization
Appendix C-2 Material Safety Data Sheets

Date Issued — February 21, 2000

Prepared by
EQ Midwest, Inc.
Cincinnati, OH
under subcontract 23900-SC-SM002F

Prepared for the
U.S. Department of Energy
Office of Environmental Restoration and Waste Management

BECHTEL JACOBS COMPANY LLC
managing the
Environmental Management Activities at the
Portsmouth Gaseous Diffusion Plant

Bechtel Jacobs Company LLC
P.O. Box 900
Piketon, Ohio 45661

under contract DE-AC05-98OR22700
for the
U.S. DEPARTMENT OF ENERGY

This document has received the appropriate
reviews for release to the public.

Waste Stream Number: SW-10

Waste Stream Title: RCW/RHW System Wastes

W SW-10
4W

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 930202-036 Project: WMGT RFD Customer Sample ID: RFD-11138
Customer: WASTE MANAGEMENT Requisition Number: 000021
Date Sampled: 2-FEB-1993 Date Sample Received: 2-FEB-1993
Sampled By: B KELLEY Date Sample Completed: 10-MAY-1993
Material Description: X333 CHROMATE WATER

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
	Uranium (Waste)	COMMENT			DK PEREZ	4-FEB-1993	NA
SW846-3051	Arsenic	3.1		mg/Kg	AL SHULTZ	4-FEB-1993	93080068
	Barium	3.7		mg/Kg	AL SHULTZ	4-FEB-1993	93080068
	Cadmium	1.8		mg/Kg	AL SHULTZ	4-FEB-1993	93080068
	Chromium	37.9		mg/Kg	AL SHULTZ	4-FEB-1993	93080068
	Lead	9.6		mg/Kg	AL SHULTZ	4-FEB-1993	93080068
	Selenium	3.8 U		mg/Kg	AL SHULTZ	4-FEB-1993	93080068
SW846-7470	Mercury	0.01 UN		mg/Kg	EK GILBERT	15-FEB-1993	93080086
S	Silver	<2		mg/kg	EK GILBERT	15-APR-1993	93080210
S..o-8080	PCB (TOTAL)	4.6		ug/ml	JN STRICKLAND	12-FEB-1993	93160044
TSD553-230	Gross Alpha Activity (Water)	20.1		pCi/mL	JJ SISLER	8-FEB-1993	93070176
	Gross Beta Activity (Water)	36.4		pCi/mL	JJ SISLER	8-FEB-1993	93070176
TSD553-380	Technetium (Waste)	J 6.0		pCi/mL	JJ SISLER	8-FEB-1993	93070175
TSD553-440	TOTAL URANIUM	93.5		ppm U	JD LITTERAL	22-FEB-1993	93070304

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
MERCURY	2	1.221	61.05
PCB (TOTAL)	1.19	0.9	75.63
SILVER	49.116	45.873	93.40

***** Comments from the Environmental and Industrial Hygiene Laboratory *****

Uranium analyzed by dept. 553.

Inorganic Data Reporting Qualifiers and Flags:
Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).
lyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for
mple weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

Laboratory Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
D. E. Boyd (Spectrochemistry/ICP Laboratory)
D. K. Perez (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)

Date Approved: 10-MAY-1993

AnaLIS ID: 930202-036
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD-11138
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number: 000021
Date Sample Received: 2-FEB-1992
Date Sampled: 2-FEB-1993

Solvents_Volatiles

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 8-FEB-1993
QA File Number: 93160046
Dilution Factor: .5
Analyst: PJ WARD

CAS		ug/ml	CAS		ug/ml
71-43-2	Benzene	140			
	2-Butanone (MEK)	20U			
56-23-5	Carbon Tetrachloride	0.01U			
108-90-7	Chlorobenzene	20U			
67-66-3	Chloroform	0.01U			
	p-Dichlorobenzene	0.03U			
107-06-2	1,2-Dichloroethane	0.25U			
75-35-4	1,1-Dichloroethene	0.01U			
127-18-4	Tetrachloroethene	0.01U			
79-01-6	Trichloroethene	0.01U			
75-01-4	Vinyl Chloride	NA			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Waste Stream Number: SW-1

Waste Stream Title: Laboratory Off-Specification Chemicals

C ner Smpl Id: VER46197001 Matrix: LIQUID Sampled: 08/27/98 10:25:00
c:X-04-WM BJC09825 Protocol:RCRA Received: 08/27/98 13:44:35
Suoproj Analyses:LIQUID Status: APPROVED Needed: 10/01/98 23:59:00
Customer:J A APPLEGATE Location: Approved: 09/30/98 17:05:59
COC#: 061114
Sample Desc:
Customer Comments:
Lab Smpl Comments:

SW-1

Analy Meth:SW846-3015 QC Batch: Test:3015PREP Rpt Basis:none Date Approved
Prep Meth: Analyzed:09/11/98 00:00:00 K A DAYS Approver: D K PEREZ 09/25/98 14:37

Analy Meth:SW846-6010A QC Batch: Test:6010AMETALS2 Rpt Basis:none Date Approved
Prep Meth: SW846-3015 Analyzed:09/12/98 00:00:00 T E SHOOK Approver: D K PEREZ 09/30/98 16:50

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Arsenic	5880		ug/L	NU			20		
Barium	280		ug/L	U			20		
Cadmium	5670		ug/L				20		
Chromium	4080		ug/L				20		
Lead	5880		ug/L	NU			20		
Selenium	6760		ug/L	U			20		
Silver	820		ug/L	U			20		

Comments: QC File: 98080745

Analy Meth:SW846-1010 QC Batch: Test:FLASHPOINT Rpt Basis:none Date Approved
Prep Meth: Analyzed:09/02/98 00:00:00 L E WILLIAMS Approver: D K PEREZ 09/30/98 17:04

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Flash Point Closed Cup	>80		deg C				1		

Comments: QC File: 98CS0215
FLASH POINT DUPLICATE READ >80 oC

EPA Qualifiers:
N - Sample spike recovery not within control limits.
U - Analyte analyzed for but undetected. Analyte result was below the Instrument Detection Limit (IDL).

Analy Meth:SW846-3520 QC Batch:QC98265015 Test:ORGEXT-SVOC Rpt Basis:none Date Approved
Prep Meth: Analyzed:09/08/98 00:00:00 D K SCAGGS Approver: C J VANMETER 09/24/98 16:46

Comments: Method SW846-3520B
The original pH of this sample was -2, so only a small amount of acid was added for the first extraction. During the addition of the base, heat and foaming were observed in the extraction column due to the large amount of base needed to achieve a pH >11. The top layer of liquid in the extraction column was a brownish color. The bottom layer of liquid in the extraction column was mostly a light colored precipitate.
The sample was extracted the second time due to the problems noted above

during the basic extraction, however, the same results were observed. The QC spike for this sample was extracted only once.

The holding time for this sample was considered as 14 days because the matrix was a waste liquid.

Analy Meth:SW846-8270B | QC Batch:QC98266000 Test:SVOC | Rpt Basis:none | Date Approved
Prep Meth: SW846-3520 | Analyzed:09/17/98 00:00:00 R J WAWRO | Approver: C J VANMETER | 09/24/98 16:48

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,2,4-Trichlorobenzene	100		ug/L	U		100	1	P	
1,2-Dichlorobenzene	100		ug/L	U		100	1	P	
1,3-Dichlorobenzene	100		ug/L	U		100	1	P	
1,4-Dichlorobenzene	100		ug/L	U		100	1	P	
2,4,5-Trichlorophenol	100		ug/L	U		100	1	P	
2,4,6-Trichlorophenol	100		ug/L	U		100	1	P	
2,4-Dichlorophenol	100		ug/L	U		100	1	P	
2,4-Dimethylphenol	100		ug/L	U		100	1	P	
2,4-Dinitrophenol	500		ug/L	JU		500	1	P	
2,4-Dinitrotoluene	100		ug/L	U		100	1	P	
2,6-Dinitrotoluene	100		ug/L	U		100	1	P	
2-Chloronaphthalene	100		ug/L	U		100	1	P	
2-Chlorophenol	100		ug/L	U		100	1	P	
2-Methyl-4,6-dinitrophenol	500		ug/L	U		500	1	P	
ylphenol	100		ug/L	U		100	1	P	
rophenol	100		ug/L	U		100	1	P	
3(4)-Methylphenol	100		ug/L	U		100	1	P	
4-Bromophenyl phenyl ether	100		ug/L	U		100	1	P	
4-Chloro-3-methylphenol	200		ug/L	U		200	1	P	
4-Chlorophenylphenyl ether	100		ug/L	U		100	1	P	
4-Nitrophenol	500		ug/L	U		500	1	P	
Acenaphthene	100		ug/L	U		100	1	P	
Acenaphthylene	100		ug/L	U		100	1	P	
Anthracene	100		ug/L	U		100	1	P	
Benzo(a)anthracene	100		ug/L	U		100	1	P	
Benzo(a)pyrene	100		ug/L	U		100	1	P	
Benzo(b)fluoranthene	100		ug/L	U		100	1	P	
Benzo(ghi)perylene	100		ug/L	JU		100	1	P	
Benzo(k)fluoranthene	100		ug/L	U		100	1	P	
Bis(2-chloroethoxy)methane	100		ug/L	U		100	1	P	
Bis(2-chloroethyl) ether	100		ug/L	U		100	1	P	
Bis(2-chloroisopropyl) ether	100		ug/L	U		100	1	P	
Bis(2-ethylhexyl)phthalate	100		ug/L	U		100	1	P	
Butylbenzylphthalate	100		ug/L	U		100	1	P	
Chrysene	100		ug/L	U		100	1	P	
Di-n-butylphthalate	100		ug/L	U		100	1	P	
Di-n-octylphthlate	100		ug/L	U		100	1	P	
Dibenz(a,h)anthracene	100		ug/L	JU		100	1	P	
Diethylphthalate	100		ug/L	U		100	1	P	
thylphthalate	100		ug/L	U		100	1	P	

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
nyldiazene	100		ug/L	U		100	1	P	
Fluoranthene	100		ug/L	U		100	1	P	
Fluorene	100		ug/L	U		100	1	P	
Hexachlorobenzene	100		ug/L	U		100	1	P	
Hexachlorobutadiene	100		ug/L	U		100	1	P	
Hexachlorocyclopentadiene	NR		ug/L				1	P	
Hexachloroethane	100		ug/L	U		100	1	P	
Indeno(1,2,3-cd)pyrene	100		ug/L	JU		100	1	P	
Isophorone	100		ug/L	U		100	1	P	
N-Nitroso-di-n-propylamine	100		ug/L	U		100	1	P	
N-Nitrosodimethylamine	100		ug/L	U		100	1	P	
N-Nitrosodiphenylamine	100		ug/L	U		100	1	P	
Naphthalene	100		ug/L	U		100	1	P	
Nitrobenzene	100		ug/L	U		100	1	P	
Pentachlorophenol	500		ug/L	U		500	1	P	
Phenanthrene	100		ug/L	U		100	1	P	
Phenol	150		ug/L			100	1	P	
Pyrene	100		ug/L	U		100	1	P	
Pyridine	100		ug/L	U		100	1	P	

Comments:

There were 2 compounds that exceeded the 15% RSD criteria for the initial calibration and are qualified as estimated values, 'J'. These compounds were: 2,4-dinitrophenol(22%) and hexachlorocyclopentadiene(23%).

Three compounds failed established recovery criteria of 30% in the continuing calibration check and are also qualified as estimates, 'J'. These compounds were indeno(1,2,3-cd)pyrene(44%), dibenzo(a,h)anthracene(60%) and benzo(g,h,i)perylene(39%).

Hexachlorocyclopentadiene is not reported (NR) because of continuing difficulties in the liquid/liquid extraction procedure for this compound. Recoveries of hexachlorocyclopentadiene from laboratory control and matrix spiked samples have historically been very poor.

Analy Meth:SW846-8260A QC Batch:QC98252002 Test:VOA Rpt Basis:none Date Approved
Prep Meth: Analyzed:09/02/98 00:00:00 B D FUHR Approver: C J VANMETER 09/10/98 15:09

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,1,1-Trichloroethane	20		ug/L	U	C	20	10		
1,1,2,2-Tetrachloroethane	20		ug/L	U	C	20	10		
1,1,2-Trichloro-1,2,2-trifluoroethane	20		ug/L	U	C	20	10		
1,1,2-Trichloroethane	20		ug/L	U	C	20	10		
1,1-Dichloroethane	20		ug/L	U	C	20	10		
-Dichloroethene	20		ug/L	U	C	20	10		

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
ichloro-1,1,2,2-tetrafluoroethane	40		ug/L	U	C	40	10		
1,2-Dichlorobenzene	20		ug/L	U	C	20	10		
1,2-Dichloroethane	20		ug/L	U	C	20	10		
1,2-Dimethylbenzene	20		ug/L	U	C	20	10		
1,3 (1,4)-Dimethylbenzene	20		ug/L	U	C	20	10		
1,3-Dichlorobenzene	20		ug/L	U	C	20	10		
1,4-Dichlorobenzene	20		ug/L	U	C	20	10		
2-Butanone	500		ug/L	JU	C	500	10		
4-Methyl-2-pentanone	500		ug/L	U	C	500	10		
Acetone	3900		ug/L		C	500	10		
Benzene	20		ug/L	U	C	20	10		
Bromodichloromethane	20		ug/L	U	C	20	10		
Bromoform	20		ug/L	U	C	20	10		
Bromomethane	40		ug/L	JU	C	40	10		
Carbon disulfide	20		ug/L	U	C	20	10		
Carbon tetrachloride	20		ug/L	U	C	20	10		
Chlorobenzene	20		ug/L	U	C	20	10		
Chloroethane	40		ug/L	U	C	40	10		
Chloroform	20		ug/L	U	C	20	10		
Chloromethane	40		ug/L	U	C	40	10		
Dibromochloromethane	20		ug/L	U	C	20	10		
Ethylbenzene	20		ug/L	U	C	20	10		
Methylene chloride	20		ug/L	U	C	20	10		
Tetrachloroethene	20		ug/L	U	C	20	10		
Toluene	20		ug/L	U	C	20	10		
hloroethene	20		ug/L	U	C	20	10		
nlorofluoromethane	40		ug/L	U	C	40	10		
Vinyl chloride	10		ug/L	U	C	10	10		
cis-1,2-Dichloroethene	20		ug/L	U	C	20	10		
trans-1,2-Dichloroethene	20		ug/L	U	C	20	10		

Comments: Method SW846-8260A

Bromomethane (35%) and 2-Butanone (55%) failed to meet the method criteria of <25%D in the daily continuing calibration check and are reported as estimated values "J."

EPA Qualifiers:

J - Estimated value.

U - Analyte analyzed for but undetected. Analyte result was below the Limit of Quantitation (LOQ).

Analy Meth:PORTS-OA97333006 QC Batch:QC98266003 Test:AB-ACT-GPC Rpt Basis:none Date Approved

Prep Meth: Analyzed:09/21/98 00:00:00 J P BREWSTER Approver: B W SHORT 09/24/98 15:41

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Alpha activity	<3.1		pCi/ml	J			3.1	
Beta activity	7.3		pCi/ml				5.9	

Meth:PORTS-XP4-TS-RL7380	QC Batch:QC98266001 Test:TC99-ACT-LS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:09/22/98 00:00:00 J P BREWSTER	Approver: B W SHORT	09/24/98 15:41

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Technetium-99	<1.1		pCi/ml				1.1	

Analy Meth:PORTS-XP4-TS-RL7720ug	QC Batch:QC98273007 Test:TOTAL-U-AS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:09/23/98 00:00:00 R J ANDRE	Approver: B W SHORT	09/30/98 14:32

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Uranium	0.018		ug/ml					
Uranium-235	NA		wt %		X			

EPA Qualifiers:
J - Indicates an estimated value.

C - Method SW846-5030A "Purge-and-Trap"
X - U-235 was below detection limits.

Waste Stream Number: SW-2

Waste Stream Title: Rags, Gloves, Wipes, Absorbent Material, etc.

Customer Smpl Id: VER47726001
t:X-04-WM BJC09825
Subj Analyses:SOLID
Customer:J A APPLEGATE
COC#: 059686
Sample Desc:
Customer Comments:
Lab Smpl Comments:

Matrix: SOLID
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 06/10/98 13:40:00
Received: 06/11/98 13:07:37
Needed: 07/16/98 23:59:00
Approved: 07/16/98 17:56:28

Analy Meth:SW846-3050A | QC Batch: | Test:3050APREP | Rpt Basis:none | Date Approved
Prep Meth: | Analyzed:06/23/98 00:00:00 K A DAYS | Approver: D K PEREZ | 07/16/98 14:08

Analy Meth:SW846-6010A | QC Batch: | Test:6010AMETALS5 | Rpt Basis:none | Date Approved
Prep Meth: SW846-3050A | Analyzed:06/25/98 00:00:00 T E SHOOK | Approver: D K PEREZ | 07/16/98 14:06

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Aluminum	44.5		mg/kg	B			1		
Antimony	80.8		mg/kg	BN			1		
Arsenic	3.4		mg/kg	B			1		N
Barium	152		mg/kg	B			1		Y
Beryllium	0.15		mg/kg	B			1		
Cadmium	0.23		mg/kg	B			1		N
Calcium	2710		mg/kg	B			1		
Chromium	79.5		mg/kg	N			1		Y
t	5.4		mg/kg	B			1		
r	517		mg/kg				1		
Iron	4800		mg/kg	B			1		
Lead	41.0		mg/kg	B			1		Y
Magnesium	388		mg/kg	B			1		
Manganese	39.7		mg/kg	BJ			1		
Molybdenum	2.7		mg/kg	B			1		
Nickel	7.2		mg/kg	B			1		
Potassium	38.5		mg/kg	JU			1		
Selenium	3.3		mg/kg	U			1		Y
Silver	2.6		mg/kg	B			1		N
Sodium	98.1		mg/kg	B			1		
Thallium	4.3		mg/kg	BN			1		
Vanadium	0.37		mg/kg	B			1		
Zinc	383		mg/kg				1		

Comments: QC File: 98080486

K and Mn qualified as estimates due to interference check not meeting acceptance limits.

Meth:SW846-7470A	QC Batch:	Test:HG7470A	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:06/18/98 00:00:00 K A DAYS		Approver: D K PEREZ	06/19/98

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Mercury	0.034		mg/kg	N		0.025	1		Y

Comments: QC File: 98080472

EPA Qualifiers:

B - Analyte result less than the Practical Quantitation Limit (PQL) and greater than or equal to the Instrument Detection Limit (IDL).
J - Qualify data for the sample as estimated.
N - Sample spike recovery not within control limits.
U - Analyte analyzed for but undetected. Analyte result was below the Instrument Detection Limit (IDL).

Analy Meth:SW846-3540	QC Batch:QC98194007 Test:ORGEXT-SVOC	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:06/23/98 00:00:00 D K SCAGGS	Approver: C J VANMETER	07/16/98 17:52

Comments: Method SW846-3540B: Semi-volatile prep
This sample matrix consisted of cloth rags and cloth gloves. A smaller sample weight was used to reduce sample matrix interference. Foaming was observed during the first phase of concentration. The extract from this phase was dark and oil-like in appearance.
A nitrogen purge was used for the final phase of concentration and the final volume was 10ml.

Analy Meth:SW846-8270B	QC Batch:QC98194009 Test:SVOC	Rpt Basis:none	Date Approved
Prep Meth: SW846-3540	Analyzed:07/07/98 00:00:00 R J WAWRO	Approver: C J VANMETER	07/16/98 17:54

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,2,4-Trichlorobenzene	12000		ug/kg	U		12000	1		
1,2-Dichlorobenzene	12000		ug/kg	U		12000	1		
1,3-Dichlorobenzene	12000		ug/kg	U		12000	1		
1,4-Dichlorobenzene	12000		ug/kg	U		12000	1		
2,4,5-Trichlorophenol	12000		ug/kg	U		12000	1		
2,4,6-Trichlorophenol	12000		ug/kg	U		12000	1		
2,4-Dichlorophenol	12000		ug/kg	U		12000	1		
2,4-Dimethylphenol	12000		ug/kg	U		12000	1		
2,4-Dinitrophenol	60000		ug/kg	JU		60000	1		
2,4-Dinitrotoluene	12000		ug/kg	U		12000	1		
2,6-Dinitrotoluene	12000		ug/kg	U		12000	1		
2-Chloronaphthalene	12000		ug/kg	U		12000	1		
2-Chlorophenol	12000		ug/kg	JU		12000	1		
2-Methyl-4,6-dinitrophenol	60000		ug/kg	JU		60000	1		
2-Methylphenol	12000		ug/kg	U		12000	1		
2-Nitrophenol	12000		ug/kg	U		12000	1		
3-Methylphenol	12000		ug/kg	U		12000	1		

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
nophenyl phenyl ether	12000		ug/kg	U		12000	1		
oro-3-methylphenol	24000		ug/kg	U		24000	1		
4-Chlorophenylphenyl ether	12000		ug/kg	U		12000	1		
4-Nitrophenol	60000		ug/kg	JU		60000	1		
Acenaphthene	12000		ug/kg	U		12000	1		
Acenaphthylene	12000		ug/kg	U		12000	1		
Anthracene	20000		ug/kg	J		12000	1		
Benzo(a)anthracene	31000		ug/kg	J		12000	1		
Benzo(a)pyrene	29000		ug/kg	J		12000	1		
Benzo(b)fluoranthene	39000		ug/kg	J		12000	1		
Benzo(ghi)perylene	22000		ug/kg	J		12000	1		
Benzo(k)fluoranthene	15000		ug/kg	J		12000	1		
Bis(2-chloroethoxy)methane	12000		ug/kg	U		12000	1		
Bis(2-chloroethyl) ether	12000		ug/kg	U		12000	1		
Bis(2-chloroisopropyl) ether	12000		ug/kg	U		12000	1		
Bis(2-ethylhexyl)phthalate	22000		ug/kg	J		12000	1		
Butylbenzylphthalate	12000		ug/kg	U		12000	1		
Chrysene	29000		ug/kg	J		12000	1		
Di-n-butylphthalate	12000		ug/kg	U		12000	1		
Di-n-octylphthlate	12000		ug/kg	U		12000	1		
Dibenz(a,h)anthracene	12000		ug/kg	U		12000	1		
Diethylphthalate	12000		ug/kg	U		12000	1		
Dimethylphthalate	12000		ug/kg	U		12000	1		
Diphenyldiazene	12000		ug/kg	U		12000	1		
Fluoranthene	63000		ug/kg	J		12000	1		
ene	12000		ug/kg	U		12000	1		
hlorobenzene	12000		ug/kg	U		12000	1		
Hexachlorobutadiene	12000		ug/kg	U		12000	1		
Hexachlorocyclopentadiene	12000		ug/kg	J		12000	1		
Hexachloroethane	12000		ug/kg	U		12000	1		
Indeno(1,2,3-cd)pyrene	22000		ug/kg	J		12000	1		
Isophorone	12000		ug/kg	U		12000	1		
N-Nitroso-di-n-propylamine	12000		ug/kg	U		12000	1		
N-Nitrosodimethylamine	12000		ug/kg	U		12000	1		
N-Nitrosodiphenylamine	12000		ug/kg	U		12000	1		
Naphthalene	85000		ug/kg	J		12000	1		
Nitrobenzene	12000		ug/kg	U		12000	1		
Pentachlorophenol	60000		ug/kg	U		60000	1		
Phenanthrene	68000		ug/kg	J		12000	1		
Phenol	12000		ug/kg	JU		12000	1		
Pyrene	60000		ug/kg	J		12000	1		
Pyridine	12000		ug/kg	U		12000	1		

Comments: There was a high level of methylene chloride extractable compounds present in this sample and the final extract concentrate volume was 10mL. The GC/MS analysis of this dark black concentrate contained an intense broad band of tentatively identified compound (TICs) that eluted from 9 to 15min. This band of TICs coeluted with some of the target analytes and surrogates. The base/neutral surrogate, nitrobenzene-d5, had high recoveries in the sample as well as in the matrix spiked sample.

Recovery of phenol and 2-chlorophenol in the matrix spiked sample was below PORTS established criteria and are qualified as estimates, 'J'.

The broad TIC band was primarily composed of aliphatic alkane

compounds.

There were 3 compounds that exceeded the 15% RSD criteria for the initial calibration and are qualified as estimated values, 'J'. These compounds were: 2,4-dinitrophenol(30%), 4,6-dinitro-2-methylphenol(20%), and 4-nitrophenol(19%).

Hexachlorocyclopentadiene recovery was below PORTS established criteria in the MS sample as well as the LCS extracted with this batch and is reported as an estimated value "J".

Sample homogeneity may have been a problem as indicated by poor recovery of the target hits of a group of PAH compounds in a spiked aliquot of this sample. These poor recoveries led to the estimation of the PAH compounds that were detected.

Analy Meth:SW846-8260A | QC Batch:QC98176003 Test:VOA | Rpt Basis:none | Date Approved
Prep Meth: | Analyzed:06/23/98 00:00:00 J N STRICKLAND | Approver: C J VANMETER | 07/07/98 16:21

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,1,1-Trichloroethane	20000		ug/kg	U		20000	10000		
1,1,2,2-Tetrachloroethane	20000		ug/kg	U		20000	10000		
1,1,2-Trichloro-1,2,2-trifluoroethane	20000		ug/kg	U		20000	10000		
1,1,2-Trichloroethane	20000		ug/kg	U		20000	10000		
1,1-Dichloroethane	20000		ug/kg	U		20000	10000		
ichloroethene	20000		ug/kg	U		20000	10000		
ichloro-1,1,2,2-tetrafluoroethane	40000		ug/kg	U		40000	10000		
1,2-Dichlorobenzene	20000		ug/kg	U		20000	10000		
1,2-Dichloroethane	20000		ug/kg	U		20000	10000		
1,2-Dimethylbenzene	29000		ug/kg			20000	10000		
1,3 (1,4)-Dimethylbenzene	74000		ug/kg			20000	10000		
1,3-Dichlorobenzene	20000		ug/kg	U		20000	10000		
1,4-Dichlorobenzene	20000		ug/kg	U		20000	10000		
2-Butanone	500000		ug/kg	U		500000	10000		
4-Methyl-2-pentanone	500000		ug/kg	U		500000	10000		
Acetone	500000		ug/kg	U		500000	10000		
Benzene	20000		ug/kg	U		20000	10000		
Bromodichloromethane	20000		ug/kg	U		20000	10000		
Bromoform	20000		ug/kg	U		20000	10000		
Bromomethane	40000		ug/kg	U		40000	10000		
Carbon disulfide	20000		ug/kg	U		20000	10000		
Carbon tetrachloride	20000		ug/kg	U		20000	10000		
Chlorobenzene	20000		ug/kg	U		20000	10000		
Chloroethane	40000		ug/kg	U		40000	10000		
Chloroform	20000		ug/kg	U		20000	10000		
Chloromethane	40000		ug/kg	U		40000	10000		
Dibromochloromethane	20000		ug/kg	U		20000	10000		
Ethylbenzene	21000		ug/kg			20000	10000		
Methylene chloride	20000		ug/kg	U		20000	10000		
Tetrachloroethene	20000		ug/kg	U		20000	10000		
ene	190000		ug/kg	J		20000	10000		

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
loroethene	20000		ug/kg	U		20000	10000		
ılorofluoromethane	40000		ug/kg	U		40000	10000		
Vinyl chloride	10000		ug/kg	U		10000	10000		
cis-1,2-Dichloroethene	20000		ug/kg	U		20000	10000		
trans-1,2-Dichloroethene	20000		ug/kg	U		20000	10000		

Comments: This sample was analyzed by the high level method which results in higher reporting limits.

Toluene failed the PORTS spike recovery limits on the MS (75% -- lower limit=82%) and MSD (77% -- lower limit=82%).

This sample had several TICs (tentatively identified compounds) of substituted benzenes and alkanes at approximately 18 minutes to 30 minutes on the chromatogram at estimated concentrations of 60000 ug/kg to 300000 ug/kg. A complete listing is available upon request.

EPA Qualifiers:
J - Estimated value.
U - Analyte analyzed for but undetected. Analyte result was below the Limit of Quantitation (LOQ).

Analy Meth:PORTS-XP4-TS-RL7280 QC Batch:QC98194012 Test:AB-ACT-GPC Rpt Basis:none Date Approved
Prep Meth: Analyzed:07/08/98 00:00:00 J P BREWSTER Approver: B W SHORT 07/13/98 13:56

⁄te Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
ı activity	<6		pCi/g				6	
Beta activity	<13		pCi/g				13	

Analy Meth:PORTS-XP4-TS-RL7385 QC Batch:QC98194016 Test:TC99-ACT-LS Rpt Basis:none Date Approved
Prep Meth: Analyzed:07/08/98 00:00:00 J P BREWSTER Approver: B W SHORT 07/14/98 09:12

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Technetium-99	<0.8		pCi/g				0.8	

Analy Meth:PORTS-XP4-TS-RL7710ug QC Batch:QC98170002 Test:TOTAL-U-AS Rpt Basis:none Date Approved
Prep Meth: Analyzed:06/15/98 00:00:00 R J ANDRE Approver: B W SHORT 06/19/98 14:51

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Uranium	0.034	0.025	ug/g					
Uranium-235	NA		wt %					

Waste Stream Number: SW-3

Waste Stream Title: Floor Sweepings

W.S. SW-3

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960110-066 Project: ER 9567E Requisition Number: 19260
Customer Sample ID: VER32855001 Customer: ENV RETORATION
Date Sampled: 10-JAN-1996 09:30 Date Sample Received: 10-JAN-1996
Sampled By: R CAUDILL Date Sample Completed: 14-FEB-1996
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311/3520	Sample Prep TCLP Semi-Volatile	COMPLETE			MR KELLEY	17-JAN-1996	96160018
SW846-1311	Sample Prep TCLP	COMPLETE			MR KELLEY	17-JAN-1996	96170011
	Sample Prep TCLP	COMPLETE			MR KELLEY	17-JAN-1996	96170011
SW846-3050A	Sample Prep Metals	COMPLETE			ML STEWART	17-JAN-1996	011796-041
SW846-6010A	Aluminum	206		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Antimony	3.6U		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Arsenic	5.5U		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Barium	18.9*		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Beryllium	.09U		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Cadmium	.56		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Calcium	2080		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Chromium	22.8N		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Cobalt	1.2		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Copper	7.3		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Iron	7930*		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Lead	18.1		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Magnesium	328*		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Manganese	63.8		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Molybdenum	1.8		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Nickel	10.7		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Potassium	546N		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Selenium	11.0		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Silver	.19U		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Sodium	114J		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Thallium	9.0*		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Vanadium	.21U		mg/kg	EL SIMPSON	17-JAN-1996	96080085
	Zinc	83.3N*		mg/kg	EL SIMPSON	17-JAN-1996	96080085
TSD553-280	Gross Alpha	8		pCi/g	JP BREWSTER	17-JAN-1996	96070064
	Gross Beta	16		pCi/g	JP BREWSTER	17-JAN-1996	96070064
TSD553-385	Technetium	29.0		pCi/g	JP BREWSTER	17-JAN-1996	96070065
TSD553-440	Cesium-134	<.94J		pCi/g	JD LITTERAL	17-JAN-1996	96070112
	Cesium-137	<1.1J		pCi/g	JD LITTERAL	17-JAN-1996	96070112
	Cobalt-60	<1.8J		pCi/g	JD LITTERAL	17-JAN-1996	96070112
	Gross Gamma	.65J	.52	pCi/g	JD LITTERAL	17-JAN-1996	96070112

TSD553-710	% U-235	2.1%	0.67%	%	CD GOOD	7-FEB-1996	96070168
	Alpha Activity	10		pCi/g	BW SHORT	7-FEB-1996	96070168
	Americium-241	<0.008	N/A	pCi/g	CD GOOD	7-FEB-1996	96070168
	Neptunium-237	<0.033	N/A	pCi/g	CD GOOD	7-FEB-1996	96070168
	Plutonium-238	<0.012	N/A	pCi/g	CD GOOD	7-FEB-1996	96070168
	Plutonium-239/240	<0.012	N/A	pCi/g	CD GOOD	7-FEB-1996	96070168
	Thorium-228	<0.098	N/A	pCi/g	CD GOOD	7-FEB-1996	96070168
	Thorium-230	<0.080	N/A	pCi/g	CD GOOD	7-FEB-1996	96070168
	Thorium-232	<0.085	N/A	pCi/g	CD GOOD	7-FEB-1996	96070168
	Thorium-234	2.0	0.29	pCi/g	CD GOOD	7-FEB-1996	96070168
	Uranium	6.1	0.87	ug/g	CD GOOD	7-FEB-1996	96070168

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
Antimony	50.0	43.76	87.52
Arsenic	50.0	44.72	89.44
Barium	50.0	49.63	99.26
Beryllium	50.0	45.15	90.30
Cadmium	50.0	45.28	90.56
Chromium	50.0	33.26	66.52
Cobalt	50.0	43.47	86.94
Copper	50.0	42.93	85.86
Lead	50.0	39.11	78.22
Manganese	50.0	47.05	94.10
M	50.0	43.52	87.04
Nickel	50.0	39.87	79.74
Potassium	500.0	362.74	72.55
Selenium	50.0	43.65	87.30
Silver	50.0	43.59	87.18
Sodium	50.0	53.04	106.08
Thallium	50.0	43.74	87.48
Vanadium	50.0	43.06	86.12
Zinc	50.0	104.16	208.32

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
C. J. Van Meter (TCLP Laboratory)
Date Approved: 14-FEB-1996

********** COMMENT PAGE **********
********** 960110-066 **********

** Comments from the Spectrochemistry/ICP Laboratory *****

SW-6010A Na qualified as estimate due to calibration verification not meeting Q. C. limits.

***** Comments from the TCLP Laboratory *****

TCLP_Method 1311/8260A : The results listed as "J" were estimated due to low spike recoveries.

TCLP_Method 1311/8270A : 2,4-Dinitrotoluene was masked by a large multicomponent band of hydrocarbons eluting from 16 minutes to 25 minutes.
Recovery for this compound was outside method acceptance criteria. Also, the qualifier mass unit ratios for identification of this compound were not within method criteria. Therefore, this compound is flagged "J."

Definition Page for Qualifiers/Flags

********** 960110-066 **********

Inorga. ata Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

rrelation coefficient for MSA is less tha 0.995.

.e value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an anal, .e.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID:	960110-066	Customer Sample ID:	VER32855001
Laboratory:	TCLP Laboratory	Customer:	ENV RETORATION
File ID:	96170011	Sample Matrix:	SOLID WASTE
Instrument ID:		Requisition Number:	19260
Authorized By:	C. J. Van Meter	Date Sample Received:	10-JAN-1996
		Date Sampled:	10-JAN-1996

TCLP_SV_ACIDS_RPT

Date Extracted/Prepared:	17-JAN-1996	Date Analyzed:	30-JAN-1996
Analysis Procedure Number:	1311/8270A	QA File Number:	96160129BB01
Percent Moisture:		Dilution Factor:	2
Percent Moisture (decanted):		Analyst:	MR KELLEY
Associated Blank:			

CAS		mg/L	CAS		mg/L
95-48-7	2-Methylphenol	0.040U			
108-39-4	m-Cresol	0.040U			
106-44-5	4-Methylphenol	0.040U			
87-86-5	Pentachlorophenol	0.080U			
95-95-4	2,4,5-Trichlorophenol	0.040U			
88-06-2	2,4,6-Trichlorophenol	0.040U			

ANALYSIS DATA REPORT

AnaLIS ID: 960110-066
Laboratory: TCLP Laboratory
File ID: 96170011
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: VER32855001
Customer: ENV RETORATION
Sample Matrix: SOLID WASTE
Requisition Number: 19260
Date Sample Received: 10-JAN-1996
Date Sampled: 10-JAN-1996

TCLP_SV_B/N_RPT

Date Extracted/Prepared: 17-JAN-1996
Analysis Procedure Number: 1311/8270A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 30-JAN-1996
QA File Number: 96160129BB01
Dilution Factor: 2
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
121-14-2	2,4-Dinitrotoluene	0.080JU			
118-74-1	Hexachlorobenzene	0.040U			
87-68-3	Hexachlorobutadiene	0.040U			
67-72-1	Hexachloroethane	0.040U			
98-95-3	Nitrobenzene	0.040U			
110-86-1	Pyridine	0.040U			

ANALYSIS DATA REPORT

AnaLIS ID: 960110-066
Laboratory: TCLP Laboratory
File ID: 96170011
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: VER32855001
Customer: ENV RETORATION
Sample Matrix: SOLID WASTE
Requisition Number: 19260
Date Sample Received: 10-JAN-1996
Date Sampled: 10-JAN-1996

TCLP_VOLATILES_RPT

Date Extracted/Prepared: 17-JAN-1996
Analysis Procedure Number: 1311/8260
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 29-JAN-1996
QA File Number: 96160129A2
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
71-43-2	Benzene	0.002JU			
56-23-5	Carbon Tetrachloride	0.002U			
108-90-7	Chlorobenzene	0.002U			
67-66-3	Chloroform	0.002U			
106-46-7	1,4-Dichlorobenzene	0.002JU			
107-06-2	1,2-Dichloroethane	0.002JU			
75-35-4	1,1-Dichloroethene	0.002U			
78-93-3	2-Butanone	0.100JU			
127-18-4	Tetrachloroethene	0.002U			
79-01-6	Trichloroethene	0.002U			
75-01-4	Vinyl Chloride	0.001JU			

Waste Stream Number: SW-4

Waste Stream Title: Batteries

PORTS MSDS #: 347

PRODUCT: STANDARD, LEAD 1000PPM IN 10% NITRIC

PART NUMBER:

FORMULA: Pb

KEYWORD: STANDARD

PORTS NUMBER: 00190041-100; 00190028-100; 00190041

PORTS MISC INFO:
LAB MSDS# 334
LAB MSDS# 347

PORTS RATING: HFR=300

MANUFACTURER:
VHG LABS INC.
180 ZACHARY RD #5
MANCHESTER
NH

03109
PHONE: PHONE: 603-622-7660
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	~ 212 F	NOTE: ~100'C.
Melting Point. . . .	~ 32 F	NOTE: ~0'C.
reezing Point . . .	NG	
our Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	~ 1	
Vapor Pressure . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Vapor Density. . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Percent Volatiles. .	~ 99	NOTE: @ 21'C.
Evaporation Rate . .	NA	NOTE: NOT APPLI/NOT AVAIL.
pH	NA	NOTE: NOT APPLI/NOT AVAIL.
Molecular Weight . .	EQ 207.20	NOTE: FORMULA WT.
Viscosity.	NG	

Solubility in Water. COMPLETE (100%).
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID, ODORLESS / ODOR THRESHOLD: NOT APPLICABLE/NOT AVAILABLE.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	NA	NOTE: NOT APPLI/NOT AVAIL.
Explosive/Flammable Limits		
Lower (LEL).	NA	NOTE: NOT APPLI/NOT AVAIL.
Upper (UEL).	NA	NOTE: NOT APPLI/NOT AVAIL.

Shipping Regulations

UN/NA Number.	NG
D.O.T. Hazard Class. . .	NG
Label	NOT GIVEN
Proper Shipping Name . .	CHEMICALS, N.O.S. (NON-REGULATED)

==========

Preparer/Contact Information: QUALITY ASSURANCE DEPARTMENT

Date Prepared/Revised 1/29/93

==== Component Information =====

LEAD
OSHA PEL (PPM):
OSHA PEL (MG/M3): 0.05
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 0.15
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 1.0
C.A.S. No.: 7439921

NITRIC ACID
OSHA PEL (PPM):
OSHA PEL (MG/M3): 5.2
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 5.2
STEL (PPM):
STEL (MG/M3): 10
Product %: EQ 10
C.A.S. No.: 7697372
Note:
PEL & TLV: 2 PPM / STEL: 4 PPM.

WATER
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: BA
C.A.S. No.: 7732185
Note:
NE = NOT ESTABLISHED / BA = BALANCE.

===== SECTIN I - PRODUCT IDENTIFICATION =====

PRODUCT NAME: Lead Plasma Emission Standard - 10,000 micrograms/ml

COMMON SYNONYMS: N/A

CHEMICAL FAMILY: Plasma Emission Standards

FORMULA: Pb

FORMULA WT.: 207.20

CAS NO.: N/A

NIOSH/RTECS NO.: QU5775000

PRODUCT USE: Laboratory Reagent

REVISION DATE: 01/29/93

TEL: (603) 622-7660

'AX: 622-5180

MANUFACTURER'S NAME AND ADDRESS:

VHG LABS, INC.

CHEMICAL PRODUCTS AND SERVICES
180 ZACHARY ROAD #5
MANCHESTER, NH 03109

===== SECTION II - COMPONENTS =====

SEE COMPONENT INFORMATION.

===== SECTION III - PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

ODOR THRESHOLD (PPM): N/A

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

===== SECTION IV - FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT (CLOSED CUP): N/A

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS:

UPPER: N/A
LOWER: N/A

FIRE EXTINGUISHING MEDIA: Use extinguishing media appropriate for surrounding fire.

PECIAL FIRE-FIGHTING PROCEDURES: Firefighters should wear proper protective quipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode.

UNUSUAL FIRE & EXPLOSION HAZARDS: Reacts with most metals to produce hydrogen gas, which can form an explosive mixture with air.

TOXIC GASES PRODUCED: Oxides of nitrogen.

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT: None identified.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE: None identified.

===== SECTION V - HEALTH HAZARD DATA =====

THRESHOLD LIMIT VALUE (TLV/TWA): 5.2 mg/m3 (2 ppm)

TLV is for Nitric acid.

SHORT-TERM EXPOSURE LIMIT (STEL): 10 mg/m3 (4 ppm)

STEL is for Nitric acid.

PERMISSIBLE EXPOSURE LIMIT (PEL): 5.2 mg/m3 (2 ppm)

PEL is for Nitric acid.

TOXICITY OF COMPONENTS:

INHALATION-1HR RAT LC50 FOR NITRIC ACID: 2500 ppm

INTRAPERITONEAL MOUSE LD50 FOR WATER: 190 g/kg

INTRAVENOUS MOUSE LD50 FOR WATER: 25 g/kg

CARCINOGENICITY: NTP: No IARC: No Z LIST: No OSHA REG: No

CARCINOGENICITY: None identified

REPRODUCTIVE EFFECTS: This product contains a chemical known to the State of California to cause birth defects and other reproductive harm.

EFFECTS OF OVEREXPOSURE:

INHALATION: Severe irritation or burns of respiratory system, headache, nausea, vomiting, dizziness, pulmonary edema, lung inflammation, may be fatal

SKIN CONTACT: Severe irritation

EYE CONTACT: Severe irritation

SKIN ABSORPTION: None identified

INGESTION: Burns to mouth, throat, and stomach, nausea, vomiting, kidney dysfunction

CHRONIC EFFECTS: Damage to lungs, teeth, anemia, kidney damage, blurred vision, lead build-up in the central nervous system

TARGET ORGANS: Eyes, skin, mucous membranes, GI tract, central nervous system, gingival tissue, respiratory system, lungs, kidneys, blood, teeth

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Damaged skin, eye disorders, cardiopulmonary disease, lung disease

PRIMARY ROUTES OF ENTRY: Inhalation, ingestion, skin contact, eye contact

EMERGENCY AND FIRST AID PROCEDURES:

INGESTION: CALL A PHYSICIAN. If swallowed, do NOT induce vomiting
If conscious, give water, milk or milk of magnesia.

INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

SKIN CONTACT: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

EYE CONTACT: In case of eye contact, immediately flush with plenty of water for at least 15 minutes.

SARA/TITLE III HAZARD CATEGORIES AND LISTS:

ACUTE: Yes CHRONIC: Yes FLAMMABILITY: No PRESSURE: No REACTIVITY: No

EXTREMELY HAZARDOUS SUBSTANCE: Yes Contains Nitric Acid (RQ = 1,000 LBS, TPQ = 1,000 LBS)

CERCLA HAZARDOUS SUBSTANCE: Yes Contains Lead (RQ = 1 LB) and Nitric Acid (RQ = 1000 LBS)

SARA 313 TOXIC CHEMICALS: Yes Contains Lead and Nitric Acid

TSCA INVENTORY: Yes

STATE LISTS:

FOR PRODUCTS SOLD IN THE STATE OF CALIFORNIA, REQUIRES THAT WE PROVIDE TO USERS AND THEIR EMPLOYEES THE FOLLOWING MESSAGE: WARNING: THIS PRODUCT CONTAINS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS AND OTHER REPRODUCTIVE HARM.

===== SECTION VI - REACTIVITY DATA =====

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Heat

INCOMPATIBLES: Strong bases, strong reducing agents, alkalies, most common metals

DECOMPOSITION PRODUCTS: Oxides of nitrogen

===== SECTION VII - SPILL & DISPOSAL PROCEDURES =====

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE: Wear self-contained breathing apparatus and full protective clothing. Stop leak if you can do so without risk. Ventilate area. Neutralize spill with soda ash or lime. With clean shovel, carefully place material into clean, dry container and cover; remove from area. Flush spill area with water.

DISPOSAL PROCEDURES: Dispose in accordance with all applicable federal, state, and local environmental regulations.

EPA HAZARDOUS WASTE NUMBER: D002 (Corrosive Waste)

===== SECTION VIII - PROTECTION INFORMATION =====

EYE/FACE PROTECTION: Goggles & Shield

PROTECTIVE CLOTHING: Lab Coat & Apron

PROTECTIVE GLOVES: Rubber

VENTILATION REQUIREMENTS: Vent Hood

===== SECTION IX - STORAGE DATA AND ADDITIONAL INFORMATION =====

STORAGE REQUIREMENTS: Keep container tightly closed. Store in secure poison area. Isolate from incompatible materials.

===== SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION =====

DOMESTIC (D.O.T.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)

INTERNATIONAL (I.M.O.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)
MARINE POLLUTANTS: No

N/A = Not Applicable or Not Available
N/E = Not Established

The information in this Material Safety Data Sheet meets the requirements of the United States OCCUPATIONAL SAFETY AND HEALTH ACT and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) and the Canadian WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. This document is intended only as a guide to the appropriate precautionary handling of the material by a person trained in, or supervised by a person trained in, chemical handling. The user is responsible for determining the application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes.

http://jupiter.ports/msds/data/347

Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, VHG cannot warn of all of the potential dangers of use or interaction with other chemicals or materials. VHG warrants that the chemical meets the specifications set forth on the label.

VHG DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.

The user should recognize that this product can cause severe injury and even death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION.

Approved by Quality Assurance Department.

♦ PORTS MSDS #: 384

PRODUCT: STANDARD, CADMIUM 10PPM IN 10% NITRIC

.T NUMBER: SRM 3108

FORMULA: Cd: [Cd(NO3)2]: HNO3

KEYWORD: STANDARD

PORTS NUMBER: 00190049-100

PORTS MISC INFO:
NOT GIVEN

PORTS RATING: HFR=300

MANUFACTURER:
NATIONAL INSTITUTE OF STANDARDS (NIST)

GAITHERSBURG
MD

20899
PHONE: PHONE: 301-975-2019
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 172 F	NOTE: 78'C, DECOMPOSES.
Melting Point. . . .	~ -30 F	NOTE: -42'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ 1.4	NOTE: DENSITY: 1.504.
Vapor Pressure . . .	EQ 8.0	NOTE: MM @ 20'C.
Vapor Density. . . .	NG	
Percent Volatiles. .	~ 100	NOTE: 122'C.
Evaporation Rate . .	NG	
pH	NG	
Molecular Weight . .	EQ 63.02	
Viscosity.	NG	
Solubility in Water.	COMPLETE.	

Odor/Appearance/Other Characteristics:
DATA FOR NITRIC ACID / A WHITE TO SLIGHTLY YELLOW LIQUID THAT.....SEE TEXT.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	N*	NOTE: NON FLAMMABLE.
Flash Point, Open Cup . . .	N*	NOTE: NON FLAMMABLE.
Fire Point.	NG	
Auto Ignition.	NA	
Explosive/Flammable Limits		
Lower (LEL).	NA	
Upper (UEL).	NA	

Shipping Regulations
UN/NA Number. NA1760
D.O.T. Hazard Class. . . CORROSIVE

Label . . . . . NOT GIVEN
Proper Shipping Name . . NITRIC ACID

==========

Preparer/Contact Information: CARMELITA S. DAVIS (301)975-6439

Date Prepared/Revised 5/01/90

===== Component Information =====

NITRIC ACID
OSHA PEL (PPM): NG
OSHA PEL (MG/M3):
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 5
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 10
C.A.S. No.: 7697372
Note:
TLV: 2 PPM.

CADMIUM
OSHA PEL (PPM):
OSHA PEL (MG/M3): 0.1
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 0.05
STEL (PPM): NG
STEL (MG/M3):
Product %: NG
C.A.S. No.: 7440439
Note:
TLV: DUST.

CADMIUM NITRATE
OSHA PEL (PPM):
OSHA PEL (MG/M3): 0.2
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 0.05
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 2.10
C.A.S. No.: 10325947
Note:
COMPOUND FORMED IN SOLUTION.

===== SECTION I. MATERIAL IDENTIFICATION =====

MATERIAL NAME: Cadmium Spectrometric Standard Solution

DESCRIPTION/OTHER DESIGNATIONS: Cadmium in Nitric Acid (aqua fortis, engraver's acid, azotic acid) Solution; *Cadmium Nitrate (cadmium nitrate hydrate) in Spectrometric Standard Solution

CHEMICAL FORMULAS: Cd: [Cd(NO3)2]: HNO3

CAS REG. NOS:

7697-37-2 Aqueous Nitric Acid
7440-43-9 Cadmium
10325-94-7 Cadmium Nitrate

DOT CLASSIFICATION: Corrosive (Nitric Acid)

NA1760

Cadmium Compounds

ID #: UN2570

SRM NUMBER: 3108

MSDS NUMBER: 3108

Cadmium Spectrometric Standard Solution

NOTE: This SRM contains approximately 1% cadmium in a 10% nitric acid solution.

*The addition of cadmium to nitric acid solution forms cadmium nitrate which will precipitate upon evaporation or drying of the solution.

ISSUED: May, 1988

REVISED: May, 1990

TELEPHONE: (301) 975-2019

MANUFACTURER/SUPPLIER: Available from a number of suppliers.

MANUFACTURER'S/SUPPLIER'S NAME AND ADDRESS:

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
OFFICE OF STANDARD REFERENCE MATERIALS PROGRAM
GAITHERSBURG, MARYLAND 20899

===== SECTION II. HAZARDOUS INGREDIENTS =====

SEE COMPONENT INFORMATION.

HAZARDOUS COMPONENTS	LIMITS AND TOXICITY DATA
Nitric Acid	HUMAN, ORAL LDLO: (4)30 mg/kg
CADMIUM	HUMAN, INHALATION LCLO: 39 mg/m3 for 20 mins. RAT, ORAL LD50: 225 mg/kg RAT, INHALATION LC50: 25 mg/m3 for 30 mins.
Cadmium Nitrate*	RABBIT, SKIN (SEV): 500 mg for 24 hrs. RABBIT, EYE (MOD.): 20 mg for 24 hrs.

*Compound formed in solution.

These standards reflect hazardous concentrations of 55-70% for nitric acid and ~ 100% for cadmium and cadmium nitrate.

===== SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

NITRIC ACID:

APPEARANCE AND ODOR: A white to slightly yellow liquid that darkens to a brownish color upon aging and/or exposure to light; characteristic NO2 odor.

SOLUBILITY IN OTHER COMPOUNDS: Decomposes in alcohol.

C. ...IUM NITRATE:

APPEARANCE AND ODOR: White, amorphous pieces of hygroscopic needles.

MOLECULAR WEIGHT: 236.42

MELTING POINT: 350 'C

SOLUBILITY IN WATER: Soluble.

SOLUBILITY IN OTHER COMPOUNDS: Soluble in ammonia and alcohol.

CADMIUM:

APPEARANCE AND ODOR: Hexagonal crystals, silver-white malleable metal.

MOLECULAR WEIGHT: 112.41

DENSITY: 8.642

BOILING POINT: 767 + or - 2 'C

MELTING POINT: 320.9 'C (becomes brittle at 80 'C)

...CTIVE INDEX: 1.13

MOHS HARDNESS: 2.0

VAPOR PRESSURE (AT 394 'C): 1 mm

SOLUBILITY IN WATER: Insoluble

SOLUBILITY IN OTHER COMPOUNDS: Soluble in acids, especially nitric, and in ammonium nitrate.

NOTE: Physical and chemical data on this nitric acid solution does not exist. The data provided above is for the hazardous ingredients >= 1%.

===== SECTION IV. FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT: Nonflammable, however, nitric acid is a strong oxidizing agent which can react with combustible materials to cause fires.

(METHOD USED): N/A

AUTOIGNITION TEMPERATURE: N/A

(NOTE: Autoignition temperature for Cd dust layer is 250 'C)

...ILITY LIMITS IN AIR (VOLUME %): N/A

EXTINGUISHING MEDIA: Nitric Acid does not burn. Use extinguishing agents that will put out the surrounding fire. Use a water spray to dilute nitric acid during fires and to absorb liberated oxides of nitrogen.

SPECIAL FIRE PROCEDURES: Self-contained breathing apparatus should be used by firefighters in an enclosed area with full protective clothing when nitric acid is involved in the fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Although nitric acid does not burn, it is a powerful oxidizing agent that can react with combustible materials to cause fire. The acid can also react with metals to liberate extremely flammable hydrogen gas.

The acid reacts violently with acetic acid, acetic anhydride, (acetone + acetic acid), (acetone + H2SO4), acetylene, acrolein, acrylonitrile, allyl alcohol, allyl chloride, 2-amino ethanol, NH3, NH4 OH, aniline, anion exchange resins, (dichromate + anion exchange resins), Sb, AsH3, Bi, B, boron decahydride, BP, BrF5, n-butyraldehyde, Ca hypophosphite, C, Cs2C2, 4-chloro-2-nitroaniline, ClF3, chlorosulfonic acid, cresol, cumene, Cu3N2, CuN3, cyanides, cyclic ketones, cyclohexanol, cyclohexanone, diborane, 2,6-di-tert-butyl phenol, diisopropyl ether, epichlorohydrin, ethanol, m-ethylaniline, ethylene imine, 5-ethyl-2methyl pyridine, 5-ethyl-2-picoline, C2H5PH2, FeO, F2, furfuryl alcohol, Ge, glyoxal, hydrazine, HN3, HI, H2O2, H2Se, H2S, H2Te, (indane + H2SO4), isoprene, (ketones + H2O2), (lactic acid + HF), Li, Li6Si2, Mg, Mg3P2, Mg-Ti alloy, Mn, mesitylene, mesityl oxide, 2-methyl-5-ethyl puridine, 4-methyl-cyclohexanone, NdP, nitrobenzene, oleum, organic matter, PH3, PH4I, P, P4I3, PCl3, phthalic acid, phthalic anhydride, KH2PO2, beta-propiolactone, propylene oxide, pyridine, Rb2C2, Se, selenium iodophosphide, (Ag + ethanol), Na, NaN3, NaOH, SbH3, sulfamic acid, (H2SO4 + glycerides), terpenes, B4H10, thiocyanates, thiophene, Ti, Ti alloy, Ti-Mg alloy, (H2SO4, + C6H5CH3), toluidine, triazine, uns-dimethyl hydrazine, U, U-alloy, U-Nd alloy, U-Nd-Zr alloy, vinylacetate, vinylidene chloride, Zn, Zr-U alloys.

Cadmium and cadmium containing compounds can react violently with fused ammonium nitrate. Contact with hydrochloric and sulfuric acids generates flammable hydrogen gas (reaction is slow).

===== SECTION V. REACTIVITY DATA =====

STABILITY: Stable

CONDITIONS TO AVOID: Avoid any contact with incompatible chemicals. Avoid excessive heat.

INCOMPATIBILITY (MATERIALS TO AVOID): Contact with organic materials such as wood, paper, sawdust, or alcohol, etc., may cause fires. Combustible materials can attain increased flammability after being exposed to nitric acid even if they do not immediately catch fire.

Oxides of nitrogen are evolved from cadmium upon oxidation by nitric acid. Cd is incompatible with strong oxidizing agents, elemental sulfur, selenium, tellurium and hydrazoic acid.

See UNUSUAL FIRE AND EXPLOSION HAZARDS.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Nitrous oxides, including NO, NO2, N2O3 and N2O as well as nitric acid mist or vapor can be produced upon decomposition or reaction of HNO3.

Cadmium can also produce toxic oxides of nitrogen upon oxidation by nitric acid. Heating cadmium metal produces toxic fumes of cadmium oxide.

HAZARDOUS POLYMERIZATION: Will Not Occur

===== SECTION VI. HEALTH HAZARD DATA =====

ROUTE OF ENTRY:

[AANHALATION: X
SKIN: X
INGESTION: X

HAZARDS (ACUTE AND CHRONIC): This material is corrosive to all body tissues. Nitric acid is extremely destructive to tissue of the mucus membranes, upper respiratory tract, eyes and skin.

Cadmium is toxic by inhalation and ingestion. Acute toxicity is almost always caused by inhalation of fumes or dust. Chronic poisoning has been reported after prolonged exposure to cadmium oxide fumes and dust, cadmium sulfides and cadmium stearates. The primary effects of chronic inhalation in humans are pulmonary emphysema and kidney damage. Skeletal abnormalities (osteoporosis and pseudofractures) and anemia have been reported following prolonged exposure to cadmium oxide. Prolonged exposure can cause anosmia and a yellow stain that gradually appears on the teeth. NIOSH has recommended that cadmium compounds be regarded as potential occupational carcinogens. This recommendation is based in part on recent epidemiological evidence of excessive lung cancer among workers exposed to cadmium oxide.

SIGNS AND SYMPTOMS OF EXPOSURE: Irritation, difficulty breathing, burning sensation, and yellow skin discoloration can result from contact with nitric acid.

Nausea and vomiting can result from uranium contact. Ingestion of cadmium compounds can cause severe gastrointestinal distress such as diarrhea and abdominal pain. Inhalation of the fumes can cause irritation of the nose and throat, cough, dyspnea, chest pains, fever and chills. Symptoms of acute intoxication do not develop until several hours after the exposure.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: N/A

NOTE: Heavy smoking has been reported to considerably increase the tissue levels of Cd.

LISTED AS A CARCINOGEN/POTENTIAL CARCINOGEN:

	YES	NO
IN THE NATIONAL TOXICOLOGY PROGRAM (NTP) REPORT ON CARCINOGENS:	X	
IN THE INTERNATIONAL AGENCY FOR RESEARCH (IARC) MONOGRAPHS:	X	
BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA):	X	

NOTE: Cadmium and cadmium nitrate are considered potential carcinogens.

EMERGENCY AND FIRST AID PROCEDURES:

SKIN: Wash immediately with soap and water. Remove contaminated clothing. Watch for chemical burns and treat them accordingly. Contact a physician if necessary.

NOTE TO PHYSICIAN: Wash affected skin areas with a 5% solution of sodium bicarbonate ($NaHCO_3$).

EYE CONTACT: Immediately flush eyes, including under the eyelids, with of water for at least 15 minutes. Contact a physician if necessary.

INHALATION: Remove the victim to fresh air and restore and/or support breathing. Contact a physician if necessary.

INGESTION: Call a poison control center. Never give anything by mouth to

someone who is convulsing. Do not induce vomiting. If the victim is responsive, administer one or two glasses of water to drink as quickly as possible after exposure.

TARGET ORGAN(S) OF ATTACK: HNO3 Lungs, Skin

?D) COMPOUNDS: Lungs, Respiratory System, Blood, GI Tract, Kidneys

N..£: Preplacement and annual medical examinations with emphasis on respiratory tract, skin irritations, dental erosion, and lung function tests, should be provided for workers frequently exposed to nitric acid. Medical surveillance procedures for urinary cadmium deposits and protein determinations, and pulmonary-function testing should also be performed.

===== SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE =====

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Notify safety personnel, provide adequate ventilation and eliminate all sources of ignition immediately in case contact with metals should produce highly flammable hydrogen gas. Cleanup personnel need protection against contact with and inhalation of nitric acid. Use water sprays to direct nitric acid away from incompatible chemicals. Surfaces contaminated with spills should be covered with soda ash or sodium bicarbonate to neutralize the acid. Place the neutralized material into containers suitable for eventual disposal, reclamation or destruction.

WASTE DISPOSAL: Follow all Federal, state and local laws governing disposal. Consider reclamation, recycling, or destruction rather than disposal into a landfill.

HANDLING & STORING: The nitrogen oxides produced from the acid are all toxic; nitr' acid itself is corrosive. Neoprene gloves and body shields should be u i ere splashing may occur. Chemical safety showers and eyewash stations m be readily available. Workers must receive training before handling this material in the workplace; even experienced workers should undergo refresher training periodically.

NOTE: DO NOT WEAR CONTACT LENSES IN THE WORK AREA! Contact lenses pose a special problem. Soft lenses can absorb irritants and all lenses concentrate them. Particles can adhere to lenses and cause corneal damage.

Store in a cool, dry, well-ventilated area away from incompatible materials, such as strong bases, metal powders, carbides, sulfides, and any other readily oxidizable material (see sect. IV and sect. V). Protect containers from physical damage and keep from direct sunlight.

===== SECTION VIII. SOURCE DATA/OTHER COMMENTS =====

SOURCES:

Genium Publishing Corporation, MSDS No. 7, August, 1988.
Genium Publishing Corporation, MSDS No. N154, October, 1985.
DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, 5TH ED., 1979.
HANDBOOK OF TOXIC AND HAZARDOUS CHEMICALS AND CARCINOGENS, 2ND ED., 1985.
HAWLEY'S CONDENSED CHEMICAL DICTIONARY, 11TH ED., 1987.
TH IGMA-ALDRICH LIBRARY OF CHEMICAL SAFETY DATA, 2ND ED., VOL. I D II, 1988.

Carmelita S. Davis (301) 975-6439

National Institute of Standards and Technology
Office of Standard Reference Materials

Gaithersburg, Maryland 20899

NOTE: Physical and chemical data contained this MSDS are provided for use in

assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references, however, NIST does not certify the data on the MSDS. The certified values for this material are given only on the NIST Certificate of Analysis.

Waste Stream Number: SW-5, 5A, 5B, and 5C

Waste Stream Title: Light Bulbs

VER46552001 Portsmouth Analytical Laboratory X981070013

Official Report

SW-5

C ner Smpl Id: VER46552001 Matrix: SOLID Sampled: 04/17/98 09:50:00
c:X-04-WM BJC09824 Protocol:RCRA Received: 04/17/98 13:35:32
Subproj Analyses:SOLID Status: APPROVED Needed: 05/22/98 00:00:00
Customer:J A APPLEGATE Location: Approved: 05/22/98 14:34:44
COC#: 54824
Sample Desc:
Customer Comments:
Lab Smpl Comments:

Analy Meth:SW846-3050A QC Batch: Test:3050APREP Rpt Basis:none Date Approved
Prep Meth: Analyzed:04/24/98 00:00:00 K A DAYS Approver: D K PEREZ 05/02/98 13:14

Analy Meth:SW846-6010A QC Batch: Test:6010AMETALS5 Rpt Basis:none Date Approved
Prep Meth: SW846-3050A Analyzed:05/07/98 00:00:00 T E SHOOK Approver: D K PEREZ 05/18/98 15:12

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Aluminum	6.7		mg/kg	BN			1		
Antimony	1.6		mg/kg	U			1		
Arsenic	2.2		mg/kg	U			1		N
Barium	0.15		mg/kg	BN			1		N
Beryllium	0.10		mg/kg	U			1		
Cadmium	0.17		mg/kg	U			1		N
Calcium	27.3		mg/kg	B			1		
Chromium	0.53		mg/kg	B			1		N
t	0.32		mg/kg	U			1		
er	0.30		mg/kg	B			1		
Iron	35.2		mg/kg	BN			1		
Lead	6.3		mg/kg	BN			1		N
Magnesium	9.2		mg/kg	B			1		
Manganese	0.14		mg/kg	U			1		
Molybdenum	0.27		mg/kg	U			1		
Nickel	0.61		mg/kg	U			1		
Potassium	31.3		mg/kg	JU			1		
Selenium	3.4		mg/kg	U			1		N
Silver	0.46		mg/kg	U			1		N
Sodium	53.3		mg/kg	BN			1		
Thallium	2.3		mg/kg	U			1		
Vanadium	0.24		mg/kg	U			1		
Zinc	14.6		mg/kg	B			1		

Comments: QC File: 98080370

Potassium was qualified a estimate due to initial calibration check did not meet acceptance limits.

C ner Smpl Id: VER46552001
c:X-04-WM BJC09824
Subproj Analyses:SOLID
Customer:J A APPLEGATE
COC#: 54824
Sample Desc:
Customer Comments:
Lab Smpl Comments:

SW-5

Matrix: SOLID
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 04/17/98 09:50:00
Received: 04/17/98 13:35:32
Needed: 05/22/98 00:00:00
Approved: 05/22/98 14:34:44

Analy Meth:SW846-3050A	QC Batch:	Test:3050APREP	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:04/24/98 00:00:00 K A DAYS		Approver: D K PEREZ	05/02/98 13:14

Analy Meth:SW846-6010A	QC Batch:	Test:6010AMETALS5	Rpt Basis:none	Date Approved
Prep Meth: SW846-3050A	Analyzed:05/07/98 00:00:00 T E SHOOK		Approver: D K PEREZ	05/18/98 15:12

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Aluminum	6.7		mg/kg	BN			1		
Antimony	1.6		mg/kg	U			1		
Arsenic	2.2		mg/kg	U			1		N
Barium	0.15		mg/kg	BN			1		N
Beryllium	0.10		mg/kg	U			1		
Cadmium	0.17		mg/kg	U			1		N
Calcium	27.3		mg/kg	B			1		
Chromium	0.53		mg/kg	B			1		N
t	0.32		mg/kg	U			1		
r	0.30		mg/kg	B			1		
Iron	35.2		mg/kg	BN			1		
Lead	6.3		mg/kg	BN			1		N
Magnesium	9.2		mg/kg	B			1		
Manganese	0.14		mg/kg	U			1		
Molybdenum	0.27		mg/kg	U			1		
Nickel	0.61		mg/kg	U			1		
Potassium	31.3		mg/kg	JU			1		
Selenium	3.4		mg/kg	U			1		N
Silver	0.46		mg/kg	U			1		N
Sodium	53.3		mg/kg	BN			1		
Thallium	2.3		mg/kg	U			1		
Vanadium	0.24		mg/kg	U			1		
Zinc	14.6		mg/kg	B			1		

Comments: QC File: 98080370

Potassium was qualified a estimate due to initial calibration check did not meet acceptance limits.

Meth:SW846-7470A	QC Batch:	Test:HG7470A	Rpt Basis:none	Date Appro
Prep Meth:	Analyzed:05/07/98 00:00:00 R B COLLEY		Approver: D K PEREZ	05/13/98 1

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Mercury	3222		mg/kg				40000		Y

Comments: File: 98080367

EPA Qualifiers:

B - Analyte result less than the Practical Quantitation Limit (PQL) and greater than or equal to the Instrument Detection Limit (IDL).

J - Qualify data for the sample as estimated.

N - Sample spike recovery not within control limits.

U - Analyte analyzed for but undetected. Analyte result was below the Instrument Detection Limit (IDL).

Analy Meth:PORTS-XP4-TS-RL7280	QC Batch:QC98126003	Test:AB-ACT-GPC	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:05/04/98 00:00:00 J P BREWSTER		Approver: B W SHORT	05/07/98 10:23

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Alpha activity	<7		pCi/g					
Beta activity	<12		pCi/g					

Analy Meth:PORTS-XP4-TS-RL7385	QC Batch:QC98126001	Test:TC99-ACT-LS	Rpt Basis:none	Date Approved
eth:	Analyzed:05/04/98 00:00:00 J P BREWSTER		Approver: B W SHORT	05/07/98 10:20

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Technetium-99	<0.6		pCi/g					

Analy Meth:PORTS-XP4-TS-RL7710ug	QC Batch:QC98142007	Test:TOTAL-U-AS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:05/18/98 00:00:00 R J ANDRE		Approver: B W SHORT	05/22/98 14:32

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Uranium	0.33	0.06	ug/g					
Uranium-235	0.8	0.6	wt %					

Waste Stream Number: SW-6

Waste Stream Title: Antifreeze

Table 1
Waste Stream SW-6
TCLP Metals Analysis from Sampling Events

Date Sampled	Composite Number	Arsenic (mg/l TCLP)	Barium (mg/l TCLP)	Cadmium (mg/l TCLP)	Chromium (mg/l TCLP)	Lead (mg/l TCLP)	Mercury (mg/l TCLP)	Selenium (mg/l TCLP)	Silver (mg/l TCLP)
08/18/98	Composite 1	2.14BJN	0.048B	<0.10	<1.0	<1.0	<0.01	<0.9	<0.2
08/18/98	Composite 2	<1.0	<0.10	0.123B	<1.0	4.78B	<0.01	2.09B	<0.2
08/18/98	Composite 3	<1.0	<0.10	0.12B	<1.0	<1.0	<0.01	1.17B	<0.2
08/18/98	Composite 4	<0.10	4.2B	0.032B	<0.10	<0.10	<0.01	0.618B	0.025B
08/18/98	Composite 5	1100JN	<0.10	0.784B	<1.0	<1.0	<0.01	1.44B	<0.2
08/18/98	Composite 6	<0.10	0.0048B	0.074B	0.057B	<0.10	<0.01	4.35	<0.2
08/18/98	Composite 7	<1.0	<0.10	0.128B	<1.0	<1.0	<0.01	1.49BN	<0.2
08/18/98	Composite 2 Dup	<1.0	<0.10	0.144B	<1.0	1.18B	<0.01	1.94BN	<0.2
08/18/98	Field Blank	<0.04	<0.002	<0.003	<0.02	<0.04	<0.001	<0.04	<0.005

Qualifiers:

B - Analyte result less than the Practical Quantitation Limit (PQL) and greater than or equal to the Instrument Detection Limit (IDL).
U - Analyte analyzed for but undetected. Analyte result was below the Instrument Detection Limit (IDL).
N - Spike sample recovery is not within recovery limits.
J - Qualify data for the sample as estimated.
* - Duplicate analysis not within control limits.

Cus[illegible]r Smpl Id: BJC037C0100SW6
[illegible] X-04-WM BJC09859
Subp[illegible]j Analyses:LIQUID
Customer:J A APPLEGATE
COC#: 061082
Sample Desc:
Customer Comments:
Lab Smpl Comments:

Matrix: LIQUID
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 08/18/98 10:35:00
Received: 08/19/98 09:10:52
Needed: 09/03/98 23:59:0[illegible]
Approved: 09/04/98 14:06:28

Analy Meth:SW846-3010A | QC Batch: | Test:3010APREP | Rpt Basis:none | Date Approved
Prep Meth: | Analyzed:08/26/98 00:00:00 K A DAYS | Approver: D K PEREZ | 09/03/98 14:25

Analy Meth:SW846-6010A | QC Batch: | Test:6010AMETALS5 | Rpt Basis:none | Date Approved
Prep Meth: | Analyzed:08/26/98 00:00:00 E L SIMPSON | Approver: D K PEREZ | 09/03/98 14:48

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Aluminum	430		ug/L	U			25		
Antimony	1020		ug/L	U			25		
Arsenic	2140		ug/L	BJN			25		
Barium	48.2		ug/L	B			25		
Beryllium	5.0		ug/L	U			25		
Boron	64900		ug/L				25		
Cadmium	57.5		ug/L	U			25		
Calcium	14400		ug/L	J			25		
[illegible]m	308		ug/L	U			25		
C[illegible]	495		ug/L	U			25		
Copper	476		ug/L	B			25		
Iron	8160		ug/L	*J			25		
Lead	735		ug/L	U			25		
Lithium	20.0		ug/L	JU			25		
Magnesium	6940		ug/L	J			25		
Manganese	107		ug/L	B			25		
Molybdenum	196000		ug/L				25		
Nickel	175		ug/L	U			25		
Phosphorus	102000		ug/L	J			25		
Potassium	529000		ug/L	J			25		
Selenium	845		ug/L	U			25		
Silicon	13600		ug/L	*J			25		
Silver	102		ug/L	U			25		
Sodium	342000		ug/L	J			25		
Thallium	978		ug/L	U			25		
Vanadium	738		ug/L	BN			25		
Zinc	6890		ug/L				25		

Comments: QC File: 98080687

Due to elevated analytes and matrix interferences, this sample required dilution.

Ag, Na and Si qualified as estimates due to calibration not meeting acceptance limits. Li and P qualified due to lack of calibration verification. As, Ca, Fe, Mg, Na and Si qualified as estimate due to lab control sample reading greater than acceptance limits. As, K and Na qualified as estimates due to

interference checks not meeting acceptance limits.

Analy Meth:SW846-7470A	QC Batch:	Test:HG7470A				Rpt Basis:none			Date Approved
Prep Meth:	Analyzed:08/24/98 00:00:00 C J MAYNARD					Approver: D K PEREZ			09/03/98 14:49
Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Mercury	10		ug/L	U			1		

Comments: QC File: 98080656

Analy Meth:SW846-9040B	QC Batch:QC98243019	Test:PH				Rpt Basis:none			Date Approved
Prep Meth:	Analyzed:08/19/98 13:50:00 R S KISOR					Approver: R E CHARLES			09/01/98 09:11
Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
pH	7.71		pH units				1		

Comments: SW846-9040B pH: The replicate result for this sample is 7.73 pH units.

Analy Meth:EPA -160.2	QC Batch:QC98245002	Test:TSS				Rpt Basis:none			Date Approved
Prep Meth:	Analyzed:08/19/98 12:00:00 A R CLAUSING					Approver: R E CHARLES			09/02/98 16:42
Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
led Solids	358		mg/L				1		

EPA Qualifiers:

* - Duplicate analysis not within control limits.
B - Analyte result less than the Practical Quantitation Limit (PQL) and greater than or equal to the Instrument Detection Limit (IDL).
J - Qualify data for the sample as estimated.
N - Sample spike recovery not within control limits.
U - Analyte analyzed for but undetected. Analyte result was below the Instrument Detection Limit (IDL).

Analy Meth:SW846-9020A	QC Batch:QC98243018	Test:TOX				Rpt Basis:none			Date Approved
Prep Meth:	Analyzed:08/27/98 00:00:00 C J HOLBROOK					Approver: R E CHARLES			09/01/98 10:26
Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Total Organic Halides (TOX)	34		ug/g				1		

Comments: The matrix of this sample was not compatible with the desorption method of SW846-9020A. The sample was analyzed by directly injecting the sample into the pyrolysis system of the instrument. The results reported are actually Total Halides, as per method OA33498025.

n ch:PORTS-OA97333006	QC Batch:QC98247002 Test:AB-ACT-GPC	Rpt Basis:none	Date Approv
Prep Meth:	Analyzed:08/31/98 00:00:00 J P BREWSTER	Approver: J J SISLER	09/04/98 13.

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Alpha activity	<0.1		pCi/ml				0.1	
Beta activity	0.7		pCi/ml				0.3	

Analy Meth:PORTS-XP4-TS-RL7720	QC Batch:QC98246004 Test:ALPHA-U-AS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:08/24/98 00:00:00 R J ANDRE	Approver: J J SISLER	09/03/98 13:57

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Uranium-233/234	0.43	0.29	pCi/L					
Uranium-235	<0.13		pCi/L					
Uranium-236	<0.12		pCi/L					
Uranium-238	<0.29		pCi/L					

Analy Meth:PORTS-XP4-TS-RL7400	QC Batch:QC98244004 Test:GAMMA-ACT-GS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:08/25/98 00:00:00 W C ZUEFLE	Approver: J J SISLER	09/03/98 09:20

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Actinium-228	<0.79		pCi/ml					
Antimony-125	<0.30		pCi/ml					
Bismuth-212	<1.34		pCi/ml					
P -214	<0.36		pCi/ml					
Ce -141	<0.07		pCi/ml					
Cerium-144	<0.29		pCi/ml					
Cesium-134	<0.13		pCi/ml					
Cesium-137	<0.18		pCi/ml					
Lead-210	<0.63		pCi/ml					
Lead-212	<0.15		pCi/ml					
Lead-214	<0.36		pCi/ml					
Niobium-95	<0.19		pCi/ml					
Potassium-40	<4.41		pCi/ml					
Protactinium-231	<3.24		pCi/ml					
Protactinium-234m	<33.6		pCi/ml					
Radium-224	<1.43		pCi/ml					
Radium-226	<0.36		pCi/ml					
Radium-228	<0.79		pCi/ml					
Ruthenium-103	<0.11		pCi/ml					
Ruthenium-106	<1.42		pCi/ml					
Thallium-208	<0.16		pCi/ml					
Zirconium-95	<0.32		pCi/ml					

n th:PORTS-XP4-TS-RL7380	QC Batch:QC98247001 Test:TC99-ACT-LS			Rpt Basis:none			Date Approved
rep Meth:	Analyzed:09/02/98 00:00:00 J P BREWSTER			Approver: J J SISLER			09/04/98 13:54

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Technetium-99	<0.8		pCi/ml				0.8	

Analy Meth:PORTS-XP4-TS-RL7720ug	QC Batch:QC98246005 Test:TOTAL-U-AS			Rpt Basis:none			Date Approved
Prep Meth:	Analyzed:08/24/98 00:00:00 R J ANDRE			Approver: J J SISLER			09/03/98 14:05

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Uranium	<0.87		ug/L					

Analy Meth:PORTS-XP4-TS-RL7720wt%	QC Batch:QC98246006 Test:U235-WT-AS			Rpt Basis:none			Date Approved
Prep Meth:	Analyzed:08/24/98 00:00:00 R J ANDRE			Approver: J J SISLER			09/03/98 14:11

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Uranium-235	NA		wt %		X			

Footnotes:

X - U-235 was below detection limits.

Waste Stream Number: SW-7

Waste Stream Title: Gas Cylinder

Waste stream SW-7 consists of off specification precision mixed chemical gases. Exact concentrations of the hazardous constituent Hydrogen Cyanide is known to be 9.9 ppm. This waste stream is listed waste P063 because Hydrogen Cyanide is the sole active ingredient in the mix.

Waste Stream Number: SW-8

Waste Stream Title: Aerosol Cans

Waste stream SW-8 consists of punctured aerosol cans and the composite residue from the cans. The punctured aerosol cans are managed as non-hazardous scrap metal. The liquid residue from the cans is managed as D001 flammable hazardous waste.

Waste Stream Number: SW-9

Waste Stream Title: Diesel Fuel, Gasoline, Kerosene

Customer Smpl Id: VER46658001
t:X-04-WM BJC09825
Subproj Analyses:LIQUID
Customer:J A APPLEGATE
COC#: 059686
Sample Desc:
Customer Comments:
Lab Smpl Comments:

Matrix: LIQUID
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 06/10/98 13:10:00
Received: 06/11/98 13:07:41
Needed: 07/16/98 23:59:00
Approved: 07/15/98 13:55:52

Analy Meth:SW846-1010 QC Batch: Test:FLASHPOINT Rpt Basis:none Date Approve
Prep Meth: Analyzed:07/14/98 00:00:00 M L STEWART Approver: D K PEREZ 07/15/98 13:5

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Flash Point Closed Cup	63.0		deg C				1		

Comments: QC File: 981100022
Replicate result was 64.0 oC.

Analy Meth:SW846-8260A QC Batch:QC98170001 Test:VOA Rpt Basis:none Date Approve
Prep Meth: Analyzed:06/18/98 00:00:00 J N STRICKLAND Approver: C J VANMETER 07/07/98 16:4

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,1,1-Trichloroethane	2000000		ug/kg	U		2000000	1000000		
1,1,2,2-Tetrachloroethane	2000000		ug/kg	U		2000000	1000000		
1,1,2-Trichloro-1,2,2-trifluoroethane	2000000		ug/kg	U		2000000	1000000		
?-Trichloroethane	2000000		ug/kg	U		2000000	1000000		
Dichloroethane	2000000		ug/kg	U		2000000	1000000		
1,1-Dichloroethene	2000000		ug/kg	U		2000000	1000000		
1,2-Dichloro-1,1,2,2-tetrafluoroethane	4000000		ug/kg	U		4000000	1000000		
1,2-Dichlorobenzene	2000000		ug/kg	U		2000000	1000000		
1,2-Dichloroethane	2000000		ug/kg	U		2000000	1000000		
1,2-Dimethylbenzene	2000000		ug/kg	U		2000000	1000000		
1,3 (1,4)-Dimethylbenzene	2000000		ug/kg	U		2000000	1000000		
1,3-Dichlorobenzene	2000000		ug/kg	U		2000000	1000000		
1,4-Dichlorobenzene	2000000		ug/kg	U		2000000	1000000		
2-Butanone	50000000		ug/kg	U		50000000	1000000		
4-Methyl-2-pentanone	50000000		ug/kg	U		50000000	1000000		
Acetone	50000000		ug/kg	U		50000000	1000000		
Benzene	2000000		ug/kg	U		2000000	1000000		
Bromodichloromethane	2000000		ug/L	U		2000000	1000000		
Bromoform	2000000		ug/kg	U		2000000	1000000		
Bromomethane	4000000		ug/kg	U		4000000	1000000		
Carbon disulfide	2000000		ug/kg	U		2000000	1000000		
Carbon tetrachloride	2000000		ug/kg	U		2000000	1000000		
Chlorobenzene	2000000		ug/kg	U		2000000	1000000		
Chloroethane	4000000		ug/kg	U		4000000	1000000		
Chloroform	2000000		ug/kg	U		2000000	1000000		
Chloromethane	4000000		ug/kg	U		4000000	1000000		
Dibromochloromethane	2000000		ug/kg	U		2000000	1000000		
Ethylbenzene	2000000		ug/kg	U		2000000	1000000		
hylene chloride	2000000		ug/kg	U		2000000	1000000		

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
[illegible]chloroethene	2000000		ug/kg	U		2000000	1000000		
[illegible]ene	2000000		ug/kg	U		2000000	1000000		
Trichloroethene	2000000		ug/kg	U		2000000	1000000		
Trichlorofluoromethane	4000000		ug/kg	U		4000000	1000000		
Vinyl chloride	1000000		ug/kg	U		1000000	1000000		
cis-1,2-Dichloroethene	2000000		ug/kg	U		2000000	1000000		
trans-1,2-Dichloroethene	2000000		ug/kg	U		2000000	1000000		

Comments: This sample was analyzed by the high level extraction method which results in higher reporting limits.

Although no target compounds were present in the sample above the reporting limits, a group of substituted alkanes and benzenes was found from approximately twenty three minutes to thirty four minutes at estimated concentrations from 5,000,000 ug/kg to 10,000,000 ug/kg. A list of TICS (tentativly identified compounds) is available upon request. The sample had an odor of diesel fuel.

EPA Qualifiers:
U - Analyte analyzed for but undetected. Analyte result was below the Limit of Quantitation (LOQ).

Analy Meth:PORTS-OA97333006 QC Batch:QC98176001 Test:AB-ACT-GPC Rpt Basis:none Date Approved
Prep Meth: Analyzed:06/23/98 00:00:00 J P BREWSTER Approver: B W SHORT 06/25/98 13:20

[illegible]te Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
[illegible] activity	<0.2		pCi/ml				0.2	
Beta activity	<0.5		pCi/ml				0.5	

Analy Meth:PORTS-XP4-TS-RL7380 QC Batch:QC98175003 Test:TC99-ACT-LS Rpt Basis:none Date Approved
Prep Meth: Analyzed:06/23/98 00:00:00 J P BREWSTER Approver: B W SHORT 06/24/98 09:30

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Technetium-99	<0.8		pCi/ml				0.8	

Analy Meth:PORTS-XP4-TS-RL7720ug QC Batch:QC98196000 Test:TOTAL-U-AS Rpt Basis:none Date Approved
Prep Meth: Analyzed:07/07/98 00:00:00 R J ANDRE Approver: B W SHORT 07/15/98 10:32

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Uranium	<0.02		ug/ml					
Uranium-235	NA		wt %					

Waste Stream Number: SW-11

Waste Stream Title: Non-Laboratory Off-Specification Chemicals

Waste stream SW-11 consists of off specification non-laboratory chemicals. The waste characteristics are based on the known properties of the waste and are assigned as indicated by the MSDS sheet for the chemical or by manufacture information.

Waste Stream Number: SW-12

Waste Stream Title: Flushing Solution

w
4w

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 930827-065 Project: WMGT RFD Requisition Number: 002722
Customer Sample ID: RFD18780 Customer: ENV./WASTE MGT.
Date Sampled: 26-AUG-1993 Date Sample Received: 27-AUG-1993
Sampled By: BK KELLEY Date Sample Completed: 29-SEP-1993
Material Description: X344 COIL CLEANING SOLN

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-6010	Arsenic	2.6U		mg/kg	TE SHOOK	7-SEP-1993	93080659
	Barium	1.00		mg/kg	TE SHOOK	7-SEP-1993	93080659
	Cadmium	0.30U		mg/kg	TE SHOOK	7-SEP-1993	93080659
	Chromium	5.7		mg/kg	TE SHOOK	7-SEP-1993	93080659
	Lead	17.2*		mg/kg	TE SHOOK	7-SEP-1993	93080659
	Selenium	4.0U		mg/kg	TE SHOOK	7-SEP-1993	93080659
	Silver	1.2		mg/kg	TE SHOOK	7-SEP-1993	93080659
SW846-7470	Mercury	<.025N		MG/KG	EK GILBERT	16-SEP-1993	93080697
TSD515-500	Uranium (Waste)	<1.0		UG/G	SK BENNINGTON	21-SEP-1993	93101062
	Gross Alpha Activity	<0.5		pCi/mL	JJ SISLER	9-SEP-1993	93071395
	Gross Beta Activity	<1.1		pCi/mL	JJ SISLER	9-SEP-1993	93071395
TSD553-370	Technetium	<1.7		pCi/mL	JJ SISLER	31-AUG-1993	93071131

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
ARSENIC	38.46	38.2894	99.56
BARIUM	38.46	37.6452	97.88
CADMIUM	38.46	37.5779	97.71
CHROMIUM	38.46	35.8673	93.26
LEAD	38.46	36.1279	93.94
MERCURY	.149	0.079	53.02
SELENIUM	38.46	36.5846	95.12
SILVER	38.46	36.0923	93.84
URANIUM (WASTE)	9.98	8.8	88.04

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for ample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial

dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

[illegible] - [illegible]y data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - [illegible] analyzed.

[illegible] condensation product.

D - [illegible]condary dilution.

E - Exceeds initial calibration range.

Laboratory Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
D. E. Boyd (Spectrochemistry/ICP Laboratory)
D. K. Perez (Environmental and Industrial Hygiene Laboratory)

Date Approved: 29-SEP-1993

Waste Stream Number: SW-13

Waste Stream Title: Circuit Boards, Miscellaneous Equipment Components

W.S. SW-13

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960219-111 Project: ER 9567E Requisition Number: 20228
Customer Sample ID: VER35239001V Customer: ENV RETORATION
Date Sampled: 19-FEB-1996 09:25 Date Sample Received: 19-FEB-1996
Sampled By: MB HAMEL Date Sample Completed: 21-MAR-1996
Material Description: X-7725 PICTURE TUBES

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311/3010A	Sample Prep TCLP Metals	COMPLETE			LD DRYDEN	4-MAR-1996	030496-004
SW846-1311	Sample Prep TCLP	COMPLETE			MR KELLEY	28-FEB-1996	96170042

Laboratory Manager: C. J. Van Meter (TCLP Laboratory)
Date Approved: 21-MAR-1996

********** COMMENT PAGE **********
********** 960219-111 **********

** Comments from the TCLP Laboratory *****

TCLP_MEthod 1311/6010A : Arsenic was qualified as estimated due to the interference

check standard not meeting acceptance limits.

Definition Page for Qualifiers/Flags

********** 960219-111 **********

I n. ata Reporting Qualifiers and Flags:

oncentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

relation coefficient for MSA is less tha 0.995.

e value is between the LC and the LLD.

tering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 960219-111
Laboratory: TCLP Laboratory
File ID: 96170042
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: VER35239001V
Customer: ENV RETORATION
Sample Matrix: SOLID WASTE
Requisition Number: 20228
Date Sample Received: 19-FEB-1996
Date Sampled: 19-FEB-1996

TCLP_METALS_ICP_RPT

Date Extracted/Prepared: 28-FEB-1996
Analysis Procedure Number: 1311/6010A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 4-MAR-1996
QA File Number: 96080234
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
7440-38-2	Arsenic	0.023JU			
7440-39-3	Barium	5.10			
7440-43-9	Cadmium	0.002U			
7440-47-3	Chromium	0.227			
7439-92-1	Lead	0.073			
7782-49-2	Selenium	0.036U			
7440-22-4	Silver	0.028			

ANALYSIS DATA REPORT

AnaLIS ID:	960219-111	Customer Sample ID:	VER35239001V
Laboratory:	TCLP Laboratory	Customer:	ENV RETORATION
File ID:	96170042	Sample Matrix:	SOLID WASTE
Instrument ID:		Requisition Number:	20228
Authorized By:	C. J. Van Meter	Date Sample Received:	19-FEB-1996
		Date Sampled:	19-FEB-1996

TCLP_HG_RPT

Date Extracted/Prepared:	28-FEB-1996	Date Analyzed:	29-FEB-1996
Analysis Procedure Number:	1311/7470	QA File Number:	96080208
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	MR KELLEY
Associated Blank:			

CAS		mg/L	CAS		mg/L
7439-97-6	Mercury	0.010U			

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960219-110 Project: ER 9567E Requisition Number: 20228
Customer Sample ID: VER35239001P Customer: ENV RETORATION
Date Sampled: 19-FEB-1996 09:25 Date Sample Received: 19-FEB-1996
Sampled By: MB HAMEL Date Sample Completed: 21-MAR-1996
Material Description: X-7725 PICTURE TUBES

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311/3010A	Sample Prep TCLP Metals	COMPLETE			LD DRYDEN	4-MAR-1996	030496-004
SW846-1311	Sample Prep TCLP	COMPLETE			MR KELLEY	28-FEB-1996	96170042

Laboratory Manager: C. J. Van Meter (TCLP Laboratory)
Date Approved: 21-MAR-1996

********** COMMENT PAGE **********
********** 960219-110 **********

* Comments from the TCLP Laboratory *****

TCLP_Method 1311/6010A : Arsenic was qualified as estimated due to the interference

check standard not meeting acceptance limits.

Definition Page for Qualifiers/Flags

960219-110

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

relation coefficient for MSA is less tha 0.995.

e value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an ana.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID:	960219-110	Customer Sample ID:	VER35239001P
Laboratory:	TCLP Laboratory	Customer:	ENV RETORATION
File ID:	96170042	Sample Matrix:	SOLID WASTE
Instrument ID:		Requisition Number:	20228
Authorized By:	C. J. Van Meter	Date Sample Received:	19-FEB-1996
		Date Sampled:	19-FEB-1996

TCLP_METALS_ICP_RPT

Date Extracted/Prepared:	28-FEB-1996	Date Analyzed:	4-MAR-1996
Analysis Procedure Number:	1311/6010A	QA File Number:	96080234
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	MR KELLEY
Associated Blank:			

CAS		mg/L	CAS		mg/L
7440-38-2	Arsenic	0.023JU			
7440-39-3	Barium	26.7			
7440-43-9	Cadmium	0.002U			
7440-47-3	Chromium	0.131			
7439-92-1	Lead	2.19			
7782-49-2	Selenium	0.035U			
7440-22-4	Silver	0.024			

ANALYSIS DATA REPORT

AnaLIS ID: 960219-110
Laboratory: TCLP Laboratory
File ID: 96170042
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: VER35239001P
Customer: ENV RETORATION
Sample Matrix: SOLID WASTE
Requisition Number: 20228
Date Sample Received: 19-FEB-1996
Date Sampled: 19-FEB-1996

TCLP_HG_RPT

Date Extracted/Prepared: 28-FEB-1996
Analysis Procedure Number: 1311/7470
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 29-FEB-1996
QA File Number: 96080208
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
7439-97-6	Mercury	0.010U			

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960219-109 Project: ER 9567E Requisition Number: 20228
Customer Sample ID: VER35239001 Customer: ENV RETORATION
Date Sampled: 19-FEB-1996 09:25 Date Sample Received: 19-FEB-1996
Sampled By: MB HAMEL Date Sample Completed: 11-MAR-1996
Material Description: X-7725 PICTURE TUBES

** No comments were made for this sample. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
TSD553-280	Gross Alpha	<1		pCi/g	JP BREWSTER	1-MAR-1996	96070289
	Gross Beta	<2		pCi/g	JP BREWSTER	1-MAR-1996	96070289
TSD553-385	Technetium	<9.5		pCi/g	JP BREWSTER	1-MAR-1996	96070290
TSD553-710	U-235	ND		pCi/g	SJ JAMES	22-FEB-1996	96070245
	Uranium	<0.017		ug/g	SJ JAMES	22-FEB-1996	96070245

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
Approved: 12-MAR-1996

Definition Page for Qualifiers/Flags

********** 960219-109 **********

Inorgan.. Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

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J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

rrelation coefficient for MSA is less tha 0.995.

.e value is between the LC and the LLD.

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Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

Waste Stream Number: SW-14

Waste Stream Title: Cleanup & Spill Residue

C ner Smpl Id: VER47132001
::X-04-WM BJC09825
Subproj Analyses:LIQUID
Customer:J A APPLEGATE
COC#: 061114
Sample Desc:
Customer Comments:
Lab Smpl Comments:

SW-14

Matrix: LIQUID
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 08/27/98 10:05:00
Received: 08/27/98 12:28:25
Needed: 10/01/98 23:59:00
Approved: 09/30/98 16:49:58

Analy Meth:SW846-3015 | QC Batch: | Test:3015PREP | Rpt Basis:none | Date Approved
Prep Meth: | Analyzed:09/11/98 00:00:00 K A DAYS | Approver: D K PEREZ | 09/25/98 14:37

Analy Meth:SW846-6010A | QC Batch: | Test:6010AMETALS2 | Rpt Basis:none | Date Approved
Prep Meth: SW846-3015 | Analyzed:09/12/98 00:00:00 T E SHOOK | Approver: D K PEREZ | 09/30/98 16:49

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Arsenic	22100		ug/L				1		
Barium	28.0		ug/L				1		
Cadmium	23.0		ug/L	U			1		
Chromium	406		ug/L				1		
Lead	294		ug/L	U			1		
Selenium	338		ug/L	U			1		
Silver	49.5		ug/L				1		

Comments: QC File: 98080745

EPA Qualifiers:
U - Analyte analyzed for but undetected. Analyte result was below the Instrument Detection Limit (IDL).

Analy Meth:SW846-3520 | QC Batch:QC98265015 Test:ORGEXT-SVOC | Rpt Basis:none | Date Approved
Prep Meth: | Analyzed:09/08/98 00:00:00 D K SCAGGS | Approver: C J VANMETER | 09/24/98 16:46

Comments: Method SW846-3520B
The holding time for this sample is actually 14 days since the sample matrix is a waste liquid and not a water.

Analy Meth:SW846-8270B | QC Batch:QC98266000 Test:SVOC | Rpt Basis:none | Date Approved
Prep Meth: SW846-3520 | Analyzed:09/17/98 00:00:00 R J WAWRO | Approver: C J VANMETER | 09/24/98 16:47

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,2,4-Trichlorobenzene	100		ug/L	U		100	1	P	
1,2-Dichlorobenzene	100		ug/L	U		100	1	P	
1,3-Dichlorobenzene	100		ug/L	U		100	1	P	
1,4-Dichlorobenzene	100		ug/L	U		100	1	P	
5-Trichlorophenol	100		ug/L	U		100	1	P	

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
;-Trichlorophenol	100		ug/L	U		100	1	P	
2,4-Dichlorophenol	100		ug/L	U		100	1	P	
2,4-Dimethylphenol	100		ug/L	U		100	1	P	
2,4-Dinitrophenol	500		ug/L	JU		500	1	P	
2,4-Dinitrotoluene	100		ug/L	U		100	1	P	
2,6-Dinitrotoluene	100		ug/L	U		100	1	P	
2-Chloronaphthalene	100		ug/L	U		100	1	P	
2-Chlorophenol	100		ug/L	U		100	1	P	
2-Methyl-4,6-dinitrophenol	500		ug/L	U		500	1	P	
2-Methylphenol	100		ug/L	U		100	1	P	
2-Nitrophenol	100		ug/L	U		100	1	P	
3(4)-Methylphenol	100		ug/L	U		100	1	P	
4-Bromophenyl phenyl ether	100		ug/L	U		100	1	P	
4-Chloro-3-methylphenol	200		ug/L	U		200	1	P	
4-Chlorophenylphenyl ether	100		ug/L	U		100	1	P	
4-Nitrophenol	500		ug/L	U		500	1	P	
Acenaphthene	100		ug/L	U		100	1	P	
Acenaphthylene	100		ug/L	U		100	1	P	
Anthracene	100		ug/L	U		100	1	P	
Benzo(a)anthracene	100		ug/L	U		100	1	P	
Benzo(a)pyrene	100		ug/L	U		100	1	P	
Benzo(b)fluoranthene	100		ug/L	U		100	1	P	
Benzo(ghi)perylene	100		ug/L	JU		100	1	P	
Benzo(k)fluoranthene	100		ug/L	U		100	1	P	
Bis(2-chloroethoxy)methane	100		ug/L	U		100	1	P	
?-chloroethyl) ether	100		ug/L	U		100	1	P	
2-chloroisopropyl) ether	100		ug/L	U		100	1	P	
Bis(2-ethylhexyl)phthalate	100		ug/L	U		100	1	P	
Butylbenzylphthalate	100		ug/L	U		100	1	P	
Chrysene	100		ug/L	U		100	1	P	
Di-n-butylphthalate	100		ug/L	U		100	1	P	
Di-n-octylphthlate	100		ug/L	U		100	1	P	
Dibenz(a,h)anthracene	100		ug/L	JU		100	1	P	
Diethylphthalate	100		ug/L	U		100	1	P	
Dimethylphthalate	100		ug/L	U		100	1	P	
Diphenyldiazene	100		ug/L	U		100	1	P	
Fluoranthene	100		ug/L	U		100	1	P	
Fluorene	100		ug/L	U		100	1	P	
Hexachlorobenzene	100		ug/L	U		100	1	P	
Hexachlorobutadiene	100		ug/L	U		100	1	P	
Hexachlorocyclopentadiene	NR		ug/L				1	P	
Hexachloroethane	100		ug/L	U		100	1	P	
Indeno(1,2,3-cd)pyrene	100		ug/L	JU		100	1	P	
Isophorone	100		ug/L	U		100	1	P	
N-Nitroso-di-n-propylamine	100		ug/L	U		100	1	P	
N-Nitrosodimethylamine	100		ug/L	U		100	1	P	
N-Nitrosodiphenylamine	100		ug/L	U		100	1	P	
Naphthalene	100		ug/L	U		100	1	P	
Nitrobenzene	100		ug/L	U		100	1	P	
Pentachlorophenol	500		ug/L	U		500	1	P	
enanthrene	100		ug/L	U		100	1	P	

te Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1	100		ug/L	U		100	1	P	
Pyrene	100		ug/L	U		100	1	P	
Pyridine	100		ug/L	U		100	1	P	

Comments:

There were 2 compounds that exceeded the 15% RSD criteria for the initial calibration and are qualified as estimated values, 'J'. These compounds were: 2,4-dinitrophenol(22%) and hexachlorocyclopentadiene(23%).

Three compounds failed established recovery criteria of 30% in the continuing calibration check and are also qualified as estimates, 'J'. These compounds were indeno(1,2,3-cd)pyrene(44%), dibenzo(a,h)anthracene(60%) and benzo(g,h,i)perylene(39%).

Hexachlorocyclopentadiene is not reported (NR) because of continuing difficulties in the liquid/liquid extraction procedure for this compound. Recoveries of hexachlorocyclopentadiene from laboratory control and matrix spiked samples have historically been very poor.

Recovery of the last surrogate compound, terphenyl-d14, was slightly below established criteria in the sample extract but was acceptable in the MS extract of this sample.

Analy Meth:SW846-8260A QC Batch:QC98245013 Test:VOA Rpt Basis:none Date Approved
eth: Analyzed:08/30/98 00:00:00 B D FUHR Approver: C J VANMETER 09/04/98 17:13

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,1,1-Trichloroethane	20		ug/L	U	C	20	10		
1,1,2,2-Tetrachloroethane	20		ug/L	U	C	20	10		
1,1,2-Trichloro-1,2,2-trifluoroethane	20		ug/L	U	C	20	10		
1,1,2-Trichloroethane	20		ug/L	U	C	20	10		
1,1-Dichloroethane	20		ug/L	U	C	20	10		
1,1-Dichloroethene	20		ug/L	U	C	20	10		
1,2-Dichloro-1,1,2,2-tetrafluoroethane	40		ug/L	U	C	40	10		
1,2-Dichlorobenzene	20		ug/L	U	C	20	10		
1,2-Dichloroethane	20		ug/L	U	C	20	10		
1,2-Dimethylbenzene	20		ug/L	U	C	20	10		
1,3 (1,4)-Dimethylbenzene	20		ug/L	U	C	20	10		
1,3-Dichlorobenzene	20		ug/L	U	C	20	10		
1,4-Dichlorobenzene	20		ug/L	U	C	20	10		
2-Butanone	500		ug/L	U	C	500	10		
4-Methyl-2-pentanone	500		ug/L	U	C	500	10		
Acetone	500		ug/L	U	C	500	10		
Benzene	20		ug/L	U	C	20	10		
Bromodichloromethane	20		ug/L	U	C	20	10		
Bromoform	20		ug/L	U	C	20	10		
Bromomethane	40		ug/L	U	C	40	10		
Carbon disulfide	20		ug/L	U	C	20	10		
Carbon tetrachloride	20		ug/L	U	C	20	10		
[illegible]orobenzene	20		ug/L	U	C	20	10		

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
[illegible]ethane	40		ug/L	U	C	40	10		
Chloroform	20		ug/L	U	C	20	10		
Chloromethane	40		ug/L	U	C	40	10		
Dibromochloromethane	20		ug/L	U	C	20	10		
Ethylbenzene	20		ug/L	U	C	20	10		
Methylene chloride	20		ug/L	U	C	20	10		
Tetrachloroethene	20		ug/L	U	C	20	10		
Toluene	20		ug/L	U	C	20	10		
Trichloroethene	20		ug/L	U	C	20	10		
Trichlorofluoromethane	40		ug/L	U	C	40	10		
Vinyl chloride	10		ug/L	U	C	10	10		
cis-1,2-Dichloroethene	20		ug/L	U	C	20	10		
trans-1,2-Dichloroethene	20		ug/L	U	C	20	10		

EPA Qualifiers:

J - Estimated value.

U - Analyte analyzed for but undetected. Analyte result was below the Limit of Quantitation (LOQ).

Analy Meth:PORTS-OA97333006 QC Batch:QC98266003 Test:AB-ACT-GPC Rpt Basis:none Date Approved
Prep Meth: Analyzed:09/21/98 00:00:00 J P BREWSTER Approver: B W SHORT 09/24/98 15:41

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Alpha activity	<0.3		pCi/ml				0.3	
Beta activity	3.5		pCi/ml				0.7	

Analy Meth:PORTS-XP4-TS-RL7380 QC Batch:QC98266001 Test:TC99-ACT-LS Rpt Basis:none Date Appro
Prep Meth: Analyzed:09/22/98 00:00:00 J P BREWSTER Approver: B W SHORT 09/24/98 15:41

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Technetium-99	<1.1		pCi/ml				1.1	

Analy Meth:PORTS-XP4-TS-RL7720ug QC Batch:QC98273006 Test:TOTAL-U-AS Rpt Basis:none Date Approved
Prep Meth: Analyzed:09/23/98 00:00:00 R J ANDRE Approver: B W SHORT 09/30/98 14:24

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Uranium	0.32	0.064	ug/ml					
Uranium-235	1.3	0.88	wt %					

C [illegible]ethod SW846-5030A "Purge-and-Trap"

Waste Stream Number: SW-16

Waste Stream Title: Glass Media

Cl[illegible]mer Smpl Id: VER46877001
[illegible]:X-04-WM BJC09825
[illegible]oj Analyses:SOLID
Customer:J A APPLEGATE
COC#: 55300
Sample Desc:
Customer Comments:
Lab Smpl Comments:

Matrix: SOLID
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 04/03/98 13:50:00
Received: 04/06/98 08:50:48
Needed: 05/11/98 00:00:00
Approved: 05/11/98 14:05:42

Analy Meth:SW846-3050A QC Batch: Test:3050APREP Rpt Basis:none
Prep Meth: Analyzed:04/24/98 00:00:00 M L STEWART Approver: D K PEREZ

Analy Meth:SW846-6010A QC Batch: Test:6010AMETALS5 Rpt Basis:none
Prep Meth: SW846-3050A Analyzed:05/07/98 00:00:00 T E SHOOK Approver: D K PEREZ

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Aluminum	339		mg/kg	B			10		
Antimony	16.9		mg/kg	*NU			10		
Arsenic	22.7		mg/kg	U			10		N
Barium	4.1		mg/kg	B			10		N
Beryllium	1.1		mg/kg	U			10		
Cadmium	300		mg/kg				10		Y
Calcium	458		mg/kg	B			10		
Chromium	11.2		mg/kg	B			10		N
[illegible]t	3.3		mg/kg	U			10		
[illegible]er	31.3		mg/kg	BN			10		
Iron	1000		mg/kg	B			10		
Lead	127		mg/kg	B			10		Y
Magnesium	98.9		mg/kg	B			10		
Manganese	40.6		mg/kg	B			10		
Molybdenum	3.9		mg/kg	BN			10		
Nickel	3120		mg/kg				10		
Potassium	322		mg/kg	JU			10		
Selenium	34.9		mg/kg	U			10		Y
Silver	32.2		mg/kg	B			10		N
Sodium	529		mg/kg	B			10		
Thallium	23.6		mg/kg	U			10		
Vanadium	2.4		mg/kg	U			10		
Zinc	28.4		mg/kg	B			10		

Comments: QC File: 98080371

Potassium qualified as estimate due to calibration verification not meeting acceptance limits.

Meth:SW846-7470A | QC Batch: | Test:HG7470A | Rpt Basis:none
Prep Meth: | Analyzed:04/16/98 00:00:00 R B COLLEY | Approver: D K PEREZ

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Mercury	0.025		mg/kg	U			1		N

Comments: QC File: 98080313

EPA Qualifiers:
* - Duplicate analysis not within control limits.
B - Analyte result less than the Practical Quantitation Limit (PQL) and greater than or equal to the Instrument Detection Limit (IDL).
J - Qualify data for the sample as estimated.
N - Sample spike recovery not within control limits.
U - Analyte analyzed for but undetected. Analyte result was below the Instrument Detection Limit (IDL).

Analy Meth:SW846-3540 | QC Batch:QC98127004 Test:ORGEXT-SVOC | Rpt Basis:none
Prep Meth: | Analyzed:04/17/98 00:00:00 D K SCAGGS | Approver: C J VANMETER

Analy Meth:SW846-8270B | QC Batch:QC98127006 Test:SVOC | Rpt Basis:none
Prep Meth: SW846-3540 | Analyzed:05/04/98 00:00:00 R J WAWRO | Approver: C J VANMETER

te Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
-Trichlorobenzene	480		ug/kg	U		480	1		
1,2-Dichlorobenzene	480		ug/kg	U		480	1		
1,3-Dichlorobenzene	480		ug/kg	U		480	1		
1,4-Dichlorobenzene	480		ug/kg	U		480	1		
2,4,5-Trichlorophenol	480		ug/kg	U		480	1		
2,4,6-Trichlorophenol	480		ug/kg	U		480	1		
2,4-Dichlorophenol	480		ug/kg	U		480	1		
2,4-Dimethylphenol	480		ug/kg	U		480	1		
2,4-Dinitrophenol	2400		ug/kg	JU		2400	1		
2,4-Dinitrotoluene	480		ug/kg	U		480	1		
2,6-Dinitrotoluene	480		ug/kg	U		480	1		
2-Chloronaphthalene	480		ug/kg	U		480	1		
2-Chlorophenol	480		ug/kg	U		480	1		
2-Methyl-4,6-dinitrophenol	2400		ug/kg	JU		2400	1		
2-Methylphenol	480		ug/kg	U		480	1		
2-Nitrophenol	480		ug/kg	U		480	1		
3(4)-Methylphenol	480		ug/kg	U		480	1		
4-Bromophenyl phenyl ether	480		ug/kg	U		480	1		
4-Chloro-3-methylphenol	960		ug/kg	U		960	1		
4-Chlorophenylphenyl ether	480		ug/kg	U		480	1		
4-Nitrophenol	2400		ug/kg	U		2400	1		
Acenaphthene	480		ug/kg	U		480	1		
Acenaphthylene	480		ug/kg	U		480	1		
Anthracene	480		ug/kg	U		480	1		
o(a)anthracene	480		ug/kg	U		480	1		

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
a)pyrene	480		ug/kg	U		480	1		
b...o(b)fluoranthene	480		ug/kg	U		480	1		
Benzo(ghi)perylene	480		ug/kg	JU		480	1		
Benzo(k)fluoranthene	480		ug/kg	U		480	1		
Bis(2-chloroethoxy)methane	480		ug/kg	U		480	1		
Bis(2-chloroethyl) ether	480		ug/kg	U		480	1		
Bis(2-chloroisopropyl) ether	480		ug/kg	U		480	1		
Bis(2-ethylhexyl)phthalate	1600		ug/kg			480	1		
Butylbenzylphthalate	480		ug/kg	U		480	1		
Chrysene	480		ug/kg	U		480	1		
Di-n-butylphthalate	480		ug/kg	U		480	1		
Di-n-octylphthlate	480		ug/kg	U		480	1		
Dibenz(a,h)anthracene	480		ug/kg	JU		480	1		
Diethylphthalate	480		ug/kg	U		480	1		
Dimethylphthalate	480		ug/kg	U		480	1		
Diphenyldiazene	480		ug/kg	U		480	1		
Fluoranthene	480		ug/kg	U		480	1		
Fluorene	480		ug/kg	U		480	1		
Hexachlorobenzene	480		ug/kg	U		480	1		
Hexachlorobutadiene	480		ug/kg	U		480	1		
Hexachlorocyclopentadiene	480		ug/kg	JU		480	1		
Hexachloroethane	480		ug/kg	U		480	1		
Indeno(1,2,3-cd)pyrene	480		ug/kg	JU		480	1		
Isophorone	480		ug/kg	U		480	1		
N-Nitroso-di-n-propylamine	480		ug/kg	U		480	1		
...rosodimethylamine	480		ug/kg	U		480	1		
...rosodiphenylamine	480		ug/kg	U		480	1		
Naphthalene	480		ug/kg	U		480	1		
Nitrobenzene	480		ug/kg	U		480	1		
Pentachlorophenol	2400		ug/kg	U		2400	1		
Phenanthrene	480		ug/kg	U		480	1		
Phenol	480		ug/kg	U		480	1		
Pyrene	480		ug/kg	U		480	1		
Pyridine	480		ug/kg	U		480	1		

Comments:

There were 3 compounds that exceeded the 15% RSD criteria for the initial calibration and are qualified as estimated values, 'J'. These compounds were: 2,4-dinitrophenol(32.7%), 4,6-dinitro-2-methylphenol(17.4%), and hexachlorocyclopentadiene(22.1%).

Three compounds exceeded %RSD (30%) criteria for the continuing calibration check and are also qualified with a 'J'. These compounds are indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene and benzo(g,h,i)perylene.

/ leth:SW846-8260A | QC Batch:QC98110010 Test:VOA | Rpt Basis:none
Pr.. meth: | Analyzed:04/16/98 00:00:00 J N STRICKLAND | Approver: C J VANMETER

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,1,1-Trichloroethane	2		ug/kg	U		2	1		
1,1,2,2-Tetrachloroethane	2		ug/kg	JU		2	1		
1,1,2-Trichloro-1,2,2-trifluoroethane	2		ug/kg	U		2	1		
1,1,2-Trichloroethane	2		ug/kg	U		2	1		
1,1-Dichloroethane	2		ug/kg	U		2	1		
1,1-Dichloroethene	2		ug/kg	U		2	1		
1,2-Dichloro-1,1,2,2-tetrafluoroethane	4		ug/kg	U		4	1		
1,2-Dichlorobenzene	2		ug/kg	U		2	1		
1,2-Dichloroethane	2		ug/kg	U		2	1		
1,2-Dimethylbenzene	2		ug/kg	U		2	1		
1,3 (1,4)-Dimethylbenzene	2		ug/kg	U		2	1		
1,3-Dichlorobenzene	2		ug/kg	U		2	1		
1,4-Dichlorobenzene	2		ug/kg	U		2	1		
2-Butanone	50		ug/kg	U		50	1		
4-Methyl-2-pentanone	50		ug/kg	U		50	1		
Acetone	50		ug/kg	U		50	1		
Benzene	2		ug/kg	U		2	1		
Bromodichloromethane	2		ug/kg	U		2	1		
Bromoform	2		ug/kg	U		2	1		
Bromomethane	4		ug/kg	U		4	1		
Carbon disulfide	2		ug/kg	U		2	1		
↴ tetrachloride	2		ug/kg	U		2	1		
obenzene	2		ug/kg	U		2	1		
Chloroethane	4		ug/kg	U		4	1		
Chloroform	2		ug/kg	U		2	1		
Chloromethane	4		ug/kg	U		4	1		
Dibromochloromethane	2		ug/kg	U		2	1		
Ethylbenzene	2		ug/kg	U		2	1		
Methylene chloride	2		ug/kg	U		2	1		
Tetrachloroethene	2		ug/kg	U		2	1		
Toluene	2		ug/kg	U		2	1		
Trichloroethene	2		ug/kg	U		2	1		
Trichlorofluoromethane	4		ug/kg	U		4	1		
Vinyl chloride	1		ug/kg	U		1	1		
cis-1,2-Dichloroethene	2		ug/kg	U		2	1		
trans-1,2-Dichloroethene	2		ug/kg	U		2	1		

TIC Name	Fn	Retention Time	Unit	Estimated Concentr	Qual	Unit
2-Ethyl-1-hexanol		25.16	min	30	J	ug/kg

Comments: A dehydrohalogenation process occurred causing 1,1,2,2-tetrachloroethane being converted to trichloroethane on the matrix spike. The compound 1,1,2,2-tetrachloroethane is estimated "J" due to a 15% recovery on the MS.

Dibromofluoromethane failed the PORTS established surrogate recovery limits (79% -- lower limit-86%).

..ifiers:
J - Estimated value.

U - Analyte analyzed for but undetected. Analyte result was below the Detection
it (DL).

Analy Meth:PORTS-XP4-TS-RL7280 QC Batch:QC98126003 Test:AB-ACT-GPC Rpt Basis:none
Prep Meth: Analyzed:05/04/98 00:00:00 J P BREWSTER Approver: B W SHORT

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Alpha activity	39		pCi/g				
Beta activity	123		pCi/g				

Analy Meth:PORTS-XP4-TS-RL7385 QC Batch:QC98126001 Test:TC99-ACT-LS Rpt Basis:none
Prep Meth: Analyzed:05/04/98 00:00:00 J P BREWSTER Approver: B W SHORT

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Technetium-99	119.5		pCi/g				

Analy Meth:PORTS-XP4-TS-RL7710ug QC Batch:QC98131001 Test:TOTAL-U-AS Rpt Basis:none
Prep Meth: Analyzed:05/10/98 00:00:00 R J ANDRE Approver: B W SHORT

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Uranium	7.02	0.91	ug/g				
Uranium-235	12	2.5	wt %				

Waste Stream Number: SW-17

Waste Stream Title: Metal Shavings

W
4W

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 910918-021 Project: WMGT RFD Customer Sample ID: RFD-4148
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 18-SEP-1991 Date Sample Received: 18-SEP-1991
Sampled By: C ATKINSON Date Sample Completed: 22-SEP-1992
Material Description: METAL SCRAPS

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311	Arsenic	0.05		mg/L	MR KELLEY	11-FEB-1992	9208P004
	Barium	0.14		mg/L	MR KELLEY	11-FEB-1992	9208P004
	Cadmium	0.09		mg/L	MR KELLEY	11-FEB-1992	9208P004
	Chromium	0.02		mg/L	MR KELLEY	11-FEB-1992	9208P004
	Lead	19.0*		mg/L	MR KELLEY	11-FEB-1992	9208P004
	Mercury	< 0.01		mg/L	MR KELLEY	31-OCT-1991	9108A099
	Selenium	0.07		mg/L	MR KELLEY	11-FEB-1992	9208P004
	Silver	0.40		mg/L	MR KELLEY	31-OCT-1991	9108A099
TSD515-500	Uranium (Waste)	3.6		ug/g	DK PEREZ	26-SEP-1991	092591-017

***** Comments from the Chemical Technology Department *****

* ected for matrix spike recovery.
* ncorrected for matrix spike recovery.

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

ike sample recovery is not within control limits.

e reported value is unusable. The value is for informational purposes only.

- The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample ıcentration is less than 50% of the spike concentration.
* - ₚlicate analysis is not within control limits.
+ - Correlation coefficient for MSA is less tha 0.995.
# - The value is between the LC and the LLD.
Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Laboratory Manager: D. K. Perez (Environmental and Industrial Hygiene Laboratory)
A. J. Saraceno (Chemical Technology Department)
Date Approved: 22-SEP-1992

W
4W

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 921030-031 Project: WMGT WMS Customer Sample ID: WMS-892
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 30-OCT-1992 Date Sample Received: 30-OCT-1992
Sampled By: AR SELBEE Date Sample Completed: 13-JAN-1993
Material Description: BEARING BRASS

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311	Arsenic	< 0.26		mg/L	MR KELLEY	10-NOV-1992	92160258
	Barium	0.06		mg/L	MR KELLEY	10-NOV-1992	92160258
	Cadmium	< 0.03		mg/L	MR KELLEY	10-NOV-1992	92160258
	Chromium	< 0.05		mg/L	MR KELLEY	10-NOV-1992	92160258
	Lead	399		mg/L	MR KELLEY	10-NOV-1992	92160258
	Mercury	< 0.01		mg/L	MR KELLEY	10-NOV-1992	92160258
	Selenium	< 0.54		mg/L	MR KELLEY	10-NOV-1992	92160258
	Silver	< 0.02		mg/L	MR KELLEY	10-NOV-1992	92160258

***** Comments from the TCLP Laboratory *****

Lead exceeded the regulatory limit of 5.0 mg/L.

rganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

- Duplicate analysis is not within control limits.

- Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte

Organic Data Reporting Qualifiers:

Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

Laboratory Manager: D. E. Boyd (TCLP Laboratory)

Date Approved: 13-JAN-1993

W
4W

104-24

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 921030-032 Project: WMGT WMS Customer Sample ID: WMS-893
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 30-OCT-1992 Date Sample Received: 30-OCT-1992
Sampled By: AR SELBEE Date Sample Completed: 13-JAN-1993
Material Description: PHOS. BRONZE

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311	Arsenic	< 0.26		mg/L	MR KELLEY	11-NOV-1992	92160261
	Barium	0.07		mg/L	MR KELLEY	11-NOV-1992	92160261
	Cadmium	< 0.03		mg/L	MR KELLEY	11-NOV-1992	92160261
	Chromium	< 0.04		mg/L	MR KELLEY	11-NOV-1992	92160261
	Lead	6.5		mg/L	MR KELLEY	11-NOV-1992	92160261
	Mercury	< 0.01		mg/L	MR KELLEY	11-NOV-1992	92160261
	Selenium	< 0.7		mg/L	MR KELLEY	11-NOV-1992	92160261
	Silver	< 0.02		mg/L	MR KELLEY	11-NOV-1992	92160261

***** Comments from the TCLP Laboratory *****

Lead exceeded the regulatory limit of 5.0 mg/L.

ganic Data Reporting Qualifiers and Flags:
Concentration Qualifiers:
B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).
U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:
E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.
M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.
N - Spike sample recovery is not within control limits.
R - The reported value is unusable. The value is for informational purposes only.
S - The reported value was obtained by the Method of Standard Additions (MSA).
UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.
- Duplicate analysis is not within control limits.
- Correlation coefficient for MSA is less tha 0.995.
- The value is between the LC and the LLD.
Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte

Organic Data Reporting Qualifiers:

Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

Laboratory Manager: D. E. Boyd (TCLP Laboratory)

Date Approved: 13-JAN-1993

Waste Stream Number: SW-18

Waste Stream Title: Brick/Concrete and Masonry Waste

Waste stream SW-18 is concrete, brick and other masonry material that is removed from spill sites of listed chemical wastes or historically contaminated areas. Each drum is assigned the appropriate waste code based on the listing of the spilled chemical.

Waste Stream Number: SW-19

Waste Stream Title: Miscellaneous Burnable Debris

SW-846

omer Smpl Id: VER36047001
ect:X-04-WM BJC09824
Subproj Analyses:SOLID
Customer:J A APPLEGATE
COC#: 54149
Sample Desc:
Customer Comments:
Lab Smpl Comments:

Matrix: SOLID
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 04/28/98 09:45:00
Received: 04/28/98 09:46:08
Needed: 06/02/98 00:00:00
Approved: 06/02/98 18:28:52

Analy Meth:SW846-3050A QC Batch: Test:3050APREP Rpt Basis:none
Prep Meth: Analyzed:05/05/98 00:00:00 M L STEWART Approver: D K PEREZ

Analy Meth:SW846-6010A QC Batch: Test:6010AMETALS5 Rpt Basis:none
Prep Meth: SW846-3050A Analyzed:05/28/98 00:00:00 E L SIMPSON Approver: D K PEREZ

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Aluminum	2540		mg/kg	B			1		
Antimony	59.9		mg/kg	BN			1		
Arsenic	108		mg/kg	BJ			1		Y
Barium	26.7		mg/kg	B			1		N
Beryllium	1.3		mg/kg	B			1		
Cadmium	9.6		mg/kg	B			1		N
Calcium	64.1		mg/kg	NU			1		
Chromium	388		mg/kg	B			1		Y
alt	7.1		mg/kg	B			1		
pper	3410		mg/kg				1		
Iron	42800		mg/kg	B			1		
Lead	394		mg/kg	B			1		Y
Magnesium	563		mg/kg	B			1		
Manganese	140		mg/kg	B			1		
Molybdenum	205		mg/kg	B			1		
Nickel	2640		mg/kg				1		
Potassium	378		mg/kg	BN			1		
Selenium	33.6		mg/kg	NU			1		Y
Silver	75.6		mg/kg	*			1		N
Sodium	1550		mg/kg	B			1		
Thallium	22.7		mg/kg	NU			1		
Vanadium	2.3		mg/kg	NU			1		
Zinc	80.0		mg/kg	B			1		

Comments: File: 98080419

As qualified as estimate due to interference check not meeting acceptance limits.

EPA Qualifiers:
* - Duplicate analysis not within control limits.
B - Analyte result less than the Practical Quantitation Limit (PQL) and greater than or equal to the Instrument Detection Limit (IDL).
Qualify data for the sample as estimated.
Sample spike recovery not within control limits.
U - Analyte analyzed for but undetected. Analyte result was below the Instrument

tection Limit (IDL).

Analy Meth:SW846-3540 | QC Batch:QC98127005 Test:ORGEXT-SVOC | Rpt Basis:none
Prep Meth: | Analyzed:04/29/98 00:00:00 D K SCAGGS | Approver: B D FUHR

Comments: A lower sample mass was used to prevent sample matrix interference problems with this extraction.

Analy Meth:SW846-8270B | QC Batch:QC98153000 Test:SVOC | Rpt Basis:none
Prep Meth: SW846-3540 | Analyzed:05/27/98 00:00:00 R J WAWRO | Approver: C J VANMETER

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,2,4-Trichlorobenzene	16000		ug/kg	U		16000	8		
1,2-Dichlorobenzene	16000		ug/kg	U		16000	8		
1,3-Dichlorobenzene	16000		ug/kg	U		16000	8		
1,4-Dichlorobenzene	16000		ug/kg	U		16000	8		
2,4,5-Trichlorophenol	NR		ug/kg			NR	8		
2,4,6-Trichlorophenol	NR		ug/kg			NR	8		
2,4-Dichlorophenol	NR		ug/kg			NR	8		
2,4-Dimethylphenol	NR		ug/kg			NR	8		
2,4-Dinitrophenol	80000		ug/kg	JU		80000	8		
2,4-Dinitrotoluene	NR		ug/kg			NR	8		
? 6-Dinitrotoluene	16000		ug/kg	U		16000	8		
loronaphthalene	16000		ug/kg	U		16000	8		
nlorophenol	NR		ug/kg			NR	8		
2-Methyl-4,6-dinitrophenol	16000		ug/kg	U		16000	8		
2-Methylphenol	16000		ug/kg	JU		16000	8		
2-Nitrophenol	16000		ug/kg	U		16000	8		
3(4)-Methylphenol	16000		ug/kg	JU		16000	8		
4-Bromophenyl phenyl ether	16000		ug/kg	U		16000	8		
4-Chloro-3-methylphenol	NR		ug/kg			NR	8		
4-Chlorophenylphenyl ether	16000		ug/kg	U		16000	8		
4-Nitrophenol	NR		ug/kg			NR	8		
Acenaphthene	16000		ug/kg	JU		16000	8		
Acenaphthylene	NR		ug/kg			NR	8		
Anthracene	NR		ug/kg			NR	8		
Benzo(a)anthracene	NR		ug/kg			NR	8		
Benzo(a)pyrene	NR		ug/kg			NR	8		
Benzo(b)fluoranthene	NR		ug/kg			NR	8		
Benzo(ghi)perylene	NR		ug/kg			NR	8		
Benzo(k)fluoranthene	NR		ug/kg			NR	8		
Bis(2-chloroethoxy)methane	16000		ug/kg	U		16000	8		
Bis(2-chloroethyl) ether	16000		ug/kg	U		16000	8		
Bis(2-chloroisopropyl) ether	16000		ug/kg	U		16000	8		
Bis(2-ethylhexyl)phthalate	360000		ug/kg			16000	8		
Butylbenzylphthalate	16000		ug/kg	U		16000	8		
Chrysene	NR		ug/kg			NR	8		
Di-n-butylphthalate	16000		ug/kg	U		16000	8		
-n-octylphthlate	NR		ug/kg			NR	8		

yte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
nz(a,h)anthracene	NR		ug/kg			NR	8		
Diethylphthalate	16000		ug/kg	U		16000	8		
Dimethylphthalate	16000		ug/kg	U		16000	8		
Diphenyldiazene	16000		ug/kg	JU		16000	8		
Fluoranthene	16000		ug/kg	U		16000	8		
Fluorene	16000		ug/kg	U		16000	8		
Hexachlorobenzene	16000		ug/kg	U		16000	8		
Hexachlorobutadiene	16000		ug/kg	U		16000	8		
Hexachlorocyclopentadiene	16000		ug/kg	U		16000	8		
Hexachloroethane	16000		ug/kg	U		16000	8		
Indeno(1,2,3-cd)pyrene	NR		ug/kg			NR	8		
Isophorone	16000		ug/kg	U		16000	8		
N-Nitroso-di-n-propylamine	16000		ug/kg	U		16000	8		
N-Nitrosodimethylamine	16000		ug/kg	U		16000	8		
N-Nitrosodiphenylamine	NR		ug/kg			NR	8		
Naphthalene	16000		ug/kg	U		16000	8		
Nitrobenzene	16000		ug/kg	U		16000	8		
Pentachlorophenol	NR		ug/kg			NR	8		
Phenanthrene	16000		ug/kg	U		16000	8		
Phenol	NR		ug/kg			NR	8		
Pyrene	NR		ug/kg			NR	8		
Pyridine	16000		ug/kg	U		16000	8		

Comments: This sample was analyzed at a 2-fold and an 8-fold dilution of the original extract concentrate because of numerous problems with recoveries of QC compounds. These were:

1. The last internal standard was almost -100% for the 2xD and the 8xD injections. The sample matrix was such that perylene-d12 could not be detected in the 2xDiluted sample and only slightly detectable in the 8xD samples.

2. The third internal standard, acenaphthene-d10, area recovery was -67% in the 2xD of the MSD, but was acceptable in the 2xD sample and both 8xD injections.
3. All 3 acid surrogate compounds failed recovery criteria in all GC runs. Therefore all acid compounds will be qualified as an estimate, 'J', as a minimum qualification.
4. Most of the acid matrix spike compounds also exhibited extremely poor recoveries in both the 2xD and 8xD GC runs. If recovery was below 10% the compound will not be reported, 'NR'. But if the recovery was below method criteria but above 10%, the compound will be reported as an estimate, 'J'.
5. Many of the remaining base or neutral compounds also had poor recoveries in the 2xD and 8xD injections of the matrix spiked sample, and will also be qualified as 'NR' or 'J '.

The 8-fold dilution run will be used for reporting data because of only one internal standard area was low, and several more MS target analytes had acceptable recoveries.

The sample had four abundant TICs, dodecane(~800ppm), tridecane (~3000ppm), tetradecane (~3000ppm) and tributylphosphate(~4000ppm),

which may have caused some of the above problems when coeluting with target analytes. But these four TICs would not have normally caused the poor recovery of the last internal standard, indicating the presence of very potent matrix altering components.

The extremely low recovery for the last internal standard would cause quantiation problems for target analytes associated with it. If the last internal standard was not found, then perhaps the other target analytes eluting in the same retention time range were also diminished.

There were 3 compounds that exceeded the 15% RSD criteria for the initial calibration and are qualified as estimated values, 'J'. These compounds were: 2,4-dinitrophenol(27%), 4-nitrophenol(17%), and acenaphthylene(15%).

EPA Qualifiers:
J - Estimated value.
U - Analyte analyzed for but undetected. Analyte result was below the Detection Limit (DL).

Analy Meth:PORTS-XP4-TS-RL7280 QC Batch:QC98152004 Test:AB-ACT-GPC Rpt Basis:none
Prep Meth: Analyzed:05/28/98 00:00:00 J J SISLER Approver: B W SHORT

lyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
,ha activity	242000		pCi/g	J		18	
Beta activity	10800		pCi/g	J		54	

Analy Meth:PORTS-XP4-TS-RL7385 QC Batch:QC98152003 Test:TC99-ACT-LS Rpt Basis:none
Prep Meth: Analyzed:05/28/98 00:00:00 J J SISLER Approver: B W SHORT

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Technetium-99	14000		pCi/g			70	

Analy Meth:PORTS-XP4-TS-RL7710ug QC Batch:QC98142007 Test:TOTAL-U-AS Rpt Basis:none
Prep Meth: Analyzed:05/18/98 00:00:00 R J ANDRE Approver: B W SHORT

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Uranium	15100	2370	ug/g				
Uranium-235	24	6	wt %				

EPA Qualifiers:
J - Indicates an estimated value.

***** END OF REPORT *****

Waste Stream Number: SW-20

Waste Stream Title: Soil From Non-ER Activities

SW-20

Portsmouth Gaseous Diffusion Plant
Technical Operations Division
Analysis Results

Customer: ENV. RESTORATION Matl. Description: ACCUMULATED WASTE
Project Number: PAWC Subproject Number: 1T

Analysis	Units	940111-021 PORTAW4830	940111-022 PORTAW1422	940207-030 PORTAW4161
1,1,1-Trichloroethane	ug/Kg	<4	<8	<20
1,1,2,2-Tetrachloroethane	ug/Kg	<2000	<8	<20
1,1,2-Trichloroethane	ug/Kg	<4	<8	<20
1,1-Dichloroethene	ug/Kg	<4	<8	<20
1,2-Dichlorobenzene	mg/Kg	0.9U	2.4U	1.1U
1,2-Dichloroethane	ug/Kg	<4	<8	<20
1,2-Dichloroethenes (cis & t)	ug/Kg	<4	<8	<20
1,4-Dichlorobenzene	mg/Kg	0.9U	2.4U	1.1U
2,4,5-TP (Silvex)	ug/g	0.10JU	0.50U	0.05U
2,4,5-Trichlorophenol	mg/Kg	0.9U	2.4U	1.1U
2,4,6-Trichlorophenol	mg/Kg	0.9U	2.4U	1.1U
2,4-D	ug/g	0.10JU	0.50U	0.05U
2,4-Dinitrotoluene	mg/Kg	3.6U	9.6U	4.4U
2-Butanone	ug/Kg	<200	<400	<1000
2-Ethoxyethanol	mg/Kg	0.9U	2.4U	1.1U
2-Nitropropane	ug/Kg	<4	<200	<500
4-Methyl-2-pentanone	ug/Kg	<4	<80	<200
[illegible]or	ug/Kg	<200	<400	<1000
[illegible]	MG/KG	1880	38.7N	209
A[illegible]ony	MG/KG	11.6UN	37.2N	26700
Aroclor-1242	ug/g	NR	NR	
Aroclor-1248	ug/g	NR	NR	
Aroclor-1254	ug/g	NR	NR	
Aroclor-1260	ug/g	NR	NR	
Aroclor-1268	ug/g	NR	NR	
Arsenic	mg/Kg	133	2.5	6.4N
Ash	%	55.5	6.6	95.63
BTU	Btu/lb	<50	2674	COMMENT
Barium	MG/KG	10.2*	0.40N*	12.2
Benzene	ug/Kg	<4	<8	<20
Beryllium	MG/KG	0.39U	0.08U	0.79U
Cadmium	MG/KG	1.4U	0.29U	2.9U
Calcium	MG/KG	163000*	432*	255
Carbon Disulfide	ug/Kg	<4	22	<20
Carbon Tetrachloride	ug/Kg	<4	<8	<20
Chloride	mg/kg	304	458	335
Chlorobenzene	ug/Kg	<4	<8	<20
Chloroethane	ug/Kg	<8	<16	<40
Chloroform	ug/Kg	<4	<8	<20
Chloromethane	ug/Kg	<8	<16	<40
Chromium	MG/KG	47.8N	0.49	1110
Cobalt	MG/KG	16.0	0.65N	64.9
C[illegible]per	MG/KG	12700	1.2	48900
[illegible]	mg/Kg	0.9U	2.4U	1.1U
[illegible]	mg/kg	<1.0	<1.0	<1.0UJ

Cyclohexanone	ug/Kg	<1000	<2000	<5000
Dichlorodifluoromethane	ug/Kg	<4	<8	<20
E[illegible]l	ug/g	<0.005	<2.500	<0.050
En[illegible]n [illegible]yde	ug/g	<0.005	<2.500	<0.050
Ethyl Acetate	ug/Kg	<4	<80	<200
Ethyl benzene	ug/Kg	<40	81	<20
Ethyl ether	ug/Kg	<4	<20	<50
Flash Point	Deg F			
Fluoride	mg/kg	2700	111	30.9
Freon 113	ug/Kg	<4	<8	<20
Freon 114	ug/Kg	<4	<8	<20
Gross Alpha	pCi/g	<9	<1.4	6
Gross Beta	pCi/g	<13	<3.4	<6
Heptachlor	ug/g	<0.005	<2.500	<0.050
Heptachlor epoxide	ug/g	<0.005	<2.500	<0.050
Hexachlorobenzene	mg/Kg	0.9U	2.4U	1.1U
Hexachlorobutadiene	mg/Kg	0.9U	2.4U	1.1U
Hexachloroethane	mg/Kg	0.9U	2.4U	1.1U
Iron	MG/KG	11500	404	188000
Isobutyl alcohol	ug/Kg	<10	<4000	<10000
Lead	MG/KG	15.4N	2.2	700
Magnesium	MG/KG	4020	93.1N	179N
Manganese	MG/KG	113N	3.0N	1200
Mercury	mg/Kg	46.0N	43.7N	.05U
Methoxychlor	ug/g	<0.005	<2.500	<0.050
Methylene Chloride	ug/Kg	<2000	<8	<20
Moisture	%	42.5	70.3	4.1
N[illegible]v[illegible]ohol	ug/Kg	<40	<4000	<10000
N[illegible]	MG/KG	3170	4.7N	4920*
Nitrobenzene	mg/Kg	0.9U	2.4U	1.1U
Np-237	pCi/g	<0.01	<0.01	<0.04
Oil & Grease	%	<0.5	1.3	9.2
Paint Filter Test		PASS	PASS	PASS
Particle Size		COMPLETE	NA	COMMENT
Pentachlorophenol	mg/Kg	3.6U	9.6U	4.4U
Potassium	MG/KG	18000	690N	249UN
Pu-238	pCi/g	<0.01	<0.01	<0.01
Pu-239/240	pCi/g	<0.01	<0.01	<0.01
Pyridine	mg/Kg	0.9U	2.4U	1.1U
Selenium	mg/Kg	1.0U	1.0U	1.4N
Silver	mg/Kg	7.73N*	2.0UN*	9.00N
Sodium	MG/KG	42300	7760	201
Specific Gravity	g/cm3	3.226	1.326	3.096
Sulfide	mg/kg	50.0	88.0	<50.0
Sulfur	mg/Kg	570.0	5050.0	.0754
TOTAL PCB'S	ug/g	<1.0	< 14	
TOX	ug/g	14.4	132.	22.8
Technetium-99 (Total)	pCi/g	0.6	<1.3	<6
Technical Chlordane	ug/g	<0.02	<10.00	<0.20
Tetrachloroethene	ug/Kg	<100	<8	<20
Thallium	mg/Kg	1.0U	1.0U	1.0UN
Toluene	ug/Kg	<4	39	<20
To[illegible]l PCB's	ug/kg		14U	4.6
[illegible]	ug/g	<0.10	<50.00	<1.00
Trich[illegible]oethene	ug/Kg	<4	<8	<20

Trichlorofluoromethane	ug/Kg	<4	<16	<40
U-234	pCi/g	0.38	0.3	3.21
[illegible]	pCi/g	<0.02	<0.034	0.138
[illegible]	pCi/g	<0.014	<0.01	<0.17
[illegible]	pCi/g	0.19	0.05	0.292
Uranium	ug/gm	0.57	0.16	0.94
Uranium-235, Wt%	% U-235	NA	NA	6.83
Vanadium	MG/KG	2.0	0.18UN	5.7
Vinyl Chloride	ug/Kg	<8	<16	<40
Xylene (total)	ug/Kg	<8	913E	<20
Zinc	MG/KG	74.3N	87.8N	303
gamma-BHC(Lindane)	ug/g	<0.005	<2.500	<0.050
pH	pH units	13.13	2.95	6.80

Analysis	Units	940207-031 PORTAW9302	940207-032 PORTAW1991	940207-033 PORTAW9506
1,1,1-Trichloroethane	ug/Kg	<10	36	<4
1,1,2,2-Tetrachloroethane	ug/Kg	<10	<4	<4
1,1,2-Trichloroethane	ug/Kg	2780E	<4	<4
1,1-Dichloroethene	ug/Kg	906E	7	<4
1,2-Dichlorobenzene	mg/Kg	15U	0.9U	1U
1,2-Dichloroethane	ug/Kg	<10	<4	<4
1,2-Dichloroethenes (cis & t)	ug/Kg	31	<4	<4
1,4-Dichlorobenzene	mg/Kg	15U	0.9U	1U
2,4,5-TP (Silvex)	ug/g	11.U	0.05U	0.05U
2,4,5-Trichlorophenol	mg/Kg	15U	0.9U	1U
[illegible]hlorophenol	mg/Kg	15U	0.9U	1U
[illegible]	ug/g	11.U	0.05U	0.05U
[illegible]initrotoluene	mg/Kg	60U	3.6U	4U
2-Butanone	ug/Kg	<500	<200	<200
2-Ethoxyethanol	mg/Kg	15U	0.9U	1U
2-Nitropropane	ug/Kg	<250	<100	<100
4-Methyl-2-pentanone	ug/Kg	<100	<40	<40
Acetone	ug/Kg	530	<200	1120
Aluminum	MG/KG	1130	3630	29900
Antimony	MG/KG	23.0UN	23.2U	23.0UN
Aroclor-1242	ug/g			
Aroclor-1248	ug/g			
Aroclor-1254	ug/g			
Aroclor-1260	ug/g			
Aroclor-1268	ug/g			
Arsenic	mg/Kg	1.0N	7.5	6.6N
Ash	%	7.93	89.62	35.49
BTU	Btu/lb	< 50	301	138
Barium	MG/KG	0.78U	26.3	21.0
Benzene	ug/Kg	<10	<4	<4
Beryllium	MG/KG	2.0	0.78U	0.78U
Cadmium	MG/KG	2.8U	2.8U	79.2
Calcium	MG/KG	624	99300	3840
Carbon Disulfide	ug/Kg	<10	<4	<4
Carbon Tetrachloride	ug/Kg	<10	<4	<4
[illegible]	mg/kg	244	1970	137
[illegible]zene	ug/Kg	<10	<4	<4
[illegible]chane	ug/Kg	<20	<8	<8

Chloroform	ug/Kg	<10	<4	<4
Chloromethane	ug/Kg	<20	<8	<8
C[illegible]i	MG/KG	2.5U	5.5	1210
Co[illegible]lt	MG/KG	2.7U	2.8	23.2
Copper	MG/KG	30.4	4.0	1070
Cresols	mg/Kg	15U	0.9U	1U
Cyanide	mg/kg	<1.0UJ	<1.0UJ	4.45J
Cyclohexanone	ug/Kg	<2500	<1000	<1000
Dichlorodifluoromethane	ug/Kg	<10	<4	<4
Endrin	ug/g	<0.10	<0.005	<0.025
Endrin aldehyde	ug/g	<0.10	<0.005	<0.025
Ethyl Acetate	ug/Kg	<100	<40	<40
Ethyl benzene	ug/Kg	<10	<4	<4
Ethyl ether	ug/Kg	<25	<10	<10
Flash Point	Deg F			
Fluoride	mg/kg	12300	COMMENTS	98.9
Freon 113	ug/Kg	<10	<4	<4
Freon 114	ug/Kg	<10	<4	<4
Gross Alpha	pCi/g	8269	<6	9500
Gross Beta	pCi/g	4611	<13	18169
Heptachlor	ug/g	<0.10	<0.005	<0.025
Heptachlor epoxide	ug/g	<0.10	<0.005	<0.025
Hexachlorobenzene	mg/Kg	15U	0.9U	1U
Hexachlorobutadiene	mg/Kg	15U	0.9U	1U
Hexachloroethane	mg/Kg	15U	0.9U	1U
Iron	MG/KG	2190	8260	21100
Isobutyl alcohol	ug/Kg	<5000	<2000	<2000
I[illegible]	MG/KG	13.4U	20.1	322
M[illegible]	MG/KG	1090	55800	1720
Manganese	MG/KG	16.6	221	348
Mercury	mg/Kg	.193	351	3.84
Methoxychlor	ug/g	<0.10	<0.005	<0.025
Methylene Chloride	ug/Kg	<10	<4	<4
Moisture	%	61.0	8.4	55.1
N-Butyl Alcohol	ug/Kg	<5000	<2000	<2000
Nickel	MG/KG	5.0U*	5.0U*	3030*
Nitrobenzene	mg/Kg	15U	0.9U	1U
Np-237	pCi/g	<0.4	<0.01	9.3
Oil & Grease	%	29.1	1.3	1.2
Paint Filter Test		FAIL	PASS	PASS
Particle Size		COMMENT	COMPLETE	COMPLETE
Pentachlorophenol	mg/Kg	60U	3.6U	4U
Potassium	MG/KG	244U	602N	244UN
Pu-238	pCi/g	<0.01	<0.01	<0.01
Pu-239/240	pCi/g	<0.01	<0.01	2.1
Pyridine	mg/Kg	15U	0.9U	1U
Selenium	mg/Kg	1.0U	1.5	1.0UN
Silver	mg/Kg	2.70N	8.90N	2.0UN
Sodium	MG/KG	4620	150N	73200
Specific Gravity	g/cm3	1.140	3.783	2.480
Sulfide	mg/kg	<500	<50.0	<50.0
Sulfur	mg/Kg	.2660	.0210	.1146
T[illegible] PCB'S	ug/g			
	ug/g	33.6	3.22	2.38
Tech[illegible]um-99 (Total)	pCi/g	174	0.5	19789

Technical Chlordane	ug/g	<0.50	<0.02	<0.10
Tetrachloroethene	ug/Kg	<10	<4	<4
[illegible]	mg/Kg	1.0U	1.0U	1.0UN
[illegible]	ug/Kg	19	<4	23
[illegible] PCB's	ug/kg	<1.3	<0.4	<0.4
Toxaphene	ug/g	<2.50	<0.10	<0.50
Trichloroethene	ug/Kg	36J	<4	<4
Trichlorofluoromethane	ug/Kg	<20	<8	<8
U-234	pCi/g	2525	0.40	3474
U-235	pCi/g	103	<0.02	91.2
U-236	pCi/g	19.7	<0.005	3.02
U-238	pCi/g	2314	0.34	160
Uranium	ug/gm	7000	1.03	523.7
Uranium-235, Wt%	% U-235	0.69	NA	8.12
Vanadium	MG/KG	1.7U	13.1	10.1
Vinyl Chloride	ug/Kg	<20	<8	<8
Xylene (total)	ug/Kg	10J	<4	<4
Zinc	MG/KG	14.9N	38.7	267
gamma-BHC(Lindane)	ug/g	<0.10	<0.005	<0.025
pH	pH units	8.32	8.26	4.59

Analysis	Units	940207-034 PORTAW1988	940207-035 PORTAW1988	940208-017 PORTAW2821
1,1,1-Trichloroethane	ug/Kg	<4	<4	<4
1,1,2,2-Tetrachloroethane	ug/Kg	<4	<4	<4
1,1,2-Trichloroethane	ug/Kg	<4	<4	<4
[illegible]roethene	ug/Kg	<4	<4	<4
[illegible]robenzene	mg/Kg	1U	1U	1.3U
[illegible]ichloroethane	ug/Kg	<4	<4	<4
1,2-Dichloroethenes (cis & t)	ug/Kg	<4	<4	<4
1,4-Dichlorobenzene	mg/Kg	1U	1U	1.3U
2,4,5-TP (Silvex)	ug/g	0.05U	0.05U	0.05U
2,4,5-Trichlorophenol	mg/Kg	1U	1U	1.3U
2,4,6-Trichlorophenol	mg/Kg	1U	1U	1.3U
2,4-D	ug/g	0.05U	0.05U	0.05U
2,4-Dinitrotoluene	mg/Kg	4U	4U	5U
2-Butanone	ug/Kg	<200	<200	<200
2-Ethoxyethanol	mg/Kg	1U	1U	1.3U
2-Nitropropane	ug/Kg	<100	<100	<100
4-Methyl-2-pentanone	ug/Kg	<40	<40	<40
Acetone	ug/Kg	<200	<200	<200
Aluminum	MG/KG	421	139	20200*
Antimony	MG/KG	23.5UN	23.2UN	22.6UN
Aroclor-1242	ug/g			NR
Aroclor-1248	ug/g			NR
Aroclor-1254	ug/g			NR
Aroclor-1260	ug/g			NR
Aroclor-1268	ug/g			NR
Arsenic	mg/Kg	2.5N	1.5N	2.6
Ash	%	95.61	96.74	16.8
BTU	Btu/lb	272	186	<50
[illegible]	MG/KG	16.3	6.9	12.8
	ug/Kg	<4	<4	<4
[illegible]um	MG/KG	0.79U	0.78U	0.76U

Cadmium	MG/KG	18.2	5.2	227*
Calcium	MG/KG	1230	618	1140*
[illegible]lfide	ug/Kg	<4	<4	<4
Ca[illegible]on [illegible]achloride	ug/Kg	<4	<4	<4
Chloride	mg/kg	103	112	830
Chlorobenzene	ug/Kg	<4	<4	<4
Chloroethane	ug/Kg	<8	<8	<8
Chloroform	ug/Kg	<4	<4	<4
Chloromethane	ug/Kg	<8	<8	<8
Chromium	MG/KG	25.5	11.7	323*
Cobalt	MG/KG	4.6	4.7	6.9N*
Copper	MG/KG	1060	523	298*
Cresols	mg/Kg	1U	1U	1.3U
Cyanide	mg/kg	<1.0UJ	<1.0UJ	5.16J
Cyclohexanone	ug/Kg	<1000	<1000	<1000
Dichlorodifluoromethane	ug/Kg	<4	<4	<4
Endrin	ug/g	<0.025	<0.050	<0.005
Endrin aldehyde	ug/g	<0.025	<0.050	<0.005
Ethyl Acetate	ug/Kg	<40	<40	<40
Ethyl benzene	ug/Kg	<4	<4	<4
Ethyl ether	ug/Kg	<10	<10	<10
Flash Point	Deg F			
Fluoride	mg/kg	477	154	9100
Freon 113	ug/Kg	<4	<4	<4
Freon 114	ug/Kg	<4	<4	<4
Gross Alpha	pCi/g	1182	1918	7631
Gross Beta	pCi/g	7908	11970	11342
[illegible]	ug/g	<0.025	<0.050	<0.005
[illegible] epoxide	ug/g	<0.025	<0.050	<0.005
Hexachlorobenzene	mg/Kg	1U	1U	1.3U
Hexachlorobutadiene	mg/Kg	1U	1U	1.3U
Hexachloroethane	mg/Kg	1U	1U	1.3U
Iron	MG/KG	8030	3750	13600*
Isobutyl alcohol	ug/Kg	<2000	<2000	<2000
Lead	MG/KG	470	364	122
Magnesium	MG/KG	376	200	942*
Manganese	MG/KG	72.5	58.4	152*
Mercury	mg/Kg	.156	.072	9.95
Methoxychlor	ug/g	<0.025	<0.050	<0.005
Methylene Chloride	ug/Kg	<4	<4	6
Moisture	%	0.3	0.1	71.9
N-Butyl Alcohol	ug/Kg	<2000	<2000	<2000
Nickel	MG/KG	1080*	744*	5180*
Nitrobenzene	mg/Kg	1U	1U	1.3U
Np-237	pCi/g	2.0	5.0	93.0
Oil & Grease	%	1.4	0.8	0.6
Paint Filter Test		PASS	PASS	PASS
Particle Size		COMPLETE	COMPLETE	COMPLETE
Pentachlorophenol	mg/Kg	4U	4U	5U
Potassium	MG/KG	249U	246U	239UN*
Pu-238	pCi/g	<0.01	0.18	5.2
Pu-239/240	pCi/g	0.47	0.19	11.0
P[illegible]d[illegible]	mg/Kg	1U	1U	1.3U
[illegible]	mg/Kg	1.7N	1.0UN	1.3
Silve[illegible]	mg/Kg	53.3N	34.5N	2.0UN

Sodium	MG/KG	2120	1600	42800*
Specific Gravity	g/cm3	2.720	2.414	2.645
[illegible]	mg/kg	<50.0	<50.0	<50.0
S	mg/Kg	.2327	.2077	SNQ
TO[illegible] PCB'S	ug/g			<0.4
TOX	ug/g	18.7	6.73	3.19
Technetium-99 (Total)	pCi/g	14212	16184	11059
Technical Chlordane	ug/g	<0.10	<0.20	<0.02
Tetrachloroethene	ug/Kg	<4	<4	<4
Thallium	mg/Kg	1.0U	1.0U	1.0U
Toluene	ug/Kg	<4	<4	5
Total PCB's	ug/kg	<0.4	<0.4	
Toxaphene	ug/g	<0.50	<1.00	<0.10
Trichloroethene	ug/Kg	<4	<4	<4
Trichlorofluoromethane	ug/Kg	<8	<8	<8
U-234	pCi/g	1508	1408	1057
U-235	pCi/g	62	52.9	25.6
U-236	pCi/g	2.48	3.81	1.95
U-238	pCi/g	176	130	33
Uranium	ug/gm	557.9	415.4	111.2
Uranium-235, Wt%	% U-235	5.18	5.94	10.7
Vanadium	MG/KG	1.8U	1.8U	5.0
Vinyl Chloride	ug/Kg	<8	<8	<8
Xylene (total)	ug/Kg	<4	<4	<4
Zinc	MG/KG	168N	57.2N	309
gamma-BHC(Lindane)	ug/g	<0.025	<0.050	<0.005
pH	pH units	8.13	7.63	8.45

Analysis	Units	940208-021 PORTAW1879	940208-022 PORTAW1576	940209-056 PORTAW3075
1,1,1-Trichloroethane	ug/Kg	<2	<20	
1,1,2,2-Tetrachloroethane	ug/Kg	<2	<20	
1,1,2-Trichloroethane	ug/Kg	<2	<20	
1,1-Dichloroethene	ug/Kg	<2	<20	
1,2-Dichlorobenzene	mg/Kg	1.2U	1U	
1,2-Dichloroethane	ug/Kg	<2	<20	
1,2-Dichloroethenes (cis & t)	ug/Kg	<2	<20	
1,4-Dichlorobenzene	mg/Kg	1.2U	1U	
2,4,5-TP (Silvex)	ug/g	0.30U	0.05U	
2,4,5-Trichlorophenol	mg/Kg	1.2U	1U	
2,4,6-Trichlorophenol	mg/Kg	1.2U	1U	
2,4-D	ug/g	0.30U	0.05U	
2,4-Dinitrotoluene	mg/Kg	5U	4U	
2-Butanone	ug/Kg	<100	<1000	
2-Ethoxyethanol	mg/Kg	1.2U	1U	
2-Nitropropane	ug/Kg	<50	<500	
4-Methyl-2-pentanone	ug/Kg	<20	<200	
Acetone	ug/Kg	<100	<1000	
Aluminum	MG/KG	11400*	113000*	1.8U
Antimony	MG/KG	23.0UN	45.1UN	4.5U
Aroclor-1242	ug/g	NR	NR	
[illegible]-1248	ug/g	NR	NR	
[illegible]254	ug/g	3.3	NR	
[illegible]1260	ug/g	2.7	NR	

Aroclor-1268	ug/g	0.8	NR	
Arsenic	mg/Kg	7.4	26.8	NA
[illegible]	%	20.1	59.8	
[illegible]	Btu/lb	<50	X	
Barium	MG/KG	74.2	132	0.15U
Benzene	ug/Kg	<2	<20	
Beryllium	MG/KG	0.78U	1.5U	0.15U
Cadmium	MG/KG	15.1*	33.4*	0.55U
Calcium	MG/KG	28700*	16800*	11.9
Carbon Disulfide	ug/Kg	<2	<20	
Carbon Tetrachloride	ug/Kg	<2	<20	
Chloride	mg/kg	152	2820	
Chlorobenzene	ug/Kg	<2	<20	
Chloroethane	ug/Kg	<4	<40	
Chloroform	ug/Kg	<2	<20	
Chloromethane	ug/Kg	<4	<40	
Chromium	MG/KG	154*	894*	0.49U
Cobalt	MG/KG	2.7U*	87.7N*	0.53U
Copper	MG/KG	423*	9340*	8.9
Cresols	mg/Kg	1.2U	1U	
Cyanide	mg/kg	<1.0UJ	<1.0	
Cyclohexanone	ug/Kg	<500	<5000	
Dichlorodifluoromethane	ug/Kg	<2	<20	
Endrin	ug/g	<0.100	<0.250	
Endrin aldehyde	ug/g	<0.100	<0.250	
Ethyl Acetate	ug/Kg	<20	<200	
Ethyl benzene	ug/Kg	<2	<20	
[illegible]	ug/Kg	<5	<50	
[illegible]	Deg F	>145	NR	
Fluoride	mg/kg	683	1150	
Freon 113	ug/Kg	<2	<20	
Freon 114	ug/Kg	<2	<20	
Gross Alpha	pCi/g	2746	23579	<2.0
Gross Beta	pCi/g	19115	5704	<1.1
Heptachlor	ug/g	<0.100	<0.250	
Heptachlor epoxide	ug/g	<0.100	<0.250	
Hexachlorobenzene	mg/Kg	1.2U	1U	
Hexachlorobutadiene	mg/Kg	1.2U	1U	
Hexachloroethane	mg/Kg	1.2U	1U	
Iron	MG/KG	17200*	523000*	13.2
Isobutyl alcohol	ug/Kg	<1000	<10000	
Lead	MG/KG	132	468	5.3
Magnesium	MG/KG	3330*	8980*	6.6
Manganese	MG/KG	143N*	4680*	0.15U
Mercury	mg/Kg	10.5	.057	NA
Methoxychlor	ug/g	<0.100	<0.250	
Methylene Chloride	ug/Kg	<2	<20	
Moisture	%	75.4	10.1	
N-Butyl Alcohol	ug/Kg	<1000	<10000	
Nickel	MG/KG	1350*	4350*	0.96U
Nitrobenzene	mg/Kg	1.2U	1U	
Np-237	pCi/g	7.7	<0.4	
[illegible]	%	<0.5	2.2	
[illegible]er Test		FAIL	PASS	
Partic[illegible] Size		COMPLETE	NA	

Pentachlorophenol	mg/Kg	5U	4U	
Potassium	MG/KG	590N*	954N*	47.4U
[illegible]	pCi/g	1.01	0.019	
[illegible]	pCi/g	3.4	0.030	
[illegible]ine	mg/Kg	1.2U	1U	
Selenium	mg/Kg	1.0U	1.0U	NA
Silver	mg/Kg	2.0UN	15.4N	NA
Sodium	MG/KG	531*	958*	15.5UN
Specific Gravity	g/cm3	2.447	6.244	
Sulfide	mg/kg	68.0	<50.0	
Sulfur	mg/Kg	SNQ	614.0	
TOTAL PCB'S	ug/g	6.8	<2.0	
TOX	ug/g	19.5	34.1	
Technetium-99 (Total)	pCi/g	16630	126.6	<3.1R
Technical Chlordane	ug/g	<0.40	<1.00	
Tetrachloroethene	ug/Kg	<2	<20	
Thallium	mg/Kg	1.0U	1.0U	NA
Toluene	ug/Kg	<2	24	
Total PCB's	ug/kg			
Toxaphene	ug/g	<2.00	<5.00	
Trichloroethene	ug/Kg	<2	<20	
Trichlorofluoromethane	ug/Kg	<4	<40	
U-234	pCi/g	2038	914	0.44
U-235	pCi/g	129	39.5	<0.013
U-236	pCi/g	NA	1.26	<0.01
U-238	pCi/g	417	40.6	<0.03
Uranium	ug/gm	1313	140.5	<0.001
U in [illegible]5, Wt%	% U-235	4.58	13.1	NA
[illegible]	MG/KG	9.3	25.7	0.34U
[illegible] Chloride	ug/Kg	<4	<40	
Xylene (total)	ug/Kg	<2	89	
Zinc	MG/KG	432	1550	5.7
gamma-BHC(Lindane)	ug/g	<0.100	<0.250	
pH	pH units	8.42	7.45	COMMENT

Analysis	Units	940209-057 PORTAW4040	940209-058 PORTAW4040	940209-059 PORTAW4040
1,1,1-Trichloroethane	ug/Kg			
1,1,2,2-Tetrachloroethane	ug/Kg			
1,1,2-Trichloroethane	ug/Kg			
1,1-Dichloroethene	ug/Kg			
1,2-Dichlorobenzene	mg/Kg			
1,2-Dichloroethane	ug/Kg			
1,2-Dichloroethenes (cis & t)	ug/Kg			
1,4-Dichlorobenzene	mg/Kg			
2,4,5-TP (Silvex)	ug/g			
2,4,5-Trichlorophenol	mg/Kg			
2,4,6-Trichlorophenol	mg/Kg			
2,4-D	ug/g			
2,4-Dinitrotoluene	mg/Kg			
2-Butanone	ug/Kg			
2 [illegible]ethanol	mg/Kg			
[illegible]pane	ug/Kg			
[illegible]-2-pentanone	ug/Kg			

Acetone	ug/Kg			
Aluminum	MG/KG	1.8U	1.7U	1.8U
[illegible]	MG/KG	6.3	4.5	4.5U
Aroclo[illegible]	ug/g			
Aroclor-1248	ug/g			
Aroclor-1254	ug/g			
Aroclor-1260	ug/g			
Aroclor-1268	ug/g			
Arsenic	mg/Kg	NA	NA	NA
Ash	%			
BTU	Btu/lb			
Barium	MG/KG	0.15U	0.14U	0.15U
Benzene	ug/Kg			
Beryllium	MG/KG	0.15U	0.14U	0.15U
Cadmium	MG/KG	0.56U	0.52U	0.55U
Calcium	MG/KG	15.5	14.1	5.6
Carbon Disulfide	ug/Kg			
Carbon Tetrachloride	ug/Kg			
Chloride	mg/kg			
Chlorobenzene	ug/Kg			
Chloroethane	ug/Kg			
Chloroform	ug/Kg			
Chloromethane	ug/Kg			
Chromium	MG/KG	0.50U	0.46U	0.49U
Cobalt	MG/KG	0.54U	0.50U	0.53U
Copper	MG/KG	0.75U	0.70U	0.74U
Cresols	mg/Kg			
C[illegible]d	mg/kg			
C[illegible]ne	ug/Kg			
Dichlorodifluoromethane	ug/Kg			
Endrin	ug/g			
Endrin aldehyde	ug/g			
Ethyl Acetate	ug/Kg			
Ethyl benzene	ug/Kg			
Ethyl ether	ug/Kg			
Flash Point	Deg F			
Fluoride	mg/kg			
Freon 113	ug/Kg			
Freon 114	ug/Kg			
Gross Alpha	pCi/g	<1.1	<1.0	2
Gross Beta	pCi/g	<3.1	<1.8	<2.5
Heptachlor	ug/g			
Heptachlor epoxide	ug/g			
Hexachlorobenzene	mg/Kg			
Hexachlorobutadiene	mg/Kg			
Hexachloroethane	mg/Kg			
Iron	MG/KG	11.5	10.4	14.0
Isobutyl alcohol	ug/Kg			
Lead	MG/KG	2.7U	2.5U	2.6U
Magnesium	MG/KG	5.9	4.3	4.5U
Manganese	MG/KG	0.15U	0.14U	0.15U
Mercury	mg/Kg	NA	NA	NA
M[illegible]hlor	ug/g			
[illegible] Chloride	ug/Kg			
Moistu[illegible]	%			

N-Butyl Alcohol	ug/Kg			
Nickel	MG/KG	0.98U	0.91U	0.96U
[illegible]	mg/Kg			
[illegible]	pCi/g			
Oil & Grease	%			
Paint Filter Test				
Particle Size				
Pentachlorophenol	mg/Kg			
Potassium	MG/KG	48.3U	44.8U	47.4U
Pu-238	pCi/g			
Pu-239/240	pCi/g			
Pyridine	mg/Kg			
Selenium	mg/Kg	NA	NA	NA
Silver	mg/Kg	NA	NA	NA
Sodium	MG/KG	39.4N	21.3N	21.1N
Specific Gravity	g/cm3			
Sulfide	mg/kg			
Sulfur	mg/Kg			
TOTAL PCB'S	ug/g			
TOX	ug/g			
Technetium-99 (Total)	pCi/g	<1.3R	<0.7R	<1.1R
Technical Chlordane	ug/g			
Tetrachloroethene	ug/Kg			
Thallium	mg/Kg	NA	NA	NA
Toluene	ug/Kg			
Total PCB's	ug/kg			
Toxaphene	ug/g			
[illegible]thene	ug/Kg			
[illegible]uoromethane	ug/Kg			
[illegible]	pCi/g	2.15	0.92	1.12
U-235	pCi/g	0.075	0.021	0.04
U-236	pCi/g	<0.01	<0.006	<0.009
U-238	pCi/g	0.053	<0.015	0.023
Uranium	ug/gm	0.19	0.01	<0.1
Uranium-235, Wt%	% U-235	17.89	NA	NA
Vanadium	MG/KG	0.35U	0.32U	0.34U
Vinyl Chloride	ug/Kg			
Xylene (total)	ug/Kg			
Zinc	MG/KG	1.6U	1.5U	1.6U
gamma-BHC(Lindane)	ug/g			
pH	pH units	COMMENT	COMMENT	COMMENT

Analysis	Units	940210-018 PORTAW1010	940210-019 PORTAW9131	940210-020 PORTAW1171
1,1,1-Trichloroethane	ug/Kg			
1,1,2,2-Tetrachloroethane	ug/Kg			
1,1,2-Trichloroethane	ug/Kg			
1,1-Dichloroethene	ug/Kg			
1,2-Dichlorobenzene	mg/Kg			
1,2-Dichloroethane	ug/Kg			
1,2-Dichloroethenes (cis & t)	ug/Kg			
[illegible]-Dichlorobenzene	mg/Kg			
Silvex)	ug/g			
[illegible]chlorophenol	mg/Kg			

2,4,6-Trichlorophenol	mg/Kg			
2,4-D	ug/g			
p[illegible]toluene	mg/Kg			
[illegible]but[illegible]	ug/Kg			
2-Ethoxyethanol	mg/Kg			
2-Nitropropane	ug/Kg			
4-Methyl-2-pentanone	ug/Kg			
Acetone	ug/Kg			
Aluminum	MG/KG	1.8U	1.8U	1.8U
Antimony	MG/KG	4.4U	4.8	6.2
Aroclor-1242	ug/g			
Aroclor-1248	ug/g			
Aroclor-1254	ug/g			
Aroclor-1260	ug/g			
Aroclor-1268	ug/g			
Arsenic	mg/Kg	NA	NA	NA
Ash	%			
BTU	Btu/lb			
Barium	MG/KG	0.15U	0.15U	0.15U
Benzene	ug/Kg			
Beryllium	MG/KG	0.15U	0.15U	0.15U
Cadmium	MG/KG	0.54U	0.55U	0.55U
Calcium	MG/KG	4.3	7.1	3.7
Carbon Disulfide	ug/Kg			
Carbon Tetrachloride	ug/Kg			
Chloride	mg/kg			
Chlorobenzene	ug/Kg			
[illegible]rc[illegible]ne	ug/Kg			
[illegible]l	ug/Kg			
Chlorome[illegible]nane	ug/Kg			
Chromium	MG/KG	0.48U	0.49U	0.49U
Cobalt	MG/KG	0.52U	0.53U	0.53U
Copper	MG/KG	0.72U	0.74U	0.74U
Cresols	mg/Kg			
Cyanide	mg/kg			
Cyclohexanone	ug/Kg			
Dichlorodifluoromethane	ug/Kg			
Endrin	ug/g			
Endrin aldehyde	ug/g			
Ethyl Acetate	ug/Kg			
Ethyl benzene	ug/Kg			
Ethyl ether	ug/Kg			
Flash Point	Deg F			
Fluoride	mg/kg			
Freon 113	ug/Kg			
Freon 114	ug/Kg			
Gross Alpha	pCi/g	1	<1.3	<0.5
Gross Beta	pCi/g	<2.3	<2.2	<1.5
Heptachlor	ug/g			
Heptachlor epoxide	ug/g			
Hexachlorobenzene	mg/Kg			
Hexachlorobutadiene	mg/Kg			
H[illegible]achl[illegible]roethane	mg/Kg			
	MG/KG	15.6	13.5	21.0
Isobu[illegible] alcohol	ug/Kg			

Lead	MG/KG	2.6U	2.6U	2.6U
Magnesium	MG/KG	6.4	8.2	5.1
[illegible]anese	MG/KG	0.15U	0.15U	0.15U
M[illegible]	mg/Kg	NA	NA	NA
Met[illegible]xychlor	ug/g			
Methylene Chloride	ug/Kg			
Moisture	%			
N-Butyl Alcohol	ug/Kg			
Nickel	MG/KG	0.94U	0.96U	0.96U
Nitrobenzene	mg/Kg			
Np-237	pCi/g			
Oil & Grease	%			
Paint Filter Test				
Particle Size				
Pentachlorophenol	mg/Kg			
Potassium	MG/KG	46.5U	47.4U	47.4U
Pu-238	pCi/g			
Pu-239/240	pCi/g			
Pyridine	mg/Kg			
Selenium	mg/Kg	NA	NA	NA
Silver	mg/Kg	NA	NA	NA
Sodium	MG/KG	15.8N	22.3N	15.5UN
Specific Gravity	g/cm3			
Sulfide	mg/kg			
Sulfur	mg/Kg			
TOTAL PCB'S	ug/g			
TOX	ug/g			
T[illegible]ne[illegible]-99 (Total)	pCi/g	<1.0	<0.9R	<0.6R
1[illegible]hlordane	ug/g			
T[illegible]chloroethene	ug/Kg			
Thallium	mg/Kg	NA	NA	NA
Toluene	ug/Kg			
Total PCB's	ug/kg			
Toxaphene	ug/g			
Trichloroethene	ug/Kg			
Trichlorofluoromethane	ug/Kg			
U-234	pCi/g	1.16	1.03	0.57
U-235	pCi/g	0.05	0.027	0.028
U-236	pCi/g	<0.008	<0.008	<0.01
U-238	pCi/g	<0.03	<0.01	0.034
Uranium	ug/gm	<0.1	<0.1	0.11
Uranium-235, Wt%	% U-235	NA	NA	NA
Vanadium	MG/KG	0.33U	0.34U	0.34U
Vinyl Chloride	ug/Kg			
Xylene (total)	ug/Kg			
Zinc	MG/KG	1.6U	1.6U	1.6U
gamma-BHC(Lindane)	ug/g			
pH	pH units	COMMENT	COMMENT	COMMENT

Analysis	Units	940210-021 PORTAW8510	940210-022 PORTAW1011	940210-023 PORTAW1835
1[illegible]1-T[illegible]ichloroethane	ug/Kg			
[illegible]trachloroethane	ug/Kg			
[illegible]chloroethane	ug/Kg			

1,1-Dichloroethene	ug/Kg			
1,2-Dichlorobenzene	mg/Kg			
[illegible]oethane	ug/Kg			
1,[illegible]-Di[illegible]oethenes (cis & t)	ug/Kg			
1,4-Dichlorobenzene	mg/Kg			
2,4,5-TP (Silvex)	ug/g			
2,4,5-Trichlorophenol	mg/Kg			
2,4,6-Trichlorophenol	mg/Kg			
2,4-D	ug/g			
2,4-Dinitrotoluene	mg/Kg			
2-Butanone	ug/Kg			
2-Ethoxyethanol	mg/Kg			
2-Nitropropane	ug/Kg			
4-Methyl-2-pentanone	ug/Kg			
Acetone	ug/Kg			
Aluminum	MG/KG	68.5	1.7U	1.7U
Antimony	MG/KG	44.7U	4.3U	4.9
Aroclor-1242	ug/g			
Aroclor-1248	ug/g			
Aroclor-1254	ug/g			
Aroclor-1260	ug/g			
Aroclor-1268	ug/g			
Arsenic	mg/Kg	NA	NA	NA
Ash	%			
BTU	Btu/lb			
Barium	MG/KG	12.6	0.15U	0.14U
Benzene	ug/Kg			
[illegible]	MG/KG	1.5U	0.15U	0.14U
[illegible]	MG/KG	32.8	0.53U	0.52U
Calcium	MG/KG	254	10.1	7.6
Carbon Disulfide	ug/Kg			
Carbon Tetrachloride	ug/Kg			
Chloride	mg/kg			
Chlorobenzene	ug/Kg			
Chloroethane	ug/Kg			
Chloroform	ug/Kg			
Chloromethane	ug/Kg			
Chromium	MG/KG	13.2	0.47U	0.46U
Cobalt	MG/KG	35.7	0.51U	0.50U
Copper	MG/KG	21.9	1.8	0.70U
Cresols	mg/Kg			
Cyanide	mg/kg			
Cyclohexanone	ug/Kg			
Dichlorodifluoromethane	ug/Kg			
Endrin	ug/g			
Endrin aldehyde	ug/g			
Ethyl Acetate	ug/Kg			
Ethyl benzene	ug/Kg			
Ethyl ether	ug/Kg			
Flash Point	Deg F			
Fluoride	mg/kg			
Freon 113	ug/Kg			
F[illegible]on 114	ug/Kg			
[illegible]a	pCi/g	2	<2	2
Gross [illegible]a	pCi/g	<2.6	<6	<4

Heptachlor	ug/g			
Heptachlor epoxide	ug/g			
[illegible]nzene	mg/Kg			
h[illegible]tadiene	mg/Kg			
He[illegible]loroethane	mg/Kg			
Iron	MG/KG	365000	28.8	12.0
Isobutyl alcohol	ug/Kg			
Lead	MG/KG	71.6	2.5U	2.5U
Magnesium	MG/KG	146	9.1	8.4
Manganese	MG/KG	1190	0.15U	0.14U
Mercury	mg/Kg	NA	NA	NA
Methoxychlor	ug/g			
Methylene Chloride	ug/Kg			
Moisture	%			
N-Butyl Alcohol	ug/Kg			
Nickel	MG/KG	24.3	0.93U	0.91U
Nitrobenzene	mg/Kg			
Np-237	pCi/g			
Oil & Grease	%			
Paint Filter Test				
Particle Size				
Pentachlorophenol	mg/Kg			
Potassium	MG/KG	492	45.6U	44.8U
Pu-238	pCi/g			
Pu-239/240	pCi/g			
Pyridine	mg/Kg			
Selenium	mg/Kg	NA	NA	NA
S[illegible]er	mg/Kg	NA	NA	NA
S[illegible]	MG/KG	155UN	21.9N	31.2N
S[illegible]ific Gravity	g/cm3			
Sulfide	mg/kg			
Sulfur	mg/Kg			
TOTAL PCB'S	ug/g			
TOX	ug/g			
Technetium-99 (Total)	pCi/g	<1.1R	<2.6R	<1.7R
Technical Chlordane	ug/g			
Tetrachloroethene	ug/Kg			
Thallium	mg/Kg	NA	NA	NA
Toluene	ug/Kg			
Total PCB's	ug/kg			
Toxaphene	ug/g			
Trichloroethene	ug/Kg			
Trichlorofluoromethane	ug/Kg			
U-234	pCi/g	1.58	2.67	2.75
U-235	pCi/g	0.086	0.09	0.12
U-236	pCi/g	<0.01	<0.06	<0.01
U-238	pCi/g	0.12	<0.02	0.05
Uranium	ug/gm	0.39	<0.1	0.22
Uranium-235, Wt%	% U-235	NA	NA	NA
Vanadium	MG/KG	6.0	0.33U	0.32U
Vinyl Chloride	ug/Kg			
Xylene (total)	ug/Kg			
Z[illegible]	MG/KG	64.9	5.3	1.5U
[illegible]Lindane)	ug/g			
	pH units	COMMENT	COMMENT	COMMENT

Analysis	Units	940214-061 PORTAW2730	940214-062 PORTAW2730	940214-063 PORTAW2730
1,1,1-Trichloroethane	ug/Kg	<20	42	<20
1,1,2,2-Tetrachloroethane	ug/Kg	<20	<20	<20
1,1,2-Trichloroethane	ug/Kg	<20	<20	<20
1,1-Dichloroethene	ug/Kg	65	39	<20
1,2-Dichlorobenzene	mg/Kg	1U	1U	1U
1,2-Dichloroethane	ug/Kg	400	108	<20
1,2-Dichloroethenes (cis & t)	ug/Kg	3000E	726	<20
1,4-Dichlorobenzene	mg/Kg	1U	1U	1U
2,4,5-TP (Silvex)	ug/g	5.05UJ	0.10UJ	0.005UJ
2,4,5-Trichlorophenol	mg/Kg	1U	1U	1U
2,4,6-Trichlorophenol	mg/Kg	1U	1U	1U
2,4-D	ug/g	0.05UJ	0.10UJ	0.005UJ
2,4-Dinitrotoluene	mg/Kg	4U	4U	4U
2-Butanone	ug/Kg	<1000	<1000	<1000
2-Ethoxyethanol	mg/Kg	50UJ	100UJ	1U
2-Nitropropane	ug/Kg	<500	<500	<500
4-Methyl-2-pentanone	ug/Kg	<200	<200	<200
Acetone	ug/Kg	<1000	<1000	<1000
Aluminum	MG/KG	3170	1510	2320
Antimony	MG/KG	3.4N	18.2N	11.5UN
Aroclor-1242	ug/g			
Aroclor-1248	ug/g			
Aroclor-1254	ug/g			
[illegible]60	ug/g			
[illegible]8	ug/g			
Arsenic	mg/Kg	1.0UW	1.0UW	4.6W
Ash	%	36.83	51.09	46.75
BTU	Btu/lb	3028	1139	816
Barium	MG/KG	93.5N	42.4N	90.7N
Benzene	ug/Kg	<20	<20	<20
Beryllium	MG/KG	0.44	0.39U	0.39U
Cadmium	MG/KG	0.28U	1.4U	1.4U
Calcium	MG/KG	13300	98500	55900
Carbon Disulfide	ug/Kg	<20	<20	<20
Carbon Tetrachloride	ug/Kg	<20	<20	<20
Chloride	mg/kg	2250	5920	39.0
Chlorobenzene	ug/Kg	<20	<20	<20
Chloroethane	ug/Kg	<40	<40	<40
Chloroform	ug/Kg	<20	<20	<20
Chloromethane	ug/Kg	<40	<40	<40
Chromium	MG/KG	3.9	2.9	3.5
Cobalt	MG/KG	3.9	3.0	2.3
Copper	MG/KG	5.4	9.2	6.1
Cresols	mg/Kg	1U	1U	1U
Cyanide	mg/kg	<1.0UJ	1.20J	<1.0UJ
Cyclohexanone	ug/Kg	<5000	<5000	<5000
Dichlorodifluoromethane	ug/Kg	<20	<20	<20
Endrin	ug/g	<0.050 J	<0.250 J	<0.005 J
[illegible]aldehyde	ug/g	<0.050 J	<0.250 J	<0.005 J
[illegible]ate	ug/Kg	<200	<200	<200
Ethyl[illegible]nzene	ug/Kg	<20	<20	<20

Ethyl ether	ug/Kg	<50	<50	<50
Flash Point	Deg F			
[illegible]	mg/kg	334	231	53.4
[illegible]	ug/Kg	<20	<20	<20
Freon 114	ug/Kg	<20	<20	<20
Gross Alpha	pCi/g	85	183	<6
Gross Beta	pCi/g	2853	5246	<13
Heptachlor	ug/g	<0.050 J	<0.250 J	<0.005 J
Heptachlor epoxide	ug/g	<0.050 J	<0.250 J	<0.005 J
Hexachlorobenzene	mg/Kg	1U	1U	1U
Hexachlorobutadiene	mg/Kg	1U	1U	1U
Hexachloroethane	mg/Kg	1U	1U	1U
Iron	MG/KG	1880	1270	1090
Isobutyl alcohol	ug/Kg	<10000	<10000	<10000
Lead	MG/KG	5.5	6.7U	8.5
Magnesium	MG/KG	1720	3120	2100
Manganese	MG/KG	31.1	13.0	29.2
Mercury	mg/Kg	.05U	.05UN	.05U
Methoxychlor	ug/g	<0.050 J	<0.250 J	<0.005 J
Methylene Chloride	ug/Kg	27	<20	<20
Moisture	%	42.8	41.9	45.6
N-Butyl Alcohol	ug/Kg	<10000	<10000	<10000
Nickel	MG/KG	44.0	3.2	34.3
Nitrobenzene	mg/Kg	1U	1U	1U
Np-237	pCi/g	<0.40	<0.40	<0.40
Oil & Grease	%	<0.5	<0.5	<0.5
Paint Filter Test		PASS	PASS	PASS
[illegible]ize		COMPLETE	COMPLETE	COMPLETE
[illegible]ophenol	mg/Kg	4U	4U	4U
[illegible]sium	MG/KG	249	173	275
Pu-238	pCi/g	0.13	<0.01	<0.01
Pu-239/240	pCi/g	0.058	<0.01	<0.01
Pyridine	mg/Kg	2.5	1U	1U
Selenium	mg/Kg	1.0UW	1.0UW	1.0UW
Silver	mg/Kg	2.0UN	2.0UN	2.0UN
Sodium	MG/KG	350	169	280
Specific Gravity	g/cm3	1.983	1.987	2.246
Sulfide	mg/kg	<50.0	<50.0	<50.0
Sulfur	mg/Kg	.1565	.0819	.1171
TOTAL PCB'S	ug/g			
TOX	ug/g	1790.	1160.	168.
Technetium-99 (Total)	pCi/g	290	448	<0.2
Technical Chlordane	ug/g	<0.20 J	<1.00 J	<0.02 J
Tetrachloroethene	ug/Kg	<20	<20	<20
Thallium	mg/Kg	1.0U	1.0U	1.0U
Toluene	ug/Kg	<20	<20	<20
Total PCB's	ug/kg	< 0.3 J	< 0.3 J	< 0.3
Toxaphene	ug/g	<1.00 J	<5.00 J	<0.10 J
Trichloroethene	ug/Kg	7870E	8600E	66
Trichlorofluoromethane	ug/Kg	<40	<40	<40
U-234	pCi/g	105	126	0.76
U-235	pCi/g	4.18	4.81	0.032
[illegible]	pCi/g	0.27	0.30	<0.003
	pCi/g	13.7	14.4	0.25
[illegible]	ug/gm	43.1	45.5	0.77

Uranium-235, Wt%	% U-235	4.52	4.93	1.95
Vanadium	MG/KG	4.8	8.9	3.3
1 ·ide	ug/Kg	252	<40	<40
λ,·en· al)	ug/Kg	<20	<20	<20
Zinc	MG/KG	7.4	4.1U	7.7
gamma-BHC(Lindane)	ug/g	<0.050 J	<0.250 J	<0.005 J
pH	pH units	8.40	8.18	8.77

Analysis	Units	940214-067 PORTAW2730	940214-068 PORTAW2730	940214-069 PORTAW2730
1,1,1-Trichloroethane	ug/Kg	<20	<20	<20
1,1,2,2-Tetrachloroethane	ug/Kg	<20	<20	<20
1,1,2-Trichloroethane	ug/Kg	<20	<20	<20
1,1-Dichloroethene	ug/Kg	<20	<20	<20
1,2-Dichlorobenzene	mg/Kg	1U	1U	1U
1,2-Dichloroethane	ug/Kg	<20	<20	<20
1,2-Dichloroethenes (cis & t)	ug/Kg	<20	<20	250J
1,4-Dichlorobenzene	mg/Kg	1U	1U	1U
2,4,5-TP (Silvex)	ug/g	0.05UJ	0.005U	0.005UJ
2,4,5-Trichlorophenol	mg/Kg	1U	1U	1U
2,4,6-Trichlorophenol	mg/Kg	1U	1U	1U
2,4-D	ug/g	0.05UJ	0.005U	0.005UJ
2,4-Dinitrotoluene	mg/Kg	4U	4U	4U
2-Butanone	ug/Kg	<1000	<1000	<1000
2-Ethoxyethanol	mg/Kg	1U	1U	1U
2-Nitropropane	ug/Kg	<500	<500	<500
t ·-pentanone	ug/Kg	<200	<200	<200
· ·	ug/Kg	<1000	<1000	<1000
Aluminum	MG/KG	2630	1610	1340
Antimony	MG/KG	2.3UN	10.9U	11.4UN
Aroclor-1242	ug/g			
Aroclor-1248	ug/g			
Aroclor-1254	ug/g			
Aroclor-1260	ug/g			
Aroclor-1268	ug/g			
Arsenic	mg/Kg	1.0UW	1.0UW	1.0UW
Ash	%	10.66	63.39	47.85
BTU	Btu/lb	4913	351	162
Barium	MG/KG	123N	32.1	29.3N
Benzene	ug/Kg	<20	<20	<20
Beryllium	MG/KG	0.17	0.37U	0.38U
Cadmium	MG/KG	0.28U	1.3U	1.4U
Calcium	MG/KG	8240	7.8UN	159000
Carbon Disulfide	ug/Kg	35	<20	<20
Carbon Tetrachloride	ug/Kg	<20	<20	<20
Chloride	mg/kg	98.5	501	433
Chlorobenzene	ug/Kg	<20	<20	<20
Chloroethane	ug/Kg	<40	<40	<40
Chloroform	ug/Kg	<20	<20	<20
Chloromethane	ug/Kg	<40	<40	<40
Chromium	MG/KG	3.1	1.8	2.9
· ·)·	MG/KG	1.6	1.8N	1.4
	MG/KG	2.6	2.8	3.4
Cresu·	mg/Kg	1U	1U	1U

Cyanide	mg/kg	<1.0	<1.0UJ	<1.0UJ
Cyclohexanone	ug/Kg	<5000	<5000	<5000
[illegible]luoromethane	ug/Kg	<20	<20	<20
[illegible]	ug/g	<0.005 J	<0.005 J	<0.005 J
[illegible]n aldehyde	ug/g	<0.005 J	<0.005 J	<0.005 J
Ethyl Acetate	ug/Kg	<200	<200	<200
Ethyl benzene	ug/Kg	<20	<20	<20
Ethyl ether	ug/Kg	<50	<50	<50
Flash Point	Deg F			
Fluoride	mg/kg	191	98.7	84.7
Freon 113	ug/Kg	<20	<20	<20
Freon 114	ug/Kg	<20	<20	<20
Gross Alpha	pCi/g	64	<18	20
Gross Beta	pCi/g	79	<21	74
Heptachlor	ug/g	<0.005 J	<0.005 J	<0.005 J
Heptachlor epoxide	ug/g	<0.005 J	<0.005 J	<0.005 J
Hexachlorobenzene	mg/Kg	1U	1U	1U
Hexachlorobutadiene	mg/Kg	1U	1U	1U
Hexachloroethane	mg/Kg	1U	1U	1U
Iron	MG/KG	1160	756	742
Isobutyl alcohol	ug/Kg	<10000	<10000	<10000
Lead	MG/KG	4.9	9.6	6.8
Magnesium	MG/KG	1380	7240	4040
Manganese	MG/KG	99.6	16.2	17.4
Mercury	mg/Kg	.05U	.05U	.05U
Methoxychlor	ug/g	<0.005 J	<0.005 J	<0.005 J
Methylene Chloride	ug/Kg	<20	<20	<20
[illegible]t[illegible]	%	45.9	29.2	55.6
[illegible]ohol	ug/Kg	<10000	<10000	<10000
N[illegible]	MG/KG	36.2	2.3U	2.5U
Nitrobenzene	mg/Kg	1U	1U	1U
Np-237	pCi/g	<0.40	<0.40	<0.40
Oil & Grease	%	<0.5	<0.5	<0.5
Paint Filter Test		PASS	PASS	PASS
Particle Size		COMPLETE	COMPLETE	COMPLETE
Pentachlorophenol	mg/Kg	4U	4U	4U
Potassium	MG/KG	346	459	327
Pu-238	pCi/g	<0.01	<0.01	<0.01
Pu-239/240	pCi/g	<0.01	<0.01	<0.01
Pyridine	mg/Kg	1U	1U	1U
Selenium	mg/Kg	1.0UW	1.0UW	1.0UW
Silver	mg/Kg	2.0UN	4.98N	2.62N
Sodium	MG/KG	416	85.9N	102
Specific Gravity	g/cm3	1.939	2.230	2.262
Sulfide	mg/kg	<50.0	<50.0	<50.0
Sulfur	mg/Kg	.2660	.0128	.0281
TOTAL PCB'S	ug/g			
TOX	ug/g	131.	65.8	98.1
Technetium-99 (Total)	pCi/g	0.4	<1.1	2.1
Technical Chlordane	ug/g	<0.02 J	<0.02 J	<0.02 J
Tetrachloroethene	ug/Kg	<20	<20	<20
Thallium	mg/Kg	1.0U	1.0U	1.0U
T[illegible]er	ug/Kg	<20	<20	<20
[illegible]s	ug/kg	< 0.3 J	< 0.3	< 0.3
p[illegible]e	ug/g	<0.10 J	<0.10 J	<0.10 J

Trichloroethene	ug/Kg	<20	<20	4000J
Trichlorofluoromethane	ug/Kg	<40	<40	<40
4	pCi/g	73.8	0.13	20.3
U-235	pCi/g	3.33	<0.02	0.88
U-236	pCi/g	0.27	<0.015	0.10
U-238	pCi/g	9.8	0.13	2.38
Uranium	ug/gm	31.0	0.40	7.56
Uranium-235, Wt%	% U-235	5.01	NA	5.42
Vanadium	MG/KG	3.0	3.7	2.9
Vinyl Chloride	ug/Kg	<40	<40	<40
Xylene (total)	ug/Kg	<20	<20	<20
Zinc	MG/KG	7.6	5.7	8.5
gamma-BHC(Lindane)	ug/g	<0.005 J	<0.005 J	<0.005 J
pH	pH units	6.73	12.52	12.40

Analysis	Units	940214-070 PORTAW2730	940214-071 PORTAW2730
1,1,1-Trichloroethane	ug/Kg	<20	295
1,1,2,2-Tetrachloroethane	ug/Kg	<20	<20
1,1,2-Trichloroethane	ug/Kg	<20	<20
1,1-Dichloroethene	ug/Kg	<20	747
1,2-Dichlorobenzene	mg/Kg	1U	1U
1,2-Dichloroethane	ug/Kg	<20	561
1,2-Dichloroethenes (cis & t)	ug/Kg	<20	12000E
1,4-Dichlorobenzene	mg/Kg	1U	1U
2,4,5-TP (Silvex)	ug/g	0.005UJ	0.05UJ
5 hlorophenol	mg/Kg	1U	1U
ilorophenol	mg/Kg	1U	1U
2,4-D	ug/g	0.005UJ	0.05UJ
2,4-Dinitrotoluene	mg/Kg	4U	4U
2-Butanone	ug/Kg	<1000	<1000
2-Ethoxyethanol	mg/Kg	1U	100UJ
2-Nitropropane	ug/Kg	<500	<500
4-Methyl-2-pentanone	ug/Kg	<200	<200
Acetone	ug/Kg	<1000	<1000
Aluminum	MG/KG	1640	2690
Antimony	MG/KG	11.6UN	2.3UN
Aroclor-1242	ug/g		
Aroclor-1248	ug/g		
Aroclor-1254	ug/g		
Aroclor-1260	ug/g		
Aroclor-1268	ug/g		
Arsenic	mg/Kg	1.0UW	1.0UW
Ash	%	41.35	11.11
BTU	Btu/lb	176	6651
Barium	MG/KG	46.6N	120N
Benzene	ug/Kg	<20	<20
Beryllium	MG/KG	0.39U	0.19
Cadmium	MG/KG	1.4U	0.29U
Calcium	MG/KG	118000	5850
Carbon Disulfide	ug/Kg	<20	<20
Tetrachloride	ug/Kg	<20	<20
	mg/kg	594	18,300
enzene	ug/Kg	<20	<20

Chloroethane	ug/Kg	<40	<40
Chloroform	ug/Kg	<20	<20
[illegible]ne	ug/Kg	<40	<40
[illegible]	MG/KG	3.1	2.8
Co[illegible]	MG/KG	2.6	0.92
Copper	MG/KG	7.1	2.4
Cresols	mg/Kg	1U	1U
Cyanide	mg/kg	<1.0UJ	<1.0UJ
Cyclohexanone	ug/Kg	<5000	<5000
Dichlorodifluoromethane	ug/Kg	<20	<20
Endrin	ug/g	<0.005 J	<0.100 J
Endrin aldehyde	ug/g	<0.005 J	<0.100 J
Ethyl Acetate	ug/Kg	<200	<200
Ethyl benzene	ug/Kg	<20	<20
Ethyl ether	ug/Kg	<50	<50
Flash Point	Deg F		
Fluoride	mg/kg	68.1	168
Freon 113	ug/Kg	<20	113
Freon 114	ug/Kg	<20	<20
Gross Alpha	pCi/g	57	<4
Gross Beta	pCi/g	153	52
Heptachlor	ug/g	<0.005 J	<0.100 J
Heptachlor epoxide	ug/g	<0.005 J	<0.100 J
Hexachlorobenzene	mg/Kg	1U	1U
Hexachlorobutadiene	mg/Kg	1U	1U
Hexachloroethane	mg/Kg	1U	1U
Iron	MG/KG	1200	1220
I[illegible]lcohol	ug/Kg	<10000	<10000
[illegible]	MG/KG	6.8U	5.1
M[illegible]	MG/KG	3460	1270
Manganese	MG/KG	29.7	34.2
Mercury	mg/Kg	.05U	.05U
Methoxychlor	ug/g	<0.005 J	<0.100 J
Methylene Chloride	ug/Kg	<20	28
Moisture	%	55.3	40.6
N-Butyl Alcohol	ug/Kg	<10000	<10000
Nickel	MG/KG	8.2	2.6
Nitrobenzene	mg/Kg	1U	1U
Np-237	pCi/g	<0.40	<0.40
Oil & Grease	%	<0.5	<0.5
Paint Filter Test		PASS	PASS
Particle Size		COMPLETE	COMPLETE
Pentachlorophenol	mg/Kg	4U	4U
Potassium	MG/KG	634	105
Pu-238	pCi/g	<0.01	<0.01
Pu-239/240	pCi/g	<0.01	<0.01
Pyridine	mg/Kg	1U	2.3
Selenium	mg/Kg	1.0UW	1.0UW
Silver	mg/Kg	2.0N	2.0UN
Sodium	MG/KG	187	248
Specific Gravity	g/cm3	2.211	1.971
Sulfide	mg/kg	<50.0	<50.0
Sulfur	mg/Kg	0.0358	.3118
[illegible] S	ug/g		
	ug/g	298.	5190.

Technetium-99 (Total)	pCi/g	3.0	<0.2
Technical Chlordane	ug/g	<0.02 J	<0.40 J
ac ethene	ug/Kg	<20	<20
ili	mg/Kg	1.0U	1.0U
Toluene	ug/Kg	<20	<20
Total PCB's	ug/kg	< 0.3	< 0.3 J
Toxaphene	ug/g	<0.10 J	<2.00 J
Trichloroethene	ug/Kg	50	20000E
Trichlorofluoromethane	ug/Kg	<40	<40
U-234	pCi/g	53.8	2.08
U-235	pCi/g	2.05	0.067
U-236	pCi/g	0.16	<0.007
U-238	pCi/g	6.17	0.30
Uranium	ug/gm	19.5	0.94
Uranium-235, Wt%	% U-235	4.90	3.34
Vanadium	MG/KG	3.8	3.4
Vinyl Chloride	ug/Kg	<40	1560
Xylene (total)	ug/Kg	<20	<20
Zinc	MG/KG	21.9	5.5
gamma-BHC(Lindane)	ug/g	<0.005 J	<0.100 J
pH	pH units	12.41	8.65

Waste Stream Number: SW-21

Waste Stream Title: Contaminated Water From Non-ER Projects

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

C m ENV./WASTE MGT. Matl. Description:
P ber: ECSS Subproject Number: EVSR

Analysis	Units	940617-025 EVSR94067	940714-077 EVSR94071	940719-029 EVSR94072
1,1,1-Trichloroethane	ug/L			
1,1,2,2-Tetrachloroethane	ug/L			
1,1,2-Trichloroethane	ug/L			
1,1-Dichloroethane	ug/L			
1,1-Dichloroethene	ug/L			
1,2-Dichloroethane	ug/L			
1,2-Dichloroethenes (cis & t)	ug/L			
2-Butanone	ug/L			
4-Methyl-2-pentanone	ug/L			
Acetone	ug/L			
Aluminum	ug/L		52.2*	
Americium 241	pCi/L		<0.14	<0.08
Ammonia-Nitrogen (Water)	mg/L			0.1
Ammonia-Nitrogen (Water)	mg/L			
Antimony	ug/L		174*	
Aroclor-1242	ug/L		NR	NR
Aroclor-1248	ug/L		NR	NR
Aroclor-1254	ug/L		NR	NR
Aroclor-1260	ug/L		<1.0	<1.0J
Aroclor-1268	ug/L		NR	NR
Arsenic	ug/L		107UJ	
Arsenic	ug/L			
Bacteria, E. Coli	col/100ml			2040B
Bacteria, F. Coli	col/100ml			2920B
Barium	ug/L		90.2	
Barium	ug/L			
Benzene	ug/L			
Be--llium	ug/L		1.8U	
B	ug/L		NA	
F romethane	ug/L			
L fo	ug/L			
Bromomethane	ug/L			
CBOD	mg/L			<5
Cadmium	UG/L			4.1U
Cadmium	ug/L		9.2U	
Calcium	ug/L		222000	
Carbon Disulfide	ug/L			
Carbon Tetrachloride	ug/L			
Chlorobenzene	ug/L			
Chloroethane	ug/L			
Chloroform	ug/L		45	
Chloromethane	ug/L			
Chromium	UG/L		9.8	
Chromium	ug/L		43.6	
Chromium,Hexa.,Dissolved	mg/L		<.01	

Chromium,Hexavalent	mg/L			<.01
Cobalt	ug/L		5.2U	
Copper	UG/L		40.6	3.5
Copper	ug/L		36.0	
D[illegible]romethane	ug/L			
L[illegible]enes (Total)	ug/L			
Dissol[illegible]olids (Water)	mg/L		2878	
Ethyl benzene	ug/L			
Freon 113	ug/L			
Freon 114	ug/L			
Gross Alpha Activity	pCi/L	<5	<14	2163
Gross Beta Activity	pCi/L	<9	23	975
Iron	UG/L		384NJ	.103NJ
Iron	ug/L		346J*	
Lead	ug/L		39.8U	
Lead	ug/L			
Magnesium	ug/L		216000	
Manganese	ug/L		6.2*	
Mercury	ug/L		1U	1U
Methylene Chloride	ug/L			
Neptunium 237	pCi/L		<0.08	<0.13
Nickel	UG/L			21.6
Nickel	ug/L		20.5U	
Nitrate-Nitrogen	mg/L			18
Oil and Grease (Water)	mg/L		<5.0	<5.0
Oil and Grease (Water)	mg/L			
PCB (TOTAL)	ug/L			
Phosphorous (Total)	mg/L		<4.9	1.1
Plutonium 238	pCi/L		<0.08	<0.11
Plutonium 239+240	pCi/L		<0.08	<0.04
Selenium	ug/L			
Selenium	ug/L		132U	
Silver	ug/L			
Silver	ug/L		4.5U	
Sodium	ug/L		243000	
Suspended Solids (Total)	mg/L		26.8	2.4
TOTAL PCB'S	ug/L		<1.0	<1.0J
Technetium	pCi/L	<24	<22	1178
T[illegible]ethene	ug/L			
Th[illegible]	ug/L		365*	
Tin	ug/L		NA	
Titanium	ug/L		NA	
Toluene	ug/L			
Trichloroethene	ug/L		18	
Trichlorofluoromethane	ug/L			
Turbidity	NTU			1.6
Uranium	UG/L		2.1	190
Uranium	mg/L	.005		
Uranium Daughter Beta		NA	NA	
Vanadium	ug/L		7.3	
Vinyl Chloride	ug/L			
Xylene (total)	ug/L			
Zinc	UG/L		71.8J	57.3NJ
Zinc	ug/L		86.7*	

Analysis	Units	940804-055 EVSR94081	941006-081 EVSR94104	941021-061 EVSR94105
1,1,1-Trichloroethane	ug/L	2 U	<2	<2
2, rachloroethane	ug/L	2 U	<2	<2
loroethane	ug/L	2 U	<2	<2
1 oethane	ug/L	2 U	<2	5
1,1-Dichloroethene	ug/L	2 U	<2	8
1,2-Dichloroethane	ug/L	2 U	<2	<2
1,2-Dichloroethenes (cis & t)	ug/L	2 U	<2	<2
2-Butanone	ug/L	100 U	<100	<100
4-Methyl-2-pentanone	ug/L	100 U	<100	<100
Acetone	ug/L	100 U	<100	<100
Aluminum	ug/L			
Americium 241	pCi/L			
Ammonia-Nitrogen (Water)	mg/L			
Ammonia-Nitrogen (Water)	mg/L	1.7	1.3	
Antimony	ug/L			
Aroclor-1242	ug/L			
Aroclor-1248	ug/L			
Aroclor-1254	ug/L			
Aroclor-1260	ug/L			
Aroclor-1268	ug/L			
Arsenic	ug/L			
Arsenic	ug/L			47.1UN
Bacteria, E. Coli	col/100ml			
Bacteria, F. Coli	col/100ml			
Barium	ug/L			
Barium	ug/L			68.8
Benzene	ug/L	2 U	<2	<2
Beryllium	ug/L			
Bismuth	ug/L			
Bromodichloromethane	ug/L	2 U	<2	<2
Bromoform	ug/L	2 U	<2	<2
Bromomethane	ug/L	4 U	<4	<4
CBOD	mg/L			
Cadmium	UG/L			4.1U
C mium	ug/L			
	ug/L			
C lfide	ug/L	2 U	<2	<2
C rachloride	ug/L	2 U	<2	<2
Chlorobenzene	ug/L	2 U	<2	<2
Chloroethane	ug/L	4 U	<4	<4
Chloroform	ug/L	2 U	<2	<2
Chloromethane	ug/L	4 U	<4	<4
Chromium	UG/L	4330	125	3.0
Chromium	ug/L			
Chromium,Hexa.,Dissolved	mg/L			
Chromium,Hexavalent	mg/L	<.02	<0.01	
Cobalt	ug/L			
Copper	UG/L	1260N	213	
Copper	ug/L			
Dibromochloromethane	ug/L	2 U	<2	<2
Dichlorobenzenes (Total)	ug/L	2 U	<2	<2
Dissolved Solids (Water)	mg/L			

Ethyl benzene	ug/L	2 U	<2	<2
Freon 113	ug/L	2 U	<2	3J
Freon 114	ug/L	4 U	<4	<4
Gross Alpha Activity	pCi/L	<18	<4	11
[illegible] Activity	pCi/L	<38	<9	23
[illegible]	UG/L	54400	1930	
Iron	ug/L			
Lead	ug/L			
Lead	ug/L	387	29.3	17.5U
Magnesium	ug/L			
Manganese	ug/L			
Mercury	ug/L	1U	1U	1U
Methylene Chloride	ug/L	2 U	<2	<2
Neptunium 237	pCi/L			
Nickel	UG/L	127J	113	
Nickel	ug/L			
Nitrate-Nitrogen	mg/L	<0.20	<0.20	
Oil and Grease (Water)	mg/L		<5.0	
Oil and Grease (Water)	mg/L	11.8		
PCB (TOTAL)	ug/L			
Phosphorous (Total)	mg/L			
Plutonium 238	pCi/L			
Plutonium 239+240	pCi/L			
Selenium	ug/L			58.UN
Selenium	ug/L			
Silver	ug/L			2.0
Silver	ug/L			
Sodium	ug/L			
Suspended Solids (Total)	mg/L	63.5	24.4	
TOTAL PCB'S	ug/L			
Technetium	pCi/L	<22	<22	<22
Tetrachloroethene	ug/L	2 U	<2	<2
Thallium	ug/L			
Tin	ug/L			
Titanium	ug/L			
Toluene	ug/L	2 U	<2	<2
Trichloroethene	ug/L	2 U	<2	15
Trichlorofluoromethane	ug/L	4 U	<4	<4
[illegible]	NTU			
[illegible]	UG/L	4.9	1.0U	6.0
Uranium	mg/L			
Uranium Daughter Beta				
Vanadium	ug/L			
Vinyl Chloride	ug/L	1 U	<1	<1
Xylene (total)	ug/L	2 U	<2	<2
Zinc	UG/L	13800	2620	
Zinc	ug/L			

Analysis	Units	941102-017 EVSR94107
1,1,1-Trichloroethane	ug/L	
1,1,2,2-Tetrachloroethane	ug/L	
1,1,2-Trichloroethane	ug/L	
1,1-Dichloroethane	ug/L	

Waste Stream Number: SW-22

Waste Stream Title: Sludges From Groundwater, Decontamination Water, Surface Water, etc.

RFD # 32031

Portsmouth Gaseous Diffusion Plant
Technical Operations Division
Analysis Results

AnaLIS ID: 950424-020 Project: ER 9506A Customer Sample ID: ESL030
Customer: ENV RESTORATION Requisition Number: 014306
Date Sampled: 21-APR-1995 13:45 Date Sample Received: 21-APR-1995
Sampled By: TA SHERWOOD Date Sample Completed: 1-MAY-1995
Material Description: LIQUID X344A PIT

** See comment page for comments. **

** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW-846-9040	pH	6.10		ph units	CJ HOLBROOK	24-APR-1995	95100475
SW846-3005A	Sample Prep Metals	COMPLETE			ML STEWART	24-APR-1995	042495-052
SW846-6010A	Arsenic	1220		UG/L	TE SHOOK	24-APR-1995	95080364
	Barium	4340		UG/L	TE SHOOK	24-APR-1995	95080364
	Cadmium	32.2UN		UG/L	TE SHOOK	24-APR-1995	95080364
	Chromium	2020		UG/L	TE SHOOK	24-APR-1995	95080364
	Lead	902		UG/L	TE SHOOK	24-APR-1995	95080364
	Nickel	323000		UG/L	TE SHOOK	24-APR-1995	95080364
	Silver	21.1UN		UG/L	TE SHOOK	24-APR-1995	95080364
SW-	Mercury	2.0U			EK GILBERT	25-APR-1995	95080362
TSD553-330	Technetium	<22		pCi/L	SC BARKER	26-APR-1995	95070626
TSD553-700	% U-235	2.2	0.45	%	CD GOOD	25-APR-1995	95070619
	Uranium	0.15	0.023	ppm	CD GOOD	25-APR-1995	95070619

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)

Date Approved: 1-MAY-1995

********** COMMENT PAGE **********
********** 950424-020 **********

Definition Page for Qualifiers/Flags

********** 950424-020 **********

I. Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

rrelation coefficient for MSA is less tha 0.995.

ue value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950424-020
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#1
Authorized By: J. J. Williams

Customer Sample ID: ESL030
Customer: ENV RESTORATION
Sample Matrix: WATER
Requisition Number: 014306
Date Sample Received: 21-APR-1995
Date Sampled: 21-APR-1995

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 25-APR-1995
QA File Number: 95160425A1
Dilution Factor: 1000
Analyst: MA NOVOTNY

CAS		ug/L	CAS		ug/L
67-64-1	Acetone	100000U	100-41-4	Ethyl benzene	2000U
71-43-2	Benzene	2000U	76-13-1	Freon 113	8,100
75-27-4	Bromodichloromethane	2000U	76-14-2	Freon 114	4000JU
75-25-2	Bromoform	2000U	108-10-1	4-Methyl-2-pentanone	100000U
74-83-9	Bromomethane	4000U	75-09-2	Methylene Chloride	2000U
78-93-3	2-Butanone	100000U	79-34-5	1,1,2,2-Tetrachloroethane	2000U
75-15-0	Carbon Disulfide	2000U	127-18-4	Tetrachloroethene	2000U
56-23-5	Carbon Tetrachloride	2000U	108-88-3	Toluene	2000U
108-90-7	Chlorobenzene	2000U	71-55-6	1,1,1-Trichloroethane	2000U
75-00-3	Chloroethane	4000U	79-00-5	1,1,2-Trichloroethane	2000U
67-66-3	Chloroform	2000U	79-01-6	Trichloroethene	14,000
74-87-3	Chloromethane	4000U	75-69-4	Trichlorofluoromethane	4000U
124-48-1	Dibromochloromethane	2000U	75-01-4	Vinyl Chloride	1000U
106-46-7	1,4-Dichlorobenzene	2000U	1330-20-7	m,p-Xylene	2000U
95-50-1	1,2-Dichlorobenzene	2000U	95-47-6	o-Xylene	2000U
541-73-1	1,3-Dichlorobenzene	2000U			
75-34-3	1,1-Dichloroethane	2000U			
107-06-2	1,2-Dichloroethane	2000U			
75-35-4	1,1-Dichloroethene	2000U			
156-59-2	cis-1,2-Dichloroethene	2000U			
156-60-5	trans-1,2-Dichloroethene	2000U			

RFD #32031

Portsmouth Gaseous Diffusion Plant
Technical Operations Division
Analysis Results

AnaLIS ID: 950424-021 Project: ER 9506A Customer Sample ID: ESL031
Customer: ENV RESTORATION Requisition Number: 014306
Date Sampled: 21-APR-1995 14:30 Date Sample Received: 21-APR-1995
Sampled By: TA SHERWOOD Date Sample Completed: 1-MAY-1995
Material Description: LIQUID X344A PIT

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW-846-9040	pH	6.15		ph units	CJ HOLBROOK	24-APR-1995	95100475
SW846-3005A	Sample Prep Metals	COMPLETE			ML STEWART	24-APR-1995	042495-052
SW846-6010A	Arsenic	1320		UG/L	TE SHOOK	24-APR-1995	95080364
	Barium	413		UG/L	TE SHOOK	24-APR-1995	95080364
	Cadmium	3.2UN		UG/L	TE SHOOK	24-APR-1995	95080364
	Chromium	422		UG/L	TE SHOOK	24-APR-1995	95080364
	Lead	171		UG/L	TE SHOOK	24-APR-1995	95080364
	Nickel	153000		UG/L	TE SHOOK	24-APR-1995	95080364
	Silver	2.1UN		UG/L	TE SHOOK	24-APR-1995	95080364
J	Mercury	5.2		ug/L	EK GILBERT	25-APR-1995	95080362
TSD553-330	Technetium	<22		pCi/L	SC BARKER	26-APR-1995	95070626
TSD553-700	% U-235	1.7	0.38	%	CD GOOD	25-APR-1995	95070619
	Uranium	1.1	0.15	ppm	CD GOOD	25-APR-1995	95070619

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)
Date Approved: 1-MAY-1995

********** COMMENT PAGE **********
********** 950424-021 **********

Definition Page for Qualifiers/Flags

950424-021

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* Duplicate analysis is not within control limits.

orrelation coefficient for MSA is less tha 0.995.

The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950424-021
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#1
Authorized By: J. J. Williams

Customer Sample ID: ESL031
Customer: ENV RESTORATION
Sample Matrix: WATER
Requisition Number: 014306
Date Sample Received: 21-APR-1995
Date Sampled: 21-APR-1995

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 25-APR-1995
QA File Number: 95160425A1
Dilution Factor: 2000
Analyst: MA NOVOTNY

CAS		ug/L	CAS		ug/L
67-64-1	Acetone	200000U	100-41-4	Ethyl benzene	4000U
71-43-2	Benzene	4000U	76-13-1	Freon 113	59,000
75-27-4	Bromodichloromethane	4000U	76-14-2	Freon 114	8000JU
75-25-2	Bromoform	4000U	108-10-1	4-Methyl-2-pentanone	200000U
74-83-9	Bromomethane	8000U	75-09-2	Methylene Chloride	4000U
78-93-3	2-Butanone	200000U	79-34-5	1,1,2,2-Tetrachloroethane	4000U
75-15-0	Carbon Disulfide	4000U	127-18-4	Tetrachloroethene	4000U
56-23-5	Carbon Tetrachloride	4000U	108-88-3	Toluene	4000U
108-90-7	Chlorobenzene	4000U	71-55-6	1,1,1-Trichloroethane	4000U
75-00-3	Chloroethane	8000U	79-00-5	1,1,2-Trichloroethane	4000U
67-66-3	Chloroform	4000U	79-01-6	Trichloroethene	88,000
74-87-3	Chloromethane	8000U	75-69-4	Trichlorofluoromethane	8000U
124-48-1	Dibromochloromethane	4000U	75-01-4	Vinyl Chloride	2000U
106-46-7	1,4-Dichlorobenzene	4000U	1330-20-7	m,p-Xylene	4000U
95-50-1	1,2-Dichlorobenzene	4000U	95-47-6	o-Xylene	4000U
541-73-1	1,3-Dichlorobenzene	4000U			
75-34-3	1,1-Dichloroethane	4000U			
107-06-2	1,2-Dichloroethane	4000U			
75-35-4	1,1-Dichloroethene	4000U			
156-59-2	cis-1,2-Dichloroethene	4000U			
156-60-5	trans-1,2-Dichloroethene	4000U			

Waste Stream Number: SW-23

Waste Stream Title: Sludges From Oils or Other Organic Liquids

W
4W

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 920527-001 Project: WMGT RFD Customer Sample ID: RFD-888-7
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 27-MAY-1992 Date Sample Received: 27-MAY-1992
Sampled By: B KELLEY Date Sample Completed: 10-FEB-1993
Material Description: UNKNOWN

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
ASTMD3828	Flash Point (Setaflash)	>140		Deg. F	DK SCAGGS	2-JUN-1992	X
SW846-7060	Arsenic	<250NJ		ug/L	TE SHOOK	30-AUG-1992	92080335
SW846-7470	Mercury	>80 NR		mg/kg	TE SHOOK	10-AUG-1992	92080280
SW846-7740	Selenium	250NJ		ug/L	TE SHOOK	30-AUG-1992	92080335
SW846-7760	Silver	201 *R		ug/L	TE SHOOK	21-AUG-1992	92080303
SW846-8080	PCB (TOTAL)	4.8		ug/mL	PA HUTCHINS	17-JUN-1992	92160119
T)	Barium	82.5NJ		MG/KG	EL SIMPSON	1-JUN-1992	92080352
	Cadmium	1.5		MG/KG	EL SIMPSON	1-JUN-1992	92080352
	Chromium	472		MG/KG	EL SIMPSON	1-JUN-1992	92080352
	Lead	151		MG/KG	EL SIMPSON	1-JUN-1992	92080352
TSD553-380	Technetium (Waste)	102.8		pCi/mL	JJ SISLER	3-SEP-1992	92070857
TSD553-440	Assay (% U-235, Waste)	18.23		% U-235	JD LITTERAL	29-MAY-1992	92070813
	Total Uranium	22.05		PPM U	JD LITTERAL	29-MAY-1992	92070813

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
ARSENIC	50	46.4	92.80
BARIUM	10.07	-36.38	-361.27
CADMIUM	10.07	9.9	98.01
CHROMIUM	10.07	-42.88	-425.82
LEAD	10.07	16.72	166.04
SELENIUM	50	40.8	81.60
SILVER	1000	9.	0.90

***** Comments from the Oil & Coal Analysis Laboratory *****

This ...le consisted of two distinct phases. The top layer was a clear liquid ...bottom layer was a dark sediment. The sample was first analyzed after mixing, then each layer was analyzed separately. No flash point was observed for any analyses.

***** Comments from the Spectrochemistry/ICP Laboratory *****

For mercury analysis: the sample saturated the system with mercury and was reported as a greater than value. The mercury analysis holding time was also exceeded.

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.
...uplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and t repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.
Secondary dilution.
Exceeds initial calibration range.

/ Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
D. E. Boyd (Spectrochemistry/ICP Laboratory)
D. E. Boyd (Organic Analytical Services)
John E. Hobensack (Oil & Coal Analysis Laboratory)

Date Approved: 11-FEB-1993

AnaLIS ID: 920527-001
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: D. E. Boyd

Customer Sample ID: RFD-888-7
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 27-MAY-1992
Date Sampled: 27-MAY-1992

Solvents_F001

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 3-FEB-1993
QA File Number: 93160045
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/ml	CAS		ug/ml
56-23-5	Carbon Tetrachloride	.02U			
75-09-2	Methylene Chloride	.02U			
127-18-4	Tetrachloroethene	22J			
71-55-6	1,1,1-Trichloroethane	13J			
79-01-6	Trichloroethene	171J			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
- Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

AnaLIS ID: 920527-001
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: D. E. Boyd

Customer Sample ID: RFD-888-7
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 27-MAY-1992
Date Sampled: 27-MAY-1992

Solvents_F003

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 3-FEB-1993
QA File Number: 93160045
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/ml	CAS		ug/ml
67-64-1	Acetone	20U			
	n-Butyl alcohol	20U			
108-94-1	Cyclohexanone	20U			
141-78-6	Ethyl Acetate	20U			
	Ethylbenzenes	20U			
60-29-7	Ethyl ether	20U			
67-56-1	Methanol	20			
	4-Methyl-2-pentanone (MIBK)	20U			
	Xylenes	60U			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Waste Stream Number: ER-1

Waste Stream Title: Groundwater and Related Water

tomer Smpl Id: VER47687001S
ject:X-04-WM BJC09824
Subproj Analyses:LIQUID
Customer:J A APPLEGATE
COC#: 061531
Sample Desc:
Customer Comments:
Lab Smpl Comments:

Matrix: LIQUID
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 09/15/98 13:35:00
Received: 09/16/98 07:25:02
Needed: 10/21/98 23:59:00
Approved: 09/25/98 11:46:51

Analy Meth:SW846-9040B | QC Batch:QC98265001 Test:PH | Rpt Basis:none | Date Approved
Prep Meth: | Analyzed:09/17/98 00:00:00 T L VININGS | Approver: R E CHARLES | 09/22/98 09:44

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
pH	6.83		pH units				1		

Analy Meth:SW846-8260A | QC Batch:QC98266006 Test:VOA-1 | Rpt Basis:none | Date Approved
Prep Meth: | Analyzed:09/21/98 00:00:00 B D FUHR | Approver: C J VANMETER | 09/25/98 11:11

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,1,1-Trichloroethane	23		ug/L		C	20	10		
Trichloroethene	1000		ug/L		C	100	50		

Comments: This sample was initially analyzed on 09/18/98 with QA# 98160918A3 at a X10 dilution. However, because the trichloroethene concentration exceeded the initial calibration range, it was re-analyzed at a X50 dilution on 09/21/98 with QA# 98160921A1.

Footnotes:
C - Method SW846-5030A "Purge-and-Trap"

***** END OF REPORT *****

te Stream ER-1

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 951027-108 Project: ER 9567D Requisition Number: 018843
Customer Sample ID: VER31810007 Customer: ENV RERSTORATION
Date Sampled: 27-OCT-1995 10:20 Date Sample Received: 27-OCT-1995
Sampled By: R CAUDILL Date Sample Completed: 11-DEC-1995
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
ACD-5101	Density	1.00		g/mL	ML STEWART	3-NOV-1995	95081159
SW846-1010	Flash Point	NR			D PEREZ	3-NOV-1995	NA
SW846-3015	Sample Prep Metals	COMPLETE			ML STEWART	3-NOV-1995	110395-011
SW846-3510	Sample Prep PCB	COMPLETE			SL EWING	1-NOV-1995	95160315
SW846-3520	Sample Prep Semi-Volatiles	COMPLETE			DG OPALINSKI	2-NOV-1995	95160322
SW846-6010A	Arsenic	70.0U		ug/L	RL POLK	3-NOV-1995	95081178
	Barium	219		ug/L	RL POLK	3-NOV-1995	95081178
	Cadmium	3.6U		ug/L	RL POLK	3-NOV-1995	95081178
	Chromium	44.8		ug/L	RL POLK	3-NOV-1995	95081178
	Lead	27.9UJ		ug/L	RL POLK	3-NOV-1995	95081178
	Selenium	94.4U		ug/L	RL POLK	3-NOV-1995	95081178
	Silver	2.4UN		ug/L	RL POLK	3-NOV-1995	95081178
SW846-7470	Mercury	10U		ug/L	RB COLLEY	6-NOV-1995	95081171
SW846-8080	PCB-1232	<1J		ug/mL	DH BLUE	9-NOV-1995	95161107M1
	PCB-1242	<1J		ug/mL	DH BLUE	9-NOV-1995	95161107M1
	PCB-1248	<1J		ug/mL	DH BLUE	9-NOV-1995	95161107M1
	PCB-1254	<1J		ug/mL	DH BLUE	9-NOV-1995	95161107M1
	PCB-1260	<1J		ug/mL	DH BLUE	9-NOV-1995	95161107M1
	PCB-1268	<1J		ug/mL	DH BLUE	9-NOV-1995	95161107M1
	Total PCB	<1J		ug/mL	DH BLUE	9-NOV-1995	95161107M1
SW846-9010A	Total Cyanide	0.3U		mg/kg	SL LEMASTER	8-NOV-1995	95101592
SW846-9020A	TOX	85.9		ug/L	DE COLLINS	21-NOV-1995	9516112IT2
SW846-9030A	Sulfide	20U		mg/kg	SL LEMASTER	9-NOV-1995	95101665
TSD553-230	Gross Alpha	47		pCi/L	JP BREWSTER	3-NOV-1995	95071649
	Gross Beta	47		pCi/L	JP BREWSTER	3-NOV-1995	95071649
	Technetium	<24		pCi/L	JP BREWSTER	3-NOV-1995	95071650
TSD553-440	Cesium-134	<0.1		pCi/g	WC ZUEFLE	15-NOV-1995	95071716

	Cesium-137	0.2		pCi/g	WC ZUEFLE	15-NOV-1995	95071716
	Cobalt-60	<0.2		pCi/g	WC ZUEFLE	15-NOV-1995	95071716
	Gross Gamma	0.2		pCi/g	WC ZUEFLE	15-NOV-1995	95071716
TSD[illegible]3-700	% U-235	ND		%	CD GOOD	30-OCT-1995	95071624
	Alpha Activity	2		pCi/L	BW SHORT	30-OCT-1995	95071624
	Americium-241	<0.30		pCi/L	CD GOOD	30-OCT-1995	95071624
	Neptunium-237	<0.33		pCi/L	CD GOOD	30-OCT-1995	95071624
	Plutonium-238	<0.12		pCi/L	CD GOOD	30-OCT-1995	95071624
	Plutonium-239/240	<0.12		pCi/L	CD GOOD	30-OCT-1995	95071624
	Protactinium-234	<0.10		pCi/L	CD GOOD	30-OCT-1995	95071624
	Thorium-228	<1.6		pCi/L	CD GOOD	30-OCT-1995	95071624
	Thorium-230	<1.0		pCi/L	CD GOOD	30-OCT-1995	95071624
	Thorium-232	<1.0		pCi/L	CD GOOD	30-OCT-1995	95071624
	Thorium-234	0.52	0.37	pCi/L	CD GOOD	30-OCT-1995	95071624
	Uranium	1.6	1.1	ug/L	CD GOOD	30-OCT-1995	95071624

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
Arsenic	500	537.62	107.52
Barium	500	433.92	86.78
Cadmium	500	504.45	100.89
Chromium	500	469.25	93.85
Lead	500	554.71	110.94
[illegible]	60	61.2	102.00
[illegible]	500	549.12	109.82
S[illegible]er	500	29.34	5.87
TOX	478	362.	75.75

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
C. J. Van Meter (Organic Analytical Services)

Date Approved: 14-DEC-1995

********** COMMENT PAGE **********
********** 951027-108 **********

*** Comments from the Spectrochemistry/ICP Laboratory *****

SW846-6010A Pb qualified as estimate due to lab control sample not meeting Q.C. limits.

SW846-1010 Flash Point not requested on the chain-of-custody.

***** Comments from the Organic Analytical Services *****

SW846-8260

Sample found to be unpreserved. (pH=7)

SW846-8080:

Sample VER31810007 required an additional 1:10 dilution which resulted in the surrogate being diluted out of the sample and the result being estimated.

SW846-9020A

The sample tested unpreserved (pH=7).

Breakthrough for the duplicate analysis was 15.3%; however, because of close agreement between results from both sets of analyses, the duplicate value was used to obtain a mean.

Definition Page for Qualifiers/Flags

* ********* 951027-108 **********************

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

uplicate analysis is not within control limits.

orrelation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 951027-108
Laboratory: Organic Analytical Services
File ID:
Instrument ID: SV1
Authorized By: C. J. Van Meter

Customer Sample ID: VER31810007
Customer: ENV RERSTORATION
Sample Matrix: OIL
Requisition Number: 018843
Date Sample Received: 27-OCT-1995
Date Sampled: 27-OCT-1995

RCRA and TCLP Semi-Volatile Compounds

Date Extracted/Prepared: 2-NOV-1995
Analysis Procedure Number: SW846-8270A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 14-NOV-1995
QA File Number: 95161114AB01
Dilution Factor: 1.0
Analyst: BD FUHR

CAS		ug/L	CAS		ug/L
95-48-7	2-Methylphenol	232U			
108-39-4	m-Cresol	232U			
106-44-5	4-Methylphenol	232U			
87-86-5	Pentachlorophenol	464U			
95-95-4	2,4,5-Trichlorophenol	232U			
88-06-2	2,4,6-Trichlorophenol	232U			
	Total Cresol	NA			
106-46-7	1,4-Dichlorobenzene	232U			
121-14-2	2,4-Dinitrotoluene	464U			
118-74-1	Hexachlorobenzene	232U			
	Hexachloro-1,3-butadiene	232U			
67-72-1	Hexachloroethane	232U			
98-95-3	Nitrobenzene	232U			
110-86-1	Pyridine	232U			

ANALYSIS DATA REPORT

AnaLIS ID: 951027-108
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#1
Authorized By: C. J. Van Meter

Customer Sample ID: VER31810007
Customer: ENV RERSTORATION
Sample Matrix: OIL
Requisition Number: 018843
Date Sample Received: 27-OCT-1995
Date Sampled: 27-OCT-1995

RCRA and TCLP Volatile Organic Compounds

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 6-NOV-1995
QA File Number: 95161106A1
Dilution Factor: 1.0
Analyst: MA NOVOTNY

CAS		ug/L	CAS		ug/L
71-43-2	Benzene	2U			
56-23-5	Carbon Tetrachloride	2U			
108-90-7	Chlorobenzene	2U			
67-66-3	Chloroform	2U			
107-06-2	1,2-Dichloroethane	2U			
75-35-4	1,1-Dichloroethene	2U			
78-93-3	2-Butanone	100U			
127-18-4	Tetrachloroethene	2U			
79-01-6	Trichloroethene	2U			
75-01-4	Vinyl Chloride	1U			

Waste Stream Number: ER-2

Waste Stream Title: PPE and Miscellaneous Debris

mer Smpl Id: VER47216001 ER-2
:t:X-04-WM BJC09824
Subproj Analyses:SOLID
Customer:J A APPLEGATE
COC#: 06113
Sample Desc:
Customer Comments:
Lab Smpl Comments:

Matrix: SOLID
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 08/27/98 09:50:00
Received: 08/27/98 12:28:29
Needed: 10/01/98 23:59:00
Approved: 10/01/98 13:26:30

Analy Meth:SW846-8260A QC Batch:QC98247012 Test:VOA Rpt Basis:none Date Approved
Prep Meth: Analyzed:09/03/98 00:00:00 J N STRICKLAND Approver: C J VANMETER 09/09/98 10:12

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,1,1-Trichloroethane	41		ug/kg		C	20	10		
1,1,2,2-Tetrachloroethane	20		ug/kg	U	C	20	10		
1,1,2-Trichloro-1,2,2-trifluoroethane	20		ug/kg	U	C	20	10		
1,1,2-Trichloroethane	20		ug/kg	U	C	20	10		
1,1-Dichloroethane	20		ug/kg	U	C	20	10		
1,1-Dichloroethene	20		ug/kg	U	C	20	10		
1,2-Dichloro-1,1,2,2-tetrafluoroethane	40		ug/kg	U	C	40	10		
1,2-Dichlorobenzene	20		ug/kg	U	C	20	10		
1,2-Dichloroethane	20		ug/kg	U	C	20	10		
1,2-Dimethylbenzene	20		ug/kg	U	C	20	10		
1,3 (1,4)-Dimethylbenzene	20		ug/kg	U	C	20	10		
1,3-Dichlorobenzene	20		ug/kg	U	C	20	10		
1,4-Dichlorobenzene	20		ug/kg	U	C	20	10		
anone	500		ug/kg	U	C	500	10		
ethyl-2-pentanone	500		ug/kg	U	C	500	10		
Acetone	500		ug/kg	U	C	500	10		
Benzene	20		ug/kg	U	C	20	10		
Bromodichloromethane	20		ug/kg	U	C	20	10		
Bromoform	20		ug/kg	U	C	20	10		
Bromomethane	40		ug/kg	U	C	40	10		
Carbon disulfide	20		ug/kg	U	C	20	10		
Carbon tetrachloride	20		ug/kg	U	C	20	10		
Chlorobenzene	20		ug/kg	U	C	20	10		
Chloroethane	40		ug/kg	U	C	40	10		
Chloroform	20		ug/kg	U	C	20	10		
Chloromethane	40		ug/kg	U	C	40	10		
Dibromochloromethane	20		ug/kg	U	C	20	10		
Ethylbenzene	20		ug/kg	U	C	20	10		
Methylene chloride	20		ug/kg	U	C	20	10		
Tetrachloroethene	20		ug/kg	U	C	20	10		
Toluene	20		ug/kg	U	C	20	10		
Trichloroethene	110		ug/kg		C	20	10		
Trichlorofluoromethane	40		ug/kg	U	C	40	10		
Vinyl chloride	10		ug/kg	U	C	10	10		
cis-1,2-Dichloroethene	20		ug/kg	U	C	20	10		
trans-1,2-Dichloroethene	20		ug/kg	U	C	20	10		

Comments: The LCS soil blank failed the established accuracy surrogate recovery for dibromofluoromethane (113% -- upper limit=112).

Dibromofluoromethane (136% -- upper limit=112%) failed the established surrogate recovery in this sample.

EPA Qualifiers:

U - Analyte analyzed for but undetected. Analyte result was below the Limit of Quantitation (LOQ).

Analy Meth:PORTS-XP4-TS-RL7280	QC Batch:QC98274000 Test:AB-ACT-GPC				Rpt Basis:none			Date Approved
Prep Meth:	Analyzed:09/29/98 00:00:00 J P BREWSTER				Approver: B W SHORT			10/01/98 13:10
Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA		Dec Lvl
Alpha activity	<6		pCi/g			6		
Beta activity	<16		pCi/g			16		

Analy Meth:PORTS-XP4-TS-RL7385	QC Batch:QC98274001 Test:TC99-ACT-LS				Rpt Basis:none			Date Approved
Prep Meth:	Analyzed:09/29/98 00:00:00 J P BREWSTER				Approver: B W SHORT			10/01/98 13:11
Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA		Dec Lvl
Technetium-99	<0.6		pCi/g			0.6		

Analy Meth:PORTS-XP4-TS-RL7710ug	QC Batch:QC98273009 Test:TOTAL-U-AS				Rpt Basis:none			Date Approved
Prep Meth:	Analyzed:09/21/98 00:00:00 R J ANDRE				Approver: B W SHORT			09/30/98 14:45
Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA		Dec Lvl
Uranium	2.8	0.37	ug/g					
ium-235	0.83	0.27	wt %					

Footnotes:

C - Method SW846-5030A "Purge-and-Trap"

ER-2

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

PPE & misc debris ER

AnaLIS ID: 971113-134 Project: ER 9762E Customer Sample ID: VER42119001
Customer: ENV RESTORATION Requisition Number: 058409
Date Sampled: 13-NOV-1997 10:30 Date Sample Received: 13-NOV-1997
Sampled By: R STANLY Date Sample Completed: 18-DEC-1997
Material Description: LAB WASTE

** See comment page for comments. **

** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-3540B	Sample Prep Semi-Volatiles	COMPLETE			DK SCAGGS	19-NOV-1997	97160309
TSD553-280	Gross Alpha	2		pCi/g	JJ SISLER	16-DEC-1997	97071724
	Gross Beta	20		pCi/g	JJ SISLER	16-DEC-1997	97071724
TSD553-385	Technetium	113.5		pCi/g	JP BREWSTER	16-DEC-1997	97071725
TSD553-710	% U-235	4.0	0.95	%	CD GOOD	18-NOV-1997	97071602
	Uranium	3.6	0.49	ug/g	CD GOOD	18-NOV-1997	97071602

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
C. J. Van Meter (Organic Analytical Services)
Approved: 18-DEC-1997

********** COMMENT PAGE **********
********** 971113-134 **********

* Comments from the Organic Analytical Services *****

Method SW846 8260A

Bromomethane did not pass the daily continuing calibration check and the value is estimated.

Due to the sample matrix, 2-bromo-1-chloropropane and 1,4-difluorobenzene-d4 failed the method area lower limit and the following target compounds quantitated from these internal standards are estimated: bromoform, chlorobenzene, dibromochloromethane, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, ethylbenzene, 1,1,2,2-tetrachloroethane, tetrachloroethene, m,p-xylene, toluene and o-xylene.

Toluene-d8 and bromofluorobenzene failed the sample surrogate recovery limits due to low recoveries but passed the recovery limits on the MS.

Trichloroethene exceeded the calibration range and the result could be much higher. This sample was spiked and trichloroethene failed the recovery limits due to the large amount present in the sample; therefore, the result is estimated.

The target compound, cis-1,2-dichloroethene also exceeded the calibration range and the result could be much higher; therefore, the result is estimated.

M[illegible]-3540B: Semi-volatile prep
[illegible]maller sample aliquot was used for extraction due to the known matrix interference of glued materials. The final dilution was also higher due to the sample matrix.

SW846-8270B

Because of the high level of methylene chloride extractable organic compounds, a smaller than normal initial sample weight was used, and a larger than normal final extract concentration was necessary. These factors resulted in the higher limits of quantitation.

The %RSD for the initial calibration of 2,4-dintrophenol (19.8%) was greater than the method criteria of 15%, therefore results for 2,4-dinitrophenol are estimated.

Definition Page for Qualifiers/Flags

********** 971113-134 **********

I ... Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

...rrelation coefficient for MSA is less tha 0.995.

...ne value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID: 971113-134
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890-3
Authorized By: C. J. Van Meter

Customer Sample ID: VER42119001
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 058409
Date Sample Received: 13-NOV-1997
Date Sampled: 13-NOV-1997

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 20-NOV-1997
QA File Number: 97161120A3
Dilution Factor: 10
Analyst: JN STRICKLAND

CAS		ug/Kg	CAS		ug/Kg
67-64-1	Acetone	500U	100-41-4	Ethyl benzene	20UJ
71-43-2	Benzene	20U	76-13-1	Freon 113	20U
75-27-4	Bromodichloromethane	20U	76-14-2	Freon 114	40U
75-25-2	Bromoform	20UJ	108-10-1	4-Methyl-2-pentanone	500U
74-83-9	Bromomethane	40UJ	75-09-2	Methylene Chloride	25
78-93-3	2-Butanone	500U	79-34-5	1,1,2,2-Tetrachloroethane	20UJ
75-15-0	Carbon Disulfide	100	127-18-4	Tetrachloroethene	380J
56-23-5	Carbon Tetrachloride	20U	108-88-3	Toluene	440J
108-90-7	Chlorobenzene	20UJ	71-55-6	1,1,1-Trichloroethane	25
75-00-3	Chloroethane	40U	79-00-5	1,1,2-Trichloroethane	20U
67-66-3	Chloroform	20U	79-01-6	Trichloroethene	5800EJ
74-87-3	Chloromethane	40U	75-69-4	Trichlorofluoromethane	40U
124-48-1	Dibromochloromethane	20UJ	75-01-4	Vinyl Chloride	10U
106-46-7	1,4-Dichlorobenzene	20UJ	1330-20-7	m,p-Xylene	20UJ
95-50-1	1,2-Dichlorobenzene	20UJ	95-47-6	o-Xylene	20UJ
541-73-1	1,3-Dichlorobenzene	20UJ			
75-34-3	1,1-Dichloroethane	20U			
107-06-2	1,2-Dichloroethane	20U			
75-35-4	1,1-Dichloroethene	31			
156-59-2	cis-1,2-Dichloroethene	9200EJ			
156-60-5	trans-1,2-Dichloroethene	59			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department
*** See comment page for comments ***

VOC ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 971113-134
Laboratory: Organic Analytical Services
Sample Matrix: SOLID WASTE
Level: (low/med): LOW
Dilution Factor: 10

Customer Sample ID: VER42119001
Customer: ENV RESTORATION
File ID:
Date Received: 13-NOV-1997
Date Analyzed: 20-NOV-1997
Concentration Units: ug/Kg

Number TICs found: 4

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.	110-54-3	Hexane	13.2	140	
2.		Unknown	19.4	400	J
3.		2-Butoxyethanol	22.9	2000	J
4.		Unknown	7.4	1000	J
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
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17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID: 971113-134
Laboratory: Organic Analytical Services
File ID:
Instrument ID: SV1
Authorized By: C. J. Van Meter

Customer Sample ID: VER42119001
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 058409
Date Sample Received: 13-NOV-1997
Date Sampled: 13-NOV-1997

Semi-Volatiles

Date Extracted/Prepared: 19-NOV-1997
Analysis Procedure Number: SW846-8270B
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 5-DEC-1997
QA File Number: 97161205801
Dilution Factor: 1.0
Analyst: RJ WAWRO

CAS		ug/Kg	CAS		ug/Kg
59-50-7	4-Chloro-3-methylphenol	10000U	606-20-2	2,6-Dinitrotoluene	5000U
95-57-8	2-Chlorophenol	5000U	78-59-1	Isophorone	5000U
120-83-2	2,4-Dichlorophenol	5000U	98-95-3	Nitrobenzene	5000U
105-67-9	2,4-Dimethylphenol	5000U	83-32-9	Acenaphthene	5000U
51-28-5	2,4-Dinitrophenol	25000UJ	208-96-8	Acenaphthylene	5000U
534-52-1	4,6-Dinitro-2-methylphenol	25000U	120-12-7	Anthracene	5000U
88-75-5	2-Nitrophenol	5000U	56-55-3	Benzo(a)anthracene	5000U
100-02-7	4-Nitrophenol	25000U	50-32-8	Benzo(a)pyrene	5000U
87-86-5	Pentachlorophenol	25000U	191-24-2	Benzo(g,h,i)perylene	5000U
108-95-2	Phenol	5000U	76-01-7	Benzo(k)fluoranthene	5000U
88-06-2	2,4,6-Trichlorophenol	5000U	218-01-9	Chrysene	5000U
117-81-7	bis(2-Ethylhexyl)phthalate	15000	53-70-3	Dibenz(a,h)anthracene	5000U
85-68-7	Butylbenzylphthalate	5000U	206-44-0	Fluoranthene	5000U
84-74-2	Di-n-butylphthalate	5000U	86-73-7	Fluorene	5000U
84-66-2	Diethylphthalate	5000U	193-39-5	Indeno(1,2,3-cd)pyrene	5000U
131-11-3	Dimethylphthalate	5000U	91-20-3	Naphthalene	5000U
117-84-0	di-n-Octylphthalate	5000U	85-01-8	Phenanthrene	5000U
62-75-9	N-Nitrosodimethylamine	5000U	129-00-0	Pyrene	5000U
86-30-6	N-Nitrosodiphenylamine	5000U	111-44-4	bis(2-Chloroethyl)ether	5000U
621-64-7	N-Nitroso-di-n-propylamine	5000U	111-91-1	bis(2-Chloroethoxy)methane	5000U
121-14-2	2,4-Dinitrotoluene	5000U	39638-32-9	bis(2-Chloroisopropyl)ether	5000U

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID: 971113-134
Laboratory: Organic Analytical Services
File ID:
Instrument ID: SV1
Authorized By: C. J. Van Meter

Customer Sample ID: VER42119001
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 058409
Date Sample Received: 13-NOV-1997
Date Sampled: 13-NOV-1997

Semi-Volatiles

Date Extracted/Prepared: 19-NOV-1997
Analysis Procedure Number: SW846-8270B
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 5-DEC-1997
QA File Number: 97161205B01
Dilution Factor: 1.0
Analyst: RJ WAWRO

CAS		ug/Kg	CAS		ug/Kg
101-55-3	4-Bromophenyl-phenylether	5000U			
7005-72-3	4-Chlorophenyl-phenylether	5000U			
91-58-7	2-Chloronaphthalene	5000U			
95-50-1	1,2-Dichlorobenzene	5000U			
541-73-1	1,3-Dichlorobenzene	5000U			
106-46-7	1,4-Dichlorobenzene	5000U			
118-74-1	Hexachlorobenzene	5000U			
87-68-3	Hexachlorobutadiene	5000U			
77-47-4	Hexachlorocyclopentadiene	5000U			
67-72-1	Hexachloroethane	5000U			
120-82-1	1,2,4-Trichlorobenzene	5000U			
110-86-1	Pyridine	5000U			
	2-Methylphenol (o-Cresol)	5000U			
	3,4-Methylphenol (m,p-Cresol)	5000U			
95-95-4	2,4,5-Trichlorophenol	5000U			
103-33-3	Azobenzene	5000U			
205-99-2	Benzo(b)fluoranthene	5000U			

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 971112-002 Project: ER 9762A Customer Sample ID: VER44424001
Customer: ENV RESTORATION Requisition Number: 058415
Date Sampled: 6-NOV-1997 13:00 Date Sample Received: 7-NOV-1997
Sampled By: B PYLES Date Sample Completed: 15-DEC-1997
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
TSD553-280	Gross Alpha	<3		pCi/g	JP BREWSTER	14-DEC-1997	97071712
	Gross Beta	<10		pCi/g	JP BREWSTER	14-DEC-1997	97071712
TSD553-385	Technetium	<0.9		pCi/g	JP BREWSTER	14-DEC-1997	97071713
TSD553-710	% U-235	ND	ND	%U-235	CD GOOD	13-NOV-1997	97071587
	Uranium	0.18	0.096	ug/g	CD GOOD	13-NOV-1997	97071587

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
C. J. Van Meter (Organic Analytical Services)
Data Approved: 15-DEC-1997

********** COMMENT PAGE **********
********** 971112-002 **********

* Comments from the Organic Analytical Services *****

Method SW846 8260A

The internal standard, 1,4-difluorobenzene-d4 did not pass the method area lower limit criteria. Two compounds, 1,4-dichlorobenzene and 1,2-dichlorobenzene which are quantitated from this internal standard are estimated values.

Definition Page for Qualifiers/Flags

********** 971112-002 **********

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

relation coefficient for MSA is less tha 0.995.

e value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an ana..

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID: 971112-002
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890-3
Authorized By: C. J. Van Meter

Customer Sample ID: VER44424001
Customer: ENV RESTORATION
Sample Matrix: WATER
Requisition Number: 058415
Date Sample Received: 7-NOV-1997
Date Sampled: 6-NOV-1997

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 13-NOV-1997
QA File Number: 97161113A3
Dilution Factor: 10
Analyst: JN STRICKLAND

CAS		ug/L	CAS		ug/L
67-64-1	Acetone	500U	100-41-4	Ethyl benzene	20U
71-43-2	Benzene	20U	76-13-1	Freon 113	20U
75-27-4	Bromodichloromethane	20U	76-14-2	Freon 114	40U
75-25-2	Bromoform	20U	108-10-1	4-Methyl-2-pentanone	500U
74-83-9	Bromomethane	40U	75-09-2	Methylene Chloride	20U
78-93-3	2-Butanone	500U	79-34-5	1,1,2,2-Tetrachloroethane	20U
75-15-0	Carbon Disulfide	20U	127-18-4	Tetrachloroethene	20U
56-23-5	Carbon Tetrachloride	20U	108-88-3	Toluene	20U
108-90-7	Chlorobenzene	20U	71-55-6	1,1,1-Trichloroethane	20U
75-00-3	Chloroethane	40U	79-00-5	1,1,2-Trichloroethane	20U
67-66-3	Chloroform	20U	79-01-6	Trichloroethene	20U
74-87-3	Chloromethane	40U	75-69-4	Trichlorofluoromethane	40U
124-48-1	Dibromochloromethane	20U	75-01-4	Vinyl Chloride	10U
106-46-7	1,4-Dichlorobenzene	20UJ	1330-20-7	m,p-Xylene	20U
95-50-1	1,2-Dichlorobenzene	20UJ	95-47-6	o-Xylene	20U
541-73-1	1,3-Dichlorobenzene	20U			
75-34-3	1,1-Dichloroethane	20U			
107-06-2	1,2-Dichloroethane	20U			
75-35-4	1,1-Dichloroethene	20U			
156-59-2	cis-1,2-Dichloroethene	20U			
156-60-5	trans-1,2-Dichloroethene	20U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department
*** See comment page for comments ***

VOC ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 971112-002
Laboratory: Organic Analytical Services
Sample Matrix: WATER
Level: (low/med): LOW
Dilution Factor: 10

Customer Sample ID: VER44424001
Customer: ENV RESTORATION
File ID:
Date Received: 7-NOV-1997
Date Analyzed: 13-NOV-1997
Concentration Units: ug/L

Number TICs found: 2

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.	2213-23-2	2,4-Dimethylheptane	23.0	50	J
2.		Decane	23.9	60	J
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
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27.					
28.					
29.					
30.					

Cu[illegible]mer Smpl Id: VER46512001
F[illegible]:X-04-WM BJC09824
[illegible]oj Analyses:SOLID
Customer:J A APPLEGATE
COC#: 54121
Sample Desc:
Customer Comments:
Lab Smpl Comments:

Matrix: SOLID
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 05/14/98 14:15:00
Received: 05/15/98 07:47:16
Needed: 06/19/98 00:00:00
Approved: 06/19/98 14:52:54

Analy Meth:SW846-8260A QC Batch:QC98141001 Test:VOA Rpt Basis:none
Prep Meth: Analyzed:05/20/98 00:00:00 J N STRICKLAND Approver: C J VANMETER

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,1,1-Trichloroethane	20		ug/kg	JU		20	10		
1,1,2,2-Tetrachloroethane	20		ug/kg	JU		20	10		
1,1,2-Trichloro-1,2,2-trifluoroethane	20		ug/kg	JU		20	10		
1,1,2-Trichloroethane	20		ug/kg	JU		20	10		
1,1-Dichloroethane	20		ug/kg	JU		20	10		
1,1-Dichloroethene	20		ug/kg	JU		20	10		
1,2-Dichloro-1,1,2,2-tetrafluoroethane	40		ug/kg	JU		40	10		
1,2-Dichlorobenzene	20		ug/kg	JU		20	10		
1,2-Dichloroethane	20		ug/kg	JU		20	10		
1,2-Dimethylbenzene	20		ug/kg	JU		20	10		
1,3 (1,4)-Dimethylbenzene	20		ug/kg	JU		20	10		
1,3-Dichlorobenzene	20		ug/kg	JU		20	10		
1 4-Dichlorobenzene	20		ug/kg	JU		20	10		
[illegible]anone	500		ug/kg	JU		500	10		
[illegible]thyl-2-pentanone	500		ug/kg	JU		500	10		
Acetone	1900		ug/kg	J		500	10		
Benzene	20		ug/kg	JU		20	10		
Bromodichloromethane	20		ug/kg	JU		20	10		
Bromoform	20		ug/kg	JU		20	10		
Bromomethane	48		ug/kg	J		40	10		
Carbon disulfide	140		ug/kg	J		20	10		
Carbon tetrachloride	20		ug/kg	JU		20	10		
Chlorobenzene	20		ug/kg	JU		20	10		
Chloroethane	40		ug/kg	JU		40	10		
Chloroform	20		ug/kg	JU		20	10		
Chloromethane	40		ug/kg	JU		40	10		
Dibromochloromethane	20		ug/kg	JU		20	10		
Ethylbenzene	20		ug/kg	JU		20	10		
Methylene chloride	28		ug/kg	J		20	10		
Tetrachloroethene	20		ug/kg	JU		20	10		
Toluene	20		ug/kg	JU		20	10		
Trichloroethene	20		ug/kg	JU		20	10		
Trichlorofluoromethane	40		ug/kg	JU		40	10		
Vinyl chloride	10		ug/kg	JU		10	10		
cis-1,2-Dichloroethene	20		ug/kg	JU		20	10		
trans-1,2-Dichloroethene	20		ug/kg	JU		20	10		

Comments: Due to matrix interferences, all four internal standards used to quantify the analytes failed the area lower limit criteria and all analytes are estimated as "J". The internal standards that failed the lower limit were pentafluorobenzene, 1,4-difluorobenzene, 2-bromo-1-chloropropane, and 1,4-difluorobenzene-d4.

All three surrogates failed the PORTS established recovery limits (dibromofluoromethane 143% -- upper limit=109%, toluene-d8 70% -- lower limit=91%, bromofluorobenzene 50% -- lower limit=87%).

This sample was spiked and the QC of the internal standards and surrogates were similar to the sample. Toluene failed the PORTS established MS recovery (67% -- lower limit=73%). Chlorobenzene failed the MS recovery (70% -- lower=72%).

There was a band of TICs (alkanes) ranging from approximately 22 minutes to 27 minutes. A listing is available upon request.

EPA Qualifiers:
J - Estimated value.
U - Analyte analyzed for but undetected. Analyte result was below the Detection Limit (DL).

Analy Meth:PORTS-XP4-TS-RL7280 QC Batch:QC98167002 Test:AB-ACT-GPC Rpt Basis:none
Prep Meth: Analyzed:06/11/98 00:00:00 J P BREWSTER Approver: B W SHORT

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Alpha activity	<4		pCi/g					
Beta activity	12		pCi/g					

Analy Meth:PORTS-XP4-TS-RL7385 QC Batch:QC98167001 Test:TC99-ACT-LS Rpt Basis:none
Prep Meth: Analyzed:06/15/98 00:00:00 J P BREWSTER Approver: B W SHORT

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Technetium-99	<1.2		pCi/g					

Analy Meth:PORTS-XP4-TS-RL7710ug QC Batch:QC98170002 Test:TOTAL-U-AS Rpt Basis:none
Prep Meth: Analyzed:06/15/98 00:00:00 R J ANDRE Approver: B W SHORT

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Uranium	0.081	0.050	ug/g					
Uranium-235	NA		wt %					

Waste Stream Number: ER-3

Waste Stream Title: Soils

ner Smpl Id: VER44694001
t:X-04-WM BJC09824
Subproj Analyses:SOIL ER-3
Customer:J A APPLEGATE
COC#: 54121
Sample Desc:
Customer Comments:
Lab Smpl Comments:

Matrix: SOIL
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 05/14/98 14:00:00
Received: 05/15/98 07:47:42
Needed: 06/19/98 00:00:00
Approved: 06/19/98 14:34:07

Analy Meth:SW846-3050A	QC Batch:	Test:3050APREP	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:06/05/98 00:00:00 M L STEWART		Approver: D K PEREZ	06/15/98 16:25

Analy Meth:SW846-6010A	QC Batch:	Test:6010AMETALS5	Rpt Basis:none	Date Approved
Prep Meth: SW846-3050A	Analyzed:06/11/98 00:00:00 T E SHOOK		Approver: D K PEREZ	06/19/98 10:57

Analyte Name	Result	+/-	Unit	Qual	Pn	LCR	Dilu	HT	CLF
Aluminum	9870		mg/kg				1		
Antimony	1.7		mg/kg	*NU			1		
Arsenic	2.3		mg/kg	*U			1		Y
Barium	56.3		mg/kg	*B			1		Y
Beryllium	0.62		mg/kg	B			1		
Cadmium	0.82		mg/kg	B			1		Y
Calcium	8720		mg/kg				1		
Chromium	17.4		mg/kg	B			1		Y
lt	9.8		mg/kg	B			1		
er	13.9		mg/kg	B			1		
Iron	17200		mg/kg				1		
Lead	10		mg/kg	BN			1		Y
Magnesium	7060		mg/kg	*			1		
Manganese	321		mg/kg	B			1		
Molybdenum	0.28		mg/kg	U			1		
Nickel	26.2		mg/kg	*BJN			1		
Potassium	1020		mg/kg	BN			1		
Selenium	3.5		mg/kg	NU			1		Y
Silver	0.48		mg/kg	U			1		Y
Sodium	137		mg/kg	BN			1		
Thallium	10.4		mg/kg	B			1		
Vanadium	11.1		mg/kg	BN			1		
Zinc	70.7		mg/kg	B			1		

Comments: QC File:98080457

Ni qualified as estimate due to interference check not meeting acceptance limits.

EPA Qualifiers:
* - Duplicate analysis not within control limits.
B - Analyte result less than the Practical Quantitation Limit (PQL) and greater than or equal to the Instrument Detection Limit (IDL).
Qualify data for the sample as estimated.
mple spike recovery not within control limits.
Analyte analyzed for but undetected. Analyte result was below the Instrument

ection Limit (IDL).

Analy Meth:SW846-8260A | QC Batch:QC98141001 Test:VOA | Rpt Basis:none | Date Appr
Prep Meth: | Analyzed:05/20/98 00:00:00 J N STRICKLAND | Approver: C J VANMETER | 06/04/98 16:44

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,1,1-Trichloroethane	21		ug/kg			20	10		
1,1,2,2-Tetrachloroethane	20		ug/kg	U		20	10		
1,1,2-Trichloro-1,2,2-trifluoroethane	140		ug/kg			20	10		
1,1,2-Trichloroethane	20		ug/kg	U		20	10		
1,1-Dichloroethane	20		ug/kg	U		20	10		
1,1-Dichloroethene	20		ug/kg	U		20	10		
1,2-Dichloro-1,1,2,2-tetrafluoroethane	40		ug/kg	U		40	10		
1,2-Dichlorobenzene	20		ug/kg	U		20	10		
1,2-Dichloroethane	20		ug/kg	U		20	10		
1,2-Dimethylbenzene	20		ug/kg	U		20	10		
1,3 (1,4)-Dimethylbenzene	20		ug/kg	U		20	10		
1,3-Dichlorobenzene	20		ug/kg	U		20	10		
1,4-Dichlorobenzene	20		ug/kg	U		20	10		
2-Butanone	500		ug/kg	U		500	10		
4-Methyl-2-pentanone	500		ug/kg	U		500	10		
Acetone	500		ug/kg	U		500	10		
Benzene	20		ug/kg	U		20	10		
Bromodichloromethane	20		ug/kg	U		20	10		
Bromoform	20		ug/kg	U		20	10		
Bromomethane	40		ug/kg	U		40	10		
n disulfide	20		ug/kg	U		20	10		
on tetrachloride	20		ug/kg	U		20	10		
Chlorobenzene	20		ug/kg	U		20	10		
Chloroethane	40		ug/kg	U		40	10		
Chloroform	20		ug/kg	U		20	10		
Chloromethane	40		ug/kg	U		40	10		
Dibromochloromethane	20		ug/kg	U		20	10		
Ethylbenzene	20		ug/kg	U		20	10		
Methylene chloride	20		ug/kg	U		20	10		
Tetrachloroethene	20		ug/kg	U		20	10		
Toluene	20		ug/kg	U		20	10		
Trichloroethene	1100		ug/kg	EJ		20	10		
Trichlorofluoromethane	40		ug/kg	U		40	10		
Vinyl chloride	10		ug/kg	U		10	10		
cis-1,2-Dichloroethene	160		ug/kg			20	10		
trans-1,2-Dichloroethene	20		ug/kg	U		20	10		

Comments: This sample was spiked and trichloroethane failed the PORTS established recovery limit (212% -- upper limit=119%). The result is estimated as "J" because of the high spike recovery which is probably due to the nonhomogenous sample.

EPA Qualifiers:

E - Result exceeds calibration range. (GC/MS flag)

J - Estimated value.

U - nalyte analyzed for but undetected. Analyte result was below the Limit of antitation (LOQ).

Meth:PORTS-XP4-TS-RL7240	QC Batch:QC98167002 Test:AB-ACT-GPC	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:06/11/98 00:00:00 J P BREWSTER	Approver: B W SHORT	06/16/98 16:05

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Alpha activity	77		pCi/g				
Beta activity	26		pCi/g				

Analy Meth:PORTS-XP4-TS-RL7340	QC Batch:QC98167001 Test:TC99-ACT-LS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:06/15/98 00:00:00 J P BREWSTER	Approver: B W SHORT	06/16/98 16:03

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Technetium-99	36.6		pCi/g				

Analy Meth:PORTS-XP4-TS-RL7620ug	QC Batch:QC98170000 Test:TOTAL-U-AS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:06/15/98 00:00:00 R J ANDRE	Approver: B W SHORT	06/19/98 14:31

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Uranium	11	1.2	ug/g				
Uranium-235	20	3.6	wt %				

Waste Stream Number: ER-4A and 4B

Waste Stream Title: Oil and Debris

WASTE STREAM: ER-4 DATE: 12/5/94

RFD#	CONT#	CONT WT	U (PPM)	U-235(frct)	U-235 (g)
=====	=========	=========	=========	=========	=========

GIVEN THE NATURE OF THIS WASTE STREAM (OILS FROM ER PROJECTS), THIS WASTE STREAM IS CONSIDERED NON-U BEARING.

PORTS MSDS #: 5505

PRODUCT: BENZENE

PART NUMBER:

FORMULA: C6H6

KEYWORD: SOLVENT

PORTS NUMBER: NNN

PORTS MISC INFO:
01-02-1000

PORTS RATING: HFR=430

MANUFACTURER:
AMERICAN BURDICK & JACKSON
1953 SOUTH HARVEY STREET
MUSKEGON
MI

49442
PHONE: PHONE: 616-726-3171
EMERGENCY PHONE: 616-726-3171

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 176 F	NOTE: 80'C, 760 MM HG.
Melting Point. . . .	NG	
Freezing Point . . .	EQ 41.9 F	NOTE: 5.5'C.
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .879	NOTE: @ 20'C.
Vapor Pressure . . .	EQ 74.6	NOTE: MM HG @ 20'C.
Vapor Density. . . .	EQ 2.8	
Percent Volatiles. .	~ 100	
Evaporation Rate . .	~ 3	NOTE: BUAC=1.
pH	NG	
Molecular Weight . .	EQ 78.11	
Viscosity.	NG	

Solubility in Water. @ 25C 0.18%.
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS LIQUID WITH A CHARACTERISTIC AROMATIC

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 12.2 F	NOTE: -11'C, TCC.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	EQ 1043.6 F	NOTE: 562'C.

Explosive/Flammable Limits

Lower (LEL).	EQ 1.3
Upper (UEL).	EQ 7.1

Shipping Regulations

UN/NA Number.	UN1114
D.O.T. Hazard Class. . .	FLAMMABLE LIQUID
Label	NOT GIVEN
Proper Shipping Name . .	BENZENE

==========

Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 3/01/88

===== Component Information =====

NZENE
OSHA PEL (PPM): 1
OSHA PEL (MG/M3):
ACGIH TLV (PPM): 10
ACGIH TLV (MG/M3):
STEL (PPM): 25
STEL (MG/M3):
Product %: ~ 100
C.A.S. No.: 71432
Note:
OSHA AND ACGIH STEL / NIOSH: 10 PPM, TLV CEILING: NOT

===== IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

CHEMICAL NAME: Benzene

CHEMICAL FAMILY: Aromatic Hydrocarbon

SYNONYMS: Benzol

CAS NO.: 71-43-2

EMERGENCY TELEPHONE NO.: 312/973-3600 (American Scientific Products)

CHEMTREC TELEPHONE NO.: 800/424-9300

NFORMATION TELEPHONE NO.: 616/726-3171 (American Burdick & Jackson)

MANUFACTURER'S NAME AND ADDRESS:

AMERICAN BURDICK & JACKSON
SUBSIDIARY OF AMERICAN HOSPITAL SUPPLY CORPORATION
1953 SOUTH HARVEY STREET
MUSKEGON, MI 49442

===== PHYSICAL AND CHEMICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Not expected to occur.

APPEARANCE AND ODOR: Clear, colorless liquid with a characteristic aromatic odor.

CONDITIONS TO AVOID: Heat, sparks, open flame, open containers, and poor ventilation.

MATERIALS TO AVOID: Strong oxidizing agents and strong acids.

AZARDOUS DECOMPOSITION PRODUCTS: Incomplete combustion can enerate carbon monoxide and other toxic vapors.

===== FIRE AND EXPLOSION HAZARD DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

USUAL FIRE AND EXPLOSION HAZARDS: Volatile and flammable.

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical or foam.

SPECIAL FIRE FIGHTING PROCEDURES: Water will not be effective in extinguishing a fire and may spread it, but a water spray can be used to cool
exposed containers. Wear full protective clothing and self-contained
breathing apparatus. Heat will build pressure and rupture closed storage
containers.

===== HAZARDOUS COMPONENTS =====

SEE COMPONENT INFORMATION.

BENZENE

CARCINOGEN

===== HEALTH HAZARDS =====

OCCUPATIONAL EXPOSURE LIMITS:

OSHA:

PEL-TWA - 1 ppm
PEL-STEL - 25 ppm

ACGIH:

TLV-TWA - 10 ppm
TLV-STEL - 25 ppm

NIOSH:

TLV-TWA - 10 ppm
TLV-C - Not Listed

CONCENTRATION IMMEDIATELY DANGEROUS TO HEALTH:

OSHA/NIOSH 2,000 ppm

ODOR THRESHOLD:

NSC 2 ppm
NIOSH Not Listed
OHS 1.5-5 ppm

CARCINOGENIC, MUTAGENIC, TERATOGENIC DATA:

Human carcinogen (NTP, IARC, OSHA)
Suspect human carcinogen (ACGIH)
Mutagenic and teratogenic data (RTEC)
Animal carcinogen (IARC)

PRIMARY ROUTES OF ENTRY: Benzene may exert its effects through inhalation, skin absorption, and ingestion.

INDUSTRIAL EXPOSURE: ROUTE OF EXPOSURE/SIGNS AND SYMPTOMS:

INHALATION: Exposure can cause dizziness, intoxication, excitement, headache, vomiting, delirium, drowsiness, and unconsciousness.

EYE CONTACT: Liquid and high vapor concentration can cause irritation, neuritis, atrophy, visual impairment, edema, and cataracts.

SKIN CONTACT: Prolonged or repeated skin contact can cause irritation and dermatitis through defatting of skin.

INGESTION: Can cause gastrointestinal tract discomfort.

EFFECTS OF OVEREXPOSURE: Benzene is a primary skin irritant, central nervous system depressant, bone marrow depressant, and leukemogen. Acute benzene exposure from inhalation or ingestion initially produces excitation and euphoria, followed by headache, drowsiness, dizziness, vomiting, delirium and unconsciousness. Respiratory irritation and pulmonary edema are possible. Severe exposure causes blurred vision, tremors, shallow and rapid respiration, ventricular fibrillation, paralysis, and convulsions. Liver and kidney damage may occur. Chronic exposure to benzene poses the most significant toxic effects. Symptoms are headache, anorexia, nervousness, weariness, anemia, pallor, bleeding under the skin and eyes, and reduced clotting ability. Bone marrow damage and leukemia may develop. Liver and kidney damage may occur.

MEDICAL CONDITION AGGRAVATED BY EXPOSURE: Preclude from exposure those individuals with diseases of the heart, lung, kidney, liver, nervous system, or the blood, and those susceptible to dermatitis.

EMERGENCY FIRST AID:

INHALATION: Immediately remove to fresh air. If not breathing, administer mouth-to-mouth rescue breathing. If there is no pulse administer cardiopulmonary resuscitation (CPR). Contact physician immediately.

EYE CONTACT: Rinse with copious amounts of water for at least 15 minutes. Get emergency medical assistance.

SKIN CONTACT: Flush thoroughly for at least 15 minutes. Wash affected skin with soap and water. Remove contaminated clothing and shoes. Wash clothing before re-use, and discard contaminated shoes. Get emergency medical assistance.

INGESTION: Call local Poison Control Center for assistance. Contact physician immediately. Aspiration Hazard - Do not induce vomiting.

===== SAFETY MEASURES AND EQUIPMENT =====

VENTILATION: Adequate ventilation is required to protect personnel

from
exposure to chemical vapors exceeding the PEL and to minimize fire hazards.
The choice of ventilation equipment, either local or general, will depend on
the conditions of use, quantity of material, and other operating parameters.

RESPIRATORY: Use approved respirator equipment. Follow NIOSH and equipment
manufacturer's recommendations to determine appropriate equipment (air-purifying, air-supplied, or self-contained breathing apparatus).

EYES: Safety glasses are considered minimum protection. Goggles or face
shield may be necessary depending on quantity of material and conditions of
use.

SKIN: Protective gloves and clothing are recommended. The choice of material
must be based on chemical resistance and other user requirements. Generally,
polyvinyl alcohol, viton(R) or nitrile latex offers acceptable chemical
resistance. Individuals who are acutely and specifically sensitive to benzene
may require additional protective equipment.

STORAGE: Benzene should be protected from temperature extremes and direct
sunlight. Proper storage of benzene must be determined based on other
materials stored and their hazards and potential chemical incompatibility. In
general, benzene should be stored in an acceptably protected and secure
flammable liquid storage room.

OTHER: Emergency eye wash fountains and safety showers should be available in
the vicinity of any potential exposure. Ground and bond metal containers to
minimize static sparks.

===== SPILL AND DISPOSAL DATA =====

SPILL CONTROL: Protect from ignition. Wear protective clothing and use
approved respirator equipment. Absorb spilled material in an absorbent
recommended for solvent spills and remove to a safe location for disposal by
approved methods. If released to the environment, comply with all regulatory
notification requirements.

WASTE DISPOSAL: Dispose of benzene as an EPA hazardous waste. Hazardous waste
numbers: U019 (Ignitable, Toxic); D001 (Ignitable).

==== SPECIAL NOTES =====

KEY:

CA: Approximately

NA: Not applicable
C: Ceiling
PEL: Permissible Exposure Level
STEL: Short Term Exposure Level
TLV: Threshold Limit Value
TWA: Time Weighted Average
BuAc: Butyl Acetate
NSC: National Safety Council ("Fundamentals of Industrial Hygiene", 1983)
OHS: Occupational Health Services ("Hazardline")

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Waste Stream Number: ER-5A and 5B

Waste Stream Title: Carbon Sludge and Spent Treatment Filters

Portsmouth Analytical Laboratory
Official Report

C r Smpl Id: VER41508001
P :X-04-WM BJC09824
ubproj Analyses:SOLID
Customer:J A APPLEGATE
COC#: 059693
Sample Desc:
Customer Comments:
Lab Smpl Comments:

ER-5A

Matrix: SOLID
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 06/10/98 13:50:00
Received: 06/11/98 13:05:14
Needed: 07/16/98 23:59:00
Approved: 07/16/98 17:55:46

Analy Meth:SW846-3050A	QC Batch:	Test:3050APREP	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:06/23/98 00:00:00 K A DAYS		Approver: D K PEREZ	07/13/98 11:20

Analy Meth:SW846-6010A	QC Batch:	Test:6010AMETALS5	Rpt Basis:none	Date Approved
Prep Meth: SW846-3050A	Analyzed:06/25/98 00:00:00 T E SHOOK		Approver: D K PEREZ	07/16/98 14:00

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Aluminum	278		mg/kg	B			1		
Antimony	4.0		mg/kg	U			1		
Arsenic	2.9		mg/kg	U			1		N
Barium	57.1		mg/kg	BN			1		N
Beryllium	0.41		mg/kg	B			1		
Cadmium	28.1		mg/kg	N			1		Y
Calcium	4390		mg/kg	*B			1		
C mium	164		mg/kg	N			1		Y
t	2.5		mg/kg	B			1		
per	3.3		mg/kg	B			1		
Iron	655		mg/kg	B			1		
Lead	521		mg/kg	*			1		Y
Magnesium	553		mg/kg	B			1		
Manganese	2000		mg/kg				1		
Molybdenum	4.4		mg/kg	B			1		
Nickel	18.6		mg/kg	B			1		
Potassium	39.2		mg/kg	BJ			1		
Selenium	3.3		mg/kg	U			1		Y
Silver	0.40		mg/kg	U			1		N
Sodium	126		mg/kg	B			1		
Thallium	3.8		mg/kg	NU			1		
Vanadium	2.7		mg/kg	B			1		
Zinc	31.2		mg/kg	B			1		

Comments: QC File: 98080486
K qualified as estimate due to interference check not meeting acceptance limits.

EPA Qualifiers:
* - Duplicate analysis not within control limits.
B - Analyte result less than the Practical Quantitation Limit (PQL) and greater than or equal to the Instrument Detection Limit (IDL).
J - Qualify data for the sample as estimated.
N mple spike recovery not within control limits.
alyte analyzed for but undetected. Analyte result was below the Instrument Detection Limit (IDL).

A leth:SW846-3540	QC Batch:QC98194007 Test:ORGEXT-SVOC	Rpt Basis:none	Date Appro
Prep Meth:	Analyzed:06/23/98 00:00:00 D K SCAGGS	Approver: C J VANMETER	07/16/98 1

Comments: Method SW846-3540B: Semi-volatile prep

This sample matrix consisted of carbon, PPE, plastic tape, and a small amount of paper waste. A smaller weight of sample was used for extraction to reduce this sample matrix interference.

Foaming was observed during the first phase of concentration and the extract had a gluey-type consistency. A nitrogen purge was used to complete the second phase of concentration. Due to the sample matrix interference, the final volume was 25ml.

Analy Meth:SW846-8270B	QC Batch:QC98194009 Test:SVOC	Rpt Basis:none	Date Approved
Prep Meth: SW846-3540	Analyzed:07/07/98 00:00:00 R J WAWRO	Approver: C J VANMETER	07/16/98 17:54

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,2,4-Trichlorobenzene	29000		ug/kg	U		29000	1		
1,2-Dichlorobenzene	29000		ug/kg	U		29000	1		
1,3-Dichlorobenzene	29000		ug/kg	U		29000	1		
1,4-Dichlorobenzene	29000		ug/kg	U		29000	1		
2,4,5-Trichlorophenol	29000		ug/kg	U		29000	1		
2 ' 6-Trichlorophenol	29000		ug/kg	U		29000	1		
ichlorophenol	29000		ug/kg	U		29000	1		
Dimethylphenol	29000		ug/kg	U		29000	1		
2,4-Dinitrophenol	144000		ug/kg	JU		144000	1		
2,4-Dinitrotoluene	29000		ug/kg	U		29000	1		
2,6-Dinitrotoluene	29000		ug/kg	U		29000	1		
2-Chloronaphthalene	29000		ug/kg	U		29000	1		
2-Chlorophenol	29000		ug/kg	U		29000	1		
2-Methyl-4,6-dinitrophenol	144000		ug/kg	JU		144000	1		
2-Methylphenol	29000		ug/kg	U		29000	1		
2-Nitrophenol	29000		ug/kg	U		29000	1		
3(4)-Methylphenol	29000		ug/kg	U		29000	1		
4-Bromophenyl phenyl ether	29000		ug/kg	U		29000	1		
4-Chloro-3-methylphenol	58000		ug/kg	U		58000	1		
4-Chlorophenylphenyl ether	29000		ug/kg	U		29000	1		
4-Nitrophenol	144000		ug/kg	JU		144000	1		
Acenaphthene	29000		ug/kg	U		29000	1		
Acenaphthylene	29000		ug/kg	U		29000	1		
Anthracene	29000		ug/kg	U		29000	1		
Benzo(a)anthracene	29000		ug/kg	U		29000	1		
Benzo(a)pyrene	29000		ug/kg	U		29000	1		
Benzo(b)fluoranthene	29000		ug/kg	U		29000	1		
Benzo(ghi)perylene	29000		ug/kg	U		29000	1		
Benzo(k)fluoranthene	29000		ug/kg	U		29000	1		
Bis(2-chloroethoxy)methane	29000		ug/kg	U		29000	1		
Bis(2-chloroethyl) ether	29000		ug/kg	U		29000	1		
'2-chloroisopropyl) ether	29000		ug/kg	U		29000	1		

e Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
ethylhexyl)phthalate	29000		ug/kg	U		29000	1		
Butylbenzylphthalate	29000		ug/kg	U		29000	1		
Chrysene	29000		ug/kg	U		29000	1		
Di-n-butylphthalate	29000		ug/kg	U		29000	1		
Di-n-octylphthlate	180000		ug/kg	J		29000	1		
Dibenz(a,h)anthracene	29000		ug/kg	U		29000	1		
Diethylphthalate	29000		ug/kg	U		29000	1		
Dimethylphthalate	29000		ug/kg	U		29000	1		
Diphenyldiazene	29000		ug/kg	U		29000	1		
Fluoranthene	29000		ug/kg	U		29000	1		
Fluorene	29000		ug/kg	U		29000	1		
Hexachlorobenzene	29000		ug/kg	U		29000	1		
Hexachlorobutadiene	29000		ug/kg	U		29000	1		
Hexachlorocyclopentadiene	29000		ug/kg	JU		29000	1		
Hexachloroethane	29000		ug/kg	U		29000	1		
Indeno(1,2,3-cd)pyrene	29000		ug/kg	U		29000	1		
Isophorone	29000		ug/kg	U		29000	1		
N-Nitroso-di-n-propylamine	29000		ug/kg	U		29000	1		
N-Nitrosodimethylamine	29000		ug/kg	U		29000	1		
N-Nitrosodiphenylamine	29000		ug/kg	U		29000	1		
Naphthalene	29000		ug/kg	U		29000	1		
Nitrobenzene	29000		ug/kg	U		29000	1		
Pentachlorophenol	144000		ug/kg	U		144000	1		
Phenanthrene	29000		ug/kg	U		29000	1		
[illegible]ol	29000		ug/kg	U		29000	1		
[illegible]e	29000		ug/kg	U		29000	1		
[illegible]dine	29000		ug/kg	U		29000	1		

Comments: The final extract concentrate volume was 25mL because of the large quantity of methylene chloride extractable compounds extracted from this sample. The GC/MS chromatogram had an intense band tentatively identified compounds (TICs) eluting from ~30 to 34 minutes. The primary components of this TIC band were phthalate esters which coeluted with the last of 6 internal standards, perylene-d12, and caused recovery of this internal standard to fail method criteria. This was also the case for a 2x dilution of this sample, however the fifth internal standard also failed criteria. But the internal standard areas were all acceptable in the all of MS and MSD extracts.

4-Nitrophenol recovery was below PORTS established criteria in the MS and MSD
extracts and was reported as an estimated value. Hexachlorocylopentadiene was also below PORTS established criteria in the MS/MSD and LCS for this extraction batch and was reported as an estimated value. Pentachlorophenol, 2,4-Dinitrophenol, and 4,6-Dinitro-2-Methylphenol recoveries were below criteria in only the
MS samples.

There were 3 compounds that exceeded the 15% RSD criteria for the initial calibration and are qualified as estimated values, 'J'. These compounds were: 2,4-dinitrophenol(30%), 4,6-dinitro-2-methylphenol(20%), and 4-nitrophenol(19%).

Sample homogeneity may have been a problem as indicated by poor recovery of the one target hit (Di-n-octylphthalate) in a spiked aliquot of this sample. This poor recovery led to the estimation of Di-n-octylphthalate.

Analy Meth:SW846-8260A | QC Batch:QC98176003 Test:VOA | Rpt Basis:none | Date Approved
Prep Meth: | Analyzed:06/23/98 00:00:00 J N STRICKLAND | Approver: C J VANMETER | 07/07/98 16:20

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,1,1-Trichloroethane	3200		ug/kg			2000	1000		
1,1,2,2-Tetrachloroethane	2000		ug/kg	U		2000	1000		
1,1,2-Trichloro-1,2,2-trifluoroethane	2000		ug/kg	U		2000	1000		
1,1,2-Trichloroethane	2000		ug/kg	U		2000	1000		
1,1-Dichloroethane	2000		ug/kg	U		2000	1000		
1,1-Dichloroethene	2000		ug/kg	U		2000	1000		
1,2-Dichloro-1,1,2,2-tetrafluoroethane	4000		ug/kg	U		4000	1000		
1,2-Dichlorobenzene	2000		ug/kg	U		2000	1000		
1,2-Dichloroethane	2000		ug/kg	U		2000	1000		
1,2-Dimethylbenzene	2000		ug/kg	U		2000	1000		
1,3 (1,4)-Dimethylbenzene	2000		ug/kg	U		2000	1000		
1,3-Dichlorobenzene	2000		ug/kg	U		2000	1000		
1,4-Dichlorobenzene	2000		ug/kg	U		2000	1000		
2-Butanone	50000		ug/kg	U		50000	1000		
4-Methyl-2-pentanone	50000		ug/kg	U		50000	1000		
Acetone	50000		ug/kg	U		50000	1000		
Benzene	2000		ug/kg	U		2000	1000		
Bromodichloromethane	2000		ug/kg	U		2000	1000		
form	2000		ug/kg	U		2000	1000		
omethane	4000		ug/kg	U		4000	1000		
Carbon disulfide	2000		ug/kg	U		2000	1000		
Carbon tetrachloride	2000		ug/kg	U		2000	1000		
Chlorobenzene	2000		ug/kg	U		2000	1000		
Chloroethane	4000		ug/kg	U		4000	1000		
Chloroform	2000		ug/kg	U		2000	1000		
Chloromethane	4000		ug/kg	U		4000	1000		
Dibromochloromethane	2000		ug/kg	U		2000	1000		
Ethylbenzene	2000		ug/kg	U		2000	1000		
Methylene chloride	2000		ug/kg	U		2000	1000		
Tetrachloroethene	2000		ug/kg	U		2000	1000		
Toluene	150000		ug/kg	E		2000	1000		
Trichloroethene	43000		ug/kg			2000	1000		
Trichlorofluoromethane	4000		ug/kg	U		4000	1000		
Vinyl chloride	1000		ug/kg	U		1000	1000		
cis-1,2-Dichloroethene	2000		ug/kg	U		2000	1000		
trans-1,2-Dichloroethene	2000		ug/kg	U		2000	1000		

Comments: This sample was analyzed by the high level method which results in higher reporting limits.

Bromofluorobenzene failed the PORTS established surrogate recovery limits (80% -- lower limit=85%).

Qualifiers:

sult exceeds calibration range. (GC/MS flag)

J - Estimated value.

U yte analyzed for but undetected. Analyte result was below the Limit of
titation (LOQ).

Analy Meth:PORTS-XP4-TS-RL7280	QC Batch:QC98194012 Test:AB-ACT-GPC	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:07/08/98 00:00:00 J P BREWSTER	Approver: B W SHORT	07/13/98 13:55

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Alpha activity	<6		pCi/g			6	
Beta activity	16		pCi/g			13	

Analy Meth:PORTS-XP4-TS-RL7385	QC Batch:QC98194016 Test:TC99-ACT-LS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:07/08/98 00:00:00 J P BREWSTER	Approver: B W SHORT	07/14/98 09:12

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Technetium-99	80.4		pCi/g			1.0	

Analy Meth:PORTS-XP4-TS-RL7710ug	QC Batch:QC98170002 Test:TOTAL-U-AS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:06/15/98 00:00:00 R J ANDRE	Approver: B W SHORT	06/19/98 14:51

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Uranium	14	1.7	ug/g				
Uranium-235	2.1	0.47	wt %				

er Smpl Id: VER44248001
c:X-04-WM BJC09824
Subproj Analyses:SOLID
Customer:J A APPLEGATE
COC#: 54121
Sample Desc:
Customer Comments:
Lab Smpl Comments:

ER-5B

Matrix: SOLID
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 05/14/98 13:40:00
Received: 05/15/98 07:47:22
Needed: 06/19/98 00:00:0
Approved: 06/19/98 14:51:52

Analy Meth:SW846-8260A QC Batch:QC98141001 Test:VOA Rpt Basis:none Date Approved
Prep Meth: Analyzed:05/20/98 00:00:00 J N STRICKLAND Approver: C J VANMETER 06/04/98 16:42

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,1,1-Trichloroethane	210		ug/kg	J		20	10		
1,1,2,2-Tetrachloroethane	20		ug/kg	JU		20	10		
1,1,2-Trichloro-1,2,2-trifluoroethane	38		ug/kg	J		20	10		
1,1,2-Trichloroethane	20		ug/kg	U		20	10		
1,1-Dichloroethane	24		ug/kg	J		20	10		
1,1-Dichloroethene	33		ug/kg	J		20	10		
1,2-Dichloro-1,1,2,2-tetrafluoroethane	40		ug/kg	JU		40	10		
1,2-Dichlorobenzene	20		ug/kg	JU		20	10		
1,2-Dichloroethane	20		ug/kg	JU		20	10		
1,2-Dimethylbenzene	20		ug/kg	JU		20	10		
1,3 (1,4)-Dimethylbenzene	20		ug/kg	JU		20	10		
1,3-Dichlorobenzene	20		ug/kg	JU		20	10		
1,4-Dichlorobenzene	20		ug/kg	JU		20	10		
anone	500		ug/kg	JU		500	10		
ethyl-2-pentanone	500		ug/kg	U		500	10		
Acetone	500		ug/kg	JU		500	10		
Benzene	20		ug/kg	JU		20	10		
Bromodichloromethane	20		ug/kg	U		20	10		
Bromoform	20		ug/kg	JU		20	10		
Bromomethane	40		ug/kg	JU		40	10		
Carbon disulfide	920		ug/kg	EJ		20	10		
Carbon tetrachloride	20		ug/kg	JU		20	10		
Chlorobenzene	20		ug/kg	JU		20	10		
Chloroethane	40		ug/kg	JU		40	10		
Chloroform	20		ug/kg	JU		20	10		
Chloromethane	40		ug/kg	JU		40	10		
Dibromochloromethane	20		ug/kg	JU		20	10		
Ethylbenzene	20		ug/kg	JU		20	10		
Methylene chloride	20		ug/kg	JU		20	10		
Tetrachloroethene	190		ug/kg	J		20	10		
Toluene	20		ug/kg	U		20	10		
Trichloroethene	1700		ug/kg	EJ		20	10		
Trichlorofluoromethane	40		ug/kg	JU		40	10		
Vinyl chloride	10		ug/kg	JU		10	10		
cis-1,2-Dichloroethene	16000		ug/kg	EJ		20	10		
trans-1,2-Dichloroethene	67		ug/kg	J		20	10		

Comments: Due to matrix interferences, three of the four internal standards used to quantify the analytes failed the area lower limit criteria and the associated analyte results are estimated as "J". The internal standards that failed the lower limit were pentafluorobenzene, 2-bromo-1-chloropropane, and 1,4-difluorobenzene-d4.

All three surrogates failed the PORTS established recovery limits (dibromofluoromethane 158% -- upper limit=109%, toluene-d8 69% -- lower limit=91%, bromofluorobenzene 53% -- lower limit=87%).

The analyte cis-1,2-dichloroethene saturated the detector and the result could be much higher.

This sample was spiked and the QC of the internal standards and surrogates were similar to the sample. The concentration of trichloroethene was higher in the sample than in the MS which was probably due to the nonhomogeneous sample and the result is estimated as "J".

EPA Qualifiers:

E - Result exceeds calibration range. (GC/MS flag)

J - Estimated value.

U - Analyte analyzed for but undetected. Analyte result was below the Limit of Quantitation (LOQ).

Analy Meth:PORTS-XP4-TS-RL7280 QC Batch:QC98167002 Test:AB-ACT-GPC Rpt Basis:none Date Approved

Prep Meth: Analyzed:06/11/98 00:00:00 J P BREWSTER Approver: B W SHORT 06/16/98 16:05

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Alpha activity	17		pCi/g				
activity	98		pCi/g				

Analy Meth:PORTS-XP4-TS-RL7385 QC Batch:QC98167001 Test:TC99-ACT-LS Rpt Basis:none Date Approved

Prep Meth: Analyzed:06/15/98 00:00:00 J P BREWSTER Approver: B W SHORT 06/16/98 16:02

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Technetium-99	67.3		pCi/g				

Analy Meth:PORTS-XP4-TS-RL7710ug QC Batch:QC98170002 Test:TOTAL-U-AS Rpt Basis:none Date Approved

Prep Meth: Analyzed:06/15/98 00:00:00 R J ANDRE Approver: B W SHORT 06/19/98 14:49

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Uranium	5.6	0.73	ug/g				
Uranium-235	3.0	0.71	wt %				

Waste Stream Number: ER-6

Waste Stream Title: Neat Trichloroethylene

ER-6
DOE

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960725-052 Project: ER 9567DC Requisition Number: 010903
Customer Sample ID: VER37121001 Customer: ENV RESTORATION
Date Sampled: 24-JUL-1996 13:00 Date Sample Received: 24-JUL-1996
Sampled By: M MCROBERTS Date Sample Completed: 4-SEP-1996
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-3580	Sample Prep Semi-Volatiles	COMPLETE			BD FUHR	24-JUL-1996	96160207
SW846-9040B	pH	6.09		pH units	CJ HOLBROOK	25-JUL-1996	96100989
TSD553-230	Gross Alpha	<.23		pCi/ml	JP BREWSTER	8-AUG-1996	96071073
	Gross Beta	<.48		pCi/ml	JP BREWSTER	8-AUG-1996	96071073
TSD553-380	Technetium	<0.8		pCi/mL	CD GOOD	3-SEP-1996	96071222
TSD553-710	% U-235	NA		%	SJ JAMES	2-AUG-1996	96071041
	Uranium	<0.012		ug/mL	SJ JAMES	2-AUG-1996	96071041

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
C. J. Van Meter (Organic Analytical Services)
Date Approved: 4-SEP-1996

********** COMMENT PAGE **********
********** 960725-052 **********

* Comments from the Environmental and Industrial Hygiene Laboratory *****

SW846-9040B pH: The replicate result for this sample is 6.18 pH units.

***** Comments from the Organic Analytical Services *****

SW846-8260A

Sample was analyzed by the high level method which involves a methanolic extraction and results in higher detection limits. Results are reported in mg/kg not ug/kg as usually reported for VOC results, due to the limited number of characters which can be reported in the AnaLIS system.

Due to solvent content in sample matrix (Trichloroethene) which required a high dilution, surrogates were analyzed at a very low concentration. As a result of the high dilution, Dibromofluoromethane and Bromofluorobenzene did not meet established criteria for surrogate recovery.

SW846-8270A

Sample was prepared by the waste dilution method because of the nature of the sample's matrix, which results in the higher detection limits reported here.

Five compounds were reported as ND (not detected), these are compounds that are not in calibration standards prepared by the lab. However, these compounds have been extensively tested in the lab for GC/MS information. H. ompounds been detected the sample would have been reinjected agains. valid calibration curve for these compounds.

Definition Page for Qualifiers/Flags

960725-052

I Inc Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

orrelation coefficient for MSA is less tha 0.995.

.he value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 960725-052
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#3
Authorized By: C. J. Van Meter

Customer Sample ID: VER37121001
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 010903
Date Sample Received: 24-JUL-1996
Date Sampled: 24-JUL-1996

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 29-JUL-1996
QA File Number: 96160729A3
Dilution Factor: 100
Analyst: MA NOVOTNY

CAS		mg/kg	CAS		mg/kg
67-64-1	Acetone	10000U	100-41-4	Ethyl benzene	200U
71-43-2	Benzene	200U	76-13-1	Freon 113	200U
75-27-4	Bromodichloromethane	200U	76-14-2	Freon 114	400U
75-25-2	Bromoform	200U	108-10-1	4-Methyl-2-pentanone	10000U
74-83-9	Bromomethane	400U	75-09-2	Methylene Chloride	200U
78-93-3	2-Butanone	10000U	79-34-5	1,1,2,2-Tetrachloroethane	200U
75-15-0	Carbon Disulfide	200U	127-18-4	Tetrachloroethene	1400
56-23-5	Carbon Tetrachloride	200U	108-88-3	Toluene	200U
108-90-7	Chlorobenzene	200U	71-55-6	1,1,1-Trichloroethane	200U
75-00-3	Chloroethane	400U	79-00-5	1,1,2-Trichloroethane	200U
67-66-3	Chloroform	200U	79-01-6	Trichloroethene	68000E
74-87-3	Chloromethane	400U	75-69-4	Trichlorofluoromethane	400U
124-48-1	Dibromochloromethane	200U	75-01-4	Vinyl Chloride	100U
106-46-7	1,4-Dichlorobenzene	200U	1330-20-7	m,p-Xylene	200U
95-50-1	1,2-Dichlorobenzene	200U	95-47-6	o-Xylene	200U
541-73-1	1,3-Dichlorobenzene	200U			
75-34-3	1,1-Dichloroethane	200U			
107-06-2	1,2-Dichloroethane	200U			
75-35-4	1,1-Dichloroethene	200U			
156-59-2	cis-1,2-Dichloroethene	4100			
156-60-5	trans-1,2-Dichloroethene	200U			

ANALYSIS DATA REPORT

AnaLIS ID: 960725-052
Laboratory: Organic Analytical Services
File ID:
Instrument ID: SV2
Authorized By: C. J. Van Meter

Customer Sample ID: VER37121001
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 010903
Date Sample Received: 24-JUL-1996
Date Sampled: 24-JUL-1996

Semi-Volatiles

Date Extracted/Prepared: 24-JUL-1996
Analysis Procedure Number: SW846-8270A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 29-JUL-1996
QA File Number: 96160729B02
Dilution Factor: 1.0
Analyst: RJ WAWRO

CAS		ug/Kg	CAS		ug/Kg
59-50-7	4-Chloro-3-methylphenol	104000U	606-20-2	2,6-Dinitrotoluene	52000U
95-57-8	2-Chlorophenol	52000U	78-59-1	Isophorone	52000U
120-83-2	2,4-Dichlorophenol	52000U	98-95-3	Nitrobenzene	52000U
105-67-9	2,4-Dimethylphenol	52000U	83-32-9	Acenaphthene	52000U
51-28-5	2,4-Dinitrophenol	260000U	208-96-8	Acenaphthylene	52000U
534-52-1	4,6-Dinitro-2-methylphenol	260000U	120-12-7	Anthracene	52000U
88-75-5	2-Nitrophenol	52000U	56-55-3	Benzo(a)anthracene	52000U
100-02-7	4-Nitrophenol	260000U	50-32-8	Benzo(a)pyrene	52000U
87-86-5	Pentachlorophenol	260000U	191-24-2	Benzo(g,h,i)perylene	52000U
108-95-2	Phenol	52000U	76-01-7	Benzo(k)fluoranthene	52000U
88-06-2	2,4,6-Trichlorophenol	52000U	218-01-9	Chrysene	52000U
117-81-7	bis(2-Ethylhexyl)phthalate	52000U	53-70-3	Dibenz(a,h)anthracene	52000U
85-68-7	Butylbenzylphthalate	52000U	206-44-0	Fluoranthene	52000U
84-74-2	Di-n-butylphthalate	52000U	86-73-7	Fluorene	52000U
84-66-2	Diethylphthalate	52000U	193-39-5	Indeno(1,2,3-cd)pyrene	52000U
131-11-3	Dimethylphthalate	52000U	91-20-3	Naphthalene	52000U
117-84-0	di-n-Octylphthalate	52000U	85-01-8	Phenanthrene	52000U
62-75-9	N-Nitrosodimethylamine	52000U	129-00-0	Pyrene	52000U
86-30-6	N-Nitrosodiphenylamine	52000U	111-44-4	bis(2-Chloroethyl)ether	52000U
621-64-7	N-Nitroso-di-n-propylamine	52000U	111-91-1	bis(2-Chloroethoxy)methane	52000U
121-14-2	2,4-Dinitrotoluene	52000U	39638-32-9	bis(2-Chloroisopropyl)ether	52000U

ANALYSIS DATA REPORT

AnaLIS ID: 960725-052
Laboratory: Organic Analytical Services
File ID:
Instrument ID: SV2
Authorized By: C. J. Van Meter

Customer Sample ID: VER37121001
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 010903
Date Sample Received: 24-JUL-1996
Date Sampled: 24-JUL-1996

Semi-Volatiles

Date Extracted/Prepared: 24-JUL-1996
Analysis Procedure Number: SW846-8270A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 29-JUL-1996
QA File Number: 96160729B02
Dilution Factor: 1.0
Analyst: RJ WAWRO

CAS		ug/Kg	CAS		ug/Kg
101-55-3	4-Bromophenyl-phenylether	52000U			
7005-72-3	4-Chlorophenyl-phenylether	52000U			
91-58-7	2-Chloronaphthalene	52000U			
95-50-1	1,2-Dichlorobenzene	52000U			
541-73-1	1,3-Dichlorobenzene	52000U			
106-46-7	1,4-Dichlorobenzene	52000U			
118-74-1	Hexachlorobenzene	52000U			
87-68-3	Hexachlorobutadiene	52000U			
77-47-4	Hexachlorocyclopentadiene	52000U			
67-72-1	Hexachloroethane	52000U			
120-82-1	1,2,4-Trichlorobenzene	52000U			
110-86-1	Pyridine	ND			
	2-Methylphenol (o-Cresol)	ND			
	3,4-Methylphenol (m,p-Cresol)	ND			
95-95-4	2,4,5-Trichlorophenol	ND			
	Azobenzene	52000U			
205-99-2	Benzo(b)fluoranthene	52000U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

SVOA_8270 ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 960725-052
Laboratory: Organic Analytical Services
Sample Matrix: LIQUID WASTE
Level: (low/med): LOW
Dilution Factor: 1.0
% Moisture: not dec.

Customer Sample ID: VER37121001
Customer: ENV RESTORATION
File ID:
Date Received: 24-JUL-1996
Date Analyzed: 29-JUL-1996

Concentration Units: ug/Kg

Number TICs found: 5

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.	79-01-6	Trichloroethene	3.42	9320000	J
2.	108-88-3	Toluene	4.25	52000	J
3.	79-00-5	1,1,2-Trichloroethane	4.52	332000	J
4.	127-18-4	Tetrachloroethene	5.17	1480000	J
5.	630-20-6	1,1,1,2-Tetrachloroethane	6.35	84300	J
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
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29.					
30.					

Waste Stream Number: ER-7

Waste Stream Title: Surface Water

ER-7

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960308-148 Project: ER 9567C Requisition Number: 20244
Customer Sample ID: VER34520001 Customer: ENV RESTORATION
Date Sampled: 8-MAR-1996 12:45 Date Sample Received: 8-MAR-1996
Sampled By: R CAUDILL Date Sample Completed: 22-APR-1996
Material Description: RAIN WATER

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
EPA 413.1	Oil & Grease (Water)	36.5		mg/L	LL CROSS	18-MAR-1996	96100388
SW846-3010A	Sample Prep Metals	COMPLETE			ML STEWART	18-MAR-1996	031896-036
SW846-3510	Sample Prep PCB	COMPLETE			SL EWING	13-MAR-1996	96160085
SW846-6010A	Arsenic	23.4UJ		ug/L	TE SHOOK	18-MAR-1996	96080306
	Barium	31.6		ug/L	TE SHOOK	18-MAR-1996	96080306
	Cadmium	2.4		ug/L	TE SHOOK	18-MAR-1996	96080306
	Chromium	11.7		ug/L	TE SHOOK	18-MAR-1996	96080306
	Lead	40.1		ug/L	TE SHOOK	18-MAR-1996	96080306
	Selenium	35.9U		ug/L	TE SHOOK	18-MAR-1996	96080306
	Silver	4.9UN		ug/L	TE SHOOK	18-MAR-1996	96080306
SW846-8080	PCB-1232	< 5J		ug/L	DH BLUE	27-MAR-1996	96160322M2
	PCB-1242	< 5J		ug/L	DH BLUE	27-MAR-1996	96160322M2
	PCB-1248	< 5J		ug/L	DH BLUE	27-MAR-1996	96160322M2
	PCB-1254	< 5J		ug/L	DH BLUE	27-MAR-1996	96160322M2
	PCB-1260	< 5J		ug/L	DH BLUE	27-MAR-1996	96160322M2
	PCB-1268	< 5J		ug/L	DH BLUE	27-MAR-1996	96160322M2
	Total PCB	< 5J		ug/L	DH BLUE	27-MAR-1996	96160322M2

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
Arsenic	400	364.71	91.18
Barium	400	367.12	91.78
Cadmium	400	367.82	91.96
Chromium	400	351.22	87.81
Lead	400	329.57	82.39
Selenium	400	314.95	78.74
Silver	400	40.32	10.08

y Manager: D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
C. J. Van Meter (Organic Analytical Services)

********** COMMENT PAGE **********
********** 960308-148 **********

* Comments from the Organic Analytical Services *****

SW846-8260A

2-Butanone did not meet method criteria for the continuing calibration and is an estimate value.

SW846-8080:

Sample result was estimated due to low surrogate recovery

***** Comments from the Spectrochemistry/ICP Laboratory *****

SW846-6010A As qualified as estimate due to interference check not meeting Q.C. limits.

Definition Page for Qualifiers/Flags

960308-148

In ...ic Data Reporting Qualifiers and Flags:

...oncentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

...rrelation coefficient for MSA is less tha 0.995.

...ne value is between the LC and the LLD.

...ntering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 960308-148
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#1
Authorized By: C. J. Van Meter

Customer Sample ID: VER34520001
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 20244
Date Sample Received: 8-MAR-1996
Date Sampled: 8-MAR-1996

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 14-MAR-1996
QA File Number: 96160314A1
Dilution Factor: 1.0
Analyst: MA NOVOTNY

CAS		ug/L	CAS		ug/L
67-64-1	Acetone	100U	100-41-4	Ethyl benzene	2U
71-43-2	Benzene	2U	76-13-1	Freon 113	4
75-27-4	Bromodichloromethane	2U	76-14-2	Freon 114	4U
75-25-2	Bromoform	2U	108-10-1	4-Methyl-2-pentanone	100U
74-83-9	Bromomethane	4U	75-09-2	Methylene Chloride	2U
78-93-3	2-Butanone	100UJ	79-34-5	1,1,2,2-Tetrachloroethane	2U
75-15-0	Carbon Disulfide	2U	127-18-4	Tetrachloroethene	2U
56-23-5	Carbon Tetrachloride	2U	108-88-3	Toluene	2U
108-90-7	Chlorobenzene	2U	71-55-6	1,1,1-Trichloroethane	12
75-00-3	Chloroethane	4U	79-00-5	1,1,2-Trichloroethane	2U
67-66-3	Chloroform	2U	79-01-6	Trichloroethene	2U
74-87-3	Chloromethane	4U	75-69-4	Trichlorofluoromethane	4U
124-48-1	Dibromochloromethane	2U	75-01-4	Vinyl Chloride	1U
106-46-7	1,4-Dichlorobenzene	2U	1330-20-7	m,p-Xylene	2U
95-50-1	1,2-Dichlorobenzene	2U	95-47-6	o-Xylene	2U
541-73-1	1,3-Dichlorobenzene	2U			
75-34-3	1,1-Dichloroethane	2U			
107-06-2	1,2-Dichloroethane	2U			
75-35-4	1,1-Dichloroethene	2U			
156-59-2	cis-1,2-Dichloroethene	2U			
156-60-5	trans-1,2-Dichloroethene	2U			

Waste Stream Number: ER-8

Waste Stream Title: Decontamination Water

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 971229-051 Project: ER 9762A Requisition Number: 54640
Customer Sample ID: VER42898001 ER-8 Customer: ENV RESTORATION
Date Sampled: 23-DEC-1997 Date Sample Received: 23-DEC-1997
Sampled By: R STANLY Date Sample Completed: 22-JAN-1998
Material Description: DECON WATER & LIQUINOX

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
OA97333006	Gross Alpha	0.7		pCi/ml	JP BREWSTER	15-JAN-1998	98070061
	Gross Beta	0.4		pCi/ml	JP BREWSTER	15-JAN-1998	98070061
SW846-3010A	Sample Prep Metals	COMPLETE			ML STEWART	29-DEC-1997	122997-070
SW846-6010A	Aluminum	104NJ		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Antimony	22.6B		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Arsenic	23.4U		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Barium	4.6B		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Beryllium	1.1U		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Cadmium	11.6B		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Calcium	5850J		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Chromium	3.4B		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Cobalt	3.4U		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Copper	70.3		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Iron	453		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Lead	63.5B		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Magnesium	1780		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Manganese	69.9		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Molybdenum	2.9U		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Nickel	60.1B		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Potassium	5040		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Selenium	35.9U		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Silver	4.9U		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Sodium	12500J		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Thallium	24.3U		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Vanadium	2.5U		UG/L	EL SIMPSON	29-DEC-1997	98080052
	Zinc	504		UG/L	EL SIMPSON	29-DEC-1997	98080052
SW846-7470A	Mercury	10U		ug/L	RK SHORT	13-JAN-1998	98080032
TSD553-380	Technetium	<0.9		pCi/L	JP BREWSTER	15-JAN-1998	98070062
TSD553-700	% U-235	6.3	3.1	% U-235	CD GOOD	31-DEC-1997	97071774
	Uranium	0.17	0.043	ug/mL	CD GOOD	31-DEC-1997	97071774

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered

Mercury	40	43.6	109.00

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
C. J. Van Meter (Organic Analytical Services)
Date Approved: 22-JAN-1998

********** COMMENT PAGE **********
********** 971229-051 **********

*** Comments from the Organic Analytical Services *****

SW846-8260A

The results for Bromomethane are estimated due to the compound not meeting the requirements of the continuing calibration.

***** Comments from the Spectrochemistry/ICP Laboratory *****

SW846-6010A Al qualified as estimate due to possible contamination. Ca and Na qualified as estimate due to lab control sample not meeting acceptance limits.

Definition Page for Qualifiers/Flags

* ********** 971229-051 **********************

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.
Duplicate analysis is not within control limits.
Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID:	971229-051	Customer Sample ID:	VER42898001
Laboratory:	Organic Analytical Services	Customer:	ENV RESTORATION
File ID:		Sample Matrix:	WATER
Instrument ID:	5890-2	Requisition Number:	54640
Authorized By:	C. J. Van Meter	Date Sample Received:	23-DEC-1997
		Date Sampled:	23-DEC-1997

VOC

Date Extracted/Prepared:		Date Analyzed:	2-JAN-1998
Analysis Procedure Number:	SW846-8260A	QA File Number:	98160102A2
Percent Moisture:		Dilution Factor:	10
Percent Moisture (decanted):		Analyst:	DE COLLINS
Associated Blank:			

CAS		ug/L	CAS		ug/L
67-64-1	Acetone	500U	100-41-4	Ethyl benzene	20U
71-43-2	Benzene	20U	76-13-1	Freon 113	20U
75-27-4	Bromodichloromethane	20U	76-14-2	Freon 114	40U
75-25-2	Bromoform	20U	108-10-1	4-Methyl-2-pentanone	500U
74-83-9	Bromomethane	40UJ	75-09-2	Methylene Chloride	20U
78-93-3	2-Butanone	500U	79-34-5	1,1,2,2-Tetrachloroethane	20U
75-15-0	Carbon Disulfide	20U	127-18-4	Tetrachloroethene	20U
56-23-5	Carbon Tetrachloride	20U	108-88-3	Toluene	20U
108-90-7	Chlorobenzene	20U	71-55-6	1,1,1-Trichloroethane	20U
75-00-3	Chloroethane	40U	79-00-5	1,1,2-Trichloroethane	20U
67-66-3	Chloroform	20U	79-01-6	Trichloroethene	20U
74-87-3	Chloromethane	40U	75-69-4	Trichlorofluoromethane	40U
124-48-1	Dibromochloromethane	20U	75-01-4	Vinyl Chloride	10U
106-46-7	1,4-Dichlorobenzene	20U	1330-20-7	m,p-Xylene	20U
95-50-1	1,2-Dichlorobenzene	20U	95-47-6	o-Xylene	20U
541-73-1	1,3-Dichlorobenzene	20U			
75-34-3	1,1-Dichloroethane	20U			
107-06-2	1,2-Dichloroethane	20U			
75-35-4	1,1-Dichloroethene	20U			
156-59-2	cis-1,2-Dichloroethene	20U			
156-60-5	trans-1,2-Dichloroethene	20U			

Waste Stream Number: ER-9

Waste Stream Title: Brick, Concrete, and Masonry Waste

Waste stream ER-9 consists of brick, concrete and masonry waste that is removed from historically contaminated areas or from decommissioning activities. Each drum is assigned the appropriate waste code based on the listing of the waste that was present prior to the decommissioning.

Waste Stream Number: ER-10

Waste Stream Title: Floor Sweepings, Vacuum Dust, etc.

Waste stream ER-10 consists of floor sweepings, vacuum dust, etc, that is removed from historically contaminated areas. Each drum is assigned the appropriate waste code based on the listing of the waste that was present prior to the cleaning activity.

Waste Stream Number: 100-1

Waste Stream Title: Office Machine Repair Solvents

100-1
USEC

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960412-032 Project: ER 9567E Requisition Number: 20251
Customer Sample ID: VER35691001 Customer: ENV RETORATION
Date Sampled: 27-MAR-1996 Date Sample Received: 28-MAR-1996
Sampled By: CAUDILL Date Sample Completed: 24-APR-1996
Material Description: PHOTO

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-3050A	Sample Prep Metals	COMPLETE			ML STEWART	12-APR-1996	041296-027
SW846-6010A	Aluminum	750000		mg/kg	TE SHOOK	12-APR-1996	96080341
	Antimony	105UN		mg/kg	TE SHOOK	12-APR-1996	96080341
	Arsenic	142UJ		mg/kg	TE SHOOK	12-APR-1996	96080341
	Barium	5.4UJ		mg/kg	TE SHOOK	12-APR-1996	96080341
	Beryllium	6.7U		mg/kg	TE SHOOK	12-APR-1996	96080341
	Cadmium	10.9U		mg/kg	TE SHOOK	12-APR-1996	96080341
	Calcium	415U		mg/kg	TE SHOOK	12-APR-1996	96080341
	Chromium	18.1U		mg/kg	TE SHOOK	12-APR-1996	96080341
	Cobalt	20.6U		mg/kg	TE SHOOK	12-APR-1996	96080341
	Copper	42.3		mg/kg	TE SHOOK	12-APR-1996	96080341
	Iron	3240		mg/kg	TE SHOOK	12-APR-1996	96080341
	Lead	108U		mg/kg	TE SHOOK	12-APR-1996	96080341
	Magnesium	147U		mg/kg	TE SHOOK	12-APR-1996	96080341
	Manganese	8530		mg/kg	TE SHOOK	12-APR-1996	96080341
	Molybdenum	17.5U		mg/kg	TE SHOOK	12-APR-1996	96080341
	Nickel	39.3U		mg/kg	TE SHOOK	12-APR-1996	96080341
	Potassium	2010U		mg/kg	TE SHOOK	12-APR-1996	96080341
	Selenium	217U		mg/kg	TE SHOOK	12-APR-1996	96080341
	Silver	29.6U		mg/kg	TE SHOOK	12-APR-1996	96080341
	Sodium	944UJ		mg/kg	TE SHOOK	12-APR-1996	96080341
	Zinc	163N		mg/kg	TE SHOOK	12-APR-1996	96080341
TSD553-280	Gross Alpha	<3		pCi/g	BW SHORT	9-APR-1996	96070461
	Gross Beta	<5		pCi/g	BW SHORT	9-APR-1996	96070461
TSD553-385	Technetium	<24		pCi/g	BW SHORT	9-APR-1996	96070462
TSD553-710	% U-235	NA		%	SJ JAMES	10-APR-1996	96070466
	Uranium	<0.02		ug/g	SJ JAMES	10-APR-1996	96070466

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
Date Approved: 24-APR-1996

********** COMMENT PAGE **********
********** 960412-032 **********

Comments from the Spectrochemistry/ICP Laboratory *****

SW846-6010A Ba and Na qualified as estimate due to calibration verification not meeting acceptance limits.

SW846-6010A As qualified as estimate due to interference check not meeting acceptance limits.

Definition Page for Qualifiers/Flags

********** 960412-032 **********

I[illegible] [illegible] Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ [illegible]rrelation coefficient for MSA is less tha 0.995.

[illegible]e value is between the LC and the LLD.

[illegible]tering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

(W - 100-1

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960219-112 Project: ER 9567E Requisition Number: 20229
Customer Sample ID: VER31922001 Customer: ENV RETORATION
Date Sampled: 19-FEB-1996 09:45 Date Sample Received: 19-FEB-1996
Sampled By: MB HAMEL Date Sample Completed: 25-MAR-1996
Material Description: PHOTORECEPTORS

** See comment page for comments. **

** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311/3010A	Sample Prep TCLP Metals	COMPLETE			LD DRYDEN	4-MAR-1996	030496-004
1311/3520	Sample Prep TCLP Semi-Volatile	COMPLETE			LD DRYDEN	4-MAR-1996	96160079
ACD-5101	Density	0.199		g/mL	ML STEWART	21-FEB-1996	96110015
ASTM-D2216	Moisture	0.5		%	ML STEWART	22-FEB-1996	96110016
SW846-1311	Sample Prep TCLP	COMPLETE			LD DRYDEN	27-FEB-1996	96170041
	Sample Prep TCLP	COMPLETE			LD DRYDEN	27-FEB-1996	96170041
SW84[illegible]	Sample Prep Metals	COMPLETE			ML STEWART	22-FEB-1996	022296-058
SW846-3540	Sample Prep PCB	NA			DH BLUE	21-FEB-1996	NA
SW846-6010A	Aluminum	16.1		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Antimony	9.0		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Arsenic	2.1U		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Barium	0.24		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Beryllium	0.10U		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Cadmium	0.19		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Calcium	48.3N		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Chromium	23.0N		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Cobalt	0.53		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Copper	4.2		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Iron	172N		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Lead	1.6U		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Magnesium	13.0		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Manganese	2.8		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Molybdenum	0.32		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Nickel	12.7N		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Potassium	30.5U		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Selenium	3.3U		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Silver	0.45UJ*		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Sodium	48.5		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Thallium	2.2UNJ		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Vanadium	0.23U		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
	Zinc	29.0		MG/KG	EL SIMPSON	22-FEB-1996	96R80242
SW846-8080	PCB-1232	NA			DH BLUE	21-FEB-1996	NA

	PCB-1242	NA		DH BLUE	21-FEB-1996	NA
	PCB-1248	NA		DH BLUE	21-FEB-1996	NA
	PCB-1254	NA		DH BLUE	21-FEB-1996	NA
	PCB-1260	NA		DH BLUE	21-FEB-1996	NA
	PCB-1268	NA		DH BLUE	21-FEB-1996	NA
	Total PCB	NA		DH BLUE	21-FEB-1996	NA
SW846-9010A	Total Cyanide	<1.0NJ	mg/kg	CJ HOLBROOK	22-FEB-1996	96100266
SW846-9020A	TOX	< 10.0	ug/g	DE COLLINS	11-MAR-1996	9616031113
SW846-9030A	Sulfide	51.8	mg/kg	CJ HOLBROOK	28-FEB-1996	96100235
SW846-9045C	pH	5.75	ph units	CJ HOLBROOK	20-FEB-1996	96100253
SW846-9095	Paint Filter Test	PASS		LD DRYDEN	22-FEB-1996	96170039
TSD553-280	Gross Alpha	<20	pCi/g	JP BREWSTER	1-MAR-1996	96070289
	Gross Beta	<28	pCi/g	JP BREWSTER	1-MAR-1996	96070289
TSD553-385	Technetium	<14.3	pCi/g	JP BREWSTER	1-MAR-1996	96070290
TSD553-440	Cesium-134	<0.1	pCi/g	WC ZUEFLE	1-MAR-1996	96070286
	Cesium-137	<0.1	pCi/g	WC ZUEFLE	1-MAR-1996	96070286
	Cobalt-60	<0.2	pCi/g	WC ZUEFLE	1-MAR-1996	96070286
	Gross Gamma	0.0	pCi/g	WC ZUEFLE	1-MAR-1996	96070286
TSD553-710	% U-235	ND	%	SJ JAMES	22-FEB-1996	96070245
	Alpha Activity	<1	pCi/g	SJ JAMES	22-FEB-1996	96070245
	Americium-241	<0.006	pCi/g	SJ JAMES	22-FEB-1996	96070245
	Neptunium-237	<0.011	pCi/g	SJ JAMES	22-FEB-1996	96070245
	Plutonium-238	<0.003	pCi/g	SJ JAMES	22-FEB-1996	96070245
	Plutonium-239/240	<0.003	pCi/g	SJ JAMES	22-FEB-1996	96070245
	Thorium-228	<0.021	pCi/g	SJ JAMES	22-FEB-1996	96070245
	Thorium-230	<0.028	pCi/g	SJ JAMES	22-FEB-1996	96070245
	Thorium-232	<0.018	pCi/g	SJ JAMES	22-FEB-1996	96070245
	Thorium-234	<0.012	pCi/g	SJ JAMES	22-FEB-1996	96070245
	Uranium	<0.036	pCi/g	SJ JAMES	22-FEB-1996	96070245

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
Aluminum	45.87	36.53	79.64
Antimony	45.87	38.33	83.56
Arsenic	45.87	39.19	85.44
Barium	45.87	42.59	92.85
Beryllium	45.87	41.60	90.69
Cadmium	45.87	41.56	90.60
Calcium	45.87	26.32	57.38
Chromium	45.87	25.35	55.26
Cobalt	45.87	41.69	90.89
Copper	45.87	39.04	85.11
Iron	45.87	-53.39	-116.39

Lead	45.87	42.17	91.93
Magnesium	45.87	35.66	77.74
Manganese	45.87	40.98	89.34
Molybd	45.87	39.58	86.29
Nic	45.87	32.87	71.66
Potassium	458.72	447.18	97.48
Selenium	45.87	44.37	96.73
Silver	45.87	42.02	91.61
Sodium	45.87	34.47	75.15
Thallium	45.87	27.32	59.56
Total Cyanide	7.65	2.42	31.63
Vanadium	45.87	39.56	86.24
Zinc	45.87	34.53	75.28

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
C. J. Van Meter (Organic Analytical Services)
C. J. Van Meter (TCLP Laboratory)
Date Approved: 25-MAR-1996

********** COMMENT PAGE **********
********** 960219-112 **********

' Comments from the Organic Analytical Services *****

SW846-9020A (Proposed SW846-9023)

Sample was extracted using 1:1 acetone/hexane following PORTS method XP4-TS-OA-7020 (Draft). This method extracts 1 g sample using 5mL extraction solvent and 1mL water. The sample undergoes sonication for 15 minutes. This method deviates from proposed method 9023 only in choice of solvent.

Sample VER 31922001 was received by the laboratory in a non-homogeneous matrix consisting of hard plastic pieces and a black granular substance. The result reported is 90% black substance and 10% plastic, due to difficulties in sample preparation of hard plastic.

Sample VER 31922001 was analyzed in QA file 9616031IT3. This QA file contained low matrix spike, and low matrix spike duplicate results for sample RFD 32130. However, since all other QC data for QA file 9616031IT3 was within limits, the result was not estimated. Sample RFD 32130 was analyzed again in a later QA file.

SW846-8080:
Sample result was not analyzed per Jeff Deemie.

*** Comments from the TCLP Laboratory *****

TCLP_Method 1311/6010A Arsenic was qualified as an estimate due to the interference check not meeting acceptance limits.

TCLP_Method 1311/8270A : This sample failed to meet established limits for recovery of the surrogate compounds nitrobenzene-d5 and 2,4,6-Tribromophenol in the MSD and sample extracts from this matrix. Nitrobenzene was low recovery while 2,4,6-Tribromophenol was a high recovery problem. The MS sample exhibited the same behavior but met established criteria.

The MS and MSD extracts failed to meet established limits for recovery of nitrobenzene, 2,4-Dinitrotoulene,

and 2,4,6-Trichlorophenol. The first two nitrogen containing compounds were a low recovery while 2,4,6-Trichlorophenol was a high recovery problem. These compounds were flagged as estimated sample quantitation limits.

***** Comments from the Spectrochemistry/ICP Laboratory *****

ACD-5101 Density duplicate result is 0.210 g/mL.
SW846-6010A Ag qualified as estimate due to lab control sample not meeting Q. C. limits.
SW846-6010A Tl qualified as estimate due to lab control sample and insufficient number of calibration verifications.

Definition Page for Qualifiers/Flags

******** ******** 960219-112 **********

Ir .ic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

rrelation coefficient for MSA is less tha 0.995.

.e value is between the LC and the LLD.

..tering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID:	960219-112	Customer Sample ID:	VER31922001
Laboratory:	TCLP Laboratory	Customer:	ENV RETORATION
File ID:	96170041	Sample Matrix:	SOLID WASTE
Instrument ID:		Requisition Number:	20229
Authorized By:	C. J. Van Meter	Date Sample Received:	19-FEB-1996
		Date Sampled:	19-FEB-1996

TCLP_SV_ACIDS_RPT

Date Extracted/Prepared:	4-MAR-1996	Date Analyzed:	15-MAR-1996
Analysis Procedure Number:	1311/8270A	QA File Number:	96160315B01
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	LD DRYDEN
Associated Blank:			

CAS		mg/L	CAS		mg/L
95-48-7	2-Methylphenol	0.020U			
108-39-4	m-Cresol	0.020U			
106-44-5	4-Methylphenol	0.020U			
87-86-5	Pentachlorophenol	0.040U			
95-95-4	2,4,5-Trichlorophenol	0.020U			
88-06-2	2,4,6-Trichlorophenol	0.020UJ			

ANALYSIS DATA REPORT

AnaLIS ID: 960219-112
Laboratory: TCLP Laboratory
File ID: 9617004196170041
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: VER31922001
Customer: ENV RETORATION
Sample Matrix: SOLID WASTE
Requisition Number: 20229
Date Sample Received: 19-FEB-1996
Date Sampled: 19-FEB-1996

TCLP_SV_B/N_RPT

Date Extracted/Prepared: 4-MAR-1996
Analysis Procedure Number: 1311/8270A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 15-MAR-1996
QA File Number: 96160315B01
Dilution Factor: 1.0
Analyst: LD DRYDEN

CAS		mg/L	CAS		mg/L
121-14-2	2,4-Dinitrotoluene	0.040UJ			
118-74-1	Hexachlorobenzene	0.020U			
87-68-3	Hexachlorobutadiene	0.020U			
67-72-1	Hexachloroethane	0.020U			
98-95-3	Nitrobenzene	0.020UJ			
110-86-1	Pyridine	0.020U			

ANALYSIS DATA REPORT

AnaLIS ID:	960219-112	Customer Sample ID:	VER31922001
Laboratory:	TCLP Laboratory	Customer:	ENV RETORATION
File ID:	96170041	Sample Matrix:	SOLID WASTE
Instrument ID:		Requisition Number:	20229
Authorized By:	C. J. Van Meter	Date Sample Received:	19-FEB-1996
		Date Sampled:	19-FEB-1996

TCLP_VOLATILES_RPT

Date Extracted/Prepared:	27-FEB-1996	Date Analyzed:	29-FEB-1996
Analysis Procedure Number:	1311/8260	QA File Number:	96160229A1
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	LD DRYDEN
Associated Blank:			

CAS		mg/L	CAS		mg/L
71-43-2	Benzene	0.002U			
56-23-5	Carbon Tetrachloride	0.002U			
108-90-7	Chlorobenzene	0.013			
67-66-3	Chloroform	0.002U			
106-46-7	1,4-Dichlorobenzene	0.002U			
107-06-2	1,2-Dichloroethane	0.002U			
75-35-4	1,1-Dichloroethene	0.002U			
78-93-3	2-Butanone	0.100U			
127-18-4	Tetrachloroethene	0.002U			
79-01-6	Trichloroethene	0.002			
75-01-4	Vinyl Chloride	0.001U			

ANALYSIS DATA REPORT

AnaLIS ID: 960219-112
Laboratory: TCLP Laboratory
File ID: 96170041
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: VER31922001
Customer: ENV RETORATION
Sample Matrix: SOLID WASTE
Requisition Number: 20229
Date Sample Received: 19-FEB-1996
Date Sampled: 19-FEB-1996

TCLP_METALS_ICP_RPT

Date Extracted/Prepared: 27-FEB-1996
Analysis Procedure Number: 1311/6010A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 4-MAR-1996
QA File Number: 96080234
Dilution Factor: 1.0
Analyst: LD DRYDEN

CAS		mg/L	CAS		mg/L
7440-38-2	Arsenic	0.023UJ			
7440-39-3	Barium	0.056			
7440-43-9	Cadmium	0.022			
7440-47-3	Chromium	0.088			
7439-92-1	Lead	0.189			
7782-49-2	Selenium	0.036U			
7440-22-4	Silver	0.034			

ANALYSIS DATA REPORT

AnaLIS ID: 960219-112
Laboratory: TCLP Laboratory
File ID: 96170041
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: VER31922001
Customer: ENV RETORATION
Sample Matrix: SOLID WASTE
Requisition Number: 20229
Date Sample Received: 19-FEB-1996
Date Sampled: 19-FEB-1996

TCLP_HG_RPT

Date Extracted/Prepared: 27-FEB-1996
Analysis Procedure Number: 1311/7470
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 29-FEB-1996
QA File Number: 96080208
Dilution Factor: 1.0
Analyst: LD DRYDEN

CAS		mg/L	CAS		mg/L
7439-97-6	Mercury	0.010U			

Waste Stream Number: 100-2

Waste Stream Title: Printing Solvent Waste

MARTIN MARIETTA

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

WSTD-100.2

January 14, 1993
POEF-554-93-22

T. A. Brooks, MS-7550

Toxicity Characteristic Leaching Procedure [TCLP] - X-100 Reproduction Area

A sample of printing pads and solvents from the reproduction area in X-100, RFD-10554 (6-17-92), was submitted for a TCLP test for metals and volatile organics. The test was performed according to Method 1311, as published in the FEDERAL REGISTER and revised June 29, 1990. The Zero Headspace Extractor [ZHE] was used to verify values of volatile organic constituents. Matrix interferences were checked for each parameter and appropriate corrections made, except for tetrachloroethylene. The value for tetrachloroethylene is estimated but is greater than the limit. The value for mercury is for informational purposes only, as analyses were performed after expiration of the holding time. Analyses showed no other concentration of toxicity characteristics exceeded the limits as stated in Table 1 of 40 CFR Part 261.24.

Tentatively identified compounds and LDR compounds were found. These organic compounds and concentration values can be found in POEF-554-92-675, December 17, 1992.

L. E. Deacon

L. E. Deacon, X-710, MS-2215, PORTS (5774)

M. R. Kelley

M. R. Kelley, X-710, MS-2215, PORTS (5774)

LED:MRK:msc

cys:
C. P. Moore	MS-7550
A. J. Saraceno	MS-2209
C. W. Skaggs	MS-2234A
N. J. Smith	MS-2212
B. E. Upham	MS-7550
D/554 File - RC	

TABLE 1. ORGANIC ANALYSES OF TCLP EXTRACT
(Units are mg/L.)

	Concentration	Regulatory Limit
VOLATILES		
Benzene	<0.046	0.5
Carbon Tetrachloride	<0.051	0.5
Chlorobenzene	<0.053	100.0
Chloroform	<0.047	6.0
1,4-Dichlorobenzene	<0.062	7.5
1,2-Dichloroethane	<0.051	0.5
1,1-Dichloroethylene	0.058	0.7
Methyl Ethyl Ketone	<2.2	200.0
Tetrachloroethylene	10 E	0.7
Trichloroethylene	<0.052	0.5
Vinyl Chloride	<0.12	0.2

E - Estimated value is uncorrected for matrix interference.

TABLE 2. METALS ANALYSES OF TCLP EXTRACT
(Units are mg/L.)

Sample	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
LIMIT	5.0	100.0	1.0	5.0	5.0	0.2	1.0	5.0
RFD-10554	0.04	0.14	0.01	0.01	0.04	<0.01*	<0.04	<1

* - For informational purposes only, analysis was performed beyond holding time.

W
4W

00-2

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 920106-021 Project: WMGT RFD Customer Sample ID: RFD-1592
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 3-JAN-1992 Date Sample Received: 6-JAN-1992
Sampled By: B KELLEY Date Sample Completed: 28-DEC-1992
Material Description: PRINTING SOLVENTS & PADS

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
	Assay (% U-235, Waste)	NA		% U-235	BW SHORT	31-JAN-1992	NA
EC-013	Mercury	NA		mg/L	EL SIMPSON	15-MAY-1992	9208M104
EC-015	Selenium	2.8U*		mg/kg	EL SIMPSON	15-MAY-1992	9208M104
EC-016	Silver	.5UN*E		mg/kg	EL SIMPSON	15-MAY-1992	9208M104
EC-040	Cadmium	2.2*		mg/kg	EL SIMPSON	15-MAY-1992	9208M104
	Chromium	10.5*		mg/kg	EL SIMPSON	15-MAY-1992	9208M104
	Lead	1.5*		mg/kg	EL SIMPSON	15-MAY-1992	9208M104
SW	Arsenic	1.9U*		mg/kg	EL SIMPSON	15-MAY-1992	9208M104
	Barium	19.2*		mg/kg	EL SIMPSON	15-MAY-1992	9208M104
TSD515-500	Uranium (Waste)	<1.0		ug/g	CJ HOLBROOK	9-JAN-1992	92100126
TSD553-340	Technetium (Waste)	<0.4		PCI/G	BJ STANLEY	14-JAN-1992	92070033

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
ARSENIC	100	72.6	72.60
BARIUM	100	113.3	113.30
CADMIUM	100	98.	97.80
CHROMIUM	100	105.0	105.00
LEAD	100	97.9	97.90
SELENIUM	100	106.8	106.80
SILVER	100	30.0	30.00
URANIUM (WASTE)	50	53.0	106.07

***** Comments from the Radiochemistry Laboratory *****

Uraniu to low for assay determination by gamma

*** Comments from the Organic Analytical Services *****

Chlorobenzene, 1,1,2-Trichloroethane, and Tetrachloroethene coelute.
There was no attempt to seperate and identify.

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but gre than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Only "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

Laboratory Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
O. A. Vita (Spectrochemistry/ICP Laboratory)
D. K. Perez (Environmental and Industrial Hygiene Laboratory)
D. E. Boyd (Organic Analytical Services)

Date Approved: 29-DEC-1992

ANALYSIS DATA REPORT

AnaLIS ID: 920106-021
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: D. E. Boyd

Customer Sample ID: RFD-1592
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 6-JAN-1992
Date Sampled: 3-JAN-1992

Solvents_F002

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 27-FEB-1992
QA File Number: NA
Dilution Factor: 10
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
108-90-7	Chlorobenzene	132J			
	o-Dichlorobenzene	0.40U			
76-13-1	Freon 113	70.3			
75-09-2	Methylene Chloride	0.20U			
127-18-4	Tetrachloroethene	132J			
71-55-6	1,1,1-Trichloroethane	0.20U			
79-00-5	1,1,2-Trichloroethane	132J			
79-01-6	Trichloroethene	0.20U			
75-69-4	Trichlorofluoromethane	0.20U			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

AnaLIS ID: 920106-021
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: D. E. Boyd

Customer Sample ID: RFD-1592
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 6-JAN-1992
Date Sampled: 3-JAN-1992

Solvents_F003

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 27-FEB-1992
QA File Number: NA
Dilution Factor: 10
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
67-64-1	Acetone	200U			
	n-Butyl alcohol	700U			
108-94-1	Cyclohexanone	100U			
141-78-6	Ethyl Acetate	300U			
	Ethylbenzenes	300U			
60-29-7	Ethyl ether	NR			
67-56-1	Methanol	50U			
	4-Methyl-2-pentanone (MIBK)	100U			
	Xylenes	250U			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

ANALYSIS DATA REPORT

AnaLIS ID: 920106-021
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: D. E. Boyd

Customer Sample ID: RFD-1592
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 6-JAN-1992
Date Sampled: 3-JAN-1992

Solvents_F005

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 27-FEB-1992
QA File Number: NA
Dilution Factor: 10
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
71-43-2	Benzene	100U			
	i-Butanol	100U			
	2-Butanone (MEK)	200U			
75-15-0	Carbon Disulfide	NA			
	2-Ethoxy ethanol	200U			
	2-Nitropropane	250U			
110-86-1	Pyridine	200U			
108-88-3	Toluene	100U			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 920620-006 Project: WMGT RFD Customer Sample ID: RFD-10554
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 17-JUN-1992 Date Sample Received: 17-JUN-1992
Sampled By: AR SELBEE Date Sample Completed: 20-JAN-1993
Material Description: PRINTING PADS & SOLVENTS

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311	Arsenic	0.04		mg/L	MR KELLEY	23-JUN-1992	RFD-10554
	Barium	0.14		mg/L	MR KELLEY	23-JUN-1992	RFD-10554
	Cadmium	0.01		mg/L	MR KELLEY	23-JUN-1992	RFD-10554
	Chromium	0.01		mg/L	MR KELLEY	23-JUN-1992	RFD-10554
	Lead	0.04		mg/L	MR KELLEY	23-JUN-1992	RFD-10554
	Mercury	< 0.01R		mg/L	MR KELLEY	23-JUN-1992	RFD-10554
	Selenium	< 0.04		mg/L	MR KELLEY	23-JUN-1992	RFD-10554
	Silver	< 1		mg/L	MR KELLEY	23-JUN-1992	RFD-10554

***** Comments from the TCLP Laboratory *****

R - Th lyses was performed after the holding time expired.

Method 8240 - The value for tetrachloroethylene exceeded the linear range of the calibration curve. The result is estimated and uncorrected for matrix spike recovery but is greater than the regulatory limit.

Tentatively identified compounds and LDR compounds were also found. These organic compounds and concentration values can be found in POEF-554-92-675, December 17, 1992.

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

ualify data for the sample as estimated.
Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and t repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.
S - The reported value was obtained by the Method of Standard Additions (MSA).
U - ify data for the sample as estimated.

- Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.
* - Duplicate analysis is not within control limits.
+ - Correlation coefficient for MSA is less tha 0.995.
# - The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Laboratory Manager: D. E. Boyd (TCLP Laboratory)
Approved: 20-JAN-1993

AnaLIS ID: 920620-006
Laboratory: TCLP Laboratory
File ID: RFD-10554
Instrument ID:
Authorized By: D. E. Boyd

Customer Sample ID: RFD-10554
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 17-JUN-1992
Date Sampled: 17-JUN-1992

TCLP_VOLATILES_RPT

Date Extracted/Prepared: 23-JUN-1992
Analysis Procedure Number: 1311
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed:
QA File Number: RFD-10554
Dilution Factor: 1.0
Analyst: LE DEACON

CAS		mg/L	CAS		mg/L
71-43-2	Benzene	0.046U			
56-23-5	Carbon Tetrachloride	0.051U			
108-90-7	Chlorobenzene	0.053U			
67-66-3	Chloroform	0.047U			
106-46-7	1,4-Dichlorobenzene	0.062U			
107-06-2	1,2-Dichloroethane	0.051U			
75-35-4	1,1-Dichloroethene	0.058			
78-93-3	2-Butanone	2.2 U			
127-18-4	Tetrachloroethene	10			
79-01-6	Trichloroethene	0.052U			
75-01-4	Vinyl Chloride	0.120U			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Waste Stream Number: 100-3

Waste Stream Title: Blue Print Solution

PORTS MSDS #: 238

PRODUCT: STANDARD, AMMONIA AS N, 1000PPM N

PART NUMBER: LC-17940-1

FORMULA:

KEYWORD: STANDARD

PORTS NUMBER: 66040995-500

PORTS MISC INFO:
NOT GIVEN

PORTS RATING: HFR=000

MANUFACTURER:
LABCHEM INC.
200 WILLIAM PITT WAY
PITTSBURGH
PA

15238
PHONE: PHONE: 412-826-5230
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 212 F	
Melting Point. . . .	EQ 32 F	
Freezing Point . . .	NG	
Sour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ 1.0	
Vapor Pressure . . .	EQ 14	NOTE: MM HG @ 20'C (H20).
Vapor Density. . . .	EQ .7	NOTE: H2O.
Percent Volatiles. .	NG	
Evaporation Rate . .	LT 1	NOTE: ETHER=1.
pH	NA	NOTE: NOT APPLI/NOT AVAIL.
Molecular Weight . .	NG	
Viscosity.	NG	

Solubility in Water. SOLUBLE.
Odor/Appearance/Other Characteristics:
CLEAR COLORLESS LIQUID, ODORLESS.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	N*	NOTE: NON-FLAMMABLE.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	NA	NOTE: NOT APPLI/NOT AVAIL.
Explosive/Flammable Limits		
Lower (LEL).	NA	NOTE: NOT APPLI/NOT AVAIL.
Upper (UEL).	NA	NOTE: NOT APPLI/NOT AVAIL.

Shipping Regulations

UN/NA Number.	NG
D.O.T. Hazard Class. . .	NG
Label	NOT GIVEN
Proper Shipping Name . .	NOT GIVEN

==========

Preparer/Contact Information: AL BERANEK 412-826-5230

Date Prepared/Revised 11/26/90

===== Component Information =====

AMMONIUM CHLORIDE
OSHA PEL (PPM): NA
OSHA PEL (MG/M3):
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 10
STEL (PPM):
STEL (MG/M3): 20
Product %: EQ .38
C.A.S. No.: 12125029
Note:
PEL: NOT APPLICABLE OR DATA NOT AVAILABLE / TLV & STEL:

WATER
OSHA PEL (PPM): NG
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NG
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 99.6
C.A.S. No.: 7732185

===== IDENTIFICATION =====

PRODUCT NAME: NITROGEN (AMMONIA) STANDARD, 1ml=1ml N = 1.22 mg NH3

Cat # 1794

ATERIAL SAFETY DATA SHEET # 113

REVISED: 11/26/90

CONTACT: Al Beranek

PHONE: (412)826-5230

MANUFACTURER'S NAME AND ADDRESS:

LABCHEM INC.
200 WILLIAM PITT WAY
PITTSBURGH, PA 15238

===== HAZARDOUS INGREDIENTS/IDENTITY INFORMATION =====

SEE COMPONENT INFORMATION.

NAME: NITROGEN (AMMONIA) STANDARD, 1ml=1mg N = 1.22mg NH3

SYN: Nitrogen reference solution

COMPONENTS:	CAS:	FORMULA/F.WT.
(1) ammonium chloride, 0.38%	12125-02-9	NH4Cl / 53.49
(2) water, 99.6%	7732-18-5	H20 / 18.00

CERCLA RATING(0-3): Health - Fire - Reactivity - Persistance - n/a

NFPA RATING (0-4): Health - Fire - Reactivity - n/a

===== PHYSICAL/CHEMICAL CHARACTERISTICS =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

=== FIRE AND EXPLOSION HAZARD DATA =====

FLASH PT.: Non-flammable

EXPLOSION LEVEL:

LOWER (LEL): N/a
UPPER (UEL): N/a

AUTOIGNITION: N/a

EXTINGUISHING MEDIA: Dry chemical, carbon dioxide, water spray or foam.

FIREFIGHTING: No acute hazard. Negligible fire hazard when exposed to heat or flame. Move container if possible, avoid breathing dusts or vapors.

===== REACTIVITY DATA =====

STABILITY: Stable under normal temperatures and pressures up to boiling point(212F).

CONDITIONS TO AVOID: Incompatibilities - water reactive substances (oleum, sodium). Ammonium chloride in sufficient concentrations react violently or explosively with bromine trifluoride, iodine heptafluoride, potassium perchlorate, ammonium nitrate.

HAZARDOUS DECOMPOSITION/BYPRODUCTS: This solution presents negligible hazard from thermal decomposition. Ammonium chloride sublimes unchanged at 644F (340C).

HAZARDOUS POLYMERIZATION: Not known to occur.

===== HEALTH HAZARD DATA =====

TOXICITY: No toxic effects anticipated at this concentration of ammonium chloride. Ammonium chloride salt is a mild respiratory and skin irritant, a severe eye irritant.

LDLO: 78 mg/Kg IV-rabbit; 500mg/Kg SubC-mouse.
LD50: 485mg/Kg IP-mouse; 30mg/Kg IM-rat; 1000mg/Kg Oral - rabbit; 1650 mg/Kg Oral-rat.

CARCINOGENICITY: None reported.

EXPOSURE LIMITS: (For ammonium chloride, as fume)

OSHA-PEL: N/a
ACGIH-TWA: 10mg/m3
-STEL: 20mg/m3
TLV CEILING: N/a
IDLH: N/a
OTHER: N/a

ACUTE HEALTH HAZARDS: No health hazards reported for this solution. Ammonium

chloride salts may irritate the nose, throat, mouth and respiratory tract and
cause wheezing, chest pain, and delayed pulmonary edema. Skin and eye contact
may produce redness and irritation. Ingestion of ammonium salts may produce
nausea, vomiting, gastric irritation - over 6 grams may cause systemic
ammonia toxicity (heavy breathing, blue skin, dullness/-restlessness,
convulsions, coma). Persons with liver or kidney impairment are at increased
risk.

CHRONIC HEALTH HAZARDS: Dermatitis, conjunctivitis may occur. Ammonium
chloride at this concentration should not present a significant health
hazard.

FIRST AID:

INHALATION: Move victim to fresh air, give artificial respiration if
necessary. Maintain airway, medical personnel may give oxygen and treat for
pulmonary edema. Keep victim warm, at rest. Get medical aid immediately.

SKIN: Remove contaminated clothing, wash area with soap and water. Flush
with large amounts of water (15-20min) until chemical is gone. Get medical
aid.

EYES: Flush with large amounts of water (15-20min) lifting upper/lower lids
occasionally until chemical is gone. Get medical aid at once.

INGESTION: Give conscious victim 2-4 glasses of water, induce vomiting
(touch finger to back of throat). Get medical aid at once.

===== PRECAUTIONS FOR SAFE HANDLING AND USE =====

SPILLS OR LEAKS: Absorb with sand, diatomaceous earth, activated charcoal, or
other suitable absorbent. Scoop into container and label for disposal. Spill
may be chemically neutralized to pH 7.

DISPOSAL: Dispose in accordance with Federal, State, and local laws.

STORAGE AND HANDLING: Store capped in virgin linear polyethylene or
equivalent plastic container at room temperature protected from heat and
water reactive materials (oleum, sodium).

===== CONTROL MEASURES =====

RESPIRATORY PROTECTION: Not required for laboratory use of this solution.
Respirators not required for laboratory.

PROTECTIVE CLOTHING AND EQUIPMENT: Gloves are recommended where repeated and

prolonged contact occurs. Wear splash-proof goggles. Do not wear contact
lenses when working with chemicals.

===== SPECIAL NOTES =====

Information in this MSDS is from available published sources and is believed
to be accurate. No warranty, express or implied, is made and LabChem Inc.
assumes no liability resulting from the use of this MSDS. The user must
determine suitability of this information for his application.

NOTE:

N/A: Means "not applicable" or data "not available".

Waste Stream Number: 100-4

Waste Stream Title: Waste Oil

PORTS MSDS #: 5505

PRODUCT: BENZENE

PART NUMBER:

FORMULA: C6H6

KEYWORD: SOLVENT

PORTS NUMBER: NNN

PORTS MISC INFO:
01-02-1000

PORTS RATING: HFR=430

MANUFACTURER:
AMERICAN BURDICK & JACKSON
1953 SOUTH HARVEY STREET
MUSKEGON
MI

49442
PHONE: PHONE: 616-726-3171
EMERGENCY PHONE: 616-726-3171

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 176 F	NOTE: 80'C, 760 MM HG.
Melting Point. . . .	NG	
Freezing Point . . .	EQ 41.9 F	NOTE: 5.5'C.
Sour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .879	NOTE: @ 20'C.
Vapor Pressure . . .	EQ 74.6	NOTE: MM HG @ 20'C.
Vapor Density. . . .	EQ 2.8	
Percent Volatiles. .	~ 100	
Evaporation Rate . .	~ 3	NOTE: BUAC=1.
pH	NG	
Molecular Weight . .	EQ 78.11	
Viscosity.	NG	

Solubility in Water. @ 25C 0.18%.
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS LIQUID WITH A CHARACTERISTIC AROMATIC

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 12.2 F	NOTE: -11'C, TCC.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	EQ 1043.6 F	NOTE: 562'C.

Explosive/Flammable Limits
Lower (LEL). . . . . EQ 1.3
Upper (UEL). . . . . EQ 7.1

Shipping Regulations
UN/NA Number. UN1114
D.O.T. Hazard Class. . . FLAMMABLE LIQUID
Label . . . . . NOT GIVEN
Proper Shipping Name . . BENZENE

==========

Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 3/01/88

http://jupiter.ports/msds/data/5

===== Component Information =====

ENZENE
OSHA PEL (PPM): 1
OSHA PEL (MG/M3):
ACGIH TLV (PPM): 10
ACGIH TLV (MG/M3):
STEL (PPM): 25
STEL (MG/M3):
Product %: ~ 100
C.A.S. No.: 71432
Note:
OSHA AND ACGIH STEL / NIOSH: 10 PPM, TLV CEILING: NOT

===== IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

CHEMICAL NAME: Benzene

CHEMICAL FAMILY: Aromatic Hydrocarbon

SYNONYMS: Benzol

CAS NO.: 71-43-2

EMERGENCY TELEPHONE NO.: 312/973-3600 (American Scientific Products)

HEMTREC TELEPHONE NO.: 800/424-9300

INFORMATION TELEPHONE NO.: 616/726-3171 (American Burdick & Jackson)

MANUFACTURER'S NAME AND ADDRESS:

AMERICAN BURDICK & JACKSON
SUBSIDIARY OF AMERICAN HOSPITAL SUPPLY CORPORATION
1953 SOUTH HARVEY STREET
MUSKEGON, MI 49442

===== PHYSICAL AND CHEMICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Not expected to occur.

APPEARANCE AND ODOR: Clear, colorless liquid with a characteristic aromatic odor.

CONDITIONS TO AVOID: Heat, sparks, open flame, open containers, and poor ventilation.

MATERIALS TO AVOID: Strong oxidizing agents and strong acids.

AZARDOUS DECOMPOSITION PRODUCTS: Incomplete combustion can enerate carbon monoxide and other toxic vapors.

===== FIRE AND EXPLOSION HAZARD DATA =====

E PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Volatile and flammable.

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical or foam.

SPECIAL FIRE FIGHTING PROCEDURES: Water will not be effective in extinguishing a fire and may spread it, but a water spray can be used to cool
exposed containers. Wear full protective clothing and self-contained
breathing apparatus. Heat will build pressure and rupture closed storage
containers.

===== HAZARDOUS COMPONENTS =====

SEE COMPONENT INFORMATION.

BENZENE

CARCINOGEN

===== HEALTH HAZARDS =====

OCCUPATIONAL EXPOSURE LIMITS:

OSHA:

PEL-TWA - 1 ppm
PEL-STEL - 25 ppm

ACGIH:

TLV-TWA - 10 ppm
TLV-STEL - 25 ppm

NIOSH:

TLV-TWA - 10 ppm
TLV-C - Not Listed

CONCENTRATION IMMEDIATELY DANGEROUS TO HEALTH:

OSHA/NIOSH 2,000 ppm

ODOR THRESHOLD:

NSC 2 ppm
NIOSH Not Listed
OHS 1.5-5 ppm

CARCINOGENIC, MUTAGENIC, TERATOGENIC DATA:

Human carcinogen (NTP, IARC, OSHA)
Suspect human carcinogen (ACGIH)
Mutagenic and teratogenic data (RTEC)
Animal carcinogen (IARC)

PRIMARY ROUTES OF ENTRY: Benzene may exert its effects through inhalation,
skin absorption, and ingestion.

INDUSTRIAL EXPOSURE: ROUTE OF EXPOSURE/SIGNS AND SYMPTOMS:

INHALATION: Exposure can cause dizziness, intoxication, excitement, headache, vomiting, delirium, drowsiness, and unconsciousness.

EYE CONTACT: Liquid and high vapor concentration can cause irritation, neuritis, atrophy, visual impairment, edema, and cataracts.

SKIN CONTACT: Prolonged or repeated skin contact can cause irritation and dermatitis through defatting of skin.

INGESTION: Can cause gastrointestinal tract discomfort.

EFFECTS OF OVEREXPOSURE: Benzene is a primary skin irritant, central nervous system depressant, bone marrow depressant, and leukemogen. Acute benzene exposure from inhalation or ingestion initially produces excitation and euphoria, followed by headache, drowsiness, dizziness, vomiting, delirium and unconsciousness. Respiratory irritation and pulmonary edema are possible. Severe exposure causes blurred vision, tremors, shallow and rapid respiration, ventricular fibrillation, paralysis, and convulsions. Liver and kidney damage may occur. Chronic exposure to benzene poses the most significant toxic effects. Symptoms are headache, anorexia, nervousness, weariness, anemia, pallor, bleeding under the skin and eyes, and reduced clotting ability. Bone marrow damage and leukemia may develop. Liver and kidney damage may occur.

MEDICAL CONDITION AGGRAVATED BY EXPOSURE: Preclude from exposure those individuals with diseases of the heart, lung, kidney, liver, nervous system, or the blood, and those susceptible to dermatitis.

EMERGENCY FIRST AID:

INHALATION: Immediately remove to fresh air. If not breathing, administer mouth-to-mouth rescue breathing. If there is no pulse administer cardiopulmonary resuscitation (CPR). Contact physician immediately.

EYE CONTACT: Rinse with copious amounts of water for at least 15 minutes. Get emergency medical assistance.

SKIN CONTACT: Flush thoroughly for at least 15 minutes. Wash affected skin with soap and water. Remove contaminated clothing and shoes. Wash clothing before re-use, and discard contaminated shoes. Get emergency medical assistance.

INGESTION: Call local Poison Control Center for assistance. Contact physician immediately. Aspiration Hazard - Do not induce vomiting.

===== SAFETY MEASURES AND EQUIPMENT =====

VENTILATION: Adequate ventilation is required to protect personnel

from
exposure to chemical vapors exceeding the PEL and to minimize fire
azards.
ne choice of ventilation equipment, either local or general, will
depend on
the conditions of use, quantity of material, and other operating
parameters.

RESPIRATORY: Use approved respirator equipment. Follow NIOSH and
equipment
manufacturer's recommendations to determine appropriate equipment
(air-purifying, air-supplied, or self-contained breathing
apparatus).

EYES: Safety glasses are considered minimum protection. Goggles or
face
shield may be necessary depending on quantity of material and
conditions of
use.

SKIN: Protective gloves and clothing are recommended. The choice of
material
must be based on chemical resistance and other user requirements.
Generally,
polyvinyl alcohol, viton(R) or nitrile latex offers acceptable
chemical
resistance. Individuals who are acutely and specifically sensitive
to benzene
may require additional protective equipment.

STORAGE: Benzene should be protected from temperature extremes and
direct
sunlight. Proper storage of benzene must be determined based on
other
materials stored and their hazards and potential chemical
incompatibility. In
general, benzene should be stored in an acceptably protected and
secure
flammable liquid storage room.

OTHER: Emergency eye wash fountains and safety showers should be
available in
the vicinity of any potential exposure. Ground and bond metal
containers to
minimize static sparks.

===== SPILL AND DISPOSAL DATA =====

SPILL CONTROL: Protect from ignition. Wear protective clothing and
use
approved respirator equipment. Absorb spilled material in an
absorbent
recommended for solvent spills and remove to a safe location for
disposal by
approved methods. If released to the environment, comply with all
regulatory
notification requirements.

WASTE DISPOSAL: Dispose of benzene as an EPA hazardous waste.
Hazardous waste
numbers: U019 (Ignitable, Toxic); D001 (Ignitable).

===== SPECIAL NOTES =====

KEY:

CA: Approximately

http://jupiter.ports/msds/data/5

NA: Not applicable
C: Ceiling
PEL: Permissible Exposure Level
STEL: Short Term Exposure Level
TLV: Threshold Limit Value
TWA: Time Weighted Average
BuAc: Butyl Acetate
NSC: National Safety Council ("Fundamentals of Industrial Hygiene", 1983)
OHS: Occupational Health Services ("Hazardline")

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Waste Stream Number: 100-5

Waste Stream Title: Flammable Solvents

APPENDIX A
Page 1 of 5

EXAMPLE OF A GWMP WORK SHEET

Prepared by: BURCH UPHAM Phone #: 2961 Date: 4/22/96

Waste generation start date: 7/1/93 Project name: USEC 100-5

A. Waste Origin

	Y	N	
1.	☐	☑	Area (1) has potential for contamination resulting from presence of unencapsulated or unconfined radioactive material or (2) is exposed to sources of particles (neutrons, protons, etc.) capable of causing activation.

B. Project Description

1. Summary of project, including equipment and processes to be used:
ELECTROSTATIC PLOTTER SOLUTIONS

C. Waste Stream Description (including secondary wastes):

1. Summary of waste generation process:
PLOTTER SOLUTION FROM PLOTTER USED IN ELECTRICAL ENGINEERING

2. Amount of waste generated, including secondary waste:
2 FT³

3. Materials involved in waste generation:
IGNITABLE SOLVENT

4. Material balance or process flow diagram for waste stream(s):
N/A

APPENDIX A
Page 2 of 5

EXAMPLE OF A GWMP WORK SHEET

D. Waste Characterization

Current information is based on: (Analytical results) Process knowledge (supply documentation)

1. Waste category: (RCRA) TSCA Radioactive Industrial/sanitary
2. EPA waste codes: D001
3. Chemical composition/contaminant: IGNITABLE SOLVENT BLEND
4. Radionuclides and concentrations: N/A
5. Regulatory agency(ies) having authority: EPA
6. RCRA categories: (Ignitable) Corrosive TCLP Reactive Listed
7. Physical form: Solid (Liquid) Gas Sludge
8. Confidence level of info.: (High) Medium Low

E. Container Information

1. Drums: (30 gal) (55 gal) 85 gal. Other: 5 gal.
2. Boxes: Metal Concrete Wood Other: _____
   Sizes: _____
3. Tank size(s): _____
4. Is waste overpacked?: Yes (No)

   If yes, describe:

   _____
   _____
   _____
   _____
   _____

5. Other:

   _____
   _____
   _____
   _____
   _____

APPENDIX A
Page 3 of 5

EXAMPLE OF A GWMP WORK SHEET

F. Waste Stream Management

1. Upon generation, waste stream is: (Stored) Treated (Disposed of)

2. Target TSDF (name, location): PDC

3. Accumulated quantity: 20 (ft^3) / m^3 _____ lb/k Other: _____

4. Summary of treatment, storage, and disposal process: INCINERATION

5. Summary of WAC for target TSDF: PROPRIETARY

6. Waste minimization techniques to be implemented: NONE

- ☐ Equipment selection
- ☐ Waste handling (spill control)
- ☐ Decontamination
- ☐ Compaction
- ☐ Material recycling
- ☐ PPE selection
- ☐ Solvent substitution
- ☐ Recovery of cutting fluids
- ☐ Segregation
- ☐ Sludge dewatering
- ☐ Material reuse (solvents, wash waters)
- ☐ Other : _____

7. Summary of minimization methods:

APPENDIX A
Page 4 of 5

EXAMPLE OF A GWMP WORK SHEET

G. **Waste Storage Area Identification**

1. ☐ Area is listed and registered as an RMA.
2. ☐ Area is listed and registered as a RCRA satellite accumulation area.
3. ☐ Area is listed and registered as a RCRA 90-day accumulation area.
4. ☐ Area is listed and registered as a TSCA 30-day storage area.

N/A

H. **Additional Comments and Information**

N/A

Completed by: Burel Upham Date completed: 4/22/96

Approved by: _____ Date approved: ___/___/___
(Certification engineer or designee)

Approved by: _____ Date approved: ___/___/___
(WMD Training Coordinator or designee)

HEWLETT PACKARD

Material Safety Data Sheet

Chemical Product Identity: Toner (pre-mixed)

HP/Assembly Part Number: 17278A Chemical/HP Part Number None

SECTION 1

Manufacturer's Name: HEWLETT PACKARD COMPANY Emergency Telephone Number: (619) 487-4100

Address (Number, Street, City, State, Zip Code) Telephone Number for Information: (619) 487-4100

16399 West Bernardo Drive Date Prepared: 6/13/90

San Diego, Ca. 92127-1899

SECTION 2 - HAZARDOUS INGREDIENTS / IDENTITY INFORMATION

Hazardous Components (Specific Chemical Identity: Common Name(s))	CAS#	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (Optional)
Solvent, ISOPAR-G (predominantly C8-C14 isoparaffinic hydrocarbons)	64742-48-9		* None Established		> 97%
Polymer & dye stuff					< 3%

National Fire Protection Association (NFPA)

Health	Flammability	Reactivity
1	2	0

Although no TLV or PEL exists for this family of chemicals, by analogy to similar chemicals and based on the recommendation of a supplier, a 300 ppm occupational exposure limit is suggested.

*Note: See page 3

SECTION 3 - PHYSICAL / CHEMICAL CHARACTERISTICS

Boiling Point 155-176°C (311-348°F) Specific Gravity (H2O = 1) 0.75 @ 20°C

Vapor Pressure (mm Hg.) < 10mm @ 25°C Melting Point < -18°C (0°F)

Vapor Density (Air = 1) approx. 5.0 Evaporation Rate (Butyl Acetate =1) 0.30

Solubility in Water < 0.1%

Appearance and Odor Black liquid: faint petroleum hydrocarbon odor

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used) See page 3 Flammable Limits LEL 0.8% UEL 7%

Extinguishing Media Dry chemical, CO_2, foam and mist. Water may be ineffective, but should be used to keep fire-exposed containers cool.

Special Fire Fighting Procedures Water not recommended as extinguishing media as it spreads hydrocarbon fires. Minimize breathing gases, vapors, and fumes.

Unusual Fire and Explosion Hazards None, however, it is flammable when exposed to direct flame or excessive temperatures.

DISCLAIMER: This Material Safety Data Sheet is offered without charge to the clients of Hewlett-Packard. Data is the most current available to Hewlett-Packard at the time of preparation and is issued as a matter of information only, no warranty as to its accuracy or completeness is expressed or implied.

SECTION 5 - REACTIVITY DATA

Chemical / HP Part Number None

ty { Unstable ____ Conditions to Avoid: N/A
Stable X

Incompatibility (Materials to Avoid) Strong oxidants (liquid chlorine, Conc. O2, (Chromic Acid)

Hazardous Decomposition or Byproducts None, however, most products of combustion are toxic.

Hazardous Polymerization { May Occur ____ Conditions to Avoid: ____
Will Not Occur X

SECTION 6 - HEALTH HAZARD DATA

Route(s) of Entry: Inhalation? Yes Skin? Yes Ingestion? Yes

Health Hazards (Acute and Chronic) Brief periods of high exposure can cause dizziness, irritation of mucous membranes, and drowsiness. Chronic exposure to concentrations below 300 ppm are not currently believed to produce long term adverse effects.

Carcinogenicity: NPT? No IARC Monographs? No OSHA Regulated? No

Signs and Symptoms of Exposure: Excessive exposure can cause headaches, nausea, and eye irritation. Severe exposure can cause mild depression and/or respiratory irritation and difficulty in breathing. Skin contact can cause drying and chapping. Eye contact can cause irritation of conjunctiva.

Medical Conditions Generally Aggravated by Exposure: ____

gency and First Aid Procedures: Ingestion: get medical attention immediately. Do not induce omiting as it may aspirate into lungs and cause pneumonia-like disorders. Eye and skin contact: See page 3.

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to Be Taken in case Material is Released or Spilled: Extinguish ignition sources, provide ventilation, soak up with inert absorbant and place in a flammable waste container. In certain situations, spill reports may need to be submitted to local authorities.

Waste Disposal Method: Consult state and local authorities for approved waste disposal method. ID Number: UN#1993

Precautions to Be Taken in Handling and Storing: Keep container closed, avoid handling near heat, strong lights, sparks, open flames, and strong oxidant.

Other Precautions: Avoid breathing vapors and prolonged or repeated skin contact.

SECTION 8 - CONTROL MEASURES

Respiratory Protection (Specify Type) None when used in well-ventilated areas according to directions

Ventilation { Local Exhaust No specific requirement Special None
Mechanical (General) General office ventilation Other None

ective Gloves For prolonged exposure Neoprene or Nitrile gloves Eye Protection See page 3

Other Protective Clothing or Equipment No specific requirement when used according to directio

Work/hygenic practices Avoid breathing vapors, and avoid prolonged skin contact.

SECTION 9 - ADDITIONAL INFORMATION

Chemical / HP Part Number None

SECTION: 4 - Fire and Explosion Hazard Data
Flash Point (method used): 38° C min (100° F) (ASTM D 56, tag closed cup)

SECTION: 6 - Health Hazard Data
First Aid Procedures: Eye contact: Thoroughly flush with water. Get medical attention.

Skin contact: Wash throughly with soap and water.

SECTION: 8 - Control Measures
Eye Protection: Use splash goggles or face shield when eye contact may occur.

Note: MSDS is based on a usage model of 5 liters or less at a given time. Hazard is predominately controlled by the hydrocarbons (solvent) under the condition of use.

For copies of Hewlett-Packard Material Safety Data Sheets contact:

Hewlett-Packard Company
Corporate Product Regulations
3172 Porter Drive
Palo Alto, CA 94304
(415) 857-8191

HEALTH PHYSICS SURFACE CONTAMINATION SURVEY

Code No. _____

cation X-100 Dept. Head _____ Issue Date _____ Survey Date 5-14-91 Survey Time 1230

rpose of Inspection roof and vents (East Wing)

Routine Survey ☐ Pre-maintenance ☐ Off-Plant Shipment ☐ Pre-construction ☐

Routine Follow-Up ☐ Post-maintenance ☐ Surplus and Salvage ☐ Special Survey ☑

Property Number ☐ _____ Details alpha & beta surface & wipes

Recommendations/Findings (Survey maps, equipment list, and personnel data are attached)

NA ☐ All areas monitored were ~~below~~ applicable Plant Allowable Limits _____

☐ Decontaminate floor areas above PAL ~~1000 dpm surface/100 cm²~~ / ~~200 dpm wipe/100 cm²~~ Alpha

☐ Decontaminate ~~floor~~ areas above PAL 25,000 dpm surface/100 cm² / 5,000 dpm wipe/100 cm² Tc-Beta

☐ Decontaminate equipment above Plant Allowable Limits ( )

NA ☐ Establish barriers or warning signs, etc., around the area indicating the hazard and the required protection to enter the area until the area is decontaminated and surveyed. (Location) _____

NA ☐ Employ personal protection when working in this area or on this equipment. (Type of Protection) _____

Comments/Summary Results: <400/<200 dpm/100 cm² alpha <6K/<800 dpm/100 cm² beta

Meters used for survey:

343-8346
228-0223
36994-2406

Walking Surface Index:

Surface N/A Wipe A Total _____

Equipment Factor:

Surface _____ Wipe _____ Total _____

Surveyor Hamilton / Johnson / Yeates Approved _____

HEALTH PHYSICS SURFACE CONTAMINATION SURVEY

Code No. _____

Location X-345 Dept. Head CONKEL Issue Date _____ Survey Date 5-7-91 Survey Time 1900

Purpose of Inspection ROOFING MATERIAL

Routine Survey ☐ Pre-maintenance ☐ Off-Plant Shipment ☐ Pre-construction ☐

Routine Follow-Up ☐ Post-maintenance ☐ Surplus and Salvage ☐ Special Survey ☑

Property Number ☐ _____ Details SURFACE AND WIPE

Recommendations/Findings (Survey maps, equipment list, and personnel data are attached)

☐ All areas monitored were below applicable Plant Allowable Limits _____

☐ Decontaminate floor areas above PAL $\frac{1000 \text{ dpm surface}/100 \text{ cm}^2}{200 \text{ dpm wipe}/100 \text{ cm}^2}$ Alpha

N/A ☐ Decontaminate floor areas above PAL $\frac{25{,}000 \text{ dpm surface}/100 \text{ cm}^2}{5{,}000 \text{ dpm wipe}/100 \text{ cm}^2}$ Tc-Beta

☐ Decontaminate equipment above Plant Allowable Limits ( )

NA ☐ Establish barriers or warning signs, etc., around the area indicating the hazard and the required protection to enter the area until the area is decontaminated and surveyed. (Location) _____

☑ Employ personal protection when working in this area or on this equipment. (Type of Protection) SEE ATTACHED A-2928

Comments/Summary MAX. RESULTS: SEE ATTACHED MAP

Meters used for survey:

262-435 440-5862
375-0903 375-5860
578-2274 206-7673
483-1166 339-3425
343-8346

Walking Surface Index:

Surface _____ Wipe _____ Total _____

Equipment Factor:

Surface _____ Wipe _____ Total _____

Surveyor HOLLEY, MEENACH, JOHNSON, Approved _____
STIFFLER, ESSMAN, HAMILTON
LYKINS, TEETERS, WHITE

Rc—D/102 (07-150—127)

HEALTH PROTECTION RECOMMENDATIONS

Roofing Material

Location: X-345 Department Head: CONKEL Survey Date: 5-7-91 Time: 1707

Purpose: ☐ Pre–Maintenance ☐ Post–Maintenance ☑ Special

The required health protection for work activities in the area indicated above is marked as a function of work activity and the contamination status as reported on the attached data sheet.

WORK ACTIVITIES	HEAVY WORK GLOVES	CLOTH COVERALLS	PAPER COVERALLS	LATEX GLOVES	TOWEL–NECK	RESPIRATOR AIR – SUPPLIED	RESPIRATOR HALF – FACE	RESPIRATOR FULL – FACE	HEAD COVER	SHOE COVERS ~~NONE~~
Destruction of Surface (welding, grinding, burning, buffing, drilling, machining)	X	X	X	X	X		X		X	
Airborne Probability Low (Handling, Inspecting)	X	X		X			X			
Airborne Probability Low (Non–handling, Inspecting)										
Airborne Probability High (Impact Tools, Sweeping)	X	X	X	X			X		X	
Wet – Decontamination	X	X	X	X			X			
Dry – Decontamination	X	X	X	X			X		X	

NOTE: Follow Personal Protection Requirements as outlined in procedures when opening system.

NOTE: Thin cotton undertaker gloves are not to be used as anticontamination apparel.

Surveyor: HOLLEY, MCENACH, STIFFLER, ESSMAN, HAMILTON, LYKINS, TEETERS, WHITE, JOHNSON

The following Anti–C apparel are required when the Contamination Area boundary becomes active, unless already required as marked above.

☐ Coveralls – 2 pair (paper or welders)

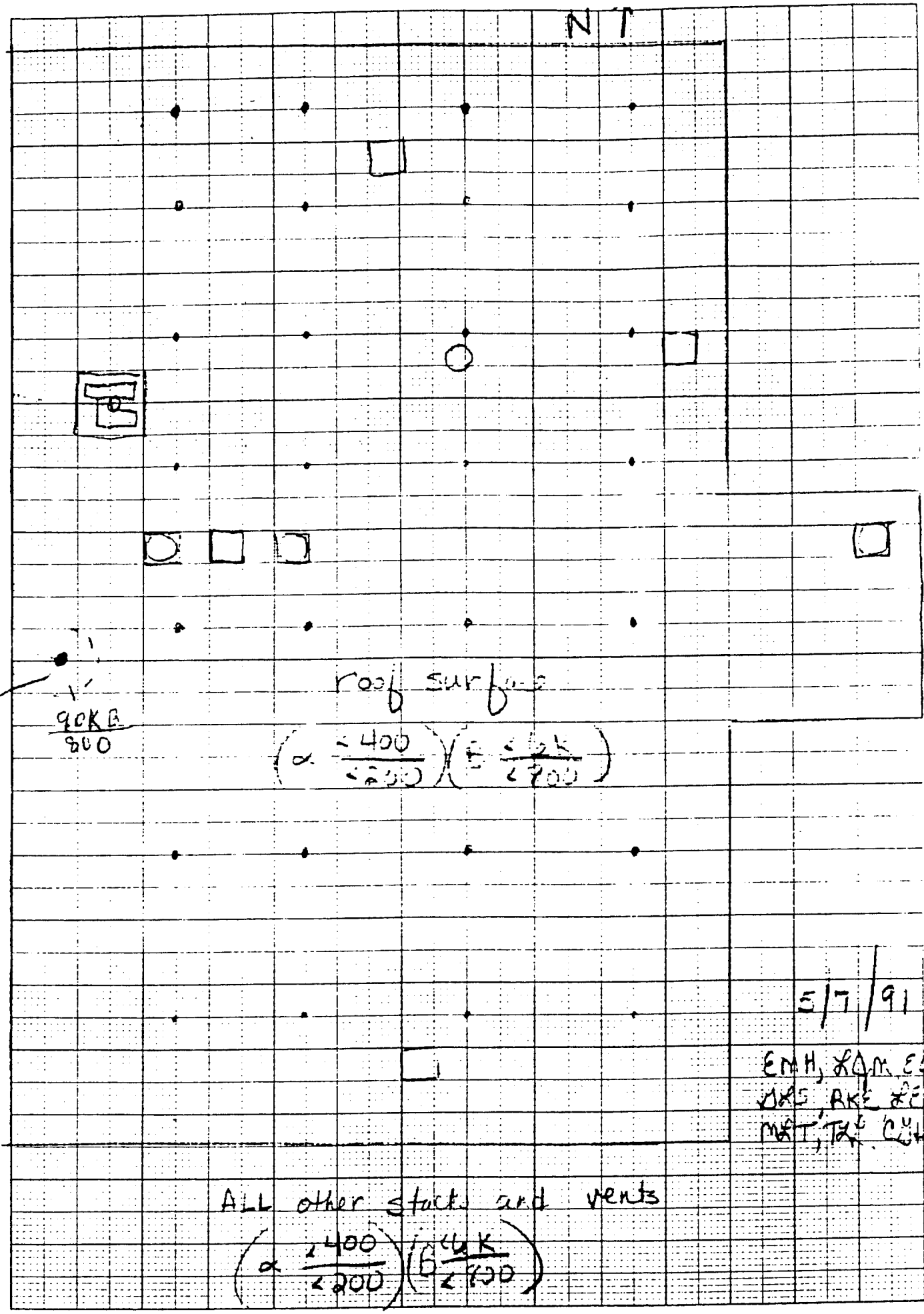
☐ Head covers

☐ Shoe covers

☐ Booties

☐ Gloves – 2 pairs (inner surgeons and outer work gloves)

Facility Custodian: _____



5/7/91

K·E 20 X 20 TO THE INCH
46 1240

Waste Stream Number: 100-6

Waste Stream Title: Film/Microfilm

W
4W

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 920904-020 Project: WMGT WML Customer Sample ID: WML-959
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 3-SEP-1992 Date Sample Received: 4-SEP-1992
Sampled By: B KELLEY Date Sample Completed: 14-OCT-1992
Material Description: MICROFILM TONER

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
ASTMD3828	Flash Point (Setaflash)	107.6		Deg. F	DK SCAGGS	9-OCT-1992	X

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

- Not reported.

- Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

L / Manager: John E. Hobensack (Oil & Coal Analysis Laboratory)
Date Approved: 15-OCT-1992

W
4W

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 920224-004 Project: WMGT WMS Customer Sample ID: WMS-743
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 21-FEB-1992 Date Sample Received: 21-FEB-1992
Sampled By: AR SELBEE Date Sample Completed: 29-OCT-1992
Material Description: POLAROID FILM PACK

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311	1,1-Dichloroethene	< 0.004		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	1,2-Dichloroethane	0.006		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	1,4-Dichlorobenzene	< 0.004		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	Arsenic	< 0.02		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	Barium	0.60		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	Benzene	< 0.003		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	Cadmium	0.14		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	Carbon Tetrachloride	< 0.004		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	Chlorobenzene	< 0.003		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	Chloroform	< 0.004		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	Chromium	0.02		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	Lead	0.16		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	Mercury	< 0.01		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	Methy ethyl ketone	6.54*		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	Selenium	< 0.30		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	Silver	0.22		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	Tetrachloroethene	< 0.003		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	Trichloroethene	< 0.004		mg/L	MR KELLEY	3-MAR-1992	WMS-743
	Vinyl Chloride	<0.009		mg/L	MR KELLEY	3-MAR-1992	WMS-743

***** Comments from the Chemical Technology Department *****

* - The value for methly ethyl ketone is estimated because the analytical result exceeded the calibration curve.

Laboratory Manager: A. J. Saraceno (Chemical Technology Department)
Date Approved: 30-OCT-1992

ANALYSIS DATA REPORT

AnaLIS ID: 920224-004
Laboratory: Chemical Technology Department
File ID: WMS-743
Instrument ID:
Authorized By: A. J. Saraceno

Customer Sample ID: WMS-743
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 21-FEB-1992
Date Sampled: 21-FEB-1992

TCLP_SV_ACIDS_RPT

Date Extracted/Prepared: 3-MAR-1992
Analysis Procedure Number: 1311
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed:
QA File Number: WMS-743
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
95-48-7	2-Methylphenol	0.182U			
108-39-4	m-Cresol	0.047U			
106-44-5	4-Methylphenol	0.182U			
87-86-5	Pentachlorophenol	0.028			
95-95-4	2,4,5-Trichlorophenol	0.059U			
88-06-2	2,4,6-Trichlorophenol	0.065U			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

AnaLIS ID: 920224-004
Laboratory: Chemical Technology Department
File ID: WMS-743
Instrument ID:
Authorized By: A. J. Saraceno

Customer Sample ID: WMS-743
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 21-FEB-1992
Date Sampled: 21-FEB-1992

TCLP_SV_B/N_RPT

Date Extracted/Prepared: 3-MAR-1992
Analysis Procedure Number: 1311
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed:
QA File Number: WMS-743
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
121-14-2	2,4-Dinitrotoluene	0.020U			
118-74-1	Hexachlorobenzene	0.042U			
87-68-3	Hexachlorobutadiene	0.024U			
67-72-1	Hexachloroethane	0.021U			
98-95-3	Nitrobenzene	0.020U			
110-86-1	Pyridine	0.032U			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Waste Stream Number: U100-7

Waste Stream Title: Spent Photoreceptors

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 950912-060 Project: WMGT PDCE Requisition Number: 017747
Customer Sample ID: RFD32426 Customer: ENV./WASTE MGT.
Date Sampled: 29-AUG-1995 13:40 Date Sample Received: 30-AUG-1995
Sampled By: MB HAMEL Date Sample Completed: 10-OCT-1995
Material Description: XT847 PHOTORECEPTERS

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311/3010A	Sample Prep TCLP Metals	COMPLETE			MR KELLEY	12-SEP-1995	95080945
1311/3520	Sample Prep TCLP Pesticides	COMPLETE			MR KELLEY	5-OCT-1995	95161005P3
	Sample Prep TCLP Semi-Volatile	COMPLETE			RK POWELL	13-SEP-1995	95160258
1311/6010A	Arsenic	0.056U		mg/L	MR KELLEY	11-SEP-1995	95170185
	Barium	0.084		mg/L	MR KELLEY	11-SEP-1995	95170185
	Cadmium	0.003U		mg/L	MR KELLEY	11-SEP-1995	95170185
	Chromium	0.019		mg/L	MR KELLEY	11-SEP-1995	95170185
	Lead	1.35		mg/L	MR KELLEY	11-SEP-1995	95170185
	Selenium	0.087		mg/L	MR KELLEY	11-SEP-1995	95170185
0	Mercury	0.010U		mg/L	MR KELLEY	11-SEP-1995	95170185
1311/7760A	Silver	0.120		mg/L	MR KELLEY	11-SEP-1995	95170185
EOX	Extractable Organic Halogen	82.5		ug/g	DE COLLINS	13-SEP-1995	9516091 3T3
OA760-345-01	Bulk Density	0.2620		g/mL	D PEREZ	28-SEP-1995	95081007
SM-2540G	% Solids	99.95		%	SK BENNINGTON	27-SEP-1995	95101341
SW-846-1311	Sample Prep TCLP	COMPLETE			MR KELLEY	11-SEP-1995	95170185
SW846-1010	Flash Point	NA			D PEREZ	14-SEP-1995	NA
SW846-1311	Sample Prep TCLP	COMPLETE			MR KELLEY	11-SEP-1995	95170185
SW846-3050	Sample Prep Metals	COMPLETE			TE SHOOK	14-SEP-1995	091495-044
SW846-6010A	Arsenic	209U		mg/kg	TE SHOOK	14-SEP-1995	95080942
	Barium	3.4U*		mg/kg	TE SHOOK	14-SEP-1995	95080942
	Cadmium	10.8U*		mg/kg	TE SHOOK	14-SEP-1995	95080942
	Chromium	188000N*		mg/kg	TE SHOOK	14-SEP-1995	95080942
	Lead	123		mg/kg	TE SHOOK	14-SEP-1995	95080942
	Selenium	591		mg/kg	TE SHOOK	14-SEP-1995	95080942
	Silver	71.0U		mg/kg	TE SHOOK	14-SEP-1995	95080942
9045	pH	5.92		PH	BJ STANLEY	1-SEP-1995	95101215

SW846-9095 Paint Filter Test PASS MR KELLEY 8-SEP-1995 95170184

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
Extractable Organic Halogen	243.9	242.3	99.34

Laboratory Manager: D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
C. J. Van Meter (Organic Analytical Services)
C. J. Van Meter (TCLP Laboratory)
Date Approved: 10-OCT-1995

********** COMMENT PAGE **********
********** 950912-060 **********

**** Comments from the Organic Analytical Services *****

SW846-9020A (Proposed SW846-9023)

Sample was extracted using 1:1 acetone/hexane following PORTS method XP4-TS-OA-7020 (Draft). This method extracts 1 g sample with 5 mL extaction solvent and 1 mL water. The sample is then sonicated for 15 minutes to complete extraction. This method deviates from proposed method 9023 only in choice of solvent.

Sample spike duplicate results

Result	Amount spiked	Spike result	% Recovered
82.5	243.9	265.6	75.1

***** Comments from the Spectrochemistry/ICP Laboratory *****

OA760-345-01 Density duplicate result is 0.2660 g/mL

Sample matrix is photorecepters, which is not a suitable matrix for SW846-1010 Ignitability.

***** Comments from the TCLP Laboratory *****

TCLP Method 1311/8270A : This sample failed method criteria for recovery of 2,4-Dinitrotoluene in the matrix spike and the matrix spike duplicate.

Definition Page for Qualifiers/Flags

**** ********** 950912-060 **********

Organic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greate than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950912-060
Laboratory: TCLP Laboratory
File ID: 95170185
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: RFD32426
Customer: ENV./WASTE MGT.
Sample Matrix: SOLID WASTE
Requisition Number: 017747
Date Sample Received: 30-AUG-1995
Date Sampled: 29-AUG-1995

TCLP_HERBICIDES_RPT

Date Extracted/Prepared: 11-SEP-1995
Analysis Procedure Number:
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed:
QA File Number: 95170185
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
94-75-7	2,4-D	0.005U			
93-72-1	2,4,5-TP (Silvex)	0.005U			

ANALYSIS DATA REPORT

AnaLIS ID: 950912-060
Laboratory: TCLP Laboratory
File ID: 95170185
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: RFD32426
Customer: ENV./WASTE MGT.
Sample Matrix: SOLID WASTE
Requisition Number: 017747
Date Sample Received: 30-AUG-1995
Date Sampled: 29-AUG-1995

TCLP_PESTICIDES_RPT

Date Extracted/Prepared: 11-SEP-1995
Analysis Procedure Number:
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed:
QA File Number: 95170185
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
57-74-9	Technical Chlordane	0.001U			
72-20-8	Endrin	0.001U			
76-44-8	Heptachlor	0.001U			
1024-57-3	Heptachlor epoxide	0.001U			
58-89-9	gamma-BHC(Lindane)	0.001U			
72-43-5	Methoxychlor	0.001U			
8001-35-2	Toxaphene	0.020U			

ANALYSIS DATA REPORT

AnaLIS ID: 950912-060
Laboratory: TCLP Laboratory
File ID: 95170185
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: RFD32426
Customer: ENV./WASTE MGT.
Sample Matrix: SOLID WASTE
Requisition Number: 017747
Date Sample Received: 30-AUG-1995
Date Sampled: 29-AUG-1995

TCLP_SV_ACIDS_RPT

Date Extracted/Prepared: 11-SEP-1995
Analysis Procedure Number:
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed:
QA File Number: 95170185
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
95-48-7	2-Methylphenol	0.020U			
108-39-4	m-Cresol	0.020U			
106-44-5	4-Methylphenol	0.020U			
87-86-5	Pentachlorophenol	0.040U			
95-95-4	2,4,5-Trichlorophenol	0.020U			
88-06-2	2,4,6-Trichlorophenol	0.020U			

ANALYSIS DATA REPORT

AnaLIS ID: 950912-060
Laboratory: TCLP Laboratory
File ID: 95170185
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: RFD32426
Customer: ENV./WASTE MGT.
Sample Matrix: SOLID WASTE
Requisition Number: 017747
Date Sample Received: 30-AUG-1995
Date Sampled: 29-AUG-1995

TCLP_SV_B/N_RPT

Date Extracted/Prepared: 11-SEP-1995
Analysis Procedure Number:
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed:
QA File Number: 95170185
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
121-14-2	2,4-Dinitrotoluene	0.040U			
118-74-1	Hexachlorobenzene	0.020U			
87-68-3	Hexachlorobutadiene	0.020U			
67-72-1	Hexachloroethane	0.020U			
98-95-3	Nitrobenzene	0.020U			
110-86-1	Pyridine	0.020U			

ANALYSIS DATA REPORT

AnaLIS ID: 950912-060
Laboratory: TCLP Laboratory
File ID: 95170185
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: RFD32426
Customer: ENV./WASTE MGT.
Sample Matrix: SOLID WASTE
Requisition Number: 017747
Date Sample Received: 30-AUG-1995
Date Sampled: 29-AUG-1995

TCLP_VOLATILES_RPT

Date Extracted/Prepared: 11-SEP-1995
Analysis Procedure Number:
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed:
QA File Number: 95170185
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
71-43-2	Benzene	0.002U			
56-23-5	Carbon Tetrachloride	0.002U			
108-90-7	Chlorobenzene	0.016			
67-66-3	Chloroform	0.002U			
106-46-7	1,4-Dichlorobenzene	0.002U			
107-06-2	1,2-Dichloroethane	0.002U			
75-35-4	1,1-Dichloroethene	0.002U			
78-93-3	2-Butanone	0.100JU			
127-18-4	Tetrachloroethene	0.002U			
79-01-6	Trichloroethene	0.002U			
75-01-4	Vinyl Chloride	0.001U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

TCLP_VOLATILES_RPT ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 950912-060
Laboratory: TCLP Laboratory
Sample Matrix: SOLID WASTE
Level: (low/med): LOW
Dilution Factor: 1.0

Customer Sample ID: RFD32426
Customer: ENV./WASTE MGT.
File ID: 95170185
Date Received: 30-AUG-1995
Date Analyzed:
Concentration Units: mg/L

Number TICs found: 2

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.	71-55-6	1,1,1-Trichloroethane	9.5	0.006	
2.	100-42-5	Styrene	16.5	0.002	
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
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26.					
27.					
28.					
29.					
30.					

100-1

Portsmouth Gaseous Diffusion Plant
Technical Operations Division
Analysis Results

AnaLIS ID: 930602-018 Project: WMGT WMS Requisition Number: 001217
Customer Sample ID: WMS960 Customer: WASTE MANAGEMENT
Date Sampled: 2-JUN-1993 10:00 Date Sample Received: 2-JUN-1993
Sampled By: BK KELLEY Date Sample Completed: 30-JUN-1993
Material Description: PHOTORECPTOR TUBES X100

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311	Arsenic	0.16U		mg/L	MR KELLEY	3-JUN-1993	93160273
	Barium	0.13		mg/L	MR KELLEY	3-JUN-1993	93160273
	Cadmium	0.02U		mg/L	MR KELLEY	3-JUN-1993	93160273
	Chromium	0.05U		mg/L	MR KELLEY	3-JUN-1993	93160273
	Lead	5.7		mg/L	MR KELLEY	3-JUN-1993	93160273
	Mercury	0.02U		mg/L	MR KELLEY	3-JUN-1993	93160273
	Selenium	0.29U		mg/L	MR KELLEY	3-JUN-1993	93160273
	Silver	0.02U		mg/L	MR KELLEY	3-JUN-1993	93160273

***** Comments from the TCLP Laboratory *****

od 1311 : The results are corrected for matrix spike recovery.

Lead exceeded the regulatory limit of 5.0 mg/L.

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To Phil	From Jamini
Co.	Co.
Dept.	Phone #
Fax #	Fax #

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

| Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

Portsmouth Gaseous Diffusion Plant
Technical Operations Division
Analysis Results

AnaLIS ID: 950504-119 Project: WMGT WMS Requisition Number: 016835
Customer Sample ID: WMS1348 Customer: ENV./WASTE MGT.
Date Sampled: 4-MAY-1995 13:35 Date Sample Received: 4-MAY-1995
Sampled By: TW BARR Date Sample Completed: 16-JUN-1995
Material Description: X847 CANON PHOTORECPTORS

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311/6010A	Arsenic	0.056U		mg/L	MR KELLEY	26-MAY-1995	95170082
	Barium	0.070		mg/L	MR KELLEY	26-MAY-1995	95170082
	Cadmium	0.031		mg/L	MR KELLEY	26-MAY-1995	95170082
	Chromium	0.002U		mg/L	MR KELLEY	26-MAY-1995	95170082
	Lead	0.022U		mg/L	MR KELLEY	26-MAY-1995	95170082
	Selenium	0.076U		mg/L	MR KELLEY	26-MAY-1995	95170082
	Silver	0.080N		mg/L	MR KELLEY	26-MAY-1995	95170082
1311/7470	Mercury	0.010U		mg/L	MR KELLEY	26-MAY-1995	95170082

Laboratory Manager: J.J. Williams (TCLP Laboratory)
Date Approved: 16-JUN-1995

Portsmouth Gaseous Diffusion Plant
Technical Operations Division
Analysis Results

AnaLIS ID: 950504-118 Project: WMGT WMS Requisition Number: 016835
Customer Sample ID: WMS1347 Customer: ENV./WASTE MGT.
Date Sampled: 4-MAY-1995 13:15 Date Sample Received: 4-MAY-1995
Sampled By: TW BARR Date Sample Completed: 18-JUN-1995
Material Description: X847 LANIER PHOTORECEPTORS

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311/6010A	Arsenic	0.122		mg/L	MR KELLEY	31-MAY-1995	95170087
	Barium	1.15		mg/L	MR KELLEY	31-MAY-1995	95170087
	Cadmium	0.928		mg/L	MR KELLEY	31-MAY-1995	95170087
	Chromium	0.008		mg/L	MR KELLEY	31-MAY-1995	95170087
	Lead	8.46		mg/L	MR KELLEY	31-MAY-1995	95170087
	Selenium	0.076U		mg/L	MR KELLEY	31-MAY-1995	95170087
	Silver	0.040U		mg/L	MR KELLEY	31-MAY-1995	95170087
1311/7470	Mercury	0.010U		mg/L	MR KELLEY	31-MAY-1995	95170087

.ory Manager: J.J. Williams (TCLP Laboratory)
Date Approved: 19-JUN-1995

Waste Stream Number: U100-9

Waste Stream Title: Silver Recovery Cartridges

PORTS MSDS #: 6215

PRODUCT: SILVER

PART NUMBER:

FORMULA: AG

KEYWORD: METAL

PORTS NUMBER: 66-019-1495

PORTS MISC INFO:

PORTS RATING: HFR=400

MANUFACTURER:
ENGELHARD-CLAL LP
700 BLAIR ROAD
CARTERET
NJ

07008
PHONE: PHONE: 908-205-5720
EMERGENCY PHONE: 800-424-9300

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 3852 F	NOTE: 2122'C.
Melting Point. . . .	EQ 1764 F	NOTE: 962'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ 10.53	
Vapor Pressure . . .	NA	NOTE: NOT APPLICABLE.
Vapor Density. . . .	NA	NOTE: NOT APPLICABLE.
Percent Volatiles. .	NG	
Evaporation Rate . .	NA	NOTE: NOT APPLICABLE.
pH	ND	NOTE: NOT DETERMINED.
Molecular Weight . .	NG	
Viscosity.	NG	
Solubility in Water.	INSOLUBLE.	

Odor/Appearance/Other Characteristics:
WHITE DUCTILE METAL, ODORLESS.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NA	NOTE: NOT APPLICABLE.
Flash Point, Open Cup . . .	NA	NOTE: NOT APPLICABLE.
Fire Point.	NG	
Auto Ignition.	NA	NOTE: NOT APPLICABLE.
Explosive/Flammable Limits		
Lower (LEL).	NA	NOTE: NOT APPLICABLE.
Upper (UEL).	NA	NOTE: NOT APPLICABLE.

Shipping Regulations

UN/NA Number.	NR
D.O.T. Hazard Class. . .	NOT REGULATED
Label	NOT GIVEN
Proper Shipping Name . .	NOT GIVEN

==========

Preparer/Contact Information: CORPORATE ENVIRONMENT, HEALTH & SAFETY GROUP

Date Prepared/Revised 3/22/93

===== Component Information =====

:LVER
OSHA PEL (PPM):
OSHA PEL (MG/M3): 0.01
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 00.1
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 100
C.A.S. No.: 7440224

===== SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION =====

PRODUCT: SILVER

COMMON NAME: SILVER

CHEMICAL NAME: SILVER

FORMULA: Ag

PRODUCT CAS NO.: 7440-22-4

PRODUCT USE:

CODE: A-2006

PRINTED: 20 JUL 1995

DATE: 22 MAR 1993

?HONE:

1-908-205-5720 (Customer Service)
1-908-205-5700 (24-Hour Emergency)

FOR CHEMICAL EMERGENCY CALL CHEMTREC (24 HOURS):

1-800-424-9300 (US, Canada, Puerto Rico, Virgin Islands)
1-202-483-7616 (Outside Above Area)

SUPPLIER'S NAME AND ADDRESS:

ENGELHARD-CLAL LP
700 BLAIR ROAD
CARTERET, NJ 07008

===== SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS =====

SEE COMPONENT INFORMATION.

NOTE: See Section VIII for Exposure Limits and Section XI for Toxicological Information.

===== SECTION 3: HAZARDS IDENTIFICATION =====

EMERGENCY OVERVIEW:

White ductile metal
Odorless

FLASH POINT: Not Applicable

May cause eye, skin and respiratory tract irritation.

Prolonged or repeated contact may result in argyria (discoloration) of the es, skin, respiratory tract or other mucous membranes.

May cause eye and skin irritation.

Not a fire or explosion hazard in solid form. Finely divided dust may ignite and burn rapidly when mixed with air in the proper proportions.

Toxic metal fumes may be released in a fire situation.

ROUTES OF ENTRY:

EYES: YES
SKIN: YES
INHALATION: YES
INGESTION: YES

POTENTIAL HEALTH EFFECTS:

EYE CONTACT: May cause irritation.
SKIN CONTACT: May cause irritation.
INHALATION: May cause irritation if exposure is prolonged or excessive.
INGESTION: No adverse effects expected. Ingestion of large amounts may be harmful.

NOTE: Health effects only apply if dust or fume is formed.

CARCINOGENICITY:

NTP: NO
IARC: NO
OSHA: NO

CHRONIC HEALTH HAZARDS: The absorption of SILVER compounds into the circulation and the subsequent deposition of reduced silver in various tissues of the body may result in the production of a generalized greyish pigmentation of the skin and mucous membrane (argyria). Generalized argyria develops after 2 to 25 years of exposure. There are no systemic effects or symptoms and no physical disability. Once deposited, there is no known means by which this silver can be eliminated; the pigmentation is permanent.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: None known.

NOTE: See Section VIII for Exposure Limits, Section XI for Toxicological Information and Section XII for Ecological Information.

===== SECTION 4: FIRST AID MEASURES =====

EYE CONTACT: Flush eyes with plenty of water. If irritation develops, call a physician.

SKIN CONTACT: Immediately wash skin with soap and plenty of water. If irritation persists, call a physician.

INHALATION: Remove to fresh air. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician.

INGESTION: Procedures normally not needed. If large quantities are ingested, seek medical advice.

===== SECTION 5: FIRE-FIGHTING MEASURES =====

FLASH POINT: Not Applicable

AUTO-IGNITION: Not Applicable

LEL: Not Applicable

UEL: Not Applicable

NFPA HAZARD CLASSIFICATION:

HEALTH: 1
FLAMMABLE: 0
REACTIVITY: 0
SPECIAL: 0

HMIS HAZARD CLASSIFICATION:

HEALTH: 1*
FLAMMABLE: 0
REACTIVITY: 0
SPECIAL: 0

*Indicates the possibility of chronic health effects. See Chronic Health Hazards in Section III for more information.

EXTINGUISHING MEDIA: Use carbon dioxide, chemical foam or dry chemical. Use any means for extinguishing surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES: Wear NIOSH/MSHA approved positive-pressure self-contained breathing apparatus and protective clothing as specified in 29 CFR 1910.156.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Not a fire or explosion hazard in solid form. Finely divided dust may ignite and burn rapidly when mixed with air in the proper proportions. Toxic metal fumes may be released in a fire situation.

==== SECTION 6: ACCIDENTAL RELEASE MEASURES =====

Contain spillage and scoop up or vacuum. Avoid dusting. Notification of the National Response Center (800/424-8802) may be required. Refer to EPA, DOT and applicable state and local regulations for current response information.

It is recommended that each user establish a spill prevention, control and countermeasure plan (SPCC). Such plan should include procedures applicable to proper storage, control and clean-up of spills, including reuse or disposal as appropriate (see Section XI: Disposal Considerations).

NOTE: In the event of an accidental release of this material, the above procedures should be followed. Additionally proper exposure controls and personal protection equipment should be used (see Section VIII - Exposure Control/Personal Protection) and disposal of the material should be in accordance with Section XI - Disposal Considerations.

===== SECTION 7: HANDLING AND STORAGE =====

Wash thoroughly after handling.
Keep container closed.
Keep away from heat, sparks and flame.
Store in a cool, dry location away from incompatible materials.
Avoid contact with eyes, skin and clothing.
Avoid breathing any dust, mist or fumes resulting from the use of this product.

Minimize dust generation and exposure.
Use only with adequate ventilation.
Do not eat, drink, or smoke in work area.

===== SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION =====

EXPOSURE LIMITS:

INGREDIENT	PEL-OSHA	TLV-ACGIH
SILVER CAS NO.: 7440-22-4	0.01 mg/m3	0.1 mg/m3

Unless otherwise noted, all values are reported as 8-hour Time-Weighted Averages (TWAs) and total dust (particulates only). All ACGIH TLVs refer to the 1994-95 Standards. All OSHA PELs refer to 29 CFR Part 1910 Air Contaminants: Final Rule, January 19, 1989*.

*NOTE: As a result of the July 7, 1992 decision by the U.S. Circuit Court of Appeals (AFL-CIO v. OSHA) to vacate the 1989 PELs, OSHA will no longer enforce these new limits and will return to the pre-1989 PELs. Engelhard, however, will continue to list the more protective 1989 levels.

NOTE: The hazards of all ingredients of this product are not known, however exposure is not expected as the product is in solid form. The threshold limit values (TLVs) and potential health effects statements are listed for ingredients of the product for which data is available. However, these statements may not be applicable as the ingredients are in solid form. If dust, powder, or fume is generated then TLVs and effects of overexposure statements will be applicable.

RESPIRATORY PROTECTION: A NIOSH/MSHA approved dust respirator is recommended if dust is generated.

VENTILATION: General; local exhaust ventilation as necessary to control any air contaminants to within their PELs or TLVs during the use of this product.

PROTECTIVE EQUIPMENT:

Safety glasses (with side shields).
Gloves.
Body protection as necessary to prevent skin contact.

PERSONNEL SAMPLING PROCEDURE:

FOR METALLIC COMPONENTS: Refer to NIOSH Manual of Analytical Methods (NMAM), 4th Edition, Method 7300.

===== SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

===== SECTION 10: STABILITY AND REACTIVITY =====

STABILITY: Generally considered stable.

AVOID: None expected.

INCOMPATIBILITY (MATERIALS TO AVOID): Strong acids and bases, acetylene, ammonia, and hydrogen peroxide.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: Toxic metal oxides are emitted when heated above the melting point. The amount of fume evolved increases as the temperature rises.

POLYMERIZATION: Polymerization is not expected to occur.

AVOID: Not applicable.

===== SECTION 11: TOXICOLOGICAL INFORMATION =====

CHEMICAL NAME	% WT.	LD50	LC50

SILVER
CAS NO.: 7440-22-4 100 Not Available Not Available

NOTE: See Sections III, VIII and XII for additional information.

===== SECTION 12: ECOLOGICAL INFORMATION =====

ECOTOXICITY: No data available.

ENVIRONMENTAL FATE: No data available.

===== SECTION 13: DISPOSAL CONSIDERATIONS =====

US EPA WASTE NUMBER: D011

This product contains SILVER or silver compounds and disposal may be regulated under EPA hazardous waste regulations, waste number D011. Before disposal, this product or mixtures containing this product should be tested for toxicity characteristics (TC) under the current EPA Hazardous Waste Regulations TCLP testing procedures, 40 CFR Part 261 et seq. Disposal/recycling/reclamation requirements will vary by location and type of disposal selected. Consult with state and local regulatory authorities.

NOTE: Chemical additions, processing or otherwise altering this material may make the waste management information presented above incomplete, inaccurate or otherwise inappropriate.

As local regulations may vary; all waste must be disposed/recycled/reclaimed in accordance with federal, state, and local environmental control regulations.

===== SECTION 14: TRANSPORT INFORMATION =====

INTERNATIONAL:

UN NUMBER: Not Regulated

UNITED STATES:

EPA WASTE NUMBER: D011
DOT CLASSIFICATION: Not Regulated

CANADA:

PIN NUMBER: Not Regulated
TDG CLASS: Not Regulated

EC:

DGL: Not Determined

===== SECTION 15: REGULATORY INFORMATION =====

US FEDERAL REGULATIONS:

TSCA: IN TSCA

SARA 311 AND 312 HAZARD CATEGORIES:

IMMEDIATE (ACUTE) HEALTH HAZARD: YES
DELAYED (CHRONIC) HEALTH HAZARD: YES
FIRE HAZARD: NO
REACTIVITY HAZARD: NO
SUDDEN RELEASE OF PRESSURE: NO

SARA SECTION 313 NOTIFICATION: This product contains a toxic chemical (or chemicals) subject to the reporting requirements of Section 313 of Title III the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

CHEMICAL NAME	GAS NUMBER	% WT.
SILVER	7440-22-4	100

OZONE DEPLETING SUBSTANCES (ODS): This product neither contains nor is manufactured with an ozone depleting substance subject to the labeling requirements of the Clean Air Act Amendments 1990 and 40 CFR Part 82.

VOLATILE ORGANIC COMPOUNDS (VOC): None

US STATE REGULATIONS:

VOLATILE ORGANIC COMPOUND (CARB): Not Determined

CANADIAN REGULATIONS:

DSL/NDSL: Not Determined
WHMIS CLASSIFICATION: Not Determined

EUROPEAN REGULATIONS:

EINECS: Not Determined

OTHER REGULATIONS:

MITI: Not Determined
AICS: Not Determined

===== SECTION 16: OTHER INFORMATION =====

REVISIONS:

REVISION NUMBER: 3

THIS MSDS HAS BEEN REVISED IN THE FOLLOWING SECTION(S):

SECTION IV: FIRST AID MEASURES
SECTION V: FIRE-FIGHTING MEASURES
SECTION VIII: EXPOSURE CONTROLS/PERSONAL PROTECTION

PREPARATION INFORMATION:

PREPARED BY: Corporate Environment, Health & Safety Group

PHONE NUMBER: See Section I

The information in this Material Safety Data Sheet should be provided to all who will use, handle, store, transport, or otherwise be exposed to this product. This information has been prepared for the guidance of plant engineering, operations, and management and for persons working with or handling this product. The information presented in the MSDS is premised upon proper handling and anticipated uses and is for the material without chemical additions/alterations. We believe this information to be reliable and up-to-date as of the date of publication, but make no warranty that it is. Additionally, if this Material Safety Data Sheet is more than three years old, please contact the supplier at the phone number listed in Section I to make certain that this sheet is current.

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Waste Stream Number: 101-2

Waste Stream Title: Silver Solution and Related Materials

PORTS MSDS #: 6215

PRODUCT: SILVER

PART NUMBER:

FORMULA: AG

KEYWORD: METAL

PORTS NUMBER: 66-019-1495

PORTS MISC INFO:

PORTS RATING: HFR=400

MANUFACTURER:
ENGELHARD-CLAL LP
700 BLAIR ROAD
CARTERET
NJ

07008
PHONE: PHONE: 908-205-5720
EMERGENCY PHONE: 800-424-9300

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 3852 F	NOTE: 2122'C.
Melting Point. . . .	EQ 1764 F	NOTE: 962'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ 10.53	
Vapor Pressure . . .	NA	NOTE: NOT APPLICABLE.
Vapor Density. . . .	NA	NOTE: NOT APPLICABLE.
Percent Volatiles. .	NG	
Evaporation Rate . .	NA	NOTE: NOT APPLICABLE.
pH	ND	NOTE: NOT DETERMINED.
Molecular Weight . .	NG	
Viscosity.	NG	

Solubility in Water. INSOLUBLE.
Odor/Appearance/Other Characteristics:
WHITE DUCTILE METAL, ODORLESS.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NA	NOTE: NOT APPLICABLE.
Flash Point, Open Cup . . .	NA	NOTE: NOT APPLICABLE.
Fire Point.	NG	
Auto Ignition.	NA	NOTE: NOT APPLICABLE.
Explosive/Flammable Limits		
Lower (LEL).	NA	NOTE: NOT APPLICABLE.
Upper (UEL).	NA	NOTE: NOT APPLICABLE.

Shipping Regulations

UN/NA Number.	NR
D.O.T. Hazard Class. . .	NOT REGULATED
Label	NOT GIVEN
Proper Shipping Name . .	NOT GIVEN

==========

Preparer/Contact Information: CORPORATE ENVIRONMENT, HEALTH & SAFETY GROUP

Date Prepared/Revised 3/22/93

===== Component Information =====

LVER
OSHA PEL (PPM):
OSHA PEL (MG/M3): 0.01
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 00.1
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 100
C.A.S. No.: 7440224

===== SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION =====

PRODUCT: SILVER

COMMON NAME: SILVER

CHEMICAL NAME: SILVER

FORMULA: Ag

PRODUCT CAS NO.: 7440-22-4

PRODUCT USE:

CODE: A-2006

PRINTED: 20 JUL 1995

DATE: 22 MAR 1993

HONE:

1-908-205-5720 (Customer Service)
1-908-205-5700 (24-Hour Emergency)

FOR CHEMICAL EMERGENCY CALL CHEMTREC (24 HOURS):

1-800-424-9300 (US, Canada, Puerto Rico, Virgin Islands)
1-202-483-7616 (Outside Above Area)

SUPPLIER'S NAME AND ADDRESS:

ENGELHARD-CLAL LP
700 BLAIR ROAD
CARTERET, NJ 07008

===== SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS =====

SEE COMPONENT INFORMATION.

NOTE: See Section VIII for Exposure Limits and Section XI for Toxicological Information.

===== SECTION 3: HAZARDS IDENTIFICATION =====

EMERGENCY OVERVIEW:

White ductile metal
Odorless

FLASH POINT: Not Applicable

May cause eye, skin and respiratory tract irritation.

Prolonged or repeated contact may result in argyria (discoloration) of the es, skin, respiratory tract or other mucous membranes.

May cause eye and skin irritation.

Not a fire or explosion hazard in solid form. Finely divided dust may ignite and burn rapidly when mixed with air in the proper proportions.

Toxic metal fumes may be released in a fire situation.

ROUTES OF ENTRY:

EYES: YES
SKIN: YES
INHALATION: YES
INGESTION: YES

POTENTIAL HEALTH EFFECTS:

EYE CONTACT: May cause irritation.
SKIN CONTACT: May cause irritation.
INHALATION: May cause irritation if exposure is prolonged or excessive.
INGESTION: No adverse effects expected. Ingestion of large amounts may be harmful.

NOTE: Health effects only apply if dust or fume is formed.

CARCINOGENICITY:

NTP: NO
IARC: NO
OSHA: NO

CHRONIC HEALTH HAZARDS: The absorption of SILVER compounds into the circulation and the subsequent deposition of reduced silver in various tissues of the body may result in the production of a generalized greyish pigmentation of the skin and mucous membrane (argyria). Generalized argyria develops after 2 to 25 years of exposure. There are no systemic effects or symptoms and no physical disability. Once deposited, there is no known means by which this silver can be eliminated; the pigmentation is permanent.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: None known.

NOTE: See Section VIII for Exposure Limits, Section XI for Toxicological Information and Section XII for Ecological Information.

===== SECTION 4: FIRST AID MEASURES =====

EYE CONTACT: Flush eyes with plenty of water. If irritation develops, call a physician.

SKIN CONTACT: Immediately wash skin with soap and plenty of water. If irritation persists, call a physician.

INHALATION: Remove to fresh air. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician.

INGESTION: Procedures normally not needed. If large quantities are ingested, seek medical advice.

===== SECTION 5: FIRE-FIGHTING MEASURES =====

FLASH POINT: Not Applicable

AUTO-IGNITION: Not Applicable

http://jupiter.ports/msds/data/6215

LEL: Not Applicable

UEL: Not Applicable

NFPA HAZARD CLASSIFICATION:

HEALTH: 1
FLAMMABLE: 0
REACTIVITY: 0
SPECIAL: 0

HMIS HAZARD CLASSIFICATION:

HEALTH: 1*
FLAMMABLE: 0
REACTIVITY: 0
SPECIAL: 0

*Indicates the possibility of chronic health effects. See Chronic Health Hazards in Section III for more information.

EXTINGUISHING MEDIA: Use carbon dioxide, chemical foam or dry chemical. Use any means for extinguishing surrounding fire.

SPECIAL FIRE FIGHTING PROCEDURES: Wear NIOSH/MSHA approved positive-pressure self-contained breathing apparatus and protective clothing as specified in 29 CFR 1910.156.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Not a fire or explosion hazard in solid form. Finely divided dust may ignite and burn rapidly when mixed with air in the proper proportions. Toxic metal fumes may be released in a fire situation.

===== SECTION 6: ACCIDENTAL RELEASE MEASURES =====

Contain spillage and scoop up or vacuum. Avoid dusting. Notification of the National Response Center (800/424-8802) may be required. Refer to EPA, DOT and applicable state and local regulations for current response information.

It is recommended that each user establish a spill prevention, control and countermeasure plan (SPCC). Such plan should include procedures applicable to proper storage, control and clean-up of spills, including reuse or disposal as appropriate (see Section XI: Disposal Considerations).

NOTE: In the event of an accidental release of this material, the above procedures should be followed. Additionally proper exposure controls and personal protection equipment should be used (see Section VIII - Exposure Control/Personal Protection) and disposal of the material should be in accordance with Section XI - Disposal Considerations.

===== SECTION 7: HANDLING AND STORAGE =====

Wash thoroughly after handling.
Keep container closed.
Keep away from heat, sparks and flame.
Store in a cool, dry location away from incompatible materials.
Avoid contact with eyes, skin and clothing.
Avoid breathing any dust, mist or fumes resulting from the use of this product.

Minimize dust generation and exposure.
Use only with adequate ventilation.
Do not eat, drink, or smoke in work area.

===== SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION =====

EXPOSURE LIMITS:

INGREDIENT	PEL-OSHA	TLV-ACGIH
SILVER CAS NO.: 7440-22-4	0.01 mg/m3	0.1 mg/m3

Unless otherwise noted, all values are reported as 8-hour Time-Weighted Averages (TWAs) and total dust (particulates only). All ACGIH TLVs refer to the 1994-95 Standards. All OSHA PELs refer to 29 CFR Part 1910 Air Contaminants: Final Rule, January 19, 1989*.

*NOTE: As a result of the July 7, 1992 decision by the U.S. Circuit Court of Appeals (AFL-CIO v. OSHA) to vacate the 1989 PELs, OSHA will no longer enforce these new limits and will return to the pre-1989 PELs. Engelhard, however, will continue to list the more protective 1989 levels.

NOTE: The hazards of all ingredients of this product are not known, however exposure is not expected as the product is in solid form. The threshold limit values (TLVs) and potential health effects statements are listed for ingredients of the product for which data is available. However, these statements may not be applicable as the ingredients are in solid form. If dust, powder, or fume is generated then TLVs and effects of overexposure statements will be applicable.

RESPIRATORY PROTECTION: A NIOSH/MSHA approved dust respirator is recommended if dust is generated.

VENTILATION: General; local exhaust ventilation as necessary to control any air contaminants to within their PELs or TLVs during the use of this product.

PROTECTIVE EQUIPMENT:

Safety glasses (with side shields).
Gloves.
Body protection as necessary to prevent skin contact.

PERSONNEL SAMPLING PROCEDURE:

FOR METALLIC COMPONENTS: Refer to NIOSH Manual of Analytical Methods (NMAM), 4th Edition, Method 7300.

===== SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

===== SECTION 10: STABILITY AND REACTIVITY =====

STABILITY: Generally considered stable.

AVOID: None expected.

INCOMPATIBILITY (MATERIALS TO AVOID): Strong acids and bases, acetylene, ammonia, and hydrogen peroxide.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: Toxic metal oxides are emitted when heated above the melting point. The amount of fume evolved increases as the temperature rises.

POLYMERIZATION: Polymerization is not expected to occur.

AVOID: Not applicable.

===== SECTION 11: TOXICOLOGICAL INFORMATION =====

CHEMICAL NAME	% WT.	LD50	LC50

SILVER
S NO.: 7440-22-4 100 Not Available Not Available

NOTE: See Sections III, VIII and XII for additional information.

===== SECTION 12: ECOLOGICAL INFORMATION =====

ECOTOXICITY: No data available.

ENVIRONMENTAL FATE: No data available.

===== SECTION 13: DISPOSAL CONSIDERATIONS =====

US EPA WASTE NUMBER: D011

This product contains SILVER or silver compounds and disposal may be regulated under EPA hazardous waste regulations, waste number D011. Before disposal, this product or mixtures containing this product should be tested for toxicity characteristics (TC) under the current EPA Hazardous Waste Regulations TCLP testing procedures, 40 CFR Part 261 et seq. Disposal/recycling/reclamation requirements will vary by location and type of disposal selected. Consult with state and local regulatory authorities.

NOTE: Chemical additions, processing or otherwise altering this material may make the waste management information presented above incomplete, inaccurate or otherwise inappropriate.

As local regulations may vary; all waste must be disposed/recycled/reclaimed in accordance with federal, state, and local environmental control regulations.

===== SECTION 14: TRANSPORT INFORMATION =====

INTERNATIONAL:

UN NUMBER: Not Regulated

UNITED STATES:

EPA WASTE NUMBER: D011
DOT CLASSIFICATION: Not Regulated

CANADA:

PIN NUMBER: Not Regulated
TDG CLASS: Not Regulated

EC:

DGL: Not Determined

===== SECTION 15: REGULATORY INFORMATION =====

US FEDERAL REGULATIONS:

TSCA: IN TSCA

SARA 311 AND 312 HAZARD CATEGORIES:

IMMEDIATE (ACUTE) HEALTH HAZARD: YES
DELAYED (CHRONIC) HEALTH HAZARD: YES
FIRE HAZARD: NO
REACTIVITY HAZARD: NO
SUDDEN RELEASE OF PRESSURE: NO

http://jupiter.ports/msds/data/6215

SARA SECTION 313 NOTIFICATION: This product contains a toxic chemical (or emicals) subject to the reporting requirements of Section 313 of Title III the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

CHEMICAL NAME	GAS NUMBER	% WT.
SILVER	7440-22-4	100

OZONE DEPLETING SUBSTANCES (ODS): This product neither contains nor is manufactured with an ozone depleting substance subject to the labeling requirements of the Clean Air Act Amendments 1990 and 40 CFR Part 82.

VOLATILE ORGANIC COMPOUNDS (VOC): None

US STATE REGULATIONS:

VOLATILE ORGANIC COMPOUND (CARB): Not Determined

CANADIAN REGULATIONS:

DSL/NDSL: Not Determined
WHMIS CLASSIFICATION: Not Determined

EUROPEAN REGULATIONS:

EINECS: Not Determined

OTHER REGULATIONS:

MITI: Not Determined
AICS: Not Determined

===== SECTION 16: OTHER INFORMATION =====

REVISIONS:

REVISION NUMBER: 3

THIS MSDS HAS BEEN REVISED IN THE FOLLOWING SECTION(S):

SECTION IV: FIRST AID MEASURES
SECTION V: FIRE-FIGHTING MEASURES
SECTION VIII: EXPOSURE CONTROLS/PERSONAL PROTECTION

PREPARATION INFORMATION:

PREPARED BY: Corporate Environment, Health & Safety Group

PHONE NUMBER: See Section I

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Waste Stream Number: 104-1

Waste Stream Title: Cleaning Solutions

W
4W

104-1

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 910227-022 Project: WMGT RFD Customer Sample ID: RFD-1708
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 13-FEB-1991 Date Sample Received: 13-FEB-1991
Sampled By: SA MOORE Date Sample Completed: 2-NOV-1992
Material Description: LEAD CLEANING SOLUTION

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
EC-006	Arsenic	ND		mg/L	EL SIMPSON	10-MAR-1992	S
EC-013	Mercury	ND		mg/L	EL SIMPSON	10-MAR-1992	S
EC-015	Selenium	ND		mg/L	EL SIMPSON	10-MAR-1992	S
EC-016	Silver	ND		mg/L	EL SIMPSON	10-MAR-1992	S
SW846-8080	PCB(TOTAL)	<1		ug/g	DK PEREZ	1-APR-1991	
TSD515-500	Uranium (Waste)	<1		ug/g	CJ HOLBROOK	5-APR-1991	NA
TS	Barium	< 20		ug/g	AL SHULTZ	13-AUG-1991	
	Cadmium	< 0.5 N		ug/g	AL SHULTZ	13-AUG-1991	
	Chromium	< 3		ug/g	AL SHULTZ	13-AUG-1991	
	Lead	1500 E		ug/g	AL SHULTZ	13-AUG-1991	
TSD553-370	Technetium (Waste)	2		pCi/ml	BJ STANLEY	19-APR-1991	

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
BARIUM	1.014	1.082	106.72
CHROMIUM	1.014	1.010	99.60

***** Comments from the Spectrochemistry/ICP Laboratory *****

N - Spike sample recovery not within control limits.

E - Reported value is estimated.

***** Comments from the Environmental and Industrial Hygiene Laboratory *****

ND-- NOT DONE,sampleis past the holding time

***** Comments from the Organic Analytical Services *****

Analysis cancelled per POEF-550-92-72, Oct.7, 1992.

Inorgar :a Reporting Qualifiers and Flags:

ation Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but gre than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

'e value is between the LC and the LLD.

g "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

Laboratory Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
D. E. Boyd (Spectrochemistry/ICP Laboratory)
D. K. Perez (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)

Date Approved: 2-NOV-1992

AnaLIS ID: 910227-022
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD-1708
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 13-FEB-1991
Date Sampled: 13-FEB-1991

Solvents_F002

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 2-NOV-1992
QA File Number: NA
Dilution Factor: 1.0
Analyst: PJ WARD

CAS			CAS		
108-90-7	Chlorobenzene	NA			
	o-Dichlorobenzene	NA			
76-13-1	Freon 113	NA			
75-09-2	Methylene Chloride	NA			
127-18-4	Tetrachloroethene	NA			
71-55-6	1,1,1-Trichloroethane	NA			
79-00-5	1,1,2-Trichloroethane	NA			
79-01-6	Trichloroethene	NA			
75-69-4	Trichlorofluoromethane	NA			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

AnaLIS ID: 910227-022
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD-1708
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 13-FEB-1991
Date Sampled: 13-FEB-1991

Solvents_F003

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 2-NOV-1992
QA File Number: NA
Dilution Factor: 1.0
Analyst: PJ WARD

CAS			CAS		
67-64-1	Acetone	NA			
	n-Butyl alcohol	NA			
108-94-1	Cyclohexanone	NA			
141-78-6	Ethyl Acetate	NA			
	Ethylbenzenes	NA			
60-29-7	Ethyl ether	NA			
67-56-1	Methanol	NA			
	4-Methyl-2-pentanone (MIBK)	NA			
	Xylenes	NA			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

ANALYSIS DATA REPORT

AnaLIS ID: 910227-022
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD-1708
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 13-FEB-1991
Date Sampled: 13-FEB-1991

Solvents_F005

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 2-NOV-1992
QA File Number: NA
Dilution Factor: 1.0
Analyst: PJ WARD

CAS			CAS		
71-43-2	Benzene	NA			
	i-Butanol	NA			
	2-Butanone (MEK)	NA			
75-15-0	Carbon Disulfide	NA			
	2-Ethoxy ethanol	NA			
	2-Nitropropane	NA			
110-86-1	Pyridine	NA			
108-88-3	Toluene	NA			

ata Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Waste Stream Number: 104-2

Waste Stream Title: Lead Dust/Debris, Filters, PPE

MARTIN MARIETTA

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

WSID-1, 4-2

December 29, 1992
POEF-554-92-708

T. A. Brooks, MS-7550

Toxicity Characteristic Leaching Procedure [TCLP] - X-104 Floor Sweepings

A sample of floor sweepings from the X-104 Building, RFD-4234 (10/21/91), was submitted for a TCLP test. The test was performed according to Method 1311, as published in the FEDERAL REGISTER and revised June 29, 1990. The Zero Headspace Extractor [ZHE] was used to verify values of volatile organic constituents. Matrix interferences were checked for each parameter and appropriate corrections made, except for lead and selenium. Analytical recoveries of surrogate standard compounds in the semivolatile extracts were less than quality control limits. Analyses showed the concentration of lead exceeded the limits as stated in Table 1 of 40 CFR Part 261.24. Because of 0% matrix spike recovery, the concentrations of the cresols and mercury are greater than limits. The detection limit for selenium is greater than the limit. Other concentrations of toxicity characteristics are less than limits.

Tentatively identified compounds and LDR compounds were found. These organic compounds and concentration values can be found in POEF-554-92-628, November 30, 1992.

L. E. Deacon

L. E. Deacon, X-710, MS-2215, PORTS (5774)

M. R. Kelley

M. R. Kelley, X-710, MS-2215, PORTS (5774)

LED:MRK:msc

cys: C. P. Moore MS-7550
A. J. Saraceno MS-2209
C. W. Skaggs MS-2234A
N. J. Smith MS-2212
B. E. Upham MS-7550
D/554 File - RC

TABLE 1. ORGANIC ANALYSES OF TCLP EXTRACT
(Units are mg/L.)

	Concentration	Regulatory Limit
VOLATILES		
Benzene	<0.003	0.5
Carbon Tetrachloride	<0.003	0.5
Chlorobenzene	<0.003	100.0
Chloroform	<0.003	6.0
1,4-Dichlorobenzene	<0.003	7.5
1,2-Dichloroethane	<0.003	0.5
1,1-Dichloroethylene	<0.003	0.7
Methyl Ethyl ketone	<0.12	200.0
Tetrachloroethylene	0.031	0.7
Trichloroethylene	<0.004	0.5
Vinyl Chloride	<0.007	0.2
SEMIVOLATILES [ACIDS]* **		
o-Cresol	>200**	200.0*
m-Cresol	>200**	200.0*
p-Cresol	>200**	200.0*
Pentachlorophenol	<0.054	100.0
2,4,5-Trichlorophenol	<0.15	400.0
2,4,6-Trichlorophenol	<0.078	2.0
SEMIVOLATILES [BASE-NEUTRALS]* **		
2,4-Dinitrotoluene	<0.040	0.13
Hexachlorobenzene	<0.13	0.13
Hexachlorobutadiene	<0.044	0.5
Hexachloroethane	<0.053	3.0
Nitrobenzene	<0.040	2.0
Pyridine	<0.20	5.0

* - Regulatory level for total cresol is 200.0 mg/L.

** - Corrected for 0% matrix spike recovery.

*** - Surrogate recoveries were less than QC limits.

TABLE 2. METALS ANALYSES OF TCLP EXTRACT
(Units are mg/L.)

Sample	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
LIMIT	5.0	100.0	1.0	5.0	5.0	0.2	1.0	5.0
RFD-4234	<3.3	13	<0.76	<0.61	840*	>0.2**	<3.4*	<0.03

* - Uncorrected for matrix spike recovery.

** - Corrected for 0% matrix spike recovery.

W
4W 104-2

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 911021-053 Project: WMGT RFD Customer Sample ID: RFD-4234
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 21-OCT-1991 Date Sample Received: 21-OCT-1991
Sampled By: SA MOORE Date Sample Completed: 5-JAN-1993
Material Description: RAGS X-104 dFS

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
	Assay (% U-235, Waste)	NA		% U-235	BW SHORT	17-JAN-1992	NA
1311	1,1-Dichloroethene	< 0.003		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	1,2-Dichloroethane	< 0.003		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	1,4-Dichlorobenzene	< 0.003		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	Arsenic	< 3.3		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	Barium	13		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	Benzene	< 0.003		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	Cadmium	< 0.76		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	Carbon Tetrachloride	< 0.003		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	Chlorobenzene	< 0.003		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	Chloroform	< 0.003		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	Chromium	< 0.61		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	Lead	840 **		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	Mercury	> 0.2***		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	Methy ethyl ketone	< 0.12		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	Selenium	< 3.4		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	Silver	< 0.03		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	Tetrachloroethene	0.031		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	Trichloroethene	< 0.004		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
	Vinyl Chloride	< 0.007		mg/L	MR KELLEY	24-OCT-1991	RFD-4234
TSD515-500	Uranium (Waste)	<1.0		UG/G	CJ HOLBROOK	14-JAN-1992	9210091
TSD553-340	Technetium (Waste)	<0.4		pci/g	BJ STANLEY	22-JAN-1992	92070054

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
URANIUM (WASTE)	50	48.8	97.62

***** Comments from the Radiochemistry Laboratory *****

Uranium to low for assay determination by gamma

***** Comments from the Chemical Technology Department *****

** - Uncorrected for matrix spike recovery.

*** - Corrected for 0% matrix spike recovery.

Ar recoveries of surrogate standard compounds in the semivolatile
e. .ts were less than quality control limits.

Tentatively identified compounds and LDR compounds were also found.
These organic compounds and concentration values can be found in POEF-554-92-628, November 30, 1992.

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

atory Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)

D. K. Perez (Environmental and Industrial Hygiene Laboratory)
A. J. Saraceno (Chemical Technology Department)
Dr oroved: 6-JAN-1993

AnaLIS ID: 911021-053
Laboratory: Chemical Technology Department
File ID: RFD-4234
Instrument ID:
Authorized By: A. J. Saraceno

Customer Sample ID: RFD-4234
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 21-OCT-1991
Date Sampled: 21-OCT-1991

TCLP_SV_ACIDS_RPT

Date Extracted/Prepared: 24-OCT-1991
Analysis Procedure Number: 1311
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed:
QA File Number: RFD-4234
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
95-48-7	2-Methylphenol	>200**			
108-39-4	m-Cresol	>200**			
106-44-5	4-Methylphenol	>200**			
87-86-5	Pentachlorophenol	0.054U			
95-95-4	2,4,5-Trichlorophenol	0.15 U			
88-06-2	2,4,6-Trichlorophenol	0.078U			

Data Reporting Qualifiers:

- Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

AnaLIS ID: 911021-053
Laboratory: Chemical Technology Department
File ID: RFD-4234
Instrument ID:
Authorized By: A. J. Saraceno

Customer Sample ID: RFD-4234
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 21-OCT-1991
Date Sampled: 21-OCT-1991

TCLP_SV_B/N_RPT

Date Extracted/Prepared: 24-OCT-1991
Analysis Procedure Number: 1311
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed:
QA File Number: RFD-4234
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
121-14-2	2,4-Dinitrotoluene	0.040U			
118-74-1	Hexachlorobenzene	0.13 U			
87-68-3	Hexachlorobutadiene	0.044U			
67-72-1	Hexachloroethane	0.053U			
98-95-3	Nitrobenzene	0.040U			
110-86-1	Pyridine	0.20 U			

Data Reporting Qualifiers:

- Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Waste Stream Number: 104-3

Waste Stream Title: Waste Lead Bullets

PORTS MSDS #: 347

PRODUCT: STANDARD, LEAD 1000PPM IN 10% NITRIC

PART NUMBER:

FORMULA: Pb

KEYWORD: STANDARD

PORTS NUMBER: 00190041-100; 00190028-100; 00190041

PORTS MISC INFO:
LAB MSDS# 334
LAB MSDS# 347

PORTS RATING: HFR=300

MANUFACTURER:
VHG LABS INC.
180 ZACHARY RD #5
MANCHESTER
NH

03109
PHONE: PHONE: 603-622-7660
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	~ 212 F	NOTE: ~100'C.
Melting Point. . . .	~ 32 F	NOTE: ~0'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	~ 1	
Vapor Pressure . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Vapor Density. . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Percent Volatiles. .	~ 99	NOTE: @ 21'C.
Evaporation Rate . .	NA	NOTE: NOT APPLI/NOT AVAIL.
pH	NA	NOTE: NOT APPLI/NOT AVAIL.
Molecular Weight . .	EQ 207.20	NOTE: FORMULA WT.
Viscosity.	NG	

Solubility in Water. COMPLETE (100%).
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID, ODORLESS / ODOR THRESHOLD: NOT APPLICABLE/NOT AVAILABLE.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	NA	NOTE: NOT APPLI/NOT AVAIL.
Explosive/Flammable Limits		
Lower (LEL).	NA	NOTE: NOT APPLI/NOT AVAIL.
Upper (UEL).	NA	NOTE: NOT APPLI/NOT AVAIL.

Shipping Regulations

UN/NA Number.	NG
D.O.T. Hazard Class. . .	NG
Label	NOT GIVEN
Proper Shipping Name . .	CHEMICALS, N.O.S. (NON-REGULATED)

==========

Preparer/Contact Information: QUALITY ASSURANCE DEPARTMENT

Date Prepared/Revised 1/29/93

===== Component Information =====

LEAD
OSHA PEL (PPM):
OSHA PEL (MG/M3): 0.05
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 0.15
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 1.0
C.A.S. No.: 7439921

NITRIC ACID
OSHA PEL (PPM):
OSHA PEL (MG/M3): 5.2
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 5.2
STEL (PPM):
STEL (MG/M3): 10
Product %: EQ 10
C.A.S. No.: 7697372
Note:
PEL & TLV: 2 PPM / STEL: 4 PPM.

WATER
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: BA
C.A.S. No.: 7732185
Note:
NE = NOT ESTABLISHED / BA = BALANCE.

===== SECTIN I - PRODUCT IDENTIFICATION =====

PRODUCT NAME: Lead Plasma Emission Standard - 10,000 micrograms/ml

COMMON SYNONYMS: N/A

CHEMICAL FAMILY: Plasma Emission Standards

FORMULA: Pb

FORMULA WT.: 207.20

CAS NO.: N/A

NIOSH/RTECS NO.: QU5775000

PRODUCT USE: Laboratory Reagent

REVISION DATE: 01/29/93

TEL: (603) 622-7660

FAX: 622-5180

MANUFACTURER'S NAME AND ADDRESS:

VHG LABS, INC.

CHEMICAL PRODUCTS AND SERVICES
180 ZACHARY ROAD #5
MANCHESTER, NH 03109

===== SECTION II - COMPONENTS =====

SEE COMPONENT INFORMATION.

===== SECTION III - PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

ODOR THRESHOLD (PPM): N/A

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

===== SECTION IV - FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT (CLOSED CUP): N/A

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS:

UPPER: N/A
LOWER: N/A

FIRE EXTINGUISHING MEDIA: Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE-FIGHTING PROCEDURES: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode.

UNUSUAL FIRE & EXPLOSION HAZARDS: Reacts with most metals to produce hydrogen gas, which can form an explosive mixture with air.

TOXIC GASES PRODUCED: Oxides of nitrogen.

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT: None identified.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE: None identified.

===== SECTION V - HEALTH HAZARD DATA =====

THRESHOLD LIMIT VALUE (TLV/TWA): 5.2 mg/m3 (2 ppm)

TLV is for Nitric acid.

SHORT-TERM EXPOSURE LIMIT (STEL): 10 mg/m3 (4 ppm)

STEL is for Nitric acid.

PERMISSIBLE EXPOSURE LIMIT (PEL): 5.2 mg/m3 (2 ppm)

PEL is for Nitric acid.

TOXICITY OF COMPONENTS:

INHALATION-1HR RAT LC50 FOR NITRIC ACID: 2500 ppm

INTRAPERITONEAL MOUSE LD50 FOR WATER: 190 g/kg

INTRAVENOUS MOUSE LD50 FOR WATER: 25 g/kg

CARCINOGENICITY: NTP: No IARC: No Z LIST: No OSHA REG: No

CARCINOGENICITY: None identified

REPRODUCTIVE EFFECTS: This product contains a chemical known to the State of California to cause birth defects and other reproductive harm.

EFFECTS OF OVEREXPOSURE:

INHALATION: Severe irritation or burns of respiratory system, headache, nausea, vomiting, dizziness, pulmonary edema, lung inflammation, may be fatal

SKIN CONTACT: Severe irritation

EYE CONTACT: Severe irritation

SKIN ABSORPTION: None identified

INGESTION: Burns to mouth, throat, and stomach, nausea, vomiting, kidney dysfunction

CHRONIC EFFECTS: Damage to lungs, teeth, anemia, kidney damage, blurred vision, lead build-up in the central nervous system

TARGET ORGANS: Eyes, skin, mucous membranes, GI tract, central nervous system, gingival tissue, respiratory system, lungs, kidneys, blood, teeth

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Damaged skin, eye disorders, cardiopulmonary disease, lung disease

PRIMARY ROUTES OF ENTRY: Inhalation, ingestion, skin contact, eye contact

EMERGENCY AND FIRST AID PROCEDURES:

INGESTION: CALL A PHYSICIAN. If swallowed, do NOT induce vomiting
If conscious, give water, milk or milk of magnesia.

INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

SKIN CONTACT: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

EYE CONTACT: In case of eye contact, immediately flush with plenty of water for at least 15 minutes.

SARA/TITLE III HAZARD CATEGORIES AND LISTS:

ACUTE: Yes CHRONIC: Yes FLAMMABILITY: No PRESSURE: No REACTIVITY: No

EXTREMELY HAZARDOUS SUBSTANCE: Yes Contains Nitric Acid (RQ = 1,000 LBS, TPQ = 1,000 LBS)

CERCLA HAZARDOUS SUBSTANCE: Yes Contains Lead (RQ = 1 LB) and Nitric Acid (RQ = 1000 LBS)

SARA 313 TOXIC CHEMICALS: Yes Contains Lead and Nitric Acid

TSCA INVENTORY: Yes

STATE LISTS:

FOR PRODUCTS SOLD IN THE STATE OF CALIFORNIA, REQUIRES THAT WE PROVIDE TO USERS AND THEIR EMPLOYEES THE FOLLOWING MESSAGE: WARNING: THIS PRODUCT CONTAINS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS AND OTHER REPRODUCTIVE HARM.

===== SECTION VI - REACTIVITY DATA =====

TABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Heat

INCOMPATIBLES: Strong bases, strong reducing agents, alkalies, most common metals

DECOMPOSITION PRODUCTS: Oxides of nitrogen

===== SECTION VII - SPILL & DISPOSAL PROCEDURES =====

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE: Wear self-contained breathing apparatus and full protective clothing. Stop leak if you can do so without risk. Ventilate area. Neutralize spill with soda ash or lime. With clean shovel, carefully place material into clean, dry container and cover; remove from area. Flush spill area with water.

DISPOSAL PROCEDURES: Dispose in accordance with all applicable federal, state, and local environmental regulations.

EPA HAZARDOUS WASTE NUMBER: D002 (Corrosive Waste)

===== SECTION VIII - PROTECTION INFORMATION =====

EYE/FACE PROTECTION: Goggles & Shield

PROTECTIVE CLOTHING: Lab Coat & Apron

PROTECTIVE GLOVES: Rubber

VENTILATION REQUIREMENTS: Vent Hood

===== SECTION IX - STORAGE DATA AND ADDITIONAL INFORMATION =====

STORAGE REQUIREMENTS: Keep container tightly closed. Store in secure poison area. Isolate from incompatible materials.

===== SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION =====

DOMESTIC (D.O.T.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)

INTERNATIONAL (I.M.O.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)
MARINE POLLUTANTS: No

N/A = Not Applicable or Not Available
N/E = Not Established

The information in this Material Safety Data Sheet meets the requirements of the United States OCCUPATIONAL SAFETY AND HEALTH ACT and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) and the Canadian WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. This document is intended only as a guide to the appropriate precautionary handling of the material by a person trained in, or supervised by a person trained in, chemical handling. The user is responsible for determining the application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes.

Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so ıried, VHG cannot warn of all of the potential dangers of use or interaction ,th other chemicals or materials. VHG warrants that the chemical meets the specifications set forth on the label.

VHG DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.

The user should recognize that this product can cause severe injury and even death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION.

Approved by Quality Assurance Department.

Waste Stream Number: Cascade-1

Waste Stream Title: Gas Analyzer Waste

4w

Portsmouth Gaseous Diffusion Plant

- Technical Services Division

Analysis Results

AnaLIS ID: 930707-024 Project: WMGT RFD Customer Sample ID: RFD17261

Customer: WASTE MANAGEMENT Requisition Number: 001274

Date Sampled: 2-JUL-1993 Date Sample Received: 7-JUL-1993

Sampled By: BK KELLEY Date Sample Completed: 31-AUG-1993

Material Description: X333 MC110 LAB WASTE

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-6010	Arsenic	3.8U		MG/KG	EL SIMPSON	30-AUG-1993	93080633
	Barium	13.8*		MG/KG	EL SIMPSON	30-AUG-1993	93080633
	Cadmium	7.9		MG/KG	EL SIMPSON	30-AUG-1993	93080633
	Chromium	22.4*		MG/KG	EL SIMPSON	30-AUG-1993	93080633
	Lead	52.8*		MG/KG	EL SIMPSON	30-AUG-1993	93080633
	Selenium	4.7U		MG/KG	EL SIMPSON	30-AUG-1993	93080633
	Silver	0.65N*		MG/KG	EL SIMPSON	30-AUG-1993	93080633
SW846-7470	Mercury	.027N		mg/kg	EK GILBERT	22-JUL-1993	93080494
SW846-8080	PCB (TOTAL)	2.5		ug/ml	JN STRICKLAND	9-JUL-1993	93160356
TSD553-230	Gross Alpha Activity	67.2		pCi/mL	JJ SISLER	26-JUL-1993	93071106
	Gross Beta Activity	139.2		pCi/mL	JJ SISLER	26-JUL-1993	93071106
-370	Technetium	22.3		pCi/ml	CJ WHEELER	20-JUL-1993	93071074
TSD553-440	Total Uranium	55.7		ppm	BW SHORT	8-JUL-1993	93071010

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
ARSENIC	39.22	39.999	101.99
BARIUM	39.22	42.2451	107.71
CADMIUM	39.22	40.3284	102.83
CHROMIUM	39.22	40.502	103.27
LEAD	39.22	43.8922	111.91
MERCURY	0.150	0.102	68.00
SELENIUM	39.22	40.8892	104.26
SILVER	39.22	28.0667	71.56

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is s than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

a - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

Laboratory Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
D. E. Boyd (Spectrochemistry/ICP Laboratory)
J. J. Williams (Organic Analytical Services)

Date Approved: 1-SEP-1993

AnaLIS ID: 930707-024
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD17261
Customer: WASTE MANAGEMENT
Sample Matrix:
Requisition Number: 001274
Date Sample Received: 7-JUL-1993
Date Sampled: 2-JUL-1993

Solvents_Volatiles

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 13-AUG-1993
QA File Number: 93160501
Dilution Factor: 0.2
Analyst: PJ WARD

CAS		ug/ml	CAS		ug/ml
71-43-2	Benzene	100U			
	2-Butanone (MEK)	100U			
56-23-5	Carbon Tetrachloride	0.004U			
108-90-7	Chlorobenzene	100U			
67-66-3	Chloroform	0.04			
	p-Dichlorobenzene	0.01U			
107-06-2	1,2-Dichloroethane	0.08U			
75-35-4	1,1-Dichloroethene	0.004U			
127-18-4	Tetrachloroethene	0.004U			
79-01-6	Trichloroethene	0.008			
75-01-4	Vinyl Chloride	NA			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

WASTE STREAM: CASCADE-1 DATE: 11/29/94

RFD#	CONT#	CONT WT	U (PPM)	U-235(frct)	U-235 (g)
17261		441	55.7	0.02	0.223038

Waste Stream Number: Cascade-2

Waste Stream Title: Solvent

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 920325-011 Project: WMGT RFD Customer Sample ID: RFD-9130
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 23-MAR-1992 Date Sample Received: 23-MAR-1992
Sampled By: B KELLEY Date Sample Completed: 30-DEC-1992
Material Description: WASTE TCE

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
	Assay (% U-235, Waste)	NA		% U-235	JD LITTERAL		
TSD515-500	Uranium (Waste)	1.1		UG/G	CJ HOLBROOK	25-MAR-1992	92100507
TSD553-380	Technetium (Waste)	2.2		pCi/ml	JJ SISLER	9-APR-1992	92070220

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
URANI' \STE)	40	31.7	79.30

I. nic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.
Duplicate analysis is not within control limits.
Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte

Organic Data Reporting Qualifiers:

...mpound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Laboratory Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
D. K. Perez (Environmental and Industrial Hygiene Laboratory)
D. E. Boyd (Organic Analytical Services)
Date Approved: 31-DEC-1992

AnaLIS ID: 920325-011
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: D. E. Boyd

Customer Sample ID: RFD-9130
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 23-MAR-1992
Date Sampled: 23-MAR-1992

Solvents_F001

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 21-DEC-1992
QA File Number: 92160314
Dilution Factor: 50
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
56-23-5	Carbon Tetrachloride	1.00U			
75-09-2	Methylene Chloride	1.00U			
127-18-4	Tetrachloroethene	15			
71-55-6	1,1,1-Trichloroethane	230E			
79-01-6	Trichloroethene	210E			

Data Reporting Qualifiers:

- Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
- Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Waste Stream Number: Cascade-3

Waste Stream Title: Decontamination Waste Solutions

Cas 3
DOE

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960920-030 Project: ER 9567DE Requisition Number: 22175
Customer Sample ID: VER36901001 Customer: ENV RESTORATIO
Date Sampled: 19-SEP-1996 09:25 Date Sample Received: 19-SEP-1996
Sampled By: B PYLES Date Sample Completed: 24-OCT-1996
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed
SW846-3010A	Sample Prep Metals	COMPLETE			ML STEWART	27-SEP-1996
SW846-6010A	Aluminum	31300*		ug/L	TE SHOOK	27-SEP-1996
	Antimony	3000B		ug/L	TE SHOOK	27-SEP-1996
	Arsenic	234UN		ug/L	TE SHOOK	27-SEP-1996
	Barium	711N		ug/L	TE SHOOK	27-SEP-1996
	Beryllium	11.0UN		ug/L	TE SHOOK	27-SEP-1996
	Cadmium	1280		ug/L	TE SHOOK	27-SEP-1996
	Calcium	192000*J		ug/L	TE SHOOK	27-SEP-1996
	Chromium	2150		ug/L	TE SHOOK	27-SEP-1996
	Cobalt	237BN		ug/L	TE SHOOK	27-SEP-1996
	Copper	5580		ug/L	TE SHOOK	27-SEP-1996
	Iron	61900*		ug/L	TE SHOOK	27-SEP-1996
	Lead	11500*		ug/L	TE SHOOK	27-SEP-1996
	Magnesium	30700		ug/L	TE SHOOK	27-SEP-1996
	Manganese	2980*		ug/L	TE SHOOK	27-SEP-1996
	Molybdenum	400N*		ug/L	TE SHOOK	27-SEP-1996
	Nickel	1200		ug/L	TE SHOOK	27-SEP-1996
	Potassium	9580000*		ug/L	TE SHOOK	27-SEP-1996
	Selenium	643BN		ug/L	TE SHOOK	27-SEP-1996
	Silver	49.0UN		ug/L	TE SHOOK	27-SEP-1996
	Sodium	2760*J		mg/L	TE SHOOK	27-SEP-1996
	Thallium	243U		ug/L	TE SHOOK	27-SEP-1996
	Vanadium	92.9BNJ		ug/L	TE SHOOK	27-SEP-1996
	Zinc	46400*		ug/L	TE SHOOK	27-SEP-1996
TSD553-230	Gross Alpha	156		pCi/mL	JP BREWSTER	3-OCT-1996
	Gross Beta	320		pCi/mL	JP BREWSTER	3-OCT-1996
TSD553-380	Technetium	85.4		pCi/mL	JP BREWSTER	23-OCT-1996
TSD553-700	% U-235	0.93	0.26	%	CD GOOD	15-OCT-1996
TSD553-710	Uranium	154	23	ug/mL	CD GOOD	15-OCT-1996

Spike Recovery Data

A		Amount Spiked	Amount Recovered	Percent Recovered

Barium	400	288.7	72.18
Beryllium	400	275.9	68.97
Cadmium	400	409.0	102.25
Cobalt	400	284.1	71.02
Molybdenum	400	267.2	66.80
Nickel	400	359.9	89.98
Selenium	400	-57.0	-14.25
Silver	400	0.	0.00
Thallium	400	368.7	92.18
Vanadium	400	134.2	33.55

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
Date Approved: 24-OCT-1996

********** COMMENT PAGE **********
********** 960920-030 **********

*** Comments from the Spectrochemistry/ICP Laboratory *****

SW846-6010A V qualified as estimate due to calibration verification not meeting Q.C. limits.

SW846-6010A Ca and Na qualified as estimate due to laboratory control sample not meeting Q.C. limits.

NOTE: Units for Na are MG/L.

Definition Page for Qualifiers/Flags

960920-030

Inc [illegible] Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample prepar sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of a dilution that is not within control limits or if the analytical (post-digestion) spike recovery for grap less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is g CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the o repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%) concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

'orrelation coefficient for MSA is less tha 0.995.

The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same fi

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

Waste Stream Number: Cascade-4

Waste Stream Title: Waste Oil/Solvent

Customer Smpl Id: VER42426001
:t:X-04-WM BJC09824
Proj Analyses:OIL
Customer:J A APPLEGATE
COC#: 061101
Sample Desc:
Customer Comments:
Lab Smpl Comments:

Matrix: OIL
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 07/09/98 13:00:00
Received: 07/10/98 09:35:24
Needed: 08/14/98 23:59:00
Approved: 08/11/98 15:55:03

Analy Meth:SW846-6010A | QC Batch: | Test:6010AMETALS5 | Rpt Basis:none | Date Approved
Prep Meth: PORTS-CEM-OP-5 | Analyzed:07/23/98 00:00:00 T E SHOOK | Approver: D K PEREZ | 07/30/98 16:33

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Aluminum	17.2		mg/kg	NU			10		
Antimony	40.8		mg/kg	NU			10		
Arsenic	29.4		mg/kg	NU			10		
Barium	1.4		mg/kg	U			10		
Beryllium	0.20		mg/kg	U			10		
Cadmium	2.3		mg/kg	U			10		
Calcium	87.8		mg/kg	JN			10		
Chromium	12.3		mg/kg	U			10		
Cobalt	19.8		mg/kg	U			10		
Copper	20.7		mg/kg				10		
Iron	115		mg/kg	N			10		
Lead	29.4		mg/kg	U			10		
Magnesium	19.8		mg/kg	NU			10		
anese	0.90		mg/kg	JU			10		
ybdenum	NA		mg/kg						
Nickel	7.0		mg/kg	U			10		
Potassium	397		mg/kg	JNU			10		
Selenium	33.8		mg/kg	JNU			10		
Silver	4.1		mg/kg	JU			10		
Sodium	62.3		mg/kg				10		
Thallium	39.1		mg/kg	NU			10		
Vanadium	2.6		mg/kg	U			10		
Zinc	20.9		mg/kg				10		

Comments: QC File: 98080558
Ca, Se, Ag qualified as estimates due to lab control sample not meeting acceptance limits. K and Mn qualified as estimate due to interference check not meeting acceptance limits.

Analy Meth:PORTS-CEM-OP-5 | QC Batch: | Test:DIESELPREP | Rpt Basis:none | Date Approved
Prep Meth: | Analyzed:07/22/98 00:00:00 M L STEWART | Approver: D K PEREZ | 08/05/98 16:39

Meth:SW846-7470A	QC Batch:	Test:HG7470A	Rpt Basis:none	Date Approved
Meth:	Analyzed:07/23/98 00:00:00 C J MAYNARD		Approver: D K PEREZ	08/03/98 6

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Mercury	1370		mg/kg				1		

Comments: QC File: 98080554

EPA Qualifiers:

J - Qualify data for the sample as estimated.

N - Sample spike recovery not within control limits.

U - Analyte analyzed for but undetected. Analyte result was below the Instrument Detection Limit (IDL).

Analy Meth:SW846-3580	QC Batch:QC98205002 Test:ORGEXT-SVOC	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:07/21/98 00:00:00 D K SCAGGS	Approver: C J VANMETER	08/11/98 15:46

Analy Meth:SW846-8270B	QC Batch:QC98216005 Test:SVOC	Rpt Basis:none	Date Approved
Prep Meth: SW846-3580	Analyzed:07/27/98 00:00:00 R J WAWRO	Approver: C J VANMETER	08/11/98 15:53

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,2,4-Trichlorobenzene	110000		ug/kg	U		110000	2		
1 2-Dichlorobenzene	110000		ug/kg	U		110000	2		
ichlorobenzene	110000		ug/kg	U		110000	2		
Jichlorobenzene	110000		ug/kg	U		110000	2		
2,4,5-Trichlorophenol	110000		ug/kg	U		110000	2		
2,4,6-Trichlorophenol	110000		ug/kg	U		110000	2		
2,4-Dichlorophenol	110000		ug/kg	U		110000	2		
2,4-Dimethylphenol	110000		ug/kg	U		110000	2		
2,4-Dinitrophenol	550000		ug/kg	JU		550000	2		
2,4-Dinitrotoluene	110000		ug/kg	U		110000	2		
2,6-Dinitrotoluene	110000		ug/kg	U		110000	2		
2-Chloronaphthalene	110000		ug/kg	U		110000	2		
2-Chlorophenol	110000		ug/kg	U		110000	2		
2-Methyl-4,6-dinitrophenol	550000		ug/kg	JU		550000	2		
2-Methylphenol	110000		ug/kg	U		110000	2		
2-Nitrophenol	110000		ug/kg	U		110000	2		
3(4)-Methylphenol	110000		ug/kg	U		110000	2		
4-Bromophenyl phenyl ether	110000		ug/kg	U		110000	2		
4-Chloro-3-methylphenol	220000		ug/kg	U		220000	2		
4-Chlorophenylphenyl ether	110000		ug/kg	U		110000	2		
4-Nitrophenol	550000		ug/kg	U		550000	2		
Acenaphthene	110000		ug/kg	U		110000	2		
Acenaphthylene	110000		ug/kg	JU		110000	2		
Anthracene	110000		ug/kg	U		110000	2		
Benzo(a)anthracene	110000		ug/kg	U		110000	2		
Benzo(a)pyrene	110000		ug/kg	U		110000	2		
Benzo(b)fluoranthene	110000		ug/kg	U		110000	2		
(ghi)perylene	110000		ug/kg	U		110000	2		

Meth:PORTS-OA97333006	QC Batch:QC98205003 Test:AB-ACT-GPC	Rpt Basis:none	Date Approved
Meth:	Analyzed:07/21/98 00:00:00 J P BREWSTER	Approver: B W SHORT	07/27/98 10:20

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Alpha activity	8230		pCi/ml	J		0.3	
Beta activity	3745		pCi/ml	J		0.8	

Analy Meth:PORTS-XP4-TS-RL7380	QC Batch:QC98204003 Test:TC99-ACT-LS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:07/21/98 00:00:00 J P BREWSTER	Approver: B W SHORT	07/27/98 10:15

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Technetium-99	3400		pCi/ml			5.5	

Analy Meth:PORTS-XP4-TS-RL7720ug	QC Batch:QC98215010 Test:TOTAL-U-AS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:07/28/98 00:00:00 R J ANDRE	Approver: B W SHORT	08/04/98 12:50

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Uranium	55	14	ug/ml				
Uranium-235	13	5.6	wt %				

EPA Qualifiers:
J - Indicates an estimated value.

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
o(k)fluoranthene	110000		ug/kg	U		110000	2		
₋(2-chloroethoxy)methane	110000		ug/kg	U		110000	2		
Bis(2-chloroethyl) ether	110000		ug/kg	U		110000	2		
Bis(2-chloroisopropyl) ether	110000		ug/kg	U		110000	2		
Bis(2-ethylhexyl)phthalate	190000		ug/kg			110000	2		
Butylbenzylphthalate	110000		ug/kg	U		110000	2		
Chrysene	110000		ug/kg	U		110000	2		
Di-n-butylphthalate	110000		ug/kg	U		110000	2		
Di-n-octylphthlate	110000		ug/kg	U		110000	2		
Dibenz(a,h)anthracene	110000		ug/kg	U		110000	2		
Diethylphthalate	110000		ug/kg	U		110000	2		
Dimethylphthalate	110000		ug/kg	U		110000	2		
Diphenyldiazene	110000		ug/kg	U		110000	2		
Fluoranthene	110000		ug/kg	U		110000	2		
Fluorene	110000		ug/kg	U		110000	2		
Hexachlorobenzene	110000		ug/kg	U		110000	2		
Hexachlorobutadiene	110000		ug/kg	JU		110000	2		
Hexachlorocyclopentadiene	110000		ug/kg	U		110000	2		
Hexachloroethane	110000		ug/kg	U		110000	2		
Indeno(1,2,3-cd)pyrene	110000		ug/kg	U		110000	2		
Isophorone	110000		ug/kg	U		110000	2		
N-Nitroso-di-n-propylamine	110000		ug/kg	U		110000	2		
N-Nitrosodimethylamine	110000		ug/kg	U		110000	2		
N-Nitrosodiphenylamine	110000		ug/kg	U		110000	2		
Naphthalene	110000		ug/kg	U		110000	2		
›benzene	110000		ug/kg	U		110000	2		
.achlorophenol	550000		ug/kg	U		550000	2		
Phenanthrene	110000		ug/kg	U		110000	2		
Phenol	110000		ug/kg	U		110000	2		
Pyrene	110000		ug/kg	U		110000	2		
Pyridine	110000		ug/kg	U		110000	2		

Comments:

There were 4 compounds that exceeded the 15% RSD criteria for the initial calibration and are qualified as estimated values, 'J'. These compounds were: 2,4-dinitrophenol(27%), 4,6-dinitro-2-methylphenol(19%), hexachlorbutadiene(16%) and acenaphthylene(16%).

Because the sample was an oil, the waste dilution sample preparation was diluted by an additional factor of 2 to minimize the matrix effects caused by the oil.

EPA Qualifiers:

J - Estimated value.

U - Analyte analyzed for but undetected. Analyte result was below the Limit of ntitation (LOQ).

Waste Stream Number: Cascade-5

Waste Stream Title: Oil

Customer Smpl Id: VER47613015
Project:X-04-WM BJC09824
Proj Analyses:LIQUID
Customer:J A APPLEGATE
COC#: 061051
Sample Desc:
Customer Comments:
Lab Smpl Comments:

Matrix: LIQUID
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 07/17/98 10:00:00
Received: 07/17/98 12:35:31
Needed: 08/21/98 23:59:00
Approved: 08/18/98 11:13:13

Analy Meth:SW846-3015 | QC Batch: | Test:3015PREP | Rpt Basis:none | Date Approved
Prep Meth: | Analyzed:07/22/98 00:00:00 M L STEWART | Approver: D K PEREZ | 08/05/98 16:40

Analy Meth:SW846-6010A | QC Batch: | Test:6010AMETALS5 | Rpt Basis:none | Date Approved
Prep Meth: SW846-3015 | Analyzed:07/23/98 00:00:00 T E SHOOK | Approver: D K PEREZ | 08/18/98 11:11

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Aluminum	17.2		ug/L	*NU			10		
Antimony	40.8		ug/L	NU			10		
Arsenic	29.4		ug/L	NU			10		
Barium	1.4		ug/L	U			10		
Beryllium	0.20		ug/L	U			10		
Cadmium	2.3		ug/L	U			10		
Calcium	78.3		ug/L	*JN			10		
Chromium	12.3		ug/L	U			10		
t	19.8		ug/L	U			10		
er	3.8		ug/L				10		
Iron	5.8		ug/L	U			10		
Lead	29.4		ug/L	U			10		
Magnesium	23.2		ug/L	*N			10		
Manganese	0.90		ug/L	JU			10		
Molybdenum	2.8		ug/L	U			10		
Nickel	7.0		ug/L	U			10		
Potassium	397		ug/L	JNU			10		
Selenium	33.8		ug/L	JNU			10		
Sodium	53.7		ug/L	N			10		
Thallium	39.1		ug/L	NU			10		
Vanadium	2.6		ug/L	U			10		
Zinc	522		ug/L				10		

Comments: QC File: 98080558
Ca, Se qualified as estimate due to Lab Control Sample not meeting acceptance limits. K and Mn qualified as estimate due to interference check not meeting acceptance limits.

Meth:SW846-7470A	QC Batch:	Test:HG7470A	Rpt Basis:none	Date Approved
Meth:	Analyzed:07/23/98 00:00:00 C J MAYNARD		Approver: D K PEREZ	08/03/98

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Mercury	10		ug/L	NU			1		

Comments: QC File: 98080554

EPA Qualifiers:
* - Duplicate analysis not within control limits.
J - Qualify data for the sample as estimated.
N - Sample spike recovery not within control limits.
U - Analyte analyzed for but undetected. Analyte result was below the Instrument Detection Limit (IDL).

Analy Meth:SW846-3520	QC Batch:QC98205002 Test:ORGEXT-SVOC	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:07/21/98 00:00:00 D K SCAGGS	Approver: C J VANMETER	07/28/98 17:13

Analy Meth:SW846-8270B	QC Batch:QC98209002 Test:SVOC	Rpt Basis:none	Date Approved
Prep Meth: SW846-3520	Analyzed:07/23/98 00:00:00 R J WAWRO	Approver: C J VANMETER	07/28/98 17:15

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,2,4-Trichlorobenzene	110000		ug/kg	U		110000	2		
ichlorobenzene	110000		ug/kg	U		110000	2		
ichlorobenzene	110000		ug/kg	U		110000	2		
1,4-Dichlorobenzene	110000		ug/kg	U		110000	2		
2,4,5-Trichlorophenol	110000		ug/kg	U		110000	2		
2,4,6-Trichlorophenol	110000		ug/kg	U		110000	2		
2,4-Dichlorophenol	110000		ug/kg	U		110000	2		
2,4-Dimethylphenol	110000		ug/kg	U		110000	2		
2,4-Dinitrophenol	550000		ug/kg	JU		550000	2		
2,4-Dinitrotoluene	110000		ug/kg	U		110000	2		
2,6-Dinitrotoluene	110000		ug/kg	U		110000	2		
2-Chloronaphthalene	110000		ug/kg	U		110000	2		
2-Chlorophenol	110000		ug/kg	U		110000	2		
2-Methyl-4,6-dinitrophenol	550000		ug/kg	JU		550000	2		
2-Methylphenol	110000		ug/kg	U		110000	2		
2-Nitrophenol	110000		ug/kg	U		110000	2		
3(4)-Methylphenol	110000		ug/kg	U		110000	2		
4-Bromophenyl phenyl ether	110000		ug/kg	U		110000	2		
4-Chloro-3-methylphenol	220000		ug/kg	U		220000	2		
4-Chlorophenylphenyl ether	110000		ug/kg	U		110000	2		
4-Nitrophenol	550000		ug/kg	U		550000	2		
Acenaphthene	110000		ug/kg	U		110000	2		
Acenaphthylene	110000		ug/kg	U		110000	2		
Anthracene	110000		ug/kg	U		110000	2		
Benzo(a)anthracene	110000		ug/kg	U		110000	2		
Benzo(a)pyrene	110000		ug/kg	U		110000	2		
(b)fluoranthene	110000		ug/kg	U		110000	2		

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
o(ghi)perylene	110000		ug/kg	U		110000	2		
o(k)fluoranthene	110000		ug/kg	U		110000	2		
Bis(2-chloroethoxy)methane	110000		ug/kg	U		110000	2		
Bis(2-chloroethyl) ether	110000		ug/kg	U		110000	2		
Bis(2-chloroisopropyl) ether	110000		ug/kg	U		110000	2		
Bis(2-ethylhexyl)phthalate	110000		ug/kg	U		110000	2		
Butylbenzylphthalate	110000		ug/kg	U		110000	2		
Chrysene	110000		ug/kg	U		110000	2		
Di-n-butylphthalate	110000		ug/kg	U		110000	2		
Di-n-octylphthlate	110000		ug/kg	U		110000	2		
Dibenz(a,h)anthracene	110000		ug/kg	U		110000	2		
Diethylphthalate	110000		ug/kg	U		110000	2		
Dimethylphthalate	110000		ug/kg	U		110000	2		
Diphenyldiazene	110000		ug/kg	U		110000	2		
Fluoranthene	110000		ug/kg	U		110000	2		
Fluorene	110000		ug/kg	U		110000	2		
Hexachlorobenzene	110000		ug/kg	U		110000	2		
Hexachlorobutadiene	110000		ug/kg	U		110000	2		
Hexachlorocyclopentadiene	110000		ug/kg	U		110000	2		
Hexachloroethane	110000		ug/kg	U		110000	2		
Indeno(1,2,3-cd)pyrene	110000		ug/kg	U		110000	2		
Isophorone	110000		ug/kg	U		110000	2		
N-Nitroso-di-n-propylamine	110000		ug/kg	U		110000	2		
N-Nitrosodimethylamine	110000		ug/kg	U		110000	2		
N-Nitrosodiphenylamine	110000		ug/kg	U		110000	2		
thalene	110000		ug/kg	U		110000	2		
benzene	110000		ug/kg	U		110000	2		
Pentachlorophenol	550000		ug/kg	U		550000	2		
Phenanthrene	110000		ug/kg	U		110000	2		
Phenol	110000		ug/kg	U		110000	2		
Pyrene	110000		ug/kg	U		110000	2		
Pyridine	110000		ug/kg	U		110000	2		

Comments:

There were 2 compounds that exceeded the 15% RSD criteria for the initial calibration and are qualified as estimated values, 'J'. These compounds were: 2,4-dinitrophenol(27%),and 4,6-dinitro-2-methylphenol(16%).

Because the sample was an oil, the waste dilution sample preparation was diluted by an additional factor of 2 to minimize the matrix effects caused by the oil.

EPA Qualifiers:

J - Estimated value.

U - Analyte analyzed for but undetected. Analyte result was below the Limit of antitation (LOQ).

Meth:PORTS-OA97333006	QC Batch:QC98205003 Test:AB-ACT-GPC	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:07/21/98 00:00:00 J P BREWSTER	Approver: B W SHORT	07/27/98 10:33

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Alpha activity	3.5		pCi/ml			0.1	
Beta activity	4.4		pCi/ml			0.4	

Analy Meth:PORTS-XP4-TS-RL7380	QC Batch:QC98204003 Test:TC99-ACT-LS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:07/21/98 00:00:00 J P BREWSTER	Approver: B W SHORT	07/27/98 10:17

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Technetium-99	4.7		pCi/ml			1.1	

Analy Meth:PORTS-XP4-TS-RL7720ug	QC Batch:QC98215010 Test:TOTAL-U-AS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:07/28/98 00:00:00 R J ANDRE	Approver: B W SHORT	08/04/98 12:54

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Uranium	5.3	0.73	ug/ml				
Uranium-235	1.2	0.47	wt %				

***** END OF REPORT *****

Waste Stream Number: Cascade-6

Waste Stream Title: Decontamination Waste Solids

WSID-CASCADE-6

W
4W

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 920129-041 Project: WMGT WMS Customer Sample ID: WMS-721
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 24-JAN-1992 Date Sample Received: 24-JAN-1992
Sampled By: AR SELBEE Date Sample Completed: 22-JAN-1993
Material Description: GUNK X 330 Evaporator trays

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311	1,1-Dichloroethene	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	1,2-Dichloroethane	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	1,4-Dichlorobenzene	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	Arsenic	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	Barium	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	Benzene	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	Cadmium	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	Carbon Tetrachloride	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	Chlorobenzene	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	Chloroform	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	Chromium	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	Lead	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	Mercury	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	Methy ethyl ketone	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	Selenium	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	Silver	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	Tetrachloroethene	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	Trichloroethene	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
	Vinyl Chloride	NA		mg/L	MR KELLEY	28-JAN-1992	WMS-721
SW846-8080	PCB (TOTAL)	28.		ug/g	PA HUTCHINS	30-MAR-1992	92160073

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
PCB (TOTAL)	8.5	9.	105.88

***** Comments from the Infrared and Chromatographic Services Laboratory *****

Sample for PCB analysis was submitted on 3-6-92.

Q.C. Data
Control, 25. ug/g PCB 1260 in soil 21. (84% Recovery)
0.3U

s identified: 1260, 1268

***** Comments from the TCLP Laboratory *****

M(.1 - Volatiles could not be analyzed within the 14 day holding time because sample load exceeded the laboratory capacity. No valid data for metals were reported.

TCLP_SV_ACIDS_RPT - Data corrected for matrix spike recovery.

TCLP_SV_B/N_RPT - Data corrected for matrix spike recovery.
X - Corrected for 0% matrix spike recovery.
Y - The concentration for pyridine exceeded the calibration range. The result is estimated and corrected for low matrix spike recovery. Pyridine exceeded the regulatory limit of 5.0 mg/L.
Recovery or surrogate compounds did not meet QC requirements.

Tentatively identified compounds were also found.
These organic compounds and concentration values can be found in POEF-554-92-618, November 24, 1992.

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

...g Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.
' ot reported.
ot analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Laboratory Manager: J. J. Williams (Organic Analytical Services)
J.J. Williams (TCLP Laboratory)
Date Approved: 22-JAN-1993

AnaLIS ID: 920129-041
Laboratory: TCLP Laboratory
File ID: WMS-721
Instrument ID:
Authorized By: J.J. Williams

Customer Sample ID: WMS-721
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 24-JAN-1992
Date Sampled: 24-JAN-1992

TCLP_SV_ACIDS_RPT

Date Extracted/Prepared: 28-JAN-1992
Analysis Procedure Number: 1311
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed:
QA File Number: WMS-721
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
95-48-7	2-Methylphenol	0.2U			
108-39-4	m-Cresol	0.09U			
106-44-5	4-Methylphenol	0.2U			
87-86-5	Pentachlorophenol	0.56U			
95-95-4	2,4,5-Trichlorophenol	0.05U			
88-06-2	2,4,6-Trichlorophenol	0.04U			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

AnaLIS ID: 920129-041
Laboratory: TCLP Laboratory
File ID: WMS-721
Instrument ID:
Authorized By: J.J. Williams

Customer Sample ID: WMS-721
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 24-JAN-1992
Date Sampled: 24-JAN-1992

TCLP_SV_B/N_RPT

Date Extracted/Prepared: 28-JAN-1992
Analysis Procedure Number: 1311
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed:
QA File Number: WMS-721
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
121-14-2	2,4-Dinitrotoluene	>0.13X			
118-74-1	Hexachlorobenzene	0.02U			
87-68-3	Hexachlorobutadiene	0.02U			
67-72-1	Hexachloroethane	>3.0 X			
98-95-3	Nitrobenzene	0.5 U			
110-86-1	Pyridine	18 Y			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Waste Stream Number: Cascade-7A and 7B

Waste Stream Title: Mercury and Debris

Duplicate

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 971112-003 Project: ER 9763E Customer Sample ID: VER45653001
Customer: ENV RESTORATION Requisition Number: 058413
Date Sampled: 6-NOV-1997 10:30 Date Sample Received: 7-NOV-1997
Sampled By: B PYLES Date Sample Completed: 17-DEC-1997
Material Description: ALUMINA & SODA LIME

** See comment page for comments. **

** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-3050A	Sample Prep Metals	COMPLETE			ML STEWART	14-NOV-1997	111497-032
SW846-6010A	Aluminum	235000		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Antimony	16.6UN		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Arsenic	70.8BNJ		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Barium	7.2BN		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Beryllium	2.7BN		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Cadmium	1.7UN		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Calcium	86900		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Chromium	2.9UN		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Cobalt	3.2UN		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Copper	75.5BN		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Iron	316B		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Lead	30.7B		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Magnesium	2910B		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Manganese	11.3BN		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Molybdenum	2.8UN		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Nickel	6.2U		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Potassium	4020B		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Selenium	34.2UN		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Silver	4.7UNJ		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Sodium	4220B		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Thallium	23.1UN		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Vanadium	2.4UN		MG/KG	TE SHOOK	14-NOV-1997	97R80890
	Zinc	38.4BN		MG/KG	TE SHOOK	14-NOV-1997	97R80890
SW846-7470A	Mercury	23.3		mg/kg	RK POWELL	4-DEC-1997	9708R909
TSD553-280	Gross Alpha	22130J		pCi/g	JP BREWSTER	14-DEC-1997	97071712
	Gross Beta	10603		pCi/g	JP BREWSTER	14-DEC-1997	97071712
TSD553-385	Technetium	70.8		pCi/g	JP BREWSTER	14-DEC-1997	97071713
TSD553-710	% U-235	2.1	0.44	%U-235	CD GOOD	13-NOV-1997	97071587
	Uranium	24797	2945	ug/g	CD GOOD	13-NOV-1997	97071587

Spike Recovery Data

	Amount Spiked	Amount Recovered	Percent Recovered
Ar			

Antimony	44.25	26.07	58.92
Arsenic	44.25	-2.86	-6.46
Barium	44.25	31.40	70.96
Beryllium	44.25	29.18	65.94
Cadmium	44.25	29.97	67.73
Chromium	44.25	5.37	12.14
Cobalt	44.25	28.59	64.61
Copper	44.25	10.54	23.82
Lead	44.25	51.34	116.02
Manganese	44.25	28.07	63.44
Nickel	44.25	37.22	84.11
Thallium	44.25	0.	0.00
Vanadium	44.25	0.	0.00
Zinc	44.25	21.56	48.72

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
Date Approved: 17-DEC-1997

********** COMMENT PAGE **********
********** 971112-003 **********

Comments from the Spectrochemistry/ICP Laboratory *****

SW846-6010A As qualified as estimate due to interference check not meeting Q.C. limits.

SW846-6010A Ag qualified as estimate due to lab control sample not meeting Q.C. limits.

Definition Page for Qualifiers/Flags

********** 971112-003 **********

Ino. . ata Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ rrelation coefficient for MSA is less tha 0.995.
e value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an an.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

Waste Stream Number: Cascade-8

Waste Stream Title: X-Ray Solutions

W.S. CAS-8

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960206-023 Project: ER 9567C Requisition Number: 20209
Customer Sample ID: VER35685001 Customer: ENV RESTORATION
Date Sampled: 5-FEB-1996 10:00 Date Sample Received: 6-FEB-1996
Sampled By: R CAUDILL Date Sample Completed: 22-MAR-1996
Material Description: waste verification

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
ACD-5101	Density	1.07		g/mL	ML STEWART	7-FEB-1996	96110011
SW846-1010	Flash Point	>80.0		oC	ML STEWART	15-MAR-1996	96110020
SW846-3051	Sample Prep Metals	COMPLETE			ML STEWART	19-FEB-1996	021996-042
SW846-3510	Sample Prep PCB	COMPLETE			SL EWING	8-FEB-1996	96160043
SW846-3520	Sample Prep Semi-Volatiles	COMPLETE			DK SCAGGS	12-FEB-1996	96160051
SW846-6010A	Arsenic	2340U		ug/L	TE SHOOK	19-FEB-1996	96080252
	Barium	110		ug/L	TE SHOOK	19-FEB-1996	96080252
	Cadmium	180U		ug/L	TE SHOOK	19-FEB-1996	96080252
	Chromium	300U		ug/L	TE SHOOK	19-FEB-1996	96080252
	Lead	1780U		ug/L	TE SHOOK	19-FEB-1996	96080252
	Selenium	3590U		ug/L	TE SHOOK	19-FEB-1996	96080252
	Silver	490UN		ug/L	TE SHOOK	19-FEB-1996	96080252
SW846-7470	Mercury	10U		ug/L	RL POLK	21-FEB-1996	96080185
SW846-8080	PCB-1232	55UJ		ug/L	DH BLUE	17-FEB-1996	96160216M5
	PCB-1242	55UJ		ug/L	DH BLUE	17-FEB-1996	96160216M5
	PCB-1248	55UJ		ug/L	DH BLUE	17-FEB-1996	96160216M5
	PCB-1254	55UJ		ug/L	DH BLUE	17-FEB-1996	96160216M5
	PCB-1260	55UJ		ug/L	DH BLUE	17-FEB-1996	96160216M5
	PCB-1268	55UJ		ug/L	DH BLUE	17-FEB-1996	96160216M5
	Total PCB	55UJ		ug/L	DH BLUE	17-FEB-1996	96160216M5
SW846-9010A	Total Cyanide	0.2UJ		mg/L	SL LEMASTER	9-FEB-1996	96100213
SW846-9020A	TOX	1200		ug/g	DE COLLINS	23-FEB-1996	9616022 3T4
SW846-9030A	Sulfide	50U		mg/L	SL LEMASTER	8-FEB-1996	96100205
SW846-9040B	pH	5.11		pH units	SL LEMASTER	6-FEB-1996	96100190
TSD5[illegible]	Gross Alpha	UJ<1.3		pCi/mL	JP BREWSTER	15-MAR-1996	96070365
	Gross Beta	10.4		pCi/mL	JP BREWSTER	15-MAR-1996	96070365
TSD553-380	Technetium	<0.9		pCi/mL	JP BREWSTER	15-MAR-1996	96070363

TSD553-440	Cesium-134	<0.1J		pCi/ml	WC ZUEFLE	17-FEB-1996	96070226
	Cesium-137	<0.2J		pCi/ml	WC ZUEFLE	17-FEB-1996	96070226
	Cobalt-60	<0.3J		pCi/ml	WC ZUEFLE	17-FEB-1996	96070226
	Gross Gamma	12.6J		pCi/ml	WC ZUEFLE	17-FEB-1996	96070226
TSD553-700	% U-235	ND	ND	%	CD GOOD	12-FEB-1996	96070187
	Alpha Activity	<1		pCi/mL	BW SHORT	12-FEB-1996	96070187
	Americium-241	<0.005	N/A	pCi/mL	CD GOOD	12-FEB-1996	96070188
	Neptunium-237	<0.016	N/A	pCi/mL	CD GOOD	12-FEB-1996	96070188
	Plutonium-238	<0.016	N/A	pCi/mL	CD GOOD	12-FEB-1996	96070188
	Plutonium-239/240	<0.016	N/A	pCi/mL	CD GOOD	12-FEB-1996	96070188
	Thorium-228	<0.050	N/A	pCi/mL	CD GOOD	12-FEB-1996	96070188
	Thorium-230	<0.039	N/A	pCi/mL	CD GOOD	12-FEB-1996	96070188
	Thorium-232	<0.041	N/A	pCi/mL	CD GOOD	12-FEB-1996	96070188
	Thorium-234	<0.068	N/A	pCi/mL	CD GOOD	12-FEB-1996	96070187
	Uranium	<0.20	NA	ug/mL	CD GOOD	12-FEB-1996	96070187

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
Arsenic	40000	35852.0	89.63
Barium	40000	39078.	97.69
Cadmium	40000	35862.	89.65
Chromium	40000	36672.0	91.68
Lead	40000	34360.0	85.90
Merc[illegible]	40.0	30.6	76.50
Sel	40000	37387.0	93.47
Silver	40000	616.0	1.54
TOX	5900	4400.	74.58

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)

********** COMMENT PAGE **********
********** 960206-023 **********

** Comments from the Radiochemistry Laboratory *****

GAMMA ACTIVITY RESULTS FOR 960206-023 ARE:

Analyte	Result(pCi/g)	+/-
K-40	12.0J	3.3J
Bi-214	0.6J	0.3J

***** Comments from the Environmental and Industrial Hygiene Laboratory *****

SW846-9010A cyanide result reported as an estimate due to blank spike outside acceptable QC limits (56% recovery). Replicate analysis was done with a result of 0.2UJ mg/L.

***** Comments from the Organic Analytical Services *****

Method SW846-3520: SV Extraction

Density problems were observed between sample and extraction solvent. Small amounts of liquid plated out onto extraction flask. More than 50 ml of H_2SO_4 was required to begin acidic extraction. Heat release and a color change from a dark clear brown to a cloudy light brown was observed during this [illegible]fication. A large amount of light precipitate made filtration of [illegible]ntrate necessary. The filtrate was reconcentrated to 2 ml volume.

SW846-8080:

Due to the high level of matrix interference an additional 1:10 dilution was required, which resulted in the surrogate being diluted out of the sample and the result estimated.

--Method SW846-8270A

The waste verification project involves samples from a variety of matrices. These matrices are greatly different. Typically, when a verification sample for semi-volatile analysis arrives at the laboratory, an assessment of the analytical approach to this sample is made. This process involves information available from previous characterization of the waste that is included in the sampling plan, as well as preliminary testing performed on portions of the sample in the lab. This assessment allows a decision to be made as to the preparation technique to be used while allowing the lowest sample quantitation limits to be obtained. This sample was initially evaluated and a determination to extract one liter of the sample by Liquid/Liquid (SW846-3520A) was made. This would yield the lowest quantitation limits possible.

The extraction technique proceeded smoothly until the concentration step. When the volume of extraction solvent was reduced, it became apparant that compounds (most likely inorganic salts) had been extracted from the sample and were now insoluble in the amount of methylene chloride solvent remaining. The conc[illegible]te was separated from the salt and filtered to remove additional r[illegible]ces. This filtrate was then concentrated to the normal final volume of

2 ml.

Recoveries below established criteria were found for 2-Methylphenol, 3(4)-Methylphenol, Hexachloroethane, Nitrobenzene, Hexachlorobutadiene, 2,4,6-Trichlorophenol, 2,4-Dinitrotoluene, and Hexachlorobenzene in the matrix spike extract of this sample. Five of six surrogate compounds failed to meet established criteria in the unspiked as well as the matrix spiked extract of this sample. The surrogates that failed were, 2-Fluorophenol, Phenol-d5, Nitrobenzene-d5, 2-Fluorobiphenyl, and Terphenyl-d14.

Compounds that exhibited less than 10% recovery in the matrix spike sample were not reported for this sample. These were, Hexachloroethane, Nitrobenzene, Hexachlorobutadiene, and 2,4-Dinitrotoluene. Compounds with greater than 10% recovery, but still below established criteria were reported as estimated sample quantitation limits. These compounds were, 2-Methylphenol, 3(4)-Methylphenol, 2,4,6-Trichlorophenol, and Hexachlorobenzene.

18 non-target compounds were detected. These compounds were searched against a mass spectral library. The matches obtained through this search were then either accepted or the compound was labeled as an unknown. A quantitation estimate was then made. The ANALIS LIMS system does not provide an adequate format for reporting this number of TICs, many of which were unknowns and should be reported with mass spectral data for the closest matches. The largest concentration estimate was for a TIC identified as molecular sulfur at 5000 ug/L. All other TIC information can be provided in standard laboratory format upon request.

SW846-9020A

Sample VER35685001 was analyzed by directly injecting sample into the pyrolysis system. This was done following " PROPOSED TEST METHOD FOR TOTAL CHLORINE IN USED OXIDATIVE COMBUSTION AND MICROCOULOMETRY". This procedure was obtained from the instrument manufacturer and will be included with the data package.

Definition Page for Qualifiers/Flags

********** 960206-023 **********

I .. ata Reporting Qualifiers and Flags:

oncentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

rrelation coefficient for MSA is less tha 0.995.

e value is between the LC and the LLD.

ltering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID:	960206-023	Customer Sample ID:	VER35685001
Laboratory:	Organic Analytical Services	Customer:	ENV RESTORATION
File ID:		Sample Matrix:	LIQUID WASTE
Instrument ID:	SV1	Requisition Number:	20209
Authorized By:	C. J. Van Meter	Date Sample Received:	6-FEB-1996
		Date Sampled:	5-FEB-1996

RCRA_SEMIVOLATILES

Date Extracted/Prepared:	12-FEB-1996	Date Analyzed:	23-FEB-1996
Analysis Procedure Number:	SW846-8270A	QA File Number:	96160223B01
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	BD FUHR
Associated Blank:			

CAS		ug/L	CAS		ug/L
95-48-7	2-Methylphenol	11UJ			
108-39-4	m-Cresol	11UJ			
106-44-5	4-Methylphenol	11UJ			
87-86-5	Pentachlorophenol	22U			
95-95-4	2,4,5-Trichlorophenol	11U			
88-06-2	2,4,6-Trichlorophenol	11UJ			
	Total Cresol	NA			
106-46-7	1,4-Dichlorobenzene	11U			
121-14-2	2,4-Dinitrotoluene	NR			
118-74-1	Hexachlorobenzene	11UJ			
	Hexachloro-1,3-butadiene	NR			
67-72-1	Hexachloroethane	NR			
98-95-3	Nitrobenzene	NR			
110-86-1	Pyridine				

ANALYSIS DATA REPORT

AnaLIS ID:	960206-023	Customer Sample ID:	VER35685001
Laboratory:	Organic Analytical Services	Customer:	ENV RESTORATION
File ID:		Sample Matrix:	LIQUID WASTE
Instrument ID:	5890#3	Requisition Number:	20209
Authorized By:	C. J. Van Meter	Date Sample Received:	6-FEB-1996
		Date Sampled:	5-FEB-1996

RCRA_VOLATILES

Date Extracted/Prepared:		Date Analyzed:	8-FEB-1996
Analysis Procedure Number:	SW846-8260A	QA File Number:	96160208A3
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	MA NOVOTNY
Associated Blank:			

CAS		ug/L	CAS		ug/L
71-43-2	Benzene	2U			
56-23-5	Carbon Tetrachloride	2U			
108-90-7	Chlorobenzene	2U			
67-66-3	Chloroform	2U			
107-06-2	1,2-Dichloroethane	2U			
75-35-4	1,1-Dichloroethene	2U			
78-93-3	2-Butanone	100U			
127-18-4	Tetrachloroethene	2U			
79-01-6	Trichloroethene	2U			
75-01-4	Vinyl Chloride	1U			

Waste Stream Number: Cascade-10

Waste Stream Title: Trap Material

Table 1. Summary Statistics for All Analy n the 1998 X-744G-06 Data Set (p. 1 of 3)

Analysis	Units	No. Results	- Analytical Nondetections - No.	#Lim	Low	High	---------- Analytical Detections ---------- No.	Min	Mean	Max	St. Dev.	Reg. Limit
PHYSICAL PROPERTIES												
Free Liquids	P/F	3	3	1	Pass	Pass	0	.	.	.	.	.
Moisture	%	3	0	0	.	.	3	0.5	1.133333	1.6	0.5686241	.
pH	pH units	3	0	0	.	.	3	4.4	4.523333	4.71	0.1644182	.
METALS												
Aluminum	ug/g	3	0	0	.	.	3	128000	213333.3	279000	77397.244	.
Antimony	ug/g	3	3	2	16.4	16.9	0	.	.	.	.	.
Arsenic	ug/g	3	3	2	17.7	18.2	0	.	.	.	.	.
Arsenic (TCLP)	mg/L	20	13	1	0.187	0.187	7	0.187	0.438429	0.778	0.2272663	5
Barium	ug/g	3	0	0	.	.	3	7.5	32.63333	66.8	30.664692	.
Barium (TCLP)	mg/L	20	0	0	.	.	20	0.037	0.90345	11.7	2.5643814	100
Beryllium	ug/g	3	2	1	0.83	0.83	1	1.5	1.5	1.5	.	.
Cadmium	ug/g	3	3	1	1.4	1.4	0	.	.	.	.	.
Cadmium (TCLP)	mg/L	20	15	1	0.014	0.014	5	0.0144	0.02008	0.028	0.0055975	1
Calcium	ug/g	3	0	0	.	.	3	229	305	405	90.421236	.
Chromium	ug/g	3	3	1	2.3	2.3	0	.	.	.	.	.
Chromium (TCLP)	mg/L	20	15	2	0.024	0.24	5	0.024	0.1282	0.304	0.1048389	5
Cobalt	ug/g	3	3	1	2.6	2.6	0	.	.	.	.	.
Copper	ug/g	3	3	2	2.4	2.5	0	.	.	.	.	.
Copper (TCLP)	mg/L	20	3	1	0.026	0.026	17	0.048	0.611647	7.92	1.8951796	.
Iron	ug/g	3	0	0	.	.	3	45.7	63.8	85.6	20.205692	.
Lead	ug/g	3	1	1	13.8	13.8	2	34.1	43.05	52	12.657211	.
Lead (TCLP)	mg/L	20	7	1	0.142	0.142	13	0.213	0.998692	3.89	1.0013889	5
Lithium	ug/g	3	0	0	.	.	3	4.2	7.533333	12.3	4.2359572	.
Magnesium	ug/g	3	0	0	.	.	3	65.9	76.03333	91.3	13.455606	.
Manganese	ug/g	3	0	0	.	.	3	66	112	148	41.904654	.
Mercury	ug/g	3	2	2	0.024	0.025	1	8.62	8.62	8.62	.	.
Mercury (TCLP)	mg/L	20	17	1	0.01	0.01	3	0.01	0.187333	0.4	0.1973863	0.2
Nickel	ug/g	3	3	2	4.9	5	0	.	.	.	.	.
Potassium	ug/g	3	3	2	313	322	0	.	.	.	.	.
Selenium	ug/g	3	3	2	27.1	27.9	0	.	.	.	.	.
Selenium (TCLP)	mg/L	20	14	1	0.287	0.287	6	0.287	0.3625	0.512	0.089234	1
Silver	ug/g	3	0	0	.	.	3	2.4	4.8	6.9	2.2649503	.
Silver (TCLP)	mg/L	20	14	1	0.04	0.04	6	0.04	0.071667	0.126	0.0350638	5
Sodium	ug/g	3	0	0	.	.	3	1980	4193.333	6740	2397.4431	.
Thallium	ug/g	3	2	2	22.9	23.6	1	35.5	35.5	35.5	.	.
Titanium	ug/g	3	0	0	.	.	3	42.2	60.73333	75.3	16.902761	.
Vanadium	ug/g	3	3	1	1.9	1.9	0	.	.	.	.	.
Zinc	ug/g	3	0	0	.	.	3	46.6	69.26667	102	29.039513	.
Zinc (TCLP)	mg/L	20	0	0	.	.	20	0.192	1.8096	23.4	5.0966198	.
INORGANICS												
Reactive Cyanide	ug/g	3	3	1	1	1	0	.	.	.	.	.
Reactive Sulfide	ug/g	3	3	1	75	75	0	.	.	.	.	.
ORGANICS												
Total Organic Carbon (TOC)	ug/g	3	1	1	300	300	2	410	855	1300	629.32504	.
Total Organic Halides (TOX)	ug/g	3	2	1	10	10	1	57	57	57	.	.
PCBs												
PCB (Total)	ug/g	3	3	1	0.5	0.5	0	.	.	.	.	.

Table 1. Summary Statistics for All Analy n the 1998 X-744G-06 Data Set (p. 2 of 3)

Analysis	Units	No. Results	- Analytical Nondetections - No.	#Lim	Low	High	Analytical Detections ---------- No.	Min	Mean	Max	St. Dev.	Reg. Limit
RADIOLOGICAL												
Alpha activity	pCi/g	3	0	0	.	.	3	55119	251384.3	439951	192531.48	.
Beta activity	pCi/g	3	0	0	.	.	3	72430	110901	162608	46523.238	.
Uranium (alpha)	ug/g	3	0	0	.	.	3	120782	175771	250554	67112.181	.
Uranium-232 (alpha)	pCi/g	3	3	3	11	614	0	.	.	.	.	.
Uranium-234 (alpha)	pCi/g	3	0	0	.	.	3	29700	235966.7	462700	217224.34	.
Uranium-235 (alpha)	pCi/g	3	0	0	.	.	3	1643	9481	16360	7405.22	.
Uranium-235 (gamma)	pCi/g	3	0	0	.	.	3	1409	5806.333	11610	5243.8946	.
Uranium-236 (alpha)	pCi/g	3	2	2	108	365	1	571	571	571	.	.
Uranium-238 (alpha)	pCi/g	3	0	0	.	.	3	40330	57576.67	82560	22152.545	.
Uranium-235 (Davies/Gray)	g/g	3	0	0	.	.	3	0.1198	0.1657	0.2474	0.0709343	.
% Uranium-235 (gamma)	Wt%	3	0	0	.	.	3	0.684	2.454667	5.06	2.3043102	.
Actinium-228 (gamma)	pCi/g	2	2	2	1.27	1.67	0	.	.	.	.	.
Americium-241 (alpha)	pCi/g	3	2	2	0.065	0.091	1	0.045	0.045	0.045	.	.
Americium-242 (alpha)	pCi/g	3	3	3	0.015	0.064	0	.	.	.	.	.
Americium-243 (alpha)	pCi/g	3	3	3	0.015	0.064	0	.	.	.	.	.
Antimony-125 (gamma)	pCi/g	2	2	2	1.88	2.4	0	.	.	.	.	.
Bismuth-212 (gamma)	pCi/g	2	2	2	4.52	5.67	0	.	.	.	.	.
Bismuth-214 (gamma)	pCi/g	2	2	2	1.16	1.44	0	.	.	.	.	.
Cerium-141 (gamma)	pCi/g	2	2	2	2.59	8.45	0	.	.	.	.	.
Cerium-144 (gamma)	pCi/g	2	2	2	8.77	21.9	0	.	.	.	.	.
Cesium-134 (gamma)	pCi/g	2	2	2	0.54	0.69	0	.	.	.	.	.
Cesium-137 (gamma)	pCi/g	2	2	2	0.62	0.77	0	.	.	.	.	.
Lead-212 (gamma)	pCi/g	2	2	2	1.64	2.98	0	.	.	.	.	.
Lead-214 (gamma)	pCi/g	2	2	2	3.38	5.68	0	.	.	.	.	.
Neptunium-237 (alpha)	pCi/g	3	1	1	0.098	0.098	2	0.68	0.7	0.72	0.0282843	.
Niobium-95 (gamma)	pCi/g	2	2	2	0.57	0.73	0	.	.	.	.	.
Plutonium-238 (alpha)	pCi/g	3	3	3	0.02	0.064	0	.	.	.	.	.
Plutonium-239/240 (alpha)	pCi/g	3	3	3	0.019	0.072	0	.	.	.	.	.
Plutonium-242 (alpha)	pCi/g	3	3	3	0.019	0.057	0	.	.	.	.	.
Plutonium-244 (alpha)	pCi/g	3	3	3	0.02	0.074	0	.	.	.	.	.
Potassium-40 (gamma)	pCi/g	3	0	0	.	.	3	5.17	6.786667	9.78	2.5950787	.
Protactinium-231 (gamma)	pCi/g	2	2	2	27.3	43.8	0	.	.	.	.	.
Protactinium-234m (gamma)	pCi/g	3	0	0	.	.	3	65400	82110	106400	21525.387	.
Radium-224 (gamma)	pCi/g	2	2	2	18	32.3	0	.	.	.	.	.
Radium-226 (gamma)	pCi/g	3	1	1	3.38	3.38	2	6.56	7.285	8.01	1.0253048	.
Radium-228 (gamma)	pCi/g	2	2	2	1.27	1.67	0	.	.	.	.	.
Ruthenium-103 (gamma)	pCi/g	2	2	2	0.64	0.8	0	.	.	.	.	.
Ruthenium-106 (gamma)	pCi/g	2	2	2	5.37	6.66	0	.	.	.	.	.
Technetium-99	pCi/g	3	1	1	154	154	2	2121	2477	2833	503.46003	.
Thallium-208 (gamma)	pCi/g	3	2	2	0.63	0.8	1	0.83	0.83	0.83	.	.
Thorium-228 (alpha)	pCi/g	3	1	1	0.22	0.22	2	1.6	1.7	1.8	0.1414214	.
Thorium-230 (alpha)	pCi/g	3	0	0	.	.	3	4.4	14.46667	22	9.0693623	.
Thorium-231 (alpha)	pCi/g	1	0	0	.	.	1	10440	10440	10440	.	.
Thorium-231 (gamma)	pCi/g	2	0	0	.	.	2	1268	4058	6848	3945.6558	.
Thorium-232 (alpha)	pCi/g	3	2	2	0.085	0.099	1	0.059	0.059	0.059	.	.
Thorium-234 (alpha)	pCi/g	1	0	0	.	.	1	82560	82560	82560	.	.
Thorium-234 (gamma)	pCi/g	2	0	0	.	.	2	12300	13645	14990	1902.1172	.
Zirconium-95 (gamma)	pCi/g	2	2	2	1.21	1.51	0	.	.	.	.	.

Plea see table notes on page 3.

Table 1 (Continued). Notes for Summary Statistics (p. 3 of 3)

1. There are forty-five containers of X-744G-06 trap material, including eight 55-gallon drums and thirty-seven "F-cans" (volume of approximately 0.3 cubic feet), and three Material Codes: 223, 224, and 225. Twenty containers were sampled. The distributions of the types of containers and material codes in the sub-population and in the sample (n=) are given in the following table.

Material Code	F-can	55 gal. Drum	Total Containers
223	6 / n=3	3 / n=2	9 / n=5
224	22 / n=9	4 / n=2	26 / n=11
225	9 / n=4	1 / n=0	10 / n=4
Total Containers	37 / n=16	8 / n=4	45 / n=20

2. A dum sample is the composite of four core samples from a drum. An F-can sample is the composite of several scoop samples from the top of a can.

2. The column "No. Results" is the number of containers sampled. None of the containers were sampled in duplicate.

3. The column "#Lim" is the number of distinct analytical detection limits. "Low" and "High" show the lowest and highest detection limits.

4. "Min," "Max," "Mean," and "St. Dev." are the minimum, maximum, mean, and standard deviation of the detected results.

5. The regulatory limits are the Toxicity Characteristics, D004-D0043. They were provided by Betchel Jacobs Waste Management personnel at Portsmouth.

6. The samples were analyzed by the Portsmouth Lockheed Martin Uranium Services Laboratory.

Table 2. Summary Statistics for All Analy[illegible] in the 1998 X-744G-06 Data Set (p. 1 of 2)
Where There Is At Least One Detected Result

Analysis	Units	No. Results	- Analytical Nondetections - No.	#Lim	Low	High	---------- Analytical Detections ---------- No.	Min	Mean	Max	St. Dev.	TCLP Limit
PHYSICAL PROPERTIES												
Moisture	%	3	0	0	.	.	3	0.5	1.133333	1.6	0.5686241	.
pH	pH units	3	0	0	.	.	3	4.4	4.523333	4.71	0.1644182	.
METALS												
Aluminum	ug/g	3	0	0	.	.	3	128000	213333.3	279000	77397.244	.
Arsenic (TCLP)	mg/L	20	13	1	0.187	0.187	7	0.187	0.438429	0.778	0.2272663	5
Barium	ug/g	3	0	0	.	.	3	7.5	32.63333	66.8	30.664692	.
Barium (TCLP)	mg/L	20	0	0	.	.	20	0.037	0.90345	11.7	2.5643814	100
Beryllium	ug/g	3	2	1	0.83	0.83	1	1.5	1.5	1.5	.	.
Cadmium (TCLP)	mg/L	20	15	1	0.014	0.014	5	0.0144	0.02008	0.028	0.0055975	1
Calcium	ug/g	3	0	0	.	.	3	229	305	405	90.421236	.
Chromium (TCLP)	mg/L	20	15	2	0.024	0.24	5	0.024	0.1282	0.304	0.1048389	5
Copper (TCLP)	mg/L	20	3	1	0.026	0.026	17	0.048	0.611647	7.92	1.8951796	.
Iron	ug/g	3	0	0	.	.	3	45.7	63.8	85.6	20.205692	.
Lead	ug/g	3	1	1	13.8	13.8	2	34.1	43.05	52	12.657211	.
Lead (TCLP)	mg/L	20	7	1	0.142	0.142	13	0.213	0.998692	3.89	1.0013889	5
Lithium	ug/g	3	0	0	.	.	3	4.2	7.533333	12.3	4.2359572	.
Magnesium	ug/g	3	0	0	.	.	3	65.9	76.03333	91.3	13.455606	.
Manganese	ug/g	3	0	0	.	.	3	66	112	148	41.904654	.
Mercury	ug/g	3	2	2	0.024	0.025	1	8.62	8.62	8.62	.	.
Mercury (TCLP)	mg/L	20	17	1	0.01	0.01	3	0.01	0.187333	0.4	0.1973863	0.2
Selenium (TCLP)	mg/L	20	14	1	0.287	0.287	6	0.287	0.3625	0.512	0.089234	1
Silver	ug/g	3	0	0	.	.	3	2.4	4.8	6.9	2.2649503	.
Silver (TCLP)	mg/L	20	14	1	0.04	0.04	6	0.04	0.071667	0.126	0.0350638	5
Sodium	ug/g	3	0	0	.	.	3	1980	4193.333	6740	2397.4431	.
Thallium	ug/g	3	2	2	22.9	23.6	1	35.5	35.5	35.5	.	.
Titanium	ug/g	3	0	0	.	.	3	42.2	60.73333	75.3	16.902761	.
Zinc	ug/g	3	0	0	.	.	3	46.6	69.26667	102	29.039513	.
Zinc (TCLP)	mg/L	20	0	0	.	.	20	0.192	1.8096	23.4	5.0966198	.
ORGANICS												
Total Organic Carbon (TOC)	ug/g	3	1	1	300	300	2	410	855	1300	629.32504	.
Total Organic Halides (TOX)	ug/g	3	2	1	10	10	1	57	57	57	.	.
RADIOLOGICAL												
Alpha activity	pCi/g	3	0	0	.	.	3	55119	251384.3	439951	192531.48	.
Beta activity	pCi/g	3	0	0	.	.	3	72430	110901	162608	46523.238	.
Uranium (alpha)	ug/g	3	0	0	.	.	3	120782	175771	250554	67112.181	.
Uranium-234 (alpha)	pCi/g	3	0	0	.	.	3	29700	235966.7	462700	217224.34	.
Uranium-235 (alpha)	pCi/g	3	0	0	.	.	3	1643	9481	16360	7405.22	.
Uranium-235 (gamma)	pCi/g	3	0	0	.	.	3	1409	5806.333	11610	5243.8946	.
Uranium-236 (alpha)	pCi/g	3	2	2	108	365	1	571	571	571	.	.
Uranium-238 (alpha)	pCi/g	3	0	0	.	.	3	40330	57576.67	82560	22152.545	.
Uranium-235 (Davies/Gray)	g/g	3	0	0	.	.	3	0.1198	0.1657	0.2474	0.0709343	.
% Uranium-235 (gamma)	Wt%	3	0	0	.	.	3	0.684	2.454667	5.06	2.3043102	.
Americium-241 (alpha)	pCi/g	3	2	2	0.065	0.091	1	0.045	0.045	0.045	.	.
Neptunium-237 (alpha)	pCi/g	3	1	1	0.098	0.098	2	0.68	0.7	0.72	0.0282843	.
Potassium-40 (gamma)	pCi/g	3	0	0	.	.	3	5.17	6.786667	9.78	2.5950787	.
Protactinium-234m (gamma)	pCi/g	3	0	0	.	.	3	65400	82110	106400	21525.387	.
Rad[illegible]226 (gamma)	pCi/g	3	1	1	3.3[illegible]	3.38	2	6.56	7.285	8.01	1.0253048	.

Table 2. Summary Statistics for All Analysis in the 1998 X-744G-06 Data Set (p. 2 of 2)
Where There Is At Least One Detected Result

Analysis	Units	No. Results	- Analytical Nondetections - No.	#Lim	Low	High	---------- Analytical Detections ---------- No.	Min	Mean	Max	St. Dev.	TCLP Limit
Technetium-99	pCi/g	3	1	1	154	154	2	2121	2477	2833	503.46003	.
Thallium-208 (gamma)	pCi/g	3	2	2	0.63	0.8	1	0.83	0.83	0.83	.	.
Thorium-228 (alpha)	pCi/g	3	1	1	0.22	0.22	2	1.6	1.7	1.8	0.1414214	.
Thorium-230 (alpha)	pCi/g	3	0	0	.	.	3	4.4	14.46667	22	9.0693623	.
Thorium-231 (alpha)	pCi/g	1	0	0	.	.	1	10440	10440	10440	.	.
Thorium-231 (gamma)	pCi/g	2	0	0	.	.	2	1268	4058	6848	3945.6558	.
Thorium-232 (alpha)	pCi/g	3	2	2	0.085	0.099	1	0.059	0.059	0.059	.	.
Thorium-234 (alpha)	pCi/g	1	0	0	.	.	1	82560	82560	82560	.	.
Thorium-234 (gamma)	pCi/g	2	0	0	.	.	2	12300	13645	14990	1902.1172	.

Please see the notes for Table 1.

Table 2a. Summary Statistics for All Analy in the 1998 X-744G-06 Data Set (p. 1 of 1)
Where There Is a TCLP Limit

Analysis	Units	No. Results	- Analytical Nondetections - No.	#Lim	Low	High	---------- Analytical Detections ---------- No.	Min	Mean	Max	St. Dev.	TCLP Limit
METALS												
Arsenic (TCLP)	mg/L	20	13	1	0.187	0.187	7	0.187	0.438429	0.778	0.2272663	5
Barium (TCLP)	mg/L	20	0	0	.	.	20	0.037	0.90345	11.7	2.5643814	100
Cadmium (TCLP)	mg/L	20	15	1	0.014	0.014	5	0.0144	0.02008	0.028	0.0055975	1
Chromium (TCLP)	mg/L	20	15	2	0.024	0.24	5	0.024	0.1282	0.304	0.1048389	5
Lead (TCLP)	mg/L	20	7	1	0.142	0.142	13	0.213	0.998692	3.89	1.0013889	5
Mercury (TCLP)	mg/L	20	17	1	0.01	0.01	3	0.01	0.187333	0.4	0.1973863	0.2
Selenium (TCLP)	mg/L	20	14	1	0.287	0.287	6	0.287	0.3625	0.512	0.089234	1
Silver (TCLP)	mg/L	20	14	1	0.04	0.04	6	0.04	0.071667	0.126	0.0350638	5

Please see the notes for Table 1.

Table 3. Summary of SW-846 Upper Confidence Bounds and Statistical Testing on 1998 X-744G-06 Data Set (p. 1 of 2)

Analysis	Units	Statistical Distribution	No. Res.	No. Det's	Data Min	Data Max	"Max Mean"	"Max Std Error"	SW-846 90% UCB: $Mean_{max}$ +t*SE_{max}	Approx. # SE_{max} < Limit	90% UCB: Alt. Stat Method	TCLP Limit	Statistical Conclusion
Arsenic (TCLP)	mg/L	Insuf Detects	20	7	0.187	0.778	0.275	0.0558	0.3491	84.63	.	5	Nonhazardous
Barium (TCLP)	mg/L	Lognormal	20	20	0.037	11.7	0.9035	0.5734	1.6648	172.8	1.2697	100	Nonhazardous
Cadmium (TCLP)	mg/L	Insuf Detects	20	5	0.014	0.028	0.0155	0.0021	0.0183	474.3	.	1	Nonhazardous
Chromium (TCLP)	mg/L	Insuf Detects	20	5	0.024	0.304	0.0609	0.0176	0.0842	280.6	.	5	Nonhazardous
Lead (TCLP)	mg/L	Unknown	20	13	0.142	3.89	0.6989	0.2088	0.9761	20.6	1.0341	5	Nonhazardous
Mercury (TCLP)	mg/L	Insuf Detects	20	3	0.01	0.4	0.0366	0.021	0.0645	7.785	0.0783	0.2	Nonhazardous
Selenium (TCLP)	mg/L	Insuf Detects	20	6	0.287	0.512	0.3097	0.0395	0.362	17.49	0.2506	1	Nonhazardous
Silver (TCLP)	mg/L	Insuf Detects	20	6	0.04	0.126	0.0495	0.0085	0.0608	579.6	.	5	Nonhazardous

Notes:

1. 90% upper confidence bounds were calculated from results from twenty different containers. None of the containers were sampled in duplicate. No modification was made for the different types of containers or different material codes.

2. Statistical Conclusions:

   Nonhazardous - By the principles and guidelines of SW-846, the upper 90% confidence bound on the mean is less than the regulatory limit.

   Hazardous - By the principles and guidelines of SW-846, the upper 90% confidence bound on the mean is greater than the regulatory limit.

3. Statistical distributions and data transformations were examined. The original results were statistically tested for agreement with a normal distribution using the Shapiro-Wilk test (please see the histograms, Figures 1-20). If the results failed normality, they were transformed using the logarithm, square root, cubed root, reciprocal, and the reciprocal of the squared and cubed results, and the reciprocal of the square root and cubed root. The transformed results were tested for normality.

   Normal - The analytical results pass a statistical test for following a normal distribution. An exact 90% upper confidence bound on the mean can be based on the t-statistic and calculated from expressions in SW-846.

   Lognormal - The logarithm of the results pass a statistical test for following a normal distribution. An exact 90% upper confidence bound on the mean can be calculated from expressions derived from the lognormal distribution.

   Unknown - No "simple" mathematical transformation could be found that yielded transformed results that pass the statistical test for following a normal distribution. However, the central limit theorem (CLT) of statistics says that data averages tend to have a normal distribution, regardless of the underlying distribution of the results. By the CLT, a t-based, approximate 90% upper confidence bound can be calculated for unknown distributions.

   Insuf Detects - There are an insufficient number of analytical detections to reliably evaluate the underlying statistical distribution. Conservatively high estimates of the mean and standard deviation are used. The t-based UCB provides an approximate 90% bound. Please see notes 6-8.

4. "No. Res" is the number of analytical results. "No. Det's" is the number of analytical detections.

5. "Data Min" and "Data Max" are the minimum and maximum results. The minimum and maximum results are not labeled as detected or nondetected. Detected min and max, and nondetected min and max are given in Table 1.

6. The "Max Mean" was determined by averaging over the detected results and the detection limits. As a result, "Max Mean" conservatively overestimates the true population mean.

7. The "Max Standard Error" approximates the variability of the mean. It is the "maximum standard deviation" divided by the square root of the number of results. The "maximum standard deviation" is the larger of either (a) the standard deviation of the results, as reported by the lab, or (b) the standard deviation of the results with zeros substituted for the nondetected results. As a result, "max standard deviation" and "max standard error" conservatively overestimate the true population standard deviations.

8. $Mean_{max} + t_c * SE_{max}$ is a conservatively high approximation of the SW-846 90% upper confidence bound on the population mean, where $Mean_{max}$ is "Max Mean," SE_{max} is "Max Standard Error of the Mean.," and t_c is the upper .90th quantile of the t-distribution with n-1 degrees of freedom. For n=20, there are 19 degrees of freedom, and t_c=1.328. By SW-846, chapter 9, if $Mean_{max} + t_c * SEmax$ is less than the regulatory limit, the chemical contaminant is considered not present in the waste at a hazardous concentration.

9. The "Approx. No. SE_{max} < Limit" is an approximate number of standard errors of the mean that "Max Mean" is less than the limit. This number must be greater than t=1.328 for n=20 for the contaminant to be found "nonhazardous." The larger "No. of SE_{max} < Limit" is, the less likely that the contaminant is present at a hazardous level. Because these numbers are so much greater than 1.328, the effects non-normality and the presence of nondetected results are of less concern. Please see Technical Note 1 in the memo.

10. "90% UCB: Alternative Statistical Methods" are UCBs calculated by methods other than the t-based, SW-846, UCB calculation. The t-based UCB is the exact calculation when the results have a normal distribution. The following statistical methods were used to calculate the "alternative" 90% UCBs:

When the logarithms of the results pass a test for following a normal distribution, the alternative UCB is from an exact calculation derived from the lognormal distribution (please see note 11 below). This exact calculation is more accurate than the t-based calculation when the underlying distribution is lognormal.

When the underlying statistical distribution of the results could not be determined or there are an insufficient number of detected results, a nonparametric "bootstrap" method was used to estimate a 90% UCB on the mean. The BC_a ("bias-corrected and accelerated") bootstrap upper confidence bounds were calculated (please see 12 below). If the randomly selected result was an analytical nondetection, a uniformly distributed result between zero and the DL was generated. There were 1,000,000 "re-samples" used in a bootstrapping calculation.

11. "Lognormal 90% UCB" gives the exact calculation for a 90% upper confidence bound on the mean when the results have a lognormal distribution. The equation is given by R. O. Gilbert, in *Statistical Methods for Environmental Pollution Monitoring*, Van Nostrand Reinhold Co., chapter 13, pp. 169-171, 1987.

12. The BC_a bootstrapped approximate 90% upper confidence bound is a nonparametric calculation. It does not require the underlying distribution to be known. The BC_a method is described in "Better Bootstrap Confidence Intervals," by Bradley Efron, Vol. 82, 1987, of the Journal of the American Statistical Association, pp. 171-185, and in *An Introduction to the Bootstrap* by Bradley Efron and Robert J. Tibshirani, Chapman & Hall, New York, 1993, pp 185-186. Please see Technical Note 2 in the memo.

13. The regulatory limits are the Toxicity Characteristics, D004-D043. They have the same measurement units as the analyses (mg/L).

14. A 90% UCB for TCLP Barium was also calculated by the BC_a bootstrap method. Bootstrapping gave an UCB of 2.1097. This is higher than the lognormal UCB of 1.2697, and closer to the t-based UCB of 1.6648. This is likely due to highly skewed distribution. The logarithms of the results are only "marginally" normal and the lognormal distribution may not adequately fit the upper tail of the data distribution. Of the three UCBs, the bootstrapped UCB is probably the most reliable. Regardless, all three are well under the TCLP limit of 100.

Table 4. A List of All Results in the 1998 X-744G-06 Data Set That Exceed a TCLP Limit

Analysis	Units	Sample ID	Type of Result	n	Result	TCLP Limit (mg/L)
Mercury (TCLP)	mg/L	F000960X744G06	Detection	1	0.4	0.2

Notes:

1. This is a complete listing of all individual analytical results, detected and nondetected, that exceed a TCLP limit.

2. TCLP Mercury passes the SW-846 statistical test. Please see Table 3.

Table 5. 1998 Data from Samples of +G-06 LEU Trap Material (p. 1 of 9)

Analysis	Result	Qualifier	Units	Laboratory ID	Sample ID	Date Complete	Date Sampled	Procedure
Free Liquids	Pass		P/F	980203-102	22225548X744G06	07MAR98	27FEB98	SW846-9095
Free Liquids	Pass		P/F	980128-066	F000960X744G06	06MAR98	27FEB98	SW846-9095
Free Liquids	Pass		P/F	980130-026	F005392X744G06	07MAR98	27FEB98	SW846-9095
Moisture	0.5		%	980203-102	22225548X744G06	07MAR98	25FEB98	ASTM-D2216
Moisture	1.3		%	980128-066	F000960X744G06	06MAR98	25FEB98	ASTM-D2216
Moisture	1.6		%	980130-026	F005392X744G06	07MAR98	25FEB98	ASTM-D2216
pH	4.4		pH units	980203-102	22225548X744G06	07MAR98	17FEB98	SW846-9045C
pH	4.46		pH units	980128-066	F000960X744G06	06MAR98	17FEB98	SW846-9045C
pH	4.71		pH units	980130-026	F005392X744G06	07MAR98	17FEB98	SW846-9045C
Aluminum	128000		ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Aluminum	233000		ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Aluminum	279000		ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Antimony	16.4	UN	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Antimony	16.4	UN	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Antimony	16.9	UN	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Arsenic	17.7	UN	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Arsenic	17.7	UN	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Arsenic	18.2	UN	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Arsenic (TCLP)	0.187		mg/L	X980980036	22006324X744G	30MAR98	30APR98	SW8466010A(TCLP)
Arsenic (TCLP)	0.462	B	mg/L	980204-014	22225540X744G06	10MAR98	10MAR98	1311/6010-2
Arsenic (TCLP)	0.687	B*	mg/L	980203-102	22225548X744G06	07MAR98	07MAR98	1311/6010-2
Arsenic (TCLP)	0.443	B	mg/L	980204-015	22225553X744G06	10MAR98	10MAR98	1311/6010-2
Arsenic (TCLP)	0.187	U	mg/L	980128-066	F000960X744G06	06MAR98	04MAR98	1311/6010-2
Arsenic (TCLP)	0.187	U	mg/L	980129-004	F000967X744G06	04MAR98	04MAR98	1311/6010-2
Arsenic (TCLP)	0.187	U	mg/L	980129-005	F000972X744G06	04MAR98	04MAR98	1311/6010-2
Arsenic (TCLP)	0.187	U	mg/L	980129-001	F001568X744G06	04MAR98	04MAR98	1311/6010-2
Arsenic (TCLP)	0.187	U	mg/L	980129-006	F002986X744G06	04MAR98	04MAR98	1311/6010-2
Arsenic (TCLP)	0.187	U	mg/L	980129-007	F003219X744G06	04MAR98	04MAR98	1311/6010-2
Arsenic (TCLP)	0.187	U	mg/L	980130-027	F003592X744G06	07MAR98	07MAR98	1311/6010-2
Arsenic (TCLP)	0.291	B	mg/L	980130-028	F003595X744G06	07MAR98	07MAR98	1311/6010-2
Arsenic (TCLP)	0.187	U	mg/L	980130-029	F004119X744G06	07MAR98	07MAR98	1311/6010-2
Arsenic (TCLP)	0.187	U	mg/L	980130-026	F005392X744G06	07MAR98	07MAR98	1311/6010-2
Arsenic (TCLP)	0.187	U	mg/L	980130-031	F005654X744G06	07MAR98	07MAR98	1311/6010-2
Arsenic (TCLP)	0.187	U	mg/L	980130-032	F005667X744G06	07MAR98	07MAR98	1311/6010-2
Arsenic (TCLP)	0.187	U	mg/L	980130-030	F005683X744G06	07MAR98	07MAR98	1311/6010-2
Arsenic (TCLP)	0.778	B	mg/L	980129-003	F012672X744G06	04MAR98	04MAR98	1311/6010-2
Arsenic (TCLP)	0.187	U	mg/L	980129-002	F991703X744G06	04MAR98	04MAR98	1311/6010-2
Arsenic (TCLP)	0.221	B	mg/L	980130-033	F995031X744G06	07MAR98	07MAR98	1311/6010-2
Barium	7.5	B	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Barium	23.6	B	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Barium	66.8	B	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Barium (TCLP)	11.7		mg/L	X980980036	22006324X744G	30MAR98	30APR98	SW8466010A(TCLP)
Barium (TCLP)	0.099	B	mg/L	980204-014	22225540X744G06	10MAR98	10MAR98	1311/6010-2
Barium (TCLP)	0.037	B	mg/L	980203-102	22225548X744G06	07MAR98	07MAR98	1311/6010-2
Barium (TCLP)	0.068	B	mg/L	980204-015	22225553X744G06	10MAR98	10MAR98	1311/6010-2
Barium (TCLP)	1.31		mg/L	980128-066	F000960X744G06	06MAR98	04MAR98	1311/6010-2
Barium (TCLP)	0.09	B	mg/L	980129-004	F000967X744G06	04MAR98	04MAR98	1311/6010-2
Barium (TCLP)	0.484		mg/L	980129-005	F000972X744G06	04MAR98	04MAR98	1311/6010-2
Barium (TCLP)	0.947		mg/L	980129-001	F001568X744G06	04MAR98	04MAR98	1311/6010-2
Barium (TCLP)	0.325	B	mg/L	980129-006	F002986X744G06	04MAR98	04MAR98	1311/6010-2
Barium (TCLP)	0.285	B	mg/L	980129-007	F003219X744G06	04MAR98	04MAR98	1311/6010-2

Table 5. 1998 Data from Samples of ,G-06 LEU Trap Material (p. 2 of 9)

Analysis	Result	Qualifier	Units	Laboratory ID	Sample ID	Date Complete	Date Sampled	Procedure
Barium (TCLP)	0.088	B	mg/L	980130-027	F003592X744G06	07MAR98	07MAR98	1311/6010-2
Barium (TCLP)	0.057	B	mg/L	980130-028	F003595X744G06	07MAR98	07MAR98	1311/6010-2
Barium (TCLP)	0.099	B	mg/L	980130-029	F004119X744G06	07MAR98	07MAR98	1311/6010-2
Barium (TCLP)	0.418	B	mg/L	980130-026	F005392X744G06	07MAR98	07MAR98	1311/6010-2
Barium (TCLP)	0.145	B	mg/L	980130-031	F005654X744G06	07MAR98	07MAR98	1311/6010-2
Barium (TCLP)	0.098	B	mg/L	980130-032	F005667X744G06	07MAR98	07MAR98	1311/6010-2
Barium (TCLP)	0.152	B	mg/L	980130-030	F005683X744G06	07MAR98	07MAR98	1311/6010-2
Barium (TCLP)	0.373	B	mg/L	980129-003	F012672X744G06	04MAR98	04MAR98	1311/6010-2
Barium (TCLP)	0.866		mg/L	980129-002	F991703X744G06	04MAR98	04MAR98	1311/6010-2
Barium (TCLP)	0.428	B	mg/L	980130-033	F995031X744G06	07MAR98	07MAR98	1311/6010-2
Beryllium	0.83	U	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Beryllium	0.83	U	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Beryllium	1.5	B	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Cadmium	1.4	U	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Cadmium	1.4	U	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Cadmium	1.4	U	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Cadmium (TCLP)	0.0144		mg/L	X980980036	22006324X744G	30MAR98	30APR98	SW8466010A(TCLP)
Cadmium (TCLP)	0.022	B	mg/L	980204-014	22225540X744G06	10MAR98	10MAR98	1311/6010-2
Cadmium (TCLP)	0.014	U	mg/L	980203-102	22225548X744G06	07MAR98	07MAR98	1311/6010-2
Cadmium (TCLP)	0.015	B	mg/L	980204-015	22225553X744G06	10MAR98	10MAR98	1311/6010-2
Cadmium (TCLP)	0.021	B	mg/L	980128-066	F000960X744G06	06MAR98	04MAR98	1311/6010-2
Cadmium (TCLP)	0.014	U	mg/L	980129-004	F000967X744G06	04MAR98	04MAR98	1311/6010-2
Cadmium (TCLP)	0.028	B	mg/L	980129-005	F000972X744G06	04MAR98	04MAR98	1311/6010-2
Cadmium (TCLP)	0.014	U	mg/L	980129-001	F001568X744G06	04MAR98	04MAR98	1311/6010-2
Cadmium (TCLP)	0.014	U	mg/L	980129-006	F002986X744G06	04MAR98	04MAR98	1311/6010-2
Cadmium (TCLP)	0.014	U	mg/L	980129-007	F003219X744G06	04MAR98	04MAR98	1311/6010-2
Cadmium (TCLP)	0.014	U	mg/L	980130-027	F003592X744G06	07MAR98	07MAR98	1311/6010-2
Cadmium (TCLP)	0.014	U	mg/L	980130-028	F003595X744G06	07MAR98	07MAR98	1311/6010-2
Cadmium (TCLP)	0.014	U	mg/L	980130-029	F004119X744G06	07MAR98	07MAR98	1311/6010-2
Cadmium (TCLP)	0.014	U	mg/L	980130-026	F005392X744G06	07MAR98	07MAR98	1311/6010-2
Cadmium (TCLP)	0.014	U	mg/L	980130-031	F005654X744G06	07MAR98	07MAR98	1311/6010-2
Cadmium (TCLP)	0.014	U	mg/L	980130-032	F005667X744G06	07MAR98	07MAR98	1311/6010-2
Cadmium (TCLP)	0.014	U	mg/L	980130-030	F005683X744G06	07MAR98	07MAR98	1311/6010-2
Cadmium (TCLP)	0.014	U	mg/L	980129-003	F012672X744G06	04MAR98	04MAR98	1311/6010-2
Cadmium (TCLP)	0.014	U	mg/L	980129-002	F991703X744G06	04MAR98	04MAR98	1311/6010-2
Cadmium (TCLP)	0.014	U	mg/L	980130-033	F995031X744G06	07MAR98	07MAR98	1311/6010-2
Calcium	229	B	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Calcium	405	B	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Calcium	281	B	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Chromium	2.3	U	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Chromium	2.3	U	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Chromium	2.3	U	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Chromium (TCLP)	0.024		mg/L	X980980036	22006324X744G	30MAR98	30APR98	SW8466010A(TCLP)
Chromium (TCLP)	0.024	U	mg/L	980204-014	22225540X744G06	10MAR98	10MAR98	1311/6010-2
Chromium (TCLP)	0.024	U	mg/L	980203-102	22225548X744G06	07MAR98	07MAR98	1311/6010-2
Chromium (TCLP)	0.024	U	mg/L	980204-015	22225553X744G06	10MAR98	10MAR98	1311/6010-2
Chromium (TCLP)	0.092	B	mg/L	980128-066	F000960X744G06	06MAR98	04MAR98	1311/6010-2
Chromium (TCLP)	0.024	U	mg/L	980129-004	F000967X744G06	04MAR98	04MAR98	1311/6010-2
Chromium (TCLP)	0.122	B	mg/L	980129-005	F000972X744G06	04MAR98	04MAR98	1311/6010-2
Chromium (TCLP)	0.099	B	mg/L	980129-001	F001568X744G06	04MAR98	04MAR98	1311/6010-2
Chromium (TCLP)	0.024	U	mg/L	980129-006	F002986X744G06	04MAR98	04MAR98	1311/6010-2

Table 5. 1998 Data from Samples of .4G-06 LEU Trap Material (p. 3 of 9)

Analysis	Result	Qualifier	Units	Laboratory ID	Sample ID	Date Complete	Date Sampled	Procedure
Chromium (TCLP)	0.24	U	mg/L	980129-007	F003219X744G06	04MAR98	04MAR98	1311/6010-2
Chromium (TCLP)	0.024	U	mg/L	980130-027	F003592X744G06	07MAR98	07MAR98	1311/6010-2
Chromium (TCLP)	0.024	U	mg/L	980130-028	F003595X744G06	07MAR98	07MAR98	1311/6010-2
Chromium (TCLP)	0.024	U	mg/L	980130-029	F004119X744G06	07MAR98	07MAR98	1311/6010-2
Chromium (TCLP)	0.024	U	mg/L	980130-026	F005392X744G06	07MAR98	07MAR98	1311/6010-2
Chromium (TCLP)	0.024	U	mg/L	980130-031	F005654X744G06	07MAR98	07MAR98	1311/6010-2
Chromium (TCLP)	0.024	U	mg/L	980130-032	F005667X744G06	07MAR98	07MAR98	1311/6010-2
Chromium (TCLP)	0.024	U	mg/L	980130-030	F005683X744G06	07MAR98	07MAR98	1311/6010-2
Chromium (TCLP)	0.304	B	mg/L	980129-003	F012672X744G06	04MAR98	04MAR98	1311/6010-2
Chromium (TCLP)	0.024	U	mg/L	980129-002	F991703X744G06	04MAR98	04MAR98	1311/6010-2
Chromium (TCLP)	0.024	U	mg/L	980130-033	F995031X744G06	07MAR98	07MAR98	1311/6010-2
Cobalt	2.6	U	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Cobalt	2.6	U	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Cobalt	2.6	U	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Copper	2.4	U	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Copper	2.4	U	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Copper	2.5	U	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Copper (TCLP)	7.92		mg/L	X980980036	22006324X744G	30MAR98	30APR98	SW8466010A(TCLP)
Copper (TCLP)	0.114	B	mg/L	980204-014	22225540X744G06	10MAR98	10MAR98	1311/6010-2
Copper (TCLP)	0.337	B*	mg/L	980203-102	22225548X744G06	07MAR98	07MAR98	1311/6010-2
Copper (TCLP)	0.055	B	mg/L	980204-015	22225553X744G06	10MAR98	10MAR98	1311/6010-2
Copper (TCLP)	0.926		mg/L	980128-066	F000960X744G06	06MAR98	04MAR98	1311/6010-2
Copper (TCLP)	0.026	U	mg/L	980129-004	F000967X744G06	04MAR98	04MAR98	1311/6010-2
Copper (TCLP)	0.091	B	mg/L	980129-005	F000972X744G06	04MAR98	04MAR98	1311/6010-2
Copper (TCLP)	0.212	B	mg/L	980129-001	F001568X744G06	04MAR98	04MAR98	1311/6010-2
Copper (TCLP)	0.121	BN	mg/L	980129-006	F002986X744G06	04MAR98	04MAR98	1311/6010-2
Copper (TCLP)	0.048	B	mg/L	980129-007	F003219X744G06	04MAR98	04MAR98	1311/6010-2
Copper (TCLP)	0.061	B	mg/L	980130-027	F003592X744G06	07MAR98	07MAR98	1311/6010-2
Copper (TCLP)	0.069	B	mg/L	980130-028	F003595X744G06	07MAR98	07MAR98	1311/6010-2
Copper (TCLP)	0.104	B	mg/L	980130-029	F004119X744G06	07MAR98	07MAR98	1311/6010-2
Copper (TCLP)	0.052	B	mg/L	980130-026	F005392X744G06	07MAR98	07MAR98	1311/6010-2
Copper (TCLP)	0.026	U	mg/L	980130-031	F005654X744G06	07MAR98	07MAR98	1311/6010-2
Copper (TCLP)	0.067	B	mg/L	980130-032	F005667X744G06	07MAR98	07MAR98	1311/6010-2
Copper (TCLP)	0.078	B	mg/L	980130-030	F005683X744G06	07MAR98	07MAR98	1311/6010-2
Copper (TCLP)	0.052	B	mg/L	980129-003	F012672X744G06	04MAR98	04MAR98	1311/6010-2
Copper (TCLP)	0.091	B	mg/L	980129-002	F991703X744G06	04MAR98	04MAR98	1311/6010-2
Copper (TCLP)	0.026	U	mg/L	980130-033	F995031X744G06	07MAR98	07MAR98	1311/6010-2
Iron	60.1	BN	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Iron	85.6	BN	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Iron	45.7	BN	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Lead	52	BN	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Lead	34.1	BN	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Lead	13.8	UN	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Lead (TCLP)	1.89		mg/L	X980980036	22006324X744G	30MAR98	30APR98	SW8466010A(TCLP)
Lead (TCLP)	0.732	B	mg/L	980204-014	22225540X744G06	10MAR98	10MAR98	1311/6010-2
Lead (TCLP)	1.05	B	mg/L	980203-102	22225548X744G06	07MAR98	07MAR98	1311/6010-2
Lead (TCLP)	1.57	B	mg/L	980204-015	22225553X744G06	10MAR98	10MAR98	1311/6010-2
Lead (TCLP)	0.58	B	mg/L	980128-066	F000960X744G06	06MAR98	04MAR98	1311/6010-2
Lead (TCLP)	0.142	U	mg/L	980129-004	F000967X744G06	04MAR98	04MAR98	1311/6010-2
Lead (TCLP)	0.662	B	mg/L	980129-005	F000972X744G06	04MAR98	04MAR98	1311/6010-2
Lead (TCLP)	0.142	U	mg/L	980129-001	F001568X744G06	04MAR98	04MAR98	1311/6010-2

Table 5. 1998 Data from Samples of 4G-06 LEU Trap Material (p. 4 of 9)

Analysis	Result	Qualifier	Units	Laboratory ID	Sample ID	Date Complete	Date Sampled	Procedure
Lead (TCLP)	0.213	B	mg/L	980129-006	F002986X744G06	04MAR98	04MAR98	1311/6010-2
Lead (TCLP)	0.142	U	mg/L	980129-007	F003219X744G06	04MAR98	04MAR98	1311/6010-2
Lead (TCLP)	0.367	B	mg/L	980130-027	F003592X744G06	07MAR98	07MAR98	1311/6010-2
Lead (TCLP)	0.296	B	mg/L	980130-028	F003595X744G06	07MAR98	07MAR98	1311/6010-2
Lead (TCLP)	0.142	U	mg/L	980130-029	F004119X744G06	07MAR98	07MAR98	1311/6010-2
Lead (TCLP)	0.142	U	mg/L	980130-026	F005392X744G06	07MAR98	07MAR98	1311/6010-2
Lead (TCLP)	0.263	B	mg/L	980130-031	F005654X744G06	07MAR98	07MAR98	1311/6010-2
Lead (TCLP)	0.732	B	mg/L	980130-032	F005667X744G06	07MAR98	07MAR98	1311/6010-2
Lead (TCLP)	0.142	U	mg/L	980130-030	F005683X744G06	07MAR98	07MAR98	1311/6010-2
Lead (TCLP)	0.738	B	mg/L	980129-003	F012672X744G06	04MAR98	04MAR98	1311/6010-2
Lead (TCLP)	3.89		mg/L	980129-002	F991703X744G06	04MAR98	04MAR98	1311/6010-2
Lead (TCLP)	0.142	U	mg/L	980130-033	F995031X744G06	07MAR98	07MAR98	1311/6010-2
Lithium	6.1		ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Lithium	12.3		ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Lithium	4.2		ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Magnesium	70.9	B	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Magnesium	91.3	B	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Magnesium	65.9	B	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Manganese	66	BN	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Manganese	122	BN	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Manganese	148	BN	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Mercury	0.024	U	ug/g	980203-102	22225548X744G06	07MAR98	03MAR98	SW846-7470A
Mercury	8.62	W	ug/g	980128-066	F000960X744G06	06MAR98	03MAR98	SW846-7470A
Mercury	0.025	UN	ug/g	980130-026	F005392X744G06	07MAR98	03MAR98	SW846-7470A
Mercury (TCLP)	0.01		mg/L	X980980036	22006324X744G	30MAR98	20APR98	SW8467470A(TCLP)
Mercury (TCLP)	0.01	U	mg/L	980204-014	22225540X744G06	10MAR98	10MAR98	1311/7470
Mercury (TCLP)	0.01	U	mg/L	980203-102	22225548X744G06	07MAR98	07MAR98	1311/7470
Mercury (TCLP)	0.01	U	mg/L	980204-015	22225553X744G06	10MAR98	10MAR98	1311/7470
Mercury (TCLP)	0.4	W	mg/L	980128-066	F000960X744G06	06MAR98	04MAR98	1311/7470
Mercury (TCLP)	0.152		mg/L	980129-004	F000967X744G06	04MAR98	04MAR98	1311/7470
Mercury (TCLP)	0.01	U	mg/L	980129-005	F000972X744G06	04MAR98	04MAR98	1311/7470
Mercury (TCLP)	0.01	UN	mg/L	980129-001	F001568X744G06	04MAR98	04MAR98	1311/7470
Mercury (TCLP)	0.01	U	mg/L	980129-006	F002986X744G06	04MAR98	04MAR98	1311/7470
Mercury (TCLP)	0.01	U	mg/L	980129-007	F003219X744G06	04MAR98	04MAR98	1311/7470
Mercury (TCLP)	0.01	U	mg/L	980130-027	F003592X744G06	07MAR98	07MAR98	1311/7470
Mercury (TCLP)	0.01	U	mg/L	980130-028	F003595X744G06	07MAR98	07MAR98	1311/7470
Mercury (TCLP)	0.01	U	mg/L	980130-029	F004119X744G06	07MAR98	07MAR98	1311/7470
Mercury (TCLP)	0.01	U	mg/L	980130-026	F005392X744G06	07MAR98	07MAR98	1311/7470
Mercury (TCLP)	0.01	U	mg/L	980130-031	F005654X744G06	07MAR98	07MAR98	1311/7470
Mercury (TCLP)	0.01	U	mg/L	980130-032	F005667X744G06	07MAR98	07MAR98	1311/7470
Mercury (TCLP)	0.01	U	mg/L	980130-030	F005683X744G06	07MAR98	07MAR98	1311/7470
Mercury (TCLP)	0.01	UN	mg/L	980129-003	F012672X744G06	04MAR98	04MAR98	1311/7470
Mercury (TCLP)	0.01	U	mg/L	980129-002	F991703X744G06	04MAR98	04MAR98	1311/7470
Mercury (TCLP)	0.01	U	mg/L	980130-033	F995031X744G06	07MAR98	07MAR98	1311/7470
Nickel	4.9	U	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Nickel	4.9	U	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Nickel	5	U	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Potassium	313	U	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Potassium	313	U	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Potassium	322	U	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Selenium	27.1	UN	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5

Table 5. 1998 Data from Samples of , G-06 LEU Trap Material (p. 5 of 9)

Analysis	Result	Qualifier	Units	Laboratory ID	Sample ID	Date Complete	Date Sampled	Procedure
Selenium	27.1	UN	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Selenium	27.9	UN	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Selenium (TCLP)	0.287		mg/L	X980980036	22006324X744G	30MAR98	30APR98	SW8466010A(TCLP)
Selenium (TCLP)	0.287	U	mg/L	980204-014	22225540X744G06	10MAR98	10MAR98	1311/6010-2
Selenium (TCLP)	0.296	B	mg/L	980203-102	22225548X744G06	07MAR98	07MAR98	1311/6010-2
Selenium (TCLP)	0.385	B	mg/L	980204-015	22225553X744G06	10MAR98	10MAR98	1311/6010-2
Selenium (TCLP)	0.287	UN*	mg/L	980128-066	F000960X744G06	06MAR98	04MAR98	1311/6010-2
Selenium (TCLP)	0.287	UN	mg/L	980129-004	F000967X744G06	04MAR98	04MAR98	1311/6010-2
Selenium (TCLP)	0.291	BN	mg/L	980129-005	F000972X744G06	04MAR98	04MAR98	1311/6010-2
Selenium (TCLP)	0.287	UN*	mg/L	980129-001	F001568X744G06	04MAR98	04MAR98	1311/6010-2
Selenium (TCLP)	0.404	BN	mg/L	980129-006	F002986X744G06	04MAR98	04MAR98	1311/6010-2
Selenium (TCLP)	0.287	U	mg/L	980129-007	F003219X744G06	04MAR98	04MAR98	1311/6010-2
Selenium (TCLP)	0.287	UN	mg/L	980130-027	F003592X744G06	07MAR98	07MAR98	1311/6010-2
Selenium (TCLP)	0.287	UN	mg/L	980130-028	F003595X744G06	07MAR98	07MAR98	1311/6010-2
Selenium (TCLP)	0.287	U	mg/L	980130-029	F004119X744G06	07MAR98	07MAR98	1311/6010-2
Selenium (TCLP)	0.287	U	mg/L	980130-026	F005392X744G06	07MAR98	07MAR98	1311/6010-2
Selenium (TCLP)	0.287	U	mg/L	980130-031	F005654X744G06	07MAR98	07MAR98	1311/6010-2
Selenium (TCLP)	0.512	B	mg/L	980130-032	F005667X744G06	07MAR98	07MAR98	1311/6010-2
Selenium (TCLP)	0.287	U	mg/L	980130-030	F005683X744G06	07MAR98	07MAR98	1311/6010-2
Selenium (TCLP)	0.287	UN*	mg/L	980129-003	F012672X744G06	04MAR98	04MAR98	1311/6010-2
Selenium (TCLP)	0.287	UN*	mg/L	980129-002	F991703X744G06	04MAR98	04MAR98	1311/6010-2
Selenium (TCLP)	0.287	U	mg/L	980130-033	F995031X744G06	07MAR98	07MAR98	1311/6010-2
Silver	2.4	N	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-7760A
Silver	6.9	N	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-7760A
Silver	5.1	N	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-7760A
Silver (TCLP)	0.126		mg/L	X980980036	22006324X744G	30MAR98	08MAY98	SW8467760A(TCLP)
Silver (TCLP)	0.04	UN*	mg/L	980204-014	22225540X744G06	10MAR98	10MAR98	1311/7760A
Silver (TCLP)	0.04	UN*	mg/L	980203-102	22225548X744G06	07MAR98	07MAR98	1311/7760A
Silver (TCLP)	0.04	N*	mg/L	980204-015	22225553X744G06	10MAR98	10MAR98	1311/7760A
Silver (TCLP)	0.04	U	mg/L	980128-066	F000960X744G06	06MAR98	04MAR98	1311/7760A
Silver (TCLP)	0.04	UN*	mg/L	980129-004	F000967X744G06	04MAR98	04MAR98	1311/7760A
Silver (TCLP)	0.04	UN*	mg/L	980129-005	F000972X744G06	04MAR98	04MAR98	1311/7760A
Silver (TCLP)	0.096		mg/L	980129-001	F001568X744G06	04MAR98	04MAR98	1311/7760A
Silver (TCLP)	0.04	U	mg/L	980129-006	F002986X744G06	04MAR98	04MAR98	1311/7760A
Silver (TCLP)	0.04	UN*	mg/L	980129-007	F003219X744G06	04MAR98	04MAR98	1311/7760A
Silver (TCLP)	0.04	UN*	mg/L	980130-027	F003592X744G06	07MAR98	07MAR98	1311/7760A
Silver (TCLP)	0.04	UN*	mg/L	980130-028	F003595X744G06	07MAR98	07MAR98	1311/7760A
Silver (TCLP)	0.044	N*	mg/L	980130-029	F004119X744G06	07MAR98	07MAR98	1311/7760A
Silver (TCLP)	0.044	N*	mg/L	980130-026	F005392X744G06	07MAR98	07MAR98	1311/7760A
Silver (TCLP)	0.04	UN*	mg/L	980130-031	F005654X744G06	07MAR98	07MAR98	1311/7760A
Silver (TCLP)	0.04	UN*	mg/L	980130-032	F005667X744G06	07MAR98	07MAR98	1311/7760A
Silver (TCLP)	0.08	N*	mg/L	980130-030	F005683X744G06	07MAR98	07MAR98	1311/7760A
Silver (TCLP)	0.04	U	mg/L	980129-003	F012672X744G06	04MAR98	04MAR98	1311/7760A
Silver (TCLP)	0.04	U	mg/L	980129-002	F991703X744G06	04MAR98	04MAR98	1311/7760A
Silver (TCLP)	0.04	U	mg/L	980130-033	F995031X744G06	07MAR98	07MAR98	1311/7760A
Sodium	1980	B	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Sodium	6740	B	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Sodium	3860	B	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Thallium	35.5	B	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Thallium	22.9	U	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Thallium	23.6	U	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5

Table 5. 1998 Data from Samples of .G-06 LEU Trap Material (p. 6 of 9)

Analysis	Result	Qualifier	Units	Laboratory ID	Sample ID	Date Complete	Date Sampled	Procedure
Titanium	64.7	*	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Titanium	75.3	*	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Titanium	42.2	*	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Vanadium	1.9	UN	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Vanadium	1.9	UN	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Vanadium	1.9	UN	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Zinc	46.6	BNJ	ug/g	980203-102	22225548X744G06	07MAR98	06MAR98	SW846-6010-5
Zinc	59.2	BNJ	ug/g	980128-066	F000960X744G06	06MAR98	06MAR98	SW846-6010-5
Zinc	102	BNJ	ug/g	980130-026	F005392X744G06	07MAR98	06MAR98	SW846-6010-5
Zinc (TCLP)	0.743		mg/L	X980980036	22006324X744G	30MAR98	30APR98	SW8466010A(TCLP)
Zinc (TCLP)	0.576	BJN	mg/L	980204-014	22225540X744G06	10MAR98	10MAR98	1311/6010-2
Zinc (TCLP)	23.4	J*	mg/L	980203-102	22225548X744G06	07MAR98	07MAR98	1311/6010-2
Zinc (TCLP)	0.466	BJN	mg/L	980204-015	22225553X744G06	10MAR98	10MAR98	1311/6010-2
Zinc (TCLP)	0.994	BNJ	mg/L	980128-066	F000960X744G06	06MAR98	04MAR98	1311/6010-2
Zinc (TCLP)	0.644	BNJ	mg/L	980129-004	F000967X744G06	04MAR98	04MAR98	1311/6010-2
Zinc (TCLP)	0.339	BNJ	mg/L	980129-005	F000972X744G06	04MAR98	04MAR98	1311/6010-2
Zinc (TCLP)	1.35	NJ	mg/L	980129-001	F001568X744G06	04MAR98	04MAR98	1311/6010-2
Zinc (TCLP)	0.726	BNJ*	mg/L	980129-006	F002986X744G06	04MAR98	04MAR98	1311/6010-2
Zinc (TCLP)	0.192	BJ	mg/L	980129-007	F003219X744G06	04MAR98	04MAR98	1311/6010-2
Zinc (TCLP)	0.787	BNJ	mg/L	980130-027	F003592X744G06	07MAR98	07MAR98	1311/6010-2
Zinc (TCLP)	0.524	BNJ	mg/L	980130-028	F003595X744G06	07MAR98	07MAR98	1311/6010-2
Zinc (TCLP)	0.207	BJ	mg/L	980130-029	F004119X744G06	07MAR98	07MAR98	1311/6010-2
Zinc (TCLP)	0.353	BJ	mg/L	980130-026	F005392X744G06	07MAR98	07MAR98	1311/6010-2
Zinc (TCLP)	0.252	BJ	mg/L	980130-031	F005654X744G06	07MAR98	07MAR98	1311/6010-2
Zinc (TCLP)	0.707	BJ	mg/L	980130-032	F005667X744G06	07MAR98	07MAR98	1311/6010-2
Zinc (TCLP)	0.335	BJ	mg/L	980130-030	F005683X744G06	07MAR98	07MAR98	1311/6010-2
Zinc (TCLP)	1.62	NJ	mg/L	980129-003	F012672X744G06	04MAR98	04MAR98	1311/6010-2
Zinc (TCLP)	0.717	BNJ	mg/L	980129-002	F991703X744G06	04MAR98	04MAR98	1311/6010-2
Zinc (TCLP)	1.26	BJ*	mg/L	980130-033	F995031X744G06	07MAR98	07MAR98	1311/6010-2
Reactive Cyanide	1	<NJ	ug/g	980203-102	22225548X744G06	07MAR98	23FEB98	SW846-9010A7
Reactive Cyanide	1	<J	ug/g	980128-066	F000960X744G06	06MAR98	23FEB98	SW846-9010A7
Reactive Cyanide	1	<J	ug/g	980130-026	F005392X744G06	07MAR98	23FEB98	SW846-9010A7
Reactive Sulfide	75	<J	ug/g	980203-102	22225548X744G06	07MAR98	23FEB98	SW846-9030A7
Reactive Sulfide	75	<NJ	ug/g	980128-066	F000960X744G06	06MAR98	23FEB98	SW846-9030A7
Reactive Sulfide	75	<J	ug/g	980130-026	F005392X744G06	07MAR98	23FEB98	SW846-9030A7
Total Organic Carbon (TOC)	410		ug/g	980203-102	22225548X744G06	07MAR98	03MAR98	SW846-9060
Total Organic Carbon (TOC)	300	U	ug/g	980128-066	F000960X744G06	06MAR98	03MAR98	SW846-9060
Total Organic Carbon (TOC)	1300		ug/g	980130-026	F005392X744G06	07MAR98	03MAR98	XP4TS-OA7031
Total Organic Halides (TOX)	57	B	ug/g	980203-102	22225548X744G06	07MAR98	03MAR98	XP4TS-OA7020
Total Organic Halides (TOX)	10	UB	ug/g	980128-066	F000960X744G06	06MAR98	03MAR98	XP4TS-OA7020
Total Organic Halides (TOX)	10	UB	ug/g	980130-026	F005392X744G06	07MAR98	03MAR98	XP4TS-OA7020
PCB (Total)	0.5	<	ug/g	980203-102	22225548X744G06	07MAR98	03MAR98	SW846-8081-2
PCB (Total)	0.5	<	ug/g	980128-066	F000960X744G06	06MAR98	03MAR98	SW846-8081-2
PCB (Total)	0.5	<	ug/g	980130-026	F005392X744G06	07MAR98	03MAR98	SW846-8081-2
Alpha activity	55119	J	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7280
Alpha activity	259083		pCi/g	980128-066	F000960X744G06	06MAR98	04MAR98	XP4TS-RL7280
Alpha activity	439951		pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7280
Beta activity	72430		pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7280
Beta activity	162608		pCi/g	980128-066	F000960X744G06	06MAR98	04MAR98	XP4TS-RL7280
Beta activity	97665		pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7280
Uranium (alpha)	120782		ug/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7710

Table 5. 1998 Data from Samples of G-06 LEU Trap Material (p. 8 of 9)

Analysis	Result	Qualifier	Units	Laboratory ID	Sample ID	Date Complete	Date Sampled	Procedure
Lead-212 (gamma)	1.64	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7400
Lead-212 (gamma)	2.98	<	pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7400
Lead-214 (gamma)	3.38	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7400
Lead-214 (gamma)	5.68	<	pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7400
Neptunium-237 (alpha)	0.098	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7710
Neptunium-237 (alpha)	0.68		pCi/g	980128-066	F000960X744G06	06MAR98	04MAR98	XP4TS-RL7710
Neptunium-237 (alpha)	0.72		pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7710
Niobium-95 (gamma)	0.57	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7400
Niobium-95 (gamma)	0.73	<	pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7400
Plutonium-238 (alpha)	0.064	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7710
Plutonium-238 (alpha)	0.021	<	pCi/g	980128-066	F000960X744G06	06MAR98	04MAR98	XP4TS-RL7710
Plutonium-238 (alpha)	0.02	<	pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7710
Plutonium-239/240 (alpha)	0.019	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7710
Plutonium-239/240 (alpha)	0.072	<	pCi/g	980128-066	F000960X744G06	06MAR98	04MAR98	XP4TS-RL7710
Plutonium-239/240 (alpha)	0.02	<	pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7710
Plutonium-242 (alpha)	0.019	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7710
Plutonium-242 (alpha)	0.057	<	pCi/g	980128-066	F000960X744G06	06MAR98	04MAR98	XP4TS-RL7710
Plutonium-242 (alpha)	0.02	<	pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7710
Plutonium-244 (alpha)	0.074	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7710
Plutonium-244 (alpha)	0.021	<	pCi/g	980128-066	F000960X744G06	06MAR98	04MAR98	XP4TS-RL7710
Plutonium-244 (alpha)	0.02	<	pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7710
Potassium-40 (gamma)	5.41		pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7400
Potassium-40 (gamma)	5.17		pCi/g	980128-066	F000960X744G06	06MAR98	04MAR98	XP4TS-RL7400
Potassium-40 (gamma)	9.78		pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7400
Protactinium-231 (gamma)	27.3	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7400
Protactinium-231 (gamma)	43.8	<	pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7400
Protactinium-234m (gamma)	74530		pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7400
Protactinium-234m (gamma)	106400		pCi/g	980128-066	F000960X744G06	06MAR98	04MAR98	XP4TS-RL7400
Protactinium-234m (gamma)	65400		pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7400
Radium-224 (gamma)	18	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7400
Radium-224 (gamma)	32.3	<	pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7400
Radium-226 (gamma)	3.38	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7400
Radium-226 (gamma)	8.01		pCi/g	980128-066	F000960X744G06	06MAR98	04MAR98	XP4TS-RL7400
Radium-226 (gamma)	6.56		pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7400
Radium-228 (gamma)	1.27	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7400
Radium-228 (gamma)	1.67	<	pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7400
Ruthenium-103 (gamma)	0.64	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7400
Ruthenium-103 (gamma)	0.8	<	pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7400
Ruthenium-106 (gamma)	5.37	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7400
Ruthenium-106 (gamma)	6.66	<	pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7400
Technetium-99	154	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7385
Technetium-99	2121		pCi/g	980128-066	F000960X744G06	06MAR98	04MAR98	XP4TS-RL7385
Technetium-99	2833		pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7385
Thallium-208 (gamma)	0.63	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7400
Thallium-208 (gamma)	0.83		pCi/g	980128-066	F000960X744G06	06MAR98	04MAR98	XP4TS-RL7400
Thallium-208 (gamma)	0.8	<	pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7400
Thorium-228 (alpha)	0.22	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7650
Thorium-228 (alpha)	1.6		pCi/g	980128-066	F000960X744G06	06MAR98	04MAR98	XP4TS-RL7650
Thorium-228 (alpha)	1.8		pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7650
Thorium-230 (alpha)	4.4		pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7650
Thorium-230 (alpha)	17		pCi/g	980128-066	F000960X744G06	06MAR98	04MAR98	XP4TS-RL7650

Table 5. 1998 Data from Samples of G-06 LEU Trap Material (p. 9 of 9)

Analysis	Result	Qualifier	Units	Laboratory ID	Sample ID	Date Complete	Date Sampled	Procedure
Thorium-230 (alpha)	22		pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7650
Thorium-231 (alpha)	10440		pCi/g	980128-066	F000960X744G06	06MAR98	04MAR98	XP4TS-RL7650
Thorium-231 (gamma)	1268		pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7400
Thorium-231 (gamma)	6848		pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7400
Thorium-232 (alpha)	0.099	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7650
Thorium-232 (alpha)	0.059		pCi/g	980128-066	F000960X744G06	06MAR98	04MAR98	XP4TS-RL7650
Thorium-232 (alpha)	0.085	<	pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7650
Thorium-234 (alpha)	82560		pCi/g	980128-066	F000960X744G06	06MAR98	04MAR98	XP4TS-RL7650
Thorium-234 (gamma)	12300		pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7400
Thorium-234 (gamma)	14990		pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7400
Zirconium-95 (gamma)	1.21	<	pCi/g	980203-102	22225548X744G06	07MAR98	04MAR98	XP4TS-RL7400
Zirconium-95 (gamma)	1.51	<	pCi/g	980130-026	F005392X744G06	07MAR98	04MAR98	XP4TS-RL7400

Waste Stream Number: 342-1

Waste Stream Title: Generator Scrap and Debris

342-1
USEC

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960906-011 Project: ER 9567UE Requisition Number: 21690
Customer Sample ID: VER32130001 Customer: ENV RESTORATION
Date Sampled: 5-SEP-1996 13:15 Date Sample Received: 5-SEP-1996
Sampled By: M MCROBERTS Date Sample Completed: 2-OCT-1996
Material Description: X-342 CINDER BLOCK

** No comments were made for this sample. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed
SW846-3050A	Sample Prep Metals	COMPLETE			ML STEWART	14-SEP-1996
SW846-6010A	Aluminum	1000B		mg/kg	TE SHOOK	14-SEP-1996
	Antimony	16.4U		mg/kg	TE SHOOK	14-SEP-1996
	Arsenic	55.3BN		mg/kg	TE SHOOK	14-SEP-1996
	Barium	3.8BN		mg/kg	TE SHOOK	14-SEP-1996
	Beryllium	1.0U		mg/kg	TE SHOOK	14-SEP-1996
	Cadmium	14.6BN		mg/kg	TE SHOOK	14-SEP-1996
	Calcium	525B		mg/kg	TE SHOOK	14-SEP-1996
	Chromium	411B		mg/kg	TE SHOOK	14-SEP-1996
	Cobalt	12.1BN		mg/kg	TE SHOOK	14-SEP-1996
	Copper	7510		mg/kg	TE SHOOK	14-SEP-1996
	Iron	59700B		mg/kg	TE SHOOK	14-SEP-1996
	Lead	71.8B		mg/kg	TE SHOOK	14-SEP-1996
	Magnesium	133B		mg/kg	TE SHOOK	14-SEP-1996
	Manganese	654B		mg/kg	TE SHOOK	14-SEP-1996
	Molybdenum	49.1BN		mg/kg	TE SHOOK	14-SEP-1996
	Nickel	164B		mg/kg	TE SHOOK	14-SEP-1996
	Potassium	43600*		mg/kg	TE SHOOK	14-SEP-1996
	Selenium	33.9UN		mg/kg	TE SHOOK	14-SEP-1996
	Silver	15.2BN*		mg/kg	TE SHOOK	14-SEP-1996
	Sodium	3190B		mg/kg	TE SHOOK	14-SEP-1996
	Thallium	74.3B		mg/kg	TE SHOOK	14-SEP-1996
	Vanadium	22.3BN		mg/kg	TE SHOOK	14-SEP-1996
	Zinc	1220B*		mg/kg	TE SHOOK	14-SEP-1996
TSD553-230	Gross Alpha	<4.2		pCi/mL	JP BREWSTER	25-SEP-1996
	Gross Beta	<9.5		pCi/mL	JP BREWSTER	25-SEP-1996
TSD553-385	Technetium	<0.6		pCi/g	JP BREWSTER	25-SEP-1996
TSD553-710	% U-235	ND		%	RJ TIPTON	19-SEP-1996
	Uranium	0.009	0.006	ug/g	RJ TIPTON	19-SEP-1996

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
Aluminum	17.24	15.6	90.49

Arsenic	17.24	-25.76	-149.42
Barium	17.24	12.55	72.80
Beryllium	17.24	15.2	88.17
Cad	17.24	0.4	2.32
Cob	17.24	3.5	20.30
Molybdenum	17.24	-32.8	-190.26
Selenium	17.24	12.7	73.67
Silver	17.24	-0.1	-0.58
Vanadium	17.24	1.7	9.86

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
Date Approved: 2-OCT-1996

Definition Page for Qualifiers/Flags

********** 960906-011 **********

Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample prepara sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of a dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graph less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is g CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the o repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%) concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.
Correlation coefficient for MSA is less tha 0.995.
The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same fi

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

Waste Stream Number: 342-2 & 342-3

Waste Stream Title: Generator Solutions and Sludge

1.1.S. 342-3

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960207-125 Project: ER 9567C Requisition Number: 20212
Customer Sample ID: VER32106002 Customer: ENV RESTORATION
Date Sampled: 6-FEB-1996 10:10 Date Sample Received: 7-FEB-1996
Sampled By: MB HAMEL Date Sample Completed: 22-MAR-1996
Material Description: waste verification

** See comment page for comments. **

** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
ACD-5101	Density	1.13		g/mL	ML STEWART	8-FEB-1996	96110012
SW846-1010	Flash Point	>80		oC	ML STEWART	15-MAR-1996	96110020
SW846-3015	Sample Prep Metals	COMPLETE			ML STEWART	8-FEB-1996	96080179
SW846-3510	Sample Prep PCB	COMPLETE			SL EWING	8-FEB-1996	96160043
SW846-3520	Sample Prep Semi-Volatiles	COMPLETE			DK SCAGGS	12-FEB-1996	96160051
SW846-6010A	Arsenic	1080000		UG/L	EL SIMPSON	8-FEB-1996	96080179
	Barium	9.0U		UG/L	EL SIMPSON	8-FEB-1996	96080179
	Cadmium	17400		UG/L	EL SIMPSON	8-FEB-1996	96080179
	Chromium	762		UG/L	EL SIMPSON	8-FEB-1996	96080179
	Lead	223UN		UG/L	EL SIMPSON	8-FEB-1996	96080179
	Selenium	755U		UG/L	EL SIMPSON	8-FEB-1996	96080179
	Silver	19.0UJN		UG/L	EL SIMPSON	8-FEB-1996	96080179
SW846-7470	Mercury	10U		ug/L	RL POLK	21-FEB-1996	96080185
SW846-8080	PCB-1232	5U		ug/L	DH BLUE	17-FEB-1996	96160216M5
	PCB-1242	5U		ug/L	DH BLUE	17-FEB-1996	96160216M5
	PCB-1248	5U		ug/L	DH BLUE	17-FEB-1996	96160216M5
	PCB-1254	5U		ug/L	DH BLUE	17-FEB-1996	96160216M5
	PCB-1260	5U		ug/L	DH BLUE	17-FEB-1996	96160216M5
	PCB-1268	5U		ug/L	DH BLUE	17-FEB-1996	96160216M5
	Total PCB	5U		ug/L	DH BLUE	17-FEB-1996	96160216M5
SW846-9010A	Total Cyanide	0.02UJ		mg/L	SL LEMASTER	9-FEB-1996	96100213
SW846-9020A	TOX	< 40		ug/L	DE COLLINS	4-MAR-1996	9616030 4T2
SW846-9030A	Sulfide	50U		mg/L	SL LEMASTER	8-FEB-1996	96100205
SW846-9040B	pH	8.62		pH units	SL LEMASTER	9-FEB-1996	96100214
TSD553-230	Gross Alpha	UJ<4.5		pCi/mL	JP BREWSTER	15-MAR-1996	96070365
	Gross Beta	105		pCi/mL	JP BREWSTER	15-MAR-1996	96070365
TSD553-380	Technetium	<0.9		pCi/mL	JP BREWSTER	15-MAR-1996	96070363

TSD553-440	Cesium-134	<0.2J		pCi/ml	WC ZUEFLE	17-FEB-1996	96070226
	Cesium-137	<0.2J		pCi/ml	WC ZUEFLE	17-FEB-1996	96070226
	Cobalt-60	<0.3J		pCi/ml	WC ZUEFLE	17-FEB-1996	96070226
	Gross Gamma	93.8J		pCi/ml	WC ZUEFLE	17-FEB-1996	96070226
TSD553-700	% U-235	ND	ND	%	CD GOOD	12-FEB-1996	96070187
	Alpha Activity	<1		pCi/mL	BW SHORT	12-FEB-1996	96070188
	Americium-241	<0.017	N/A	pCi/mL	CD GOOD	12-FEB-1996	96070188
	Neptunium-237	<0.024	N/A	pCi/mL	CD GOOD	12-FEB-1996	96070188
	Plutonium-238	<0.006	N/A	pCi/mL	CD GOOD	12-FEB-1996	96070188
	Plutonium-239/240	<0.006	N/A	pCi/mL	CD GOOD	12-FEB-1996	96070188
	Protactinium-234	<0.01	N/A	pCi/mL	CD GOOD	12-FEB-1996	96070187
	Thorium-228	<0.035	N/A	pCi/mL	CD GOOD	12-FEB-1996	96070188
	Thorium-230	<0.035	N/A	pCi/mL	CD GOOD	12-FEB-1996	96070188
	Thorium-232	<0.024	N/A	pCi/mL	CD GOOD	12-FEB-1996	96070188
	Thorium-234	<0.012	N/A	pCi/mL	CD GOOD	12-FEB-1996	96070187
	Uranium	<0.050	NA	ug/mL	CD GOOD	12-FEB-1996	96070187

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
Mercury	40.0	44.8	112.00

Lab Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
C. J. Van Meter (Organic Analytical Services)

Date Approved: 22-MAR-1996

********** COMMENT PAGE **********
********** 960207-125 **********

** Comments from the Environmental and Industrial Hygiene Laboratory *****

SW846-9040B pH run in replicate. Replicate pH=8.61.

SW846-9010A cyanide reported as an estimate due to blank spike recovery outside acceptable QC limits (56% recovery).

***** Comments from the Spectrochemistry/ICP Laboratory *****

SW846-6010A Ag qualified as estimate due to interference check not meeting Q.C. limits.

ACD-5101 Density duplicate result is 1.11 g/mL.

***** Comments from the Radiochemistry Laboratory *****

GAMMA ACTIVITY RESULTS FOR 960207-125 ARE:

Analyte	Result(pCi/ml)	+/-
K-40	93.8J	10.5J

***** Comments from the Organic Analytical Services *****

M 846-3520:SV Extraction

A light green precipitate was observed during basic extraction. More than 25 ml H_2SO_4 was required to complete acid extraction and foaming occurred during this process. A white insoluble precipitate remained after acidic extraction.

--Method SW846-8270A

Recoveries for hexachloroethane, nitrobenzene, and 2,4-Dinitrotoluene were below method acceptance criteria in the matrix spike of this sample. For this reason these compounds were reported as estimated sample quantitation limits.

SW846-9020A

Sample was diluted due to instrument malfunctions which caused a shortage of sample.

Definition Page for Qualifiers/Flags

********** 960207-125 **********

Ino. Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

orrelation coefficient for MSA is less tha 0.995.

he value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 960207-125
Laboratory: Organic Analytical Services
File ID:
Instrument ID: SV1
Authorized By: C. J. Van Meter

Customer Sample ID: VER32106002
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 20212
Date Sample Received: 7-FEB-1996
Date Sampled: 6-FEB-1996

RCRA_SEMIVOLATILES

Date Extracted/Prepared: 12-FEB-1996
Analysis Procedure Number: SW846-8270A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 16-FEB-1996
QA File Number: 96160216B01
Dilution Factor: 1.0
Analyst: BD FUHR

CAS		ug/L	CAS		ug/L
95-48-7	2-Methylphenol	11U			
108-39-4	m-Cresol	11U			
106-44-5	4-Methylphenol	11U			
87-86-5	Pentachlorophenol	22U			
95-95-4	2,4,5-Trichlorophenol	11U			
88-06-2	2,4,6-Trichlorophenol	11U			
	Total Cresol	NA			
106-46-7	1,4-Dichlorobenzene	11U			
121-14-2	2,4-Dinitrotoluene	22UJ			
118-74-1	Hexachlorobenzene	11U			
	Hexachloro-1,3-butadiene	11U			
67-72-1	Hexachloroethane	11UJ			
98-95-3	Nitrobenzene	11UJ			
110-86-1	Pyridine	11U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

RCRA_SEMIVOLATILES ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 960207-125
Laboratory: Organic Analytical Services
Sample Matrix: LIQUID WASTE
Level: (low/med): LOW
Dilution Factor: 1.0

Customer Sample ID: VER32106002
Customer: ENV RESTORATION
File ID:
Date Received: 7-FEB-1996
Date Analyzed: 16-FEB-1996
Concentration Units: ug/L

Number TICs found: 5

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.		2-Butoxy-Ethanol	7.62	300	J
2.	65-85-0	Benzoic acid	12.92	30	J
3.		Caprolactam	14.28	20	J
4.	112-05-0	Nonanoic Acid	14.42	20	J
5.		unknown	25.88	20	J
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
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23.					
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29.					
30.					

ANALYSIS DATA REPORT

AnaLIS ID: 960207-125
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#3
Authorized By: C. J. Van Meter

Customer Sample ID: VER32106002
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 20212
Date Sample Received: 7-FEB-1996
Date Sampled: 6-FEB-1996

RCRA_VOLATILES

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 9-FEB-1996
QA File Number: 96160209A3
Dilution Factor: 1.0
Analyst: MA NOVOTNY

CAS		ug/L	CAS		ug/L
71-43-2	Benzene	2U			
56-23-5	Carbon Tetrachloride	2U			
108-90-7	Chlorobenzene	2U			
67-66-3	Chloroform	2U			
107-06-2	1,2-Dichloroethane	2U			
75-35-4	1,1-Dichloroethene	2U			
78-93-3	2-Butanone	280			
127-18-4	Tetrachloroethene	2U			
79-01-6	Trichloroethene	2U			
75-01-4	Vinyl Chloride	1U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

RCRA_VOLATILES ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 960207-125
Laboratory: Organic Analytical Services
Sample Matrix: LIQUID WASTE
Level: (low/med): LOW
Dilution Factor: 1.0

Customer Sample ID: VER32106002
Customer: ENV RESTORATION
File ID:
Date Received: 7-FEB-1996
Date Analyzed: 9-FEB-1996
Concentration Units: ug/L

Number TICs found: 3

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.	67-64-1	Acetone	9.95	550	
2.	108-88-3	Toluene	17.9	5	
3.	75-07-0	Acetaldehyde	7.65	20	J
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
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23.					
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25.					
26.					
27.					
28.					
29.					
30.					

Waste Stream Number: U343-2

Waste Stream Title: Parts Cleaning Solution

EXXON CHEMICAL

MATERIAL SAFETY DATA SHEET

EXXON CHEMICAL AMERICAS, P.O. BOX 3272, HOUSTON, TEXAS 77001
A Division of EXXON CHEMICAL COMPANY, A Division of EXXON CORPORATION

1014889

ACTREL 4493L CLEANER

DATE PREPARED: MAY 8, 199
MSDS NO.: 92864493

SECTION 1 PRODUCT IDENTIFICATION & EMERGENCY INFORMATION

PRODUCT NAME: ACTREL 4493L CLEANER

CHEMICAL NAME:
Petroleum Hydrocarbon CAS 64771-72-8

CHEMICAL FAMILY:
Aliphatic Hydrocarbon

PRODUCT DESCRIPTION:
Clear colorless liquid; mild hydrocarbon odor.

EMERGENCY TELEPHONE NUMBERS: EXXON CHEMICAL AMERICAS 713-870-6000
CHEMTREC 800-424-9300

SECTION 2 HAZARDOUS INGREDIENT INFORMATION

This product is not hazardous as defined in 29 CFR 1910.1200

SECTION 3 HEALTH INFORMATION & PROTECTION

NATURE OF HAZARD

EYE CONTACT:
Slightly irritating but does not injure eye tissue.

SKIN CONTACT:
Occasional brief contact with the liquid will not result in significant irritation unless evaporation is impeded.
Frequent or prolonged contact may irritate and cause dermatitis.
Low order of toxicity.
Skin contact may aggravate an existing dermatitis condition.

INHALATION:
High vapor/aerosol concentrations (greater than approximately 700 ppm, attainable at elevated temperatures well above ambient) are irritating to the eyes and the respiratory tract, and may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death.
Negligible hazard at ambient temperature (-18 to 38 Deg C; 0 to 100 Deg F)

INGESTION:
Small amounts of this product aspirated into the respiratory system during ingestion or vomiting may cause mild to severe pulmonary injury, possibly progressing to death.
Low order of toxicity.

FIRST AID

EYE CONTACT:
Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:
Flush with large amounts of water; use soap if available. Remove grossly contaminated clothing, including shoes, and launder before reuse.

INHALATION:
Using proper respiratory protection, immediately remove the affected victim from exposure. Administer artificial respiration if breathing is stopped. Keep at rest. Call for prompt medical attention.

INGESTION:
If swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

WORKPLACE EXPOSURE LIMITS

EXXON RECOMMENDS THE FOLLOWING OCCUPATIONAL EXPOSURE LIMITS:
300 ppm total hydrocarbon based on composition.

PRECAUTIONS

SPECIAL PRECAUTIONS:
Health studies have shown that many petroleum hydrocarbons pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

PERSONAL PROTECTION:
For open systems where contact is likely, wear safety glasses with side shields, long sleeves, and chemical resistant gloves.
Where contact may occur, wear safety glasses with side shields.
Where concentrations in air may exceed the limits given in this Section and engineering, work practice or other means of exposure reduction are not adequate, NIOSH/MSHA approved respirators may be necessary to prevent overexposure by inhalation.

VENTILATION:
The use of mechanical dilution ventilation is recommended whenever this product is used in a confined space, is heated above ambient temperatures, or is agitated.

SECTION 4 FIRE & EXPLOSION HAZARD

FLASHPOINT: 203 Deg F. METHOD: PMCC D-93 NOTE: Typical
FLAMMABLE LIMITS: LEL: 1.4 UEL: 8.9
AUTOIGNITION TEMPERATURE: 410 Deg F. NOTE: Approximately

GENERAL HAZARD:
Low Hazard, liquid can burn upon heating to temperatures at or above the flashpoint.
"Empty" containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner, or properly disposed of.

FIRE FIGHTING:
Use water spray to cool fire exposed surfaces and to protect personnel.
Isolate "fuel" supply from fire.
Use foam, dry chemical, or water spray to extinguish fire.
Avoid spraying water directly into storage containers due to danger of boilover.
This liquid is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode.

HAZARDOUS COMBUSTION PRODUCTS:
No unusual

SECTION 5 SPILL CONTROL PROCEDURE

LAND SPILL:
Eliminate sources of ignition. Prevent additional discharge of material, if possible to do so without hazard. For small spills implement cleanup procedures; for large spills implement cleanup procedures and, if in public area, keep public away and advise authorities. Also, if this product is subject to CERCLA reporting (see Section 7) notify the National Response Center.
Prevent liquid from entering sewers, watercourses, or low areas. Contain spilled liquid with sand or earth.
Recover by pumping or with a suitable absorbent.
Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

WATER SPILL:
Remove from surface by skimming or with suitable adsorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in non-confined waters.
Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

SECTION 6 NOTES

HAZARD RATING SYSTEMS:
This information is for people trained in:
National Paint & Coatings Association's (NPCA)
Hazardous Materials Identification System (HMIS)
National Fire Protection Association (NFPA 704)
Identification of the Fire Hazards of Materials

	NPCA-HMIS	NFPA 704
HEALTH	1	1
FLAMMABILITY	1	1
REACTIVITY	0	0

KEY
4 = Severe
3 = Serious
2 = Moderate
1 = Slight
0 = Minima

EXXON CHEMICAL

MATERIAL SAFETY DATA SHEET

EXXON CHEMICAL AMERICAS, P.O. BOX 3272, HOUSTON, TEXAS 77001
A Division of EXXON CHEMICAL COMPANY, A Division of EXXON CORPORATION

SECTION 7 REGULATORY INFORMATION

DEPARTMENT OF TRANSPORTATION (DOT):
DOT HAZARD CLASS: Not regulated
DOT IDENTIFICATION NUMBER: Not Available

FLASHPOINT: 203 Deg F. METHOD: PMCC D-93 NOTE: Typical

TSCA:
This product is listed on the TSCA Inventory at CAS Registry Number 64771-72-8

CERCLA:
If this product is accidentally spilled, it is not subject to any special reporting under the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). We recommend you contact local authorities to determine if there may be other local reporting requirements.

SARA TITLE III:
Under the provisions of Title III, Sections 311/312 of the Superfund Amendments and Reauthorization Act, this product is classified into the following hazard categories:
Not Hazardous.
This product does not contain Section 313 Reportable Ingredients.

SECTION 8 TYPICAL PHYSICAL & CHEMICAL PROPERTIES

SPECIFIC GRAVITY:
0.76 at 60
SOLUBILITY IN WATER, WT. % AT °F:
Insoluble
SP. GRAV. OF VAPOR, at 1 atm (Air=1):
Greater than 1.00
EVAPORATION RATE, n-Bu Acetate=1:
Negligible
VAPOR PRESSURE, mmHg at °F:
Less Than 1 at 100
VISCOSITY OF LIQUID, CST AT °F:
2 at 77
FREEZING/MELTING POINT, °F:
25 Pour Point ASTM D97
BOILING POINT, °F:
430 to 480 Approximately

SECTION 9 REACTIVITY DATA

STABILITY:
Stable
CONDITIONS TO AVOID INSTABILITY:
Not Applicable
HAZARDOUS POLYMERIZATION:
Will not occur

MATERIALS AND CONDITIONS TO AVOID INCOMPATIBILITY:
Strong oxidizing agents
HAZARDOUS DECOMPOSITION PRODUCTS:
None

SECTION 10 STORAGE AND HANDLING

EXXON CHEMICAL

MATERIAL SAFETY DATA SHEET

EXXON CHEMICAL AMERICAS, P.O. BOX 3272, HOUSTON, TEXAS 77001
A Division of EXXON CHEMICAL COMPANY, A Division of EXXON CORPORATION

STORAGE TEMPERATURE, °F:
Ambient

LOADING/UNLOADING TEMPERATURE, °F:
Ambient

STORAGE/TRANSPORT PRESSURE, mmHg:
Atmospheric

VISC. AT LOADING/UNLOADING TEMP., cST
2

REVISION SUMMARY:
Since APRIL 12,1992 this MSDS has been revised in Section(s):
4, 5, 6

REFERENCE NUMBER:	DATE PREPARED:	SUPERSEDES ISSUE DATE:
HDHA-C-25082	May 8,1992	April 12,1992

OR ADDITIONAL PRODUCT INFORMATION, CONTACT YOUR TECHNICAL SALES REPRESENTATIVE
OR ADDITIONAL HEALTH/SAFETY INFORMATION, CALL 713-870-6884

IS INFORMATION RELATES TO THE SPECIFIC MATERIAL DESIGNATED AND MAY NOT BE VALID FOR SUCH MATERIAL USED IN COMBINAT
ITH ANY OTHER MATERIALS OR IN ANY PROCESS. SUCH INFORMATION IS TO THE BEST OF OUR KNOWLEDGE AND BELIEF, ACCURATE AN
LIABLE AS OF THE DATE COMPILED. HOWEVER, NO REPRESENTATION, WARRANTY OR GUARANTEE IS MADE AS TO ITS ACCURACY
LIABILITY OR COMPLETENESS. IT IS THE USER'S RESPONSIBILITY TO SATISFY HIMSELF AS TO THE SUITABILITY AND COMPLETENESS
ICH INFORMATION FOR HIS OWN PARTICULAR USE. WE DO NOT ACCEPT LIABILITY FOR ANY LOSS OR DAMAGE THAT MAY OCCUR
IOM THE USE OF THIS INFORMATION NOR DO WE OFFER WARRANTY AGAINST PATENT INFRINGEMENT.

Waste Stream Number: 344-1A and 1B

Waste Stream Title: Oil/Filters and Oil Debris

Internal Correspondence

MARTIN MARIETTA ENERGY SYSTEMS, INC.

July 11, 1991
POEF-554-91-324

W. A. Kelley, MS-7550

Toxicity Characteristic Leaching Procedure [TCLP] - X-344 Roof

Representative samples taken from the X-344 roof to determine the disposition of refuse created during roof repair were submitted by Waste Management for TCLP tests. Samples WMS-631, WMS-632, WMS-633, WMS-634 (all 5-6-91) were tested using Method 1311, as published in the Federal Register and revised on June 29, 1990. Analyses showed no TC characteristics greater than limits stated in Table 1 of 40 CFR Part 261.24. Volatile organic constituents were tested using Zero Headspace Extractors [ZHE] to verify values. Matrix interferences were checked in extracts for each parameter and appropriate corrections made. Data from analyses are shown in Tables 1 and 2.

Additional tentatively identified compounds were also reported. These compounds were identified using computer-based probability matching of sample spectra to a reference library database. Data given in Table 3 are estimations based on comparison to internal standards.

L. E. Deacon, X-710, MS-2215, (5774)

M. R. Kelley, X-710, MS-2215, (5774)

LED:MRK:msc

cys: T. A. Acox MS-7550
C. P. Moore MS-7550
N. J. Smith MS-2232
D/554 File - RC

TABLE 1. ORGANIC ANALYSES OF TCLP EXTRACTS

All values of samples WMS-631, WMS-632, WMS-633, and WMS-634 are as shown for each compound. Values are given in mg/L.

	Concentration	Regulatory Limit
Volatiles		
Benzene	<0.005	0.5
Carbon tetrachloride	<0.005	0.5
Chlorobenzene	<0.005	100.0
Chloroform	<0.005	6.0
1,4-Dichlorobenzene	<0.005	7.5
1,2-Dichloroethane	<0.005	0.5
1,1-Dichloroethylene	<0.005	0.7
Methyl ethyl ketone	<0.100	200.0
Tetrachloroethylene	<0.005	0.7
Trichloroethylene	<0.005	0.5
Vinyl chloride	<0.010	0.2
Semivolatiles [acids]		
o-Cresol	<0.010	200.0*
m-Cresol	<0.010	200.0*
p-Cresol	<0.010	200.0*
Pentachlorophenol	<0.100	100.0
2,4,5-Trichlorophenol	<0.010	400.0
2,4,6-Trichlorophenol	<0.010	2.0
Semivolatiles [base-neutral]		
2,4-Dinitrotoluene	<0.01	0.13
Hexachlorobenzene	<0.01	0.13
Hexachlorobutadiene	<0.01	0.5
Hexachloroethane	<0.01	3.0
Nitrobenzene	<0.01	2.0
Pyridine	<0.01	5.0

---

* - Regulatory limit for total cresol is 200.0 mg/L.

TABLE 2. METALS ANALYSES OF TCLP EXTRACTS
(Values are mg/L)

Sample	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
LIMIT	5.0	100.0	1.0	5.0	5.0	0.2	1.0	5.0
WMS-631	<0.50	0.352	<0.015	<0.018	0.052	<0.01	0.21	<0.10
WMS-632	<0.50	0.364	<0.015	<0.018	0.073	<0.01	0.21	<0.10
WMS-633	<0.50	0.355	<0.015	0.027	0.109	<0.01	0.10	<0.10
WMS-634	<0.50	0.313	0.032	0.042	0.429	<0.01	0.15	<0.10

TABLE 3. ORGANIC TENTATIVELY IDENTIFIED COMPOUNDS
(Values are mg/L)

	WMS-631	WMS-632	WMS-633	WMS-634	Detection Limit
Methoxyhydroxy benzaldehyde	0.04	0.30	1.5	0.03	0.02
Naphthalene	0.08	0.20	1.5	0.03	0.02
Furfural	--	--	0.10	--	0.02
Benzaldehyde	--	--	0.02	--	0.02
Isoquinoline	--	--	0.03	--	0.02

Waste Stream Number: 344-2

Waste Stream Title: Solvent

344-2
USEC

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960909-085 Project: ER 9567UC Requisition Number: 22853
Customer Sample ID: VER38095001 Customer: ENV RESTORATI
Date Sampled: 9-SEP-1996 09:40 Date Sample Received: 9-SEP-1996
Sampled By: B PYLES Date Sample Completed: 10-OCT-1996
Material Description: oil liquid

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed
SW846-3580A	Sample Prep Semi-Volatiles	COMPLETE			DK SCAGGS	23-SEP-1996
TSD553-230	Gross Alpha	J 0.4		pCi/mL	JP BREWSTER	23-SEP-1996
	Gross Beta	<0.3		pCi/mL	JP BREWSTER	23-SEP-1996
TSD553-380	Technetium	<0.8		pCi/mL	JP BREWSTER	23-SEP-1996
TSD553-700	% U-235	ND		pCi/L	RJ TIPTON	1-OCT-1996
	Uranium	148	80	ug/L	RJ TIPTON	1-OCT-1996

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
C. J. Van Meter (Organic Analytical Services)
Date Approved: 15-OCT-1996

********** COMMENT PAGE **********
********** 960909-085 **********

**** Comments from the Organic Analytical Services *****

SW846-8260A

Due to solvent content in sample, analysis was performed by the high level method which involves a methanolic extraction and results in higher detection limits.

--Method SW846-8270A

Due to this sample matrix (oil) being soluble in the extraction solvent (methylene chloride), this sample was prepared by the waste dilution method. This resulted in the higher sample quantitation limits reported.

The first sample, other than blanks and laboratory control samples injected in the analytical batch QA #96160924B02, apparently reacted in the injection port liner of the GC resulting in poor response for the last two internal standards in all subsequent injections for this batch. These samples were VER38095-001, VER39161-001, and VER37026-001 with all their associated MS & MSD preparations. The effects of this low internal standard area were limited to high recovery of the last B/N surrogate (Terphenyl-d14) and high recovery of the matrix spike compound Pyrene. Contact was made with the customer for the verification project (Jeff Deemie) through the project manager (John Taphorn). Problems discussed included the usefulness of information obtainable by the re-injection of these samples as required by the method, as well as reporting requirements for compounds that exceeded the initial calibration range and compounds not present in the initial calibration. The response received was to not devote more resources to re- -ting these samples and to report compounds that exceed the initial cal- -ion or are not present in the initial calibration as estimated values.

Five compounds were reported as ND (not detected), these are compounds that are not in calibration standards prepared for this run. However, these compounds have been extensively tested in the lab for GC/MS information. Had these compounds been detected, the sample would have been reinjected against a valid calibration curve for these compounds or reported as estimates.

The GC chromatogram contained 6 separate bands of peaks that were about 1 to 1.5 minutes wide ocurring between 18 and 32 minutes. These 6 bands bands were fairly intense and masked/interfered with some of the target compounds that happened to co-elute with them.

There were more than fifty non-target compounds with area abundances approximately equal to or greater than 10% of the internal standards. The mass spectra of these compounds were compared by computer to a reference mass spectral database library containing ~75,000 spectra. The identification matches were then reviewed and either accepted and reported or rejected and reported as unknowns. The large portion of these TICs were left as unknowns since no reliable match could be obtained. However, many of these TICs were due to the 6 broad peaks mentioned above. They all had similar mass spectra data including masses of 85, 101, 135, and 151, which agreed well with the mass spectra from an MFL oil standard. Although the retention times for this sample and the MFL oil standard did not agree well, these TICs very likely are comprised of similar molecular fragments cor- -ng multi-fluorinated and chlorinated molecules. Due to th- -lity of the AnaLIS system for reporting TIC's

in an appropriate format, they are not included in this report. A detailed listing of these TICs in standard laboratory format is included in the data package for this sample, and can be made available upon request.

Definition Page for Qualifiers/Flags

********** 960909-085 **********

Inc. Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample prepar sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of a dilution that is not within control limits or if the analytical (post-digestion) spike recovery for grap less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is g CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the c repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%) concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.
Correlation coefficient for MSA is less tha 0.995.
The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same fi

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 960909-085
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#3
Authorized By: C. J. Van Meter

Customer Sample ID: VER38095001
Customer: ENV RESTORATI
Sample Matrix: LIQUID WASTE
Requisition Number: 22853
Date Sample Received: 9-SEP-1996
Date Sampled: 9-SEP-1996

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 17-SEP-1996
QA File Number: 96160917A3
Dilution Factor: 1000
Analyst: MA NOVOTNY

CAS		ug/kg	CAS	
67-64-1	Acetone	860000	100-41-4	Ethyl benzene
71-43-2	Benzene	2000U	76-13-1	Freon 113
75-27-4	Bromodichloromethane	2000U	76-14-2	Freon 114
75-25-2	Bromoform	2000U	108-10-1	4-Methyl-2-pentanone
74-83-9	Bromomethane	12000	75-09-2	Methylene Chloride
78-93-3	2-Butanone	100000U	79-34-5	1,1,2,2-Tetrachloroethane
75-15-0	Carbon Disulfide	2000U	127-18-4	Tetrachloroethene
56-23-5	Carbon Tetrachloride	2000U	108-88-3	Toluene
108-90-7	Chlorobenzene	2000U	71-55-6	1,1,1-Trichloroethane
75-00-3	Chloroethane	4000U	79-00-5	1,1,2-Trichloroethane
67-66-3	Chloroform	2000U	79-01-6	Trichloroethene
74-87-3	Chloromethane	9400	75-69-4	Trichlorofluoromethane
124-48-1	Dibromochloromethane	2000U	75-01-4	Vinyl Chloride
106-46-7	1,4-Dichlorobenzene	2000U	1330-20-7	m,p-Xylene
95-50-1	1,2-Dichlorobenzene	2000U	95-47-6	o-Xylene
541-73-1	1,3-Dichlorobenzene	2000U		
75-34-3	1,1-Dichloroethane	14000		
107-06-2	1,2-Dichloroethane	2000U		
75-35-4	1,1-Dichloroethene	89000		
156-59-2	cis-1,2-Dichloroethene	2000U		
156-60-5	trans-1,2-Dichloroethene	2000U		

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

VOC ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 960909-085
Laboratory: Organic Analytical Services
Sample Matrix: LIQUID WASTE
Level: (low/med): LOW
Dilution Factor: 1000

Customer Sample ID: VER38095001
Customer: ENV RESTORATION
File ID:
Date Received: 9-SEP-1996
Date Analyzed: 17-SEP-1996
Concentration Units: ug/kg

Number TICs found: 2

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.	95-63-6	1,2,4-Trimethylbenzene	23.6	6600	
2.		3,3'-thiobis[2-methyl-1propene	23.9	70000	J
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

ANALYSIS DATA REPORT

AnaLIS ID: 960909-085
Laboratory: Organic Analytical Services
File ID:
Instrument ID: SV2
Authorized By: C. J. Van Meter

Customer Sample ID: VER38095001
Customer: ENV RESTORAT
Sample Matrix: LIQUID WASTE
Requisition Number: 22853
Date Sample Received: 9-SEP-1996
Date Sampled: 9-SEP-1996

Semi-Volatiles

Date Extracted/Prepared: 23-SEP-1996
Analysis Procedure Number: SW846-8270A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 24-SEP-1996
QA File Number: 96160924B02
Dilution Factor: 1.0
Analyst: BD FUHR

CAS		ug/kg	CAS	
59-50-7	4-Chloro-3-methylphenol	87800U	606-20-2	2,6-Dinitrotoluene
95-57-8	2-Chlorophenol	43900U	78-59-1	Isophorone
120-83-2	2,4-Dichlorophenol	43900U	98-95-3	Nitrobenzene
105-67-9	2,4-Dimethylphenol	43900U	83-32-9	Acenaphthene
51-28-5	2,4-Dinitrophenol	220000U	208-96-8	Acenaphthylene
534-52-1	4,6-Dinitro-2-methylphenol	220000U	120-12-7	Anthracene
88-75-5	2-Nitrophenol	43900U	56-55-3	Benzo(a)anthracene
100-02-7	4-Nitrophenol	220000U	50-32-8	Benzo(a)pyrene
87-86-5	Pentachlorophenol	220000U	191-24-2	Benzo(g,h,i)perylene
108-95-2	Phenol	43900U	76-01-7	Benzo(k)fluoranthene
88-06-2	2,4,6-Trichlorophenol	43900U	218-01-9	Chrysene
117-81-7	bis(2-Ethylhexyl)phthalate	43900U	53-70-3	Dibenz(a,h)anthracene
85-68-7	Butylbenzylphthalate	43900U	206-44-0	Fluoranthene
84-74-2	Di-n-butylphthalate	43900U	86-73-7	Fluorene
84-66-2	Diethylphthalate	43900U	193-39-5	Indeno(1,2,3-cd)pyrene
131-11-3	Dimethylphthalate	43900U	91-20-3	Naphthalene
117-84-0	di-n-Octylphthalate	43900U	85-01-8	Phenanthrene
62-75-9	N-Nitrosodimethylamine	43900U	129-00-0	Pyrene
86-30-6	N-Nitrosodiphenylamine	43900U	111-44-4	bis(2-Chloroethyl)ether
621-64-7	N-Nitroso-di-n-propylamine	43900U	111-91-1	bis(2-Chloroethoxy)methane
121-14-2	2,4-Dinitrotoluene	43900U	39638-32-9	bis(2-Chloroisopropyl)ether

ANALYSIS DATA REPORT

AnaLIS ID:	960909-085	Customer Sample ID:	VER38095001
Laboratory:	Organic Analytical Services	Customer:	ENV RESTORATIO
File ID:		Sample Matrix:	LIQUID W
Instrument ID:	SV2	Requisition Number:	22853
Authorized By:	C. J. Van Meter	Date Sample Received:	9-SEP-1996
		Date Sampled:	9-SEP-1996

Semi-Volatiles

Date Extracted/Prepared:	23-SEP-1996	Date Analyzed:	24-SEP-1996
Analysis Procedure Number:	SW846-8270A	QA File Number:	96160924B02
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	BD FUHR
Associated Blank:			

CAS		ug/kg	CAS	
101-55-3	4-Bromophenyl-phenylether	43900U		
7005-72-3	4-Chlorophenyl-phenylether	43900U		
91-58-7	2-Chloronaphthalene	43900U		
95-50-1	1,2-Dichlorobenzene	43900U		
541-73-1	1,3-Dichlorobenzene	43900U		
106-46-7	1,4-Dichlorobenzene	43900U		
118-74-1	Hexachlorobenzene	43900U		
87-68-3	Hexachlorobutadiene	43900U		
77-47-4	Hexachlorocyclopentadiene	43900U		
67-72-1	Hexachloroethane	43900U		
120-82-1	1,2,4-Trichlorobenzene	43900U		
110-86-1	Pyridine	ND		
	2-Methylphenol (o-Cresol)	ND		
	3,4-Methylphenol (m,p-Cresol)	ND		
95-95-4	2,4,5-Trichlorophenol	ND		
	Azobenzene	43900U		
205-99-2	Benzo(b)fluoranthene	43900U		

Waste Stream Number: U344-5

Waste Stream Title: Decontamination Solutions

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 961123-008 Project: WMGT RFD Requisition Number: 24499
Customer Sample ID: RFD14495R Customer: ENV./WASTE MGT.
Date Sampled: 22-NOV-1996 14:00 Date Sample Received: 22-NOV-1996
Sampled By: M ALIFF Date Sample Completed: 13-DEC-1996
Material Description: decon soln

** No comments were made for this sample. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
TSD552-150	% U-235	2.4		% U-235	AL SHULTZ	11-DEC-1996	9607M246
	Uranium	7140		UG/L	AL SHULTZ	11-DEC-1996	9607M246

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
Date Approved: 16-DEC-1996

Definition Page for Qualifiers/Flags

961123-008

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greate than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

- Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an /te

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 961123-009 Project: WMGT RFD Requisition Number: 24499
Customer Sample ID: RFD14495RD Customer: ENV./WASTE MGT.
Date Sampled: 22-NOV-1996 14:00 Date Sample Received: 22-NOV-1996
Sampled By: M ALIFF Date Sample Completed: 13-DEC-1996
Material Description: decon soln

** No comments were made for this sample. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
TSD552-150	% U-235	2.8		% U-235	AL SHULTZ	11-DEC-1996	9607M246
	Uranium	5830		UG/L	AL SHULTZ	11-DEC-1996	9607M246

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
Date Approved: 16-DEC-1996

Definition Page for Qualifiers/Flags

961123-009

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

- Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an a ce.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

344-5

w
4w

Portsmouth Gaseous Diffusion Plant
Technical Operations Division
Analysis Results

AnaLIS ID: 931124-131 Project: WMGT RFD Requisition Number: 006405
Customer Sample ID: RFD14495 Customer: ENV./WASTE MGT.
Date Sampled: 22-NOV-1993 13:30 Date Sample Received: 24-NOV-1993
Sampled By: BK KELLEY Date Sample Completed: 11-JAN-1994
Material Description: X344 MOP WATER

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-6010	Arsenic	3.2U		MG/KG	EL SIMPSON	1-DEC-1993	93080984
	Barium	0.43		MG/KG	EL SIMPSON	1-DEC-1993	93080984
	Cadmium	1.3		MG/KG	EL SIMPSON	1-DEC-1993	93080984
	Chromium	0.64		MG/KG	EL SIMPSON	1-DEC-1993	93080984
	Lead	1.6		MG/KG	EL SIMPSON	1-DEC-1993	93080984
	Selenium	4.5U		MG/KG	EL SIMPSON	1-DEC-1993	93080984
	Silver	0.24UN		MG/KG	EL SIMPSON	1-DEC-1993	93080984
SW846-7470	Mercury	.032		MG/KG	EK GILBERT	16-DEC-1993	93081071
TSD515-500	Uranium (Waste)	8.5		UG/G	SK BENNINGTON	14-DEC-1993	93101392
30	Gross Alpha Activity	15		pCi/mL	JJ SISLER	14-DEC-1993	93072040
	Gross Beta Activity	5		pCi/mL	JJ SISLER	14-DEC-1993	93072040
TSD553-380	Technetium	<0.9		pCi/mL	JJ SISLER	13-DEC-1993	93072025

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
Arsenic	37.74	33.0774	87.65
Barium	37.74	37.2615	98.73
Cadmium	37.74	36.4943	96.70
Chromium	37.74	38.2326	101.31
Lead	37.74	36.9849	98.00
Mercury	.147	0.116	78.91
Selenium	37.74	29.4755	78.10
Silver	37.74	8.4877	22.49
Uranium (Waste)	94.3	85.6	90.77

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial

dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

Qualify data for the sample as estimated.

m - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

- Aldol condensation product.

- Secondary dilution.

E - Exceeds initial calibration range.

Laboratory Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
D. E. Boyd (Spectrochemistry/ICP Laboratory)
D. K. Perez (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)

Date Approved: 13-JAN-1994

AnaLIS ID: 931124-131
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD14495
Customer: ENV./WASTE MGT.
Sample Matrix: WASTE
Requisition Number: 006405
Date Sample Received: 24-NOV-1993
Date Sampled: 22-NOV-1993

Solvents_Volatiles

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 7-JAN-1994
QA File Number: 94160029
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/ml	CAS		ug/ml
71-43-2	Benzene	60U			
78-93-3	2-Butanone	60U			
56-23-5	Carbon Tetrachloride	.001U			
108-90-7	Chlorobenzene	60U			
67-66-3	Chloroform	NA			
106-46-7	1,4-Dichlorobenzene	.02U			
107-06-2	1,2-Dichloroethane	.01U			
75-35-4	1,1-Dichloroethene	.004U			
127-18-4	Tetrachloroethene	.001U			
79-01-6	Trichloroethene	.001U			
75-01-4	Vinyl Chloride	NA			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Waste Stream Number: Switch-1

Waste Stream Title: Lead Cable

PORTS MSDS #: 347

PRODUCT: STANDARD, LEAD 1000PPM IN 10% NITRIC

PART NUMBER:

FORMULA: Pb

KEYWORD: STANDARD

PORTS NUMBER: 00190041-100; 00190028-100; 00190041

PORTS MISC INFO:
LAB MSDS# 334
LAB MSDS# 347

PORTS RATING: HFR=300

MANUFACTURER:
VHG LABS INC.
180 ZACHARY RD #5
MANCHESTER
NH

03109
PHONE: PHONE: 603-622-7660
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	~ 212 F	NOTE: ~100'C.
Melting Point. . . .	~ 32 F	NOTE: ~0'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	~ 1	
Vapor Pressure . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Vapor Density. . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Percent Volatiles. .	~ 99	NOTE: @ 21'C.
Evaporation Rate . .	NA	NOTE: NOT APPLI/NOT AVAIL.
pH	NA	NOTE: NOT APPLI/NOT AVAIL.
Molecular Weight . .	EQ 207.20	NOTE: FORMULA WT.
Viscosity.	NG	

Solubility in Water. COMPLETE (100%).
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID, ODORLESS / ODOR THRESHOLD: NOT APPLICABLE/NOT AVAILABLE.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	NA	NOTE: NOT APPLI/NOT AVAIL.
Explosive/Flammable Limits		
Lower (LEL).	NA	NOTE: NOT APPLI/NOT AVAIL.
Upper (UEL).	NA	NOTE: NOT APPLI/NOT AVAIL.

Shipping Regulations

UN/NA Number.	NG
D.O.T. Hazard Class. . .	NG
Label	NOT GIVEN
Proper Shipping Name . .	CHEMICALS, N.O.S. (NON-REGULATED)

==========

Preparer/Contact Information: QUALITY ASSURANCE DEPARTMENT

Date Prepared/Revised 1/29/93

===== Component Information =====

LEAD
OSHA PEL (PPM):
OSHA PEL (MG/M3): 0.05
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 0.15
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 1.0
C.A.S. No.: 7439921

NITRIC ACID
OSHA PEL (PPM):
OSHA PEL (MG/M3): 5.2
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 5.2
STEL (PPM):
STEL (MG/M3): 10
Product %: EQ 10
C.A.S. No.: 7697372
Note:
PEL & TLV: 2 PPM / STEL: 4 PPM.

WATER
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: BA
C.A.S. No.: 7732185
Note:
NE = NOT ESTABLISHED / BA = BALANCE.

===== SECTIN I - PRODUCT IDENTIFICATION =====

PRODUCT NAME: Lead Plasma Emission Standard - 10,000 micrograms/ml

COMMON SYNONYMS: N/A

CHEMICAL FAMILY: Plasma Emission Standards

FORMULA: Pb

FORMULA WT.: 207.20

CAS NO.: N/A

NIOSH/RTECS NO.: QU5775000

PRODUCT USE: Laboratory Reagent

REVISION DATE: 01/29/93

TEL: (603) 622-7660

FAX: 622-5180

MANUFACTURER'S NAME AND ADDRESS:

VHG LABS, INC.

CHEMICAL PRODUCTS AND SERVICES
180 ZACHARY ROAD #5
MANCHESTER, NH 03109

===== SECTION II - COMPONENTS =====

SEE COMPONENT INFORMATION.

===== SECTION III - PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

ODOR THRESHOLD (PPM): N/A

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

===== SECTION IV - FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT (CLOSED CUP): N/A

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS:

UPPER: N/A
LOWER: N/A

FIRE EXTINGUISHING MEDIA: Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE-FIGHTING PROCEDURES: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode.

UNUSUAL FIRE & EXPLOSION HAZARDS: Reacts with most metals to produce hydrogen gas, which can form an explosive mixture with air.

TOXIC GASES PRODUCED: Oxides of nitrogen.

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT: None identified.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE: None identified.

===== SECTION V - HEALTH HAZARD DATA =====

THRESHOLD LIMIT VALUE (TLV/TWA): 5.2 mg/m3 (2 ppm)

TLV is for Nitric acid.

SHORT-TERM EXPOSURE LIMIT (STEL): 10 mg/m3 (4 ppm)

STEL is for Nitric acid.

PERMISSIBLE EXPOSURE LIMIT (PEL): 5.2 mg/m3 (2 ppm)

PEL is for Nitric acid.

TOXICITY OF COMPONENTS:

INHALATION-1HR RAT LC50 FOR NITRIC ACID: 2500 ppm

INTRAPERITONEAL MOUSE LD50 FOR WATER: 190 g/kg

INTRAVENOUS MOUSE LD50 FOR WATER: 25 g/kg

CARCINOGENICITY: NTP: No IARC: No Z LIST: No OSHA REG: No

CARCINOGENICITY: None identified

REPRODUCTIVE EFFECTS: This product contains a chemical known to the State of California to cause birth defects and other reproductive harm.

EFFECTS OF OVEREXPOSURE:

INHALATION: Severe irritation or burns of respiratory system, headache, nausea, vomiting, dizziness, pulmonary edema, lung inflammation, may be fatal

SKIN CONTACT: Severe irritation

EYE CONTACT: Severe irritation

SKIN ABSORPTION: None identified

INGESTION: Burns to mouth, throat, and stomach, nausea, vomiting, kidney dysfunction

CHRONIC EFFECTS: Damage to lungs, teeth, anemia, kidney damage, blurred vision, lead build-up in the central nervous system

TARGET ORGANS: Eyes, skin, mucous membranes, GI tract, central nervous system, gingival tissue, respiratory system, lungs, kidneys, blood, teeth

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Damaged skin, eye disorders, cardiopulmonary disease, lung disease

PRIMARY ROUTES OF ENTRY: Inhalation, ingestion, skin contact, eye contact

EMERGENCY AND FIRST AID PROCEDURES:

INGESTION: CALL A PHYSICIAN. If swallowed, do NOT induce vomiting
If conscious, give water, milk or milk of magnesia.

INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

SKIN CONTACT: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

EYE CONTACT: In case of eye contact, immediately flush with plenty of water for at least 15 minutes.

SARA/TITLE III HAZARD CATEGORIES AND LISTS:

ACUTE: Yes CHRONIC: Yes FLAMMABILITY: No PRESSURE: No REACTIVITY: No

EXTREMELY HAZARDOUS SUBSTANCE: Yes Contains Nitric Acid (RQ = 1,000 LBS, TPQ = 1,000 LBS)

CERCLA HAZARDOUS SUBSTANCE: Yes Contains Lead (RQ = 1 LB) and Nitric Acid (RQ = 1000 LBS)

SARA 313 TOXIC CHEMICALS: Yes Contains Lead and Nitric Acid

TSCA INVENTORY: Yes

STATE LISTS:

FOR PRODUCTS SOLD IN THE STATE OF CALIFORNIA, REQUIRES THAT WE PROVIDE TO USERS AND THEIR EMPLOYEES THE FOLLOWING MESSAGE: WARNING: THIS PRODUCT CONTAINS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS AND OTHER REPRODUCTIVE HARM.

===== SECTION VI - REACTIVITY DATA =====

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Heat

INCOMPATIBLES: Strong bases, strong reducing agents, alkalies, most common metals

DECOMPOSITION PRODUCTS: Oxides of nitrogen

===== SECTION VII - SPILL & DISPOSAL PROCEDURES =====

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE: Wear self-contained breathing apparatus and full protective clothing. Stop leak if you can do so without risk. Ventilate area. Neutralize spill with soda ash or lime. With clean shovel, carefully place material into clean, dry container and cover; remove from area. Flush spill area with water.

DISPOSAL PROCEDURES: Dispose in accordance with all applicable federal, state, and local environmental regulations.

EPA HAZARDOUS WASTE NUMBER: D002 (Corrosive Waste)

===== SECTION VIII - PROTECTION INFORMATION =====

EYE/FACE PROTECTION: Goggles & Shield

PROTECTIVE CLOTHING: Lab Coat & Apron

PROTECTIVE GLOVES: Rubber

VENTILATION REQUIREMENTS: Vent Hood

===== SECTION IX - STORAGE DATA AND ADDITIONAL INFORMATION =====

STORAGE REQUIREMENTS: Keep container tightly closed. Store in secure poison area. Isolate from incompatible materials.

===== SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION =====

DOMESTIC (D.O.T.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)

INTERNATIONAL (I.M.O.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)
MARINE POLLUTANTS: No

N/A = Not Applicable or Not Available
N/E = Not Established

The information in this Material Safety Data Sheet meets the requirements of the United States OCCUPATIONAL SAFETY AND HEALTH ACT and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) and the Canadian WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. This document is intended only as a guide to the appropriate precautionary handling of the material by a person trained in, or supervised by a person trained in, chemical handling. The user is responsible for determining the application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes.

Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, VHG cannot warn of all of the potential dangers of use or interaction with other chemicals or materials. VHG warrants that the chemical meets the specifications set forth on the label.

VHG DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.

The user should recognize that this product can cause severe injury and even death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION.

Approved by Quality Assurance Department.

Waste Stream Number: Switch-2

Waste Stream Title: Oil

W
4W

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 920624-001 Project: WMGT RFD Customer Sample ID: RFD-8534
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 23-JUN-1992 Date Sample Received: 23-JUN-1992
Sampled By: B KELLEY Date Sample Completed: 18-DEC-1992
Material Description: WASTE OIL & SOLVENT

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
ASTMD3828	Flash Point (Setaflash)	86		Deg. F	DK SCAGGS	23-JUL-1992	X
EC-013	Mercury	NA		ug/L	TE SHOOK	22-SEP-1992	NA
SW846-3051	Arsenic	3.8*		mg/kg	AL SHULTZ	18-NOV-1992	92080457
	Selenium	0.69		mg/kg	AL SHULTZ	18-NOV-1992	92080457
	Silver	15.5*		mg/kg	AL SHULTZ	18-NOV-1992	92080457
TSD515-500	Uranium (Waste)	<1.0		ug/g	DK PEREZ	7-JUL-1992	92101072
TSD552-103	Barium	.02		mg/kg	EK GILBERT	7-JUL-1992	92080284
	Cadmium	.03 U*		mg/kg	EK GILBERT	7-JUL-1992	92080284
	Chromium	.06		mg/kg	EK GILBERT	7-JUL-1992	92080284
	Lead	.29 *		mg/kg	EK GILBERT	7-JUL-1992	92080284
TSD553-440	Assay (% U-235, Waste)	NA			JD LITTERAL	3-AUG-1992	92070696

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
BARIUM	9.99	11.03	110.41
CADMIUM	9.99	10.14	101.50
CHROMIUM	9.99	7.78	77.88
LEAD	9.99	9.39	93.99
URANIUM (WASTE)	40	38.7	96.75

***** Comments from the Spectrochemistry/ICP Laboratory *****

Sample beyond holding time for mercury.

***** Comments from the Organic Analytical Services *****

There was a matrix interference with 1,2-dichloroethane and chloroform.

nic Data Reporting Qualifiers and Flags:
centration Qualifiers:
D - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but great
than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furna less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.
M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.
N - Spike sample recovery is not within control limits.
R - The reported value is unusable. The value is for informational purposes only.
S - The reported value was obtained by the Method of Standard Additions (MSA).
UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.
* - Duplicate analysis is not within control limits.
+ - Correlation coefficient for MSA is less tha 0.995.
# - The value is between the LC and the LLD.
Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analy

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
- Indicates an estimated value.
- Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Laboratory Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
O. A. Vita (Spectrochemistry/ICP Laboratory)
D. K. Perez (Environmental and Industrial Hygiene Laboratory)
D. E. Boyd (Organic Analytical Services)
John E. Hobensack (Oil & Coal Analysis Laboratory)
Date Approved: 20-DEC-1992

AnaLIS ID: 920624-001
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: D. E. Boyd

Customer Sample ID: RFD-8534
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 23-JUN-1992
Date Sampled: 23-JUN-1992

Solvents_Volatiles

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 27-JUL-1992
QA File Number: 92160161
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
71-43-2	Benzene	320			
	2-Butanone (MEK)	1400			
56-23-5	Carbon Tetrachloride	0.4U			
108-90-7	Chlorobenzene	0.8U			
67-66-3	Chloroform	NA			
	p-Dichlorobenzene	.4U			
107-06-2	1,2-Dichloroethane	NA			
75-35-4	1,1-Dichloroethene	0.4U			
127-18-4	Tetrachloroethene	0.4U			
79-01-6	Trichloroethene	0.4U			
75-01-4	Vinyl Chloride	NA			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

W
4W

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

WSID-SWITCH-2

AnaLIS ID: 920309-039 Project: WMGT RFD Customer Sample ID: RFD-8617
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 6-MAR-1992 Date Sample Received: 6-MAR-1992
Sampled By: B KELLEY Date Sample Completed: 23-OCT-1992
Material Description: SWITCHYARD OIL

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
EC-006	Arsenic	NA		mg/L	EL SIMPSON		
EC-013	Mercury	<.02 N		mg/kg	SJ SCHOETTLE	11-MAR-1992	9208A073
EC-015	Selenium	NA		mg/L	EL SIMPSON		
EC-040	Barium	NA		mg/L	AL SHULTZ		
	Cadmium	NA		mg/L	AL SHULTZ		
	Chromium	NA		mg/L	AL SHULTZ		
	Lead	NA		mg/L	AL SHULTZ		
S' '0	Silver	<1.0 N		mg/kg	TE SHOOK	21-AUG-1992	92080304
SW846-8080	PCB (TOTAL)	7.4		ug/g	JN STRICKLAND	13-MAR-1992	92160055
TSD515-500	Uranium (Waste)	2.0		ug/g	CJ HOLBROOK	13-MAR-1992	92100416
TSD553-370	Technetium (Waste)	11.7		pCi/mL	JJ SISLER	17-MAR-1992	92070185
TSD553-440	Assay (% U-235, Waste)	NA		% U-235	JD LITTERAL	29-SEP-1992	92070975

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
MERCURY	.200	0.140	70.00
SILVER	1000	343.	34.30
URANIUM (WASTE)	40	36.6	91.50

***** Comments from the Infrared and Chromatographic Services Laboratory *****

	Percent Sample (Vol./Vol.)	Total PCB, ppm
Organic Layer	17	7.4 (ug/g)
Aqueous Layer	83	<0.3 (ug/ml)

O. ayer (Spike, 8.96 ppm PCB-1260) 14.8 ug/g (83% Recovery)
Aqueous Layer (Spike, 2.2 ppm PCB-1260) 2.2 ug/ml (100% recovery)

ata Reporting Qualifiers and Flags:

.ration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greate than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

The value is between the LC and the LLD.

ng "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

Laboratory Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
D. E. Boyd (Spectrochemistry/ICP Laboratory)
D. K. Perez (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)

Date Approved: 23-OCT-1992

Waste Stream Number: Switch-3

Waste Stream Title: Switches

PORTS MSDS #: 347

PRODUCT: STANDARD, LEAD 1000PPM IN 10% NITRIC

PART NUMBER:

FORMULA: Pb

KEYWORD: STANDARD

PORTS NUMBER: 00190041-100; 00190028-100; 00190041

PORTS MISC INFO:
LAB MSDS# 334
LAB MSDS# 347

PORTS RATING: HFR=300

MANUFACTURER:
VHG LABS INC.
180 ZACHARY RD #5
MANCHESTER
NH

03109
PHONE: PHONE: 603-622-7660
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	~ 212 F	NOTE: ~100'C.
Melting Point. . . .	~ 32 F	NOTE: ~0'C.
Freezing Point . . .	NG	
Dour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	~ 1	
Vapor Pressure . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Vapor Density. . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Percent Volatiles. .	~ 99	NOTE: @ 21'C.
Evaporation Rate . .	NA	NOTE: NOT APPLI/NOT AVAIL.
pH	NA	NOTE: NOT APPLI/NOT AVAIL.
Molecular Weight . .	EQ 207.20	NOTE: FORMULA WT.
Viscosity.	NG	

Solubility in Water. COMPLETE (100%).
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID, ODORLESS / ODOR THRESHOLD: NOT APPLICABLE/NOT AVAILABLE.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	NA	NOTE: NOT APPLI/NOT AVAIL.
Explosive/Flammable Limits		
Lower (LEL).	NA	NOTE: NOT APPLI/NOT AVAIL.
Upper (UEL).	NA	NOTE: NOT APPLI/NOT AVAIL.

Shipping Regulations

UN/NA Number.	NG
D.O.T. Hazard Class. . .	NG
Label	NOT GIVEN
Proper Shipping Name . .	CHEMICALS, N.O.S. (NON-REGULATED)

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Preparer/Contact Information: QUALITY ASSURANCE DEPARTMENT

Date Prepared/Revised 1/29/93

===== Component Information =====

LEAD
OSHA PEL (PPM):
OSHA PEL (MG/M3): 0.05
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 0.15
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 1.0
C.A.S. No.: 7439921

NITRIC ACID
OSHA PEL (PPM):
OSHA PEL (MG/M3): 5.2
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 5.2
STEL (PPM):
STEL (MG/M3): 10
Product %: EQ 10
C.A.S. No.: 7697372
Note:
PEL & TLV: 2 PPM / STEL: 4 PPM.

WATER
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: BA
C.A.S. No.: 7732185
Note:
NE = NOT ESTABLISHED / BA = BALANCE.

===== SECTIN I - PRODUCT IDENTIFICATION =====

PRODUCT NAME: Lead Plasma Emission Standard - 10,000 micrograms/ml

COMMON SYNONYMS: N/A

CHEMICAL FAMILY: Plasma Emission Standards

FORMULA: Pb

FORMULA WT.: 207.20

CAS NO.: N/A

NIOSH/RTECS NO.: QU5775000

PRODUCT USE: Laboratory Reagent

REVISION DATE: 01/29/93

TEL: (603) 622-7660

FAX: 622-5180

MANUFACTURER'S NAME AND ADDRESS:

VHG LABS, INC.

CHEMICAL PRODUCTS AND SERVICES
180 ZACHARY ROAD #5
MANCHESTER, NH 03109

===== SECTION II - COMPONENTS =====

SEE COMPONENT INFORMATION.

===== SECTION III - PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

ODOR THRESHOLD (PPM): N/A

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

===== SECTION IV - FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT (CLOSED CUP): N/A

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS:

UPPER: N/A
LOWER: N/A

FIRE EXTINGUISHING MEDIA: Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE-FIGHTING PROCEDURES: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode.

UNUSUAL FIRE & EXPLOSION HAZARDS: Reacts with most metals to produce hydrogen gas, which can form an explosive mixture with air.

TOXIC GASES PRODUCED: Oxides of nitrogen.

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT: None identified.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE: None identified.

===== SECTION V - HEALTH HAZARD DATA =====

THRESHOLD LIMIT VALUE (TLV/TWA): 5.2 mg/m3 (2 ppm)

TLV is for Nitric acid.

SHORT-TERM EXPOSURE LIMIT (STEL): 10 mg/m3 (4 ppm)

STEL is for Nitric acid.

PERMISSIBLE EXPOSURE LIMIT (PEL): 5.2 mg/m3 (2 ppm)

PEL is for Nitric acid.

TOXICITY OF COMPONENTS:

INHALATION-1HR RAT LC50 FOR NITRIC ACID: 2500 ppm

INTRAPERITONEAL MOUSE LD50 FOR WATER: 190 g/kg

INTRAVENOUS MOUSE LD50 FOR WATER: 25 g/kg

CARCINOGENICITY: NTP: No IARC: No Z LIST: No OSHA REG: No

CARCINOGENICITY: None identified

REPRODUCTIVE EFFECTS: This product contains a chemical known to the State of California to cause birth defects and other reproductive harm.

EFFECTS OF OVEREXPOSURE:

INHALATION: Severe irritation or burns of respiratory system, headache, nausea, vomiting, dizziness, pulmonary edema, lung inflammation, may be fatal

SKIN CONTACT: Severe irritation

EYE CONTACT: Severe irritation

SKIN ABSORPTION: None identified

INGESTION: Burns to mouth, throat, and stomach, nausea, vomiting, kidney dysfunction

CHRONIC EFFECTS: Damage to lungs, teeth, anemia, kidney damage, blurred vision, lead build-up in the central nervous system

TARGET ORGANS: Eyes, skin, mucous membranes, GI tract, central nervous system, gingival tissue, respiratory system, lungs, kidneys, blood, teeth

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Damaged skin, eye disorders, cardiopulmonary disease, lung disease

PRIMARY ROUTES OF ENTRY: Inhalation, ingestion, skin contact, eye contact

EMERGENCY AND FIRST AID PROCEDURES:

INGESTION: CALL A PHYSICIAN. If swallowed, do NOT induce vomiting If conscious, give water, milk or milk of magnesia.

INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

SKIN CONTACT: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

EYE CONTACT: In case of eye contact, immediately flush with plenty of water for at least 15 minutes.

SARA/TITLE III HAZARD CATEGORIES AND LISTS:

ACUTE: Yes CHRONIC: Yes FLAMMABILITY: No PRESSURE: No REACTIVITY: No

EXTREMELY HAZARDOUS SUBSTANCE: Yes Contains Nitric Acid (RQ = 1,000 LBS, TPQ = 1,000 LBS)

CERCLA HAZARDOUS SUBSTANCE: Yes Contains Lead (RQ = 1 LB) and Nitric Acid (RQ = 1000 LBS)

SARA 313 TOXIC CHEMICALS: Yes Contains Lead and Nitric Acid

TSCA INVENTORY: Yes

STATE LISTS:

FOR PRODUCTS SOLD IN THE STATE OF CALIFORNIA, REQUIRES THAT WE PROVIDE TO USERS AND THEIR EMPLOYEES THE FOLLOWING MESSAGE: WARNING: THIS PRODUCT CONTAINS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS AND OTHER REPRODUCTIVE HARM.

===== SECTION VI - REACTIVITY DATA =====

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Heat

INCOMPATIBLES: Strong bases, strong reducing agents, alkalies, most common metals

DECOMPOSITION PRODUCTS: Oxides of nitrogen

===== SECTION VII - SPILL & DISPOSAL PROCEDURES =====

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE: Wear self-contained breathing apparatus and full protective clothing. Stop leak if you can do so without risk. Ventilate area. Neutralize spill with soda ash or lime. With clean shovel, carefully place material into clean, dry container and cover; remove from area. Flush spill area with water.

DISPOSAL PROCEDURES: Dispose in accordance with all applicable federal, state, and local environmental regulations.

EPA HAZARDOUS WASTE NUMBER: D002 (Corrosive Waste)

===== SECTION VIII - PROTECTION INFORMATION =====

EYE/FACE PROTECTION: Goggles & Shield

PROTECTIVE CLOTHING: Lab Coat & Apron

PROTECTIVE GLOVES: Rubber

VENTILATION REQUIREMENTS: Vent Hood

===== SECTION IX - STORAGE DATA AND ADDITIONAL INFORMATION =====

STORAGE REQUIREMENTS: Keep container tightly closed. Store in secure poison area. Isolate from incompatible materials.

===== SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION =====

DOMESTIC (D.O.T.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)

INTERNATIONAL (I.M.O.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)
MARINE POLLUTANTS: No

N/A = Not Applicable or Not Available
N/E = Not Established

The information in this Material Safety Data Sheet meets the requirements of the United States OCCUPATIONAL SAFETY AND HEALTH ACT and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) and the Canadian WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. This document is intended only as a guide to the appropriate precautionary handling of the material by a person trained in, or supervised by a person trained in, chemical handling. The user is responsible for determining the application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes.

Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, VHG cannot warn of all of the potential dangers of use or interaction with other chemicals or materials. VHG warrants that the chemical meets the specifications set forth on the label.

VHG DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.

The user should recognize that this product can cause severe injury and even death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION.

Approved by Quality Assurance Department.

Waste Stream Number: 600-1

Waste Stream Title: Solvent

W
4W

Portsmouth Gaseous Diffusion Plant
Technical Operations Division
Analysis Results

AnaLIS ID: 940901-160 Project: WMGT RFD Requisition Number: 011114
Customer Sample ID: RFD24249 Customer: ENV./WASTE MGT.
Date Sampled: 1-SEP-1994 11:00 Date Sample Received: 1-SEP-1994
Sampled By: R CAUDILL Date Sample Completed: 23-NOV-1994
Material Description: X333 DEGREASER at DAP

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
ASTMD3828	Flash Point (Setaflash)	> 212		Deg. F	LE WILLIAMS	8-SEP-1994	X
SW846-6010	Arsenic	4.1U		mg/kg	TE SHOOK	16-SEP-1994	94081086
	Barium	2.6		mg/kg	TE SHOOK	16-SEP-1994	94081086
	Cadmium	0.67		mg/kg	TE SHOOK	16-SEP-1994	94081086
	Chromium	1.6		mg/kg	TE SHOOK	16-SEP-1994	94081086
	Lead	3.6		mg/kg	TE SHOOK	16-SEP-1994	94081086
	Silver	0.19		mg/kg	TE SHOOK	16-SEP-1994	94081086
SW846-7470	Mercury	.025UN		mg/kg	KA DAYS	12-SEP-1994	94081113
SW846-7740	Selenium	1.0U		mg/kg	EL SIMPSON	8-SEP-1994	94081086
0	PCB (TOTAL)	7.5		ug/g	DL HUSTED	13-SEP-1994	94160913M1
TSD515-500	Uranium	<1.2		ug/g	TE BARNETT	12-SEP-1994	94101191
TSD553-380	Technetium	<0.9		pCi/mL	BW SHORT	15-OCT-1994	94071827
TSD553-440	% U-235	NA		% U-235	BW SHORT	14-SEP-1994	NA

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
Arsenic	38.46	38.94	101.25
Barium	38.46	41.16	107.02
Cadmium	38.46	40.05	104.13
Chromium	38.46	40.59	105.54
Lead	38.46	41.09	106.84
Mercury	.150	0.105	70.00
Selenium	400	405.9	101.47
Silver	38.46	38.78	100.83

***** Comments from the Radiochemistry Laboratory *****

o low for assay determination by gamma. B. W. Short

***** Comments from the Organic Analytical Services *****

Method SW846-8080:

Sample	Percent Sample (Vol./Vol.)	Total PCB, ppm
RFD 24..7		
Organic layer	13	7.5 ug/g
Aqueous layer	87	<0.3 ug/ml

Sample	Amount PCB-1260 Spiked	Amount PCB-1260 Recovered	Percent Recovered
Organic layer - spike	4.83 ug/g	11.9 ug/g	91
Replicate spike	4.83 ug/g	11.1 ug/g	75
Aqueous layer - spike	2.50 ug/ml	1.9 ug/ml	76
Replicate spike	2.50 ug/ml	2.0 ug/ml	80

Procedure #TSD554-019 (SOLVENT ANALYSIS)

Aqueous layer

F001 and F002 compounds are all <0.02ug/mL
F003 and F005 compounds are all <100ug/mL

(n: acetone and ethyl ether = NA)
(e.. on: chlorobenzene = <0.10ug/mL)

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sam

concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

\+ Correlation coefficient for MSA is less tha 0.995.

e value is between the LC and the LLD.

...ng "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)
John E. Hobensack (Oil & Coal Analysis Laboratory)

Date Approved: 23-NOV-1994

AnaLIS ID: 940901-160
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD24249
Customer: ENV./WASTE MGT.
Sample Matrix: WASTE
Requisition Number: 011114
Date Sample Received: 1-SEP-1994
Date Sampled: 1-SEP-1994

Solvents_F001

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-019
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 10-NOV-1994
QA File Number: 9410112102
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
56-23-5	Carbon Tetrachloride	0.2U			
75-09-2	Methylene Chloride	0.2U			
127-18-4	Tetrachloroethene	0.2U			
71-55-6	1,1,1-Trichloroethane	0.2U			
79-01-6	Trichloroethene	0.2U			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
\ - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

AnaLIS ID: 940901-160
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD24249
Customer: ENV./WASTE MGT.
Sample Matrix: WASTE
Requisition Number: 011114
Date Sample Received: 1-SEP-1994
Date Sampled: 1-SEP-1994

Solvents_F002

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-019
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 10-NOV-1994
QA File Number: 9410112102
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
108-90-7	Chlorobenzene	1.0U			
	o-Dichlorobenzene	0.2U			
76-13-1	Freon 113	0.2U			
75-09-2	Methylene Chloride	0.2U			
127-18-4	Tetrachloroethene	0.2U			
71-55-6	1,1,1-Trichloroethane	0.2U			
79-00-5	1,1,2-Trichloroethane	0.2U			
79-01-6	Trichloroethene	0.2U			
75-69-4	Trichlorofluoromethane	0.2U			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

AnaLIS ID: 940901-160
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD24249
Customer: ENV./WASTE MGT.
Sample Matrix: WASTE
Requisition Number: 011114
Date Sample Received: 1-SEP-1994
Date Sampled: 1-SEP-1994

Solvents_F003

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-019
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 10-NOV-1994
QA File Number: 9410112102
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
67-64-1	Acetone	NA			
71-36-3	N-Butyl Alcohol	200U			
108-94-1	Cyclohexanone	200U			
141-78-6	Ethyl Acetate	200U			
	Ethylbenzenes	200U			
60-29-7	Ethyl ether	NA			
67-56-1	Methanol	200U			
	4-Methyl-2-pentanone (MIBK)	200U			
	Xylenes	590			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

AnaLIS ID: 940901-160
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD24249
Customer: ENV./WASTE MGT.
Sample Matrix: WASTE
Requisition Number: 011114
Date Sample Received: 1-SEP-1994
Date Sampled: 1-SEP-1994

Solvents_F005

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-019
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 10-NOV-1994
QA File Number: 9410112102
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
71-43-2	Benzene	200U			
	i-Butanol	200U			
78-93-3	2-Butanone	200U			
75-15-0	Carbon Disulfide	NA			
	2-Ethoxy ethanol	200U			
79-46-9	2-Nitropropane	200U			
110-86-1	Pyridine	200U			
108-88-3	Toluene	200U			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Waste Stream Number: 600-2

Waste Stream Title: Oil

W
4W

600-2

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 920102-011 Project: WMGT RFD Customer Sample ID: RFD-8129
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 31-DEC-1991 Date Sample Received: 31-DEC-1991
Sampled By: AR SELBEE Date Sample Completed: 30-DEC-1992
Material Description: WASTE OIL X770

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
EC-006	Arsenic	NA		mg/L	EL SIMPSON		
EC-013	Mercury	NA		mg/L	EL SIMPSON		
EC-015	Selenium	NA		mg/L	EL SIMPSON		
EC-016	Silver	NA		mg/L	EL SIMPSON		
EC-401	Barium	3.1 RN		mg/K	AL SHULTZ	8-JAN-1992	92080030
	Cadmium	0.61 N*R		mg/K	AL SHULTZ	8-JAN-1992	92080030
	Chromium	0.54 RN		mg/K	AL SHULTZ	8-JAN-1992	92080030
	Lead	1.8 RN		mg/K	AL SHULTZ	8-JAN-1992	92080030

***** Comments from the Spectrochemistry/ICP Laboratory *****

R - Results are unusable due to QC around the run.

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.
The reported value was obtained by the Method of Standard Additions (MSA).
Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.
\+ - Correlation coefficient for MSA is less tha 0.995.
e value is between the LC and the LLD.
cl g "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Laboratory Manager: O. A. Vita (Spectrochemistry/ICP Laboratory)
D. E. Boyd (Organic Analytical Services)
Date Approved: 31-DEC-1992

AnaLIS ID: 920102-011
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: D. E. Boyd

Customer Sample ID: RFD-8129
Customer: WASTE MANAGEMENT
Sample Matrix: OIL
Requisition Number:
Date Sample Received: 31-DEC-1991
Date Sampled: 31-DEC-1991

Solvents_F002

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 25-FEB-1992
QA File Number: NA
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
108-90-7	Chlorobenzene	NA			
	o-Dichlorobenzene	NA			
76-13-1	Freon 113	NA			
75-09-2	Methylene Chloride	NA			
127-18-4	Tetrachloroethene	NA			
71-55-6	1,1,1-Trichloroethane	NA			
79-00-5	1,1,2-Trichloroethane	NA			
79-01-6	Trichloroethene	NA			
75-69-4	Trichlorofluoromethane	NA			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

AnaLIS ID: 920102-011
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: D. E. Boyd

Customer Sample ID: RFD-8129
Customer: WASTE MANAGEMENT
Sample Matrix: OIL
Requisition Number:
Date Sample Received: 31-DEC-1991
Date Sampled: 31-DEC-1991

Solvents_F003

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 25-FEB-1992
QA File Number: NA
Dilution Factor: 4
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
67-64-1	Acetone	80U			
	n-Butyl alcohol	280U			
108-94-1	Cyclohexanone	NA			
141-78-6	Ethyl Acetate	120U			
	Ethylbenzenes	65J			
60-29-7	Ethyl ether	250			
67-56-1	Methanol	20U			
	4-Methyl-2-pentanone (MIBK)	40U			
	Xylenes	100U			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

ANALYSIS DATA REPORT

AnaLIS ID: 920102-011
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: D. E. Boyd

Customer Sample ID: RFD-8129
Customer: WASTE MANAGEMENT
Sample Matrix: OIL
Requisition Number:
Date Sample Received: 31-DEC-1991
Date Sampled: 31-DEC-1991

Solvents_F005

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 25-FEB-1992
QA File Number: NA
Dilution Factor: 4
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
71-43-2	Benzene	190			
	i-Butanol	50			
	2-Butanone (MEK)	80U			
75-15-0	Carbon Disulfide	NA			
	2-Ethoxy ethanol	80			
	2-Nitropropane	100U			
110-86-1	Pyridine	80U			
108-88-3	Toluene	40			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Waste Stream Number: U600B-2

Waste Stream Title: Parts Cleaning Solutions

EXXON CHEMICAL

MATERIAL SAFETY DATA SHEET

EXXON CHEMICAL AMERICAS, P.O. BOX 3272, HOUSTON, TEXAS 77001
A Division of EXXON CHEMICAL COMPANY, A Division of EXXON CORPORATION

1014889

ACTREL 4493L CLEANER

DATE PREPARED: MAY 8, 1992
MSDS NO.: 92864493

SECTION 1 PRODUCT IDENTIFICATION & EMERGENCY INFORMATION

PRODUCT NAME: ACTREL 4493L CLEANER

CHEMICAL NAME:
Petroleum Hydrocarbon CAS 64771-72-8

CHEMICAL FAMILY:
Aliphatic Hydrocarbon

PRODUCT DESCRIPTION:
Clear colorless liquid; mild hydrocarbon odor.

EMERGENCY TELEPHONE NUMBERS: EXXON CHEMICAL AMERICAS 713-870-6000
CHEMTREC 800-424-9300

SECTION 2 HAZARDOUS INGREDIENT INFORMATION

This product is not hazardous as defined in 29 CFR 1910.1200

SECTION 3 HEALTH INFORMATION & PROTECTION

NATURE OF HAZARD

EYE CONTACT:
Slightly irritating but does not injure eye tissue.

SKIN CONTACT:
Occasional brief contact with the liquid will not result in significant irritation unless evaporation is impeded.
Frequent or prolonged contact may irritate and cause dermatitis.
Low order of toxicity.
Skin contact may aggravate an existing dermatitis condition.

INHALATION:
High vapor/aerosol concentrations (greater than approximately 700 ppm, attainable at elevated temperatures well above ambient) are irritating to the eyes and the respiratory tract, and may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death.
Negligible hazard at ambient temperature (-18 to 38 Deg C; 0 to 100 Deg F)

INGESTION:
Small amounts of this product aspirated into the respiratory system during ingestion or vomiting may cause mild to severe pulmonary injury, possibly progressing to death.
Low order of toxicity.

FIRST AID

EYE CONTACT:
Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

SKIN CONTACT:
Flush with large amounts of water; use soap if available. Remove grossly contaminated clothing, including shoes, and launder before reuse.

INHALATION:
Using proper respiratory protection, immediately remove the affected victim from exposure. Administer artificial respiration if breathing is stopped. Keep at rest. Call for prompt medical attention.

INGESTION:
If swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

WORKPLACE EXPOSURE LIMITS

EXXON RECOMMENDS THE FOLLOWING OCCUPATIONAL EXPOSURE LIMITS:
300 ppm total hydrocarbon based on composition.

PRECAUTIONS

SPECIAL PRECAUTIONS:
Health studies have shown that many petroleum hydrocarbons pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

PERSONAL PROTECTION:
For open systems where contact is likely, wear safety glasses with side shields, long sleeves, and chemical resistant gloves.
Where contact may occur, wear safety glasses with side shields.
Where concentrations in air may exceed the limits given in this Section and engineering, work practice or other means of exposure reduction are not adequate, NIOSH/MSHA approved respirators may be necessary to prevent overexposure by inhalation.

VENTILATION:
The use of mechanical dilution ventilation is recommended whenever this product is used in a confined space, is heated above ambient temperatures, or is agitated.

SECTION 4 FIRE & EXPLOSION HAZARD

FLASHPOINT: 203 Deg F. METHOD: PMCC D-93 NOTE: Typical
FLAMMABLE LIMITS: LEL: 1.4 UEL: 8.9
AUTOIGNITION TEMPERATURE: 410 Deg F. NOTE: Approximately

GENERAL HAZARD:
Low Hazard, liquid can burn upon heating to temperatures at or above the flashpoint.
"Empty" containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner, or properly disposed of.

FIRE FIGHTING:
Use water spray to cool fire exposed surfaces and to protect personnel.
Isolate "fuel" supply from fire.
Use foam, dry chemical, or water spray to extinguish fire.
Avoid spraying water directly into storage containers due to danger of boilover.
This liquid is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode.

HAZARDOUS COMBUSTION PRODUCTS:
No unusual

SECTION 5 SPILL CONTROL PROCEDURE

LAND SPILL:
Eliminate sources of ignition. Prevent additional discharge of material, if possible to do so without hazard. For small spills implement cleanup procedures; for large spills implement cleanup procedures and, if in public area, keep public away and advise authorities. Also, if this product is subject to CERCLA reporting (see Section 7) notify the National Response Center.
Prevent liquid from entering sewers, watercourses, or low areas. Contain spilled liquid with sand or earth.
Recover by pumping or with a suitable absorbent.
Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

WATER SPILL:
Remove from surface by skimming or with suitable adsorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in non-confined waters.
Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

SECTION 6 NOTES

HAZARD RATING SYSTEMS:
This information is for people trained in:
National Paint & Coatings Association's (NPCA)
Hazardous Materials Identification System (HMIS)
National Fire Protection Association (NFPA 704)
Identification of the Fire Hazards of Materials

	NPCA-HMIS	NFPA 704
HEALTH	1	1
FLAMMABILITY	1	1
REACTIVITY	0	0

KEY
4 = Severe
3 = Serious
2 = Moderate
1 = Slight
0 = Minimal

EXXON CHEMICAL

MATERIAL SAFETY DATA SHEET

EXXON CHEMICAL AMERICAS, P.O. BOX 3272, HOUSTON, TEXAS 77001
A Division of EXXON CHEMICAL COMPANY, A Division of EXXON CORPORATION

SECTION 7 REGULATORY INFORMATION

DEPARTMENT OF TRANSPORTATION (DOT):
DOT HAZARD CLASS: Not regulated
DOT IDENTIFICATION NUMBER: Not Available

FLASHPOINT: 203 Deg F. METHOD: PMCC D-93 NOTE: Typical

TSCA:
This product is listed on the TSCA Inventory at CAS Registry Number 64771-72-8

CERCLA:
If this product is accidentally spilled, it is not subject to any special reporting under the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). We recommend you contact local authorities to determine if there may be other local reporting requirements.

SARA TITLE III:
Under the provisions of Title III, Sections 311/312 of the Superfund Amendments and Reauthorization Act, this product is classified into the following hazard categories:
Not Hazardous.
This product does not contain Section 313 Reportable Ingredients.

SECTION 8 TYPICAL PHYSICAL & CHEMICAL PROPERTIES

SPECIFIC GRAVITY:
0.76 at 60
SOLUBILITY IN WATER, WT. % AT °F:
Insoluble
SP. GRAV. OF VAPOR, at 1 atm (Air=1):
Greater than 1.00
EVAPORATION RATE, n-Bu Acetate=1:
Negligible
VAPOR PRESSURE, mmHg at °F:
Less Than 1 at 100
VISCOSITY OF LIQUID, CST AT °F:
2 at 77
FREEZING/MELTING POINT, °F:
25 Pour Point ASTM D97
BOILING POINT, °F:
430 to 480 Approximately

SECTION 9 REACTIVITY DATA

STABILITY:
Stable
CONDITIONS TO AVOID INSTABILITY:
Not Applicable
HAZARDOUS POLYMERIZATION:
Will not occur

MATERIALS AND CONDITIONS TO AVOID INCOMPATIBILITY:
Strong oxidizing agents
HAZARDOUS DECOMPOSITION PRODUCTS:
None

SECTION 10 STORAGE AND HANDLING

EXXON CHEMICAL

MATERIAL SAFETY DATA SHEET

EXXON CHEMICAL AMERICAS, P.O. BOX 3272, HOUSTON, TEXAS 77001
A Division of EXXON CHEMICAL COMPANY, A Division of EXXON CORPORATION

STORAGE TEMPERATURE, °F:
Ambient

STORAGE/TRANSPORT PRESSURE, mmHg:
Atmospheric

LOADING/UNLOADING TEMPERATURE, °F:
Ambient

VISC. AT LOADING/UNLOADING TEMP., cST
2

REVISION SUMMARY:
Since APRIL 12,1992 this MSDS has been revised in Section(s):
4, 5, 6

REFERENCE NUMBER:	DATE PREPARED:	SUPERSEDES ISSUE DATE:
HDHA-C-25082	May 8,1992	April 12,1992

FOR ADDITIONAL PRODUCT INFORMATION, CONTACT YOUR TECHNICAL SALES REPRESENTATIVE
FOR ADDITIONAL HEALTH/SAFETY INFORMATION, CALL 713-870-6884

THIS INFORMATION RELATES TO THE SPECIFIC MATERIAL DESIGNATED AND MAY NOT BE VALID FOR SUCH MATERIAL USED IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY PROCESS. SUCH INFORMATION IS TO THE BEST OF OUR KNOWLEDGE AND BELIEF, ACCURATE AND RELIABLE AS OF THE DATE COMPILED. HOWEVER, NO REPRESENTATION, WARRANTY OR GUARANTEE IS MADE AS TO ITS ACCURACY RELIABILITY OR COMPLETENESS. IT IS THE USER'S RESPONSIBILITY TO SATISFY HIMSELF AS TO THE SUITABILITY AND COMPLETENESS OF SUCH INFORMATION FOR HIS OWN PARTICULAR USE. WE DO NOT ACCEPT LIABILITY FOR ANY LOSS OR DAMAGE THAT MAY OCCUR FROM THE USE OF THIS INFORMATION NOR DO WE OFFER WARRANTY AGAINST PATENT INFRINGEMENT.

Waste Stream Number: 600-3

Waste Stream Title: PPE and Related Solid

4W

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 920716-038 Project: WMGT RFD Customer Sample ID: RFD-10780
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 15-JUL-1992 Date Sample Received: 15-JUL-1992
Sampled By: B KELLEY Date Sample Completed: 4-DEC-1992
Material Description: COVERALLS & GLOVES

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-7060	Arsenic	5.5 N		mg/kg	TE SHOOK	25-NOV-1992	92080328
SW846-7470	Mercury	.02 NR		mg/kg	TE SHOOK	25-AUG-1992	92080306
SW846-7740	Selenium	<1.4		mg/kg	TE SHOOK	25-NOV-1992	92080328
SW846-7760	Silver	<0.2		MG/KG	EK GILBERT	30-NOV-1992	92080477
TSD515-500	Uranium (Waste)	<1.0		ug/g	CJ HOLBROOK	24-JUL-1992	92102230
TSD552-103	Barium	25.6 N*J		mg/kg	EK GILBERT	23-JUL-1992	92080349
	Cadmium	0.54 U		mg/kg	EK GILBERT	23-JUL-1992	92080349
	Chromium	4.1		mg/kg	EK GILBERT	23-JUL-1992	92080349
	Lead	41.3 *NJ		mg/kg	EK GILBERT	23-JUL-1992	92080349
T	Gross Alpha Activity (Soil)	<1		pCi/G	JJ SISLER	2-SEP-1992	92070881
	Gross Beta Activity (Soil)	#3		pCi/G	JJ SISLER	2-SEP-1992	92070881
TSD553-340	Technetium (Waste)	<0.4		pCi/G	JJ SISLER	6-AUG-1992	92070721

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
ARSENIC	40.00	26.14	65.35
MERCURY	.200	0.025	12.50
SELENIUM	40.00	31.22	78.05
SILVER	.1	0.102	102.00
URANIUM (WASTE)	50	54.1	108.20

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

- The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is

less than 40% on both the original and the diluted sample.

T - Qualify data for the sample as estimated.
Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.
N - Spike sample recovery is not within control limits.
R - The reported value is unusable. The value is for informational purposes only.
S - The reported value was obtained by the Method of Standard Additions (MSA).
UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.
* - Duplicate analysis is not within control limits.
+ - Correlation coefficient for MSA is less tha 0.995.
# - The value is between the LC and the LLD.
Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
Secondary dilution.
E - Exceeds initial calibration range.

Laboratory Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
O. A. Vita (Spectrochemistry/ICP Laboratory)
D. K. Perez (Environmental and Industrial Hygiene Laboratory)
Date Approved: 4-DEC-1992

Waste Stream Number: 608-1

Waste Stream Title: Mercury Cleanup Materials

608-1

ES&H ANALYTICAL SERVICES
Data Summary Report

30-Aug-1995
Page 1

Project:ER SubProject: 9547A

		Units	# Detects	MIN	MAX	AVG	STD DEV
Dissolved Solids	EPA 160.1	mg/L	2	8.00000	18.00000	13.00000	7.07107
Petroleum Hydroca	EPA 418.1	MG/L	2	2.44000	2.74000	2.59000	0.21213
Barium	SW846-6010-2	ug/L	1	1.10000	1.10000	1.10000	0.00000
Lead	SW846-6010-2	ug/L	1	212.00000	212.00000	212.00000	0.00000
Silver	SW846-6010-2	ug/L	1	2.10000	2.10000	2.10000	0.00000
ethylene Chlorid	SW846-8260	ug/L	2	2.00000	4.00000	3.00000	1.41421

Project:ER SubProject: 9547E

		Units	# Detects	MIN	MAX	AVG	STD DEV
Moisture	ASTM-D2216	%	9	0.90000	89.60000	27.08889	33.03015
Petroleum Hydroca	EPA 418.1	mg/kg	9	110.00000	1290000.00000	338092.22222	549844.46096
Bari	SW846-6010-1	mg/kg	9	0.18000	625.00000	73.84000	206.86516
Cadm	SW846-6010-1	mg/kg	4	0.38000	1.80000	0.97000	0.70019
Chromium	SW846-6010-1	mg/kg	9	0.22000	47.90000	8.40667	15.32207
Lead	SW846-6010-1	mg/kg	8	5.40000	182000.00000	23052.05000	64228.82915
Arsenic	SW846-7060	mg/kg	4	1.10000	27.70000	10.00000	12.08911
Mercury	SW846-7470	mg/kg	7	3.30000	536.00000	253.30000	223.68501
Silver	SW846-7760A	mg/kg	2	4.70000	4.80000	4.75000	0.07071
Ethyl benzene	SW846-8260	ug/kg	2	25.00000	36.00000	30.50000	7.77817
Toluene	SW846-8260	ug/kg	2	60.00000	64.00000	62.00000	2.82843
m,p-Xylene	SW846-8260	ug/kg	4	39.00000	87.00000	62.00000	19.69772
o-Xylene	SW846-8260	ug/kg	4	18.00000	68.00000	41.00000	22.42023
Uranium, Total	TSD515-500	ug/g	8	0.20000	3.70000	1.28750	1.37263
Gross Alpha	TSD553-240	pCi/g	3	8.00000	71.00000	31.66667	34.29772
Gross	TSD553-240	pCi/g	2	19.00000	39.00000	29.00000	14.14214

chnetium-99	TSD553-340	pCi/g	2	3.50000	8.40000	5.95000	3.46482

Project:ER SubProject: 9547E

Analysis	Result	Units	Sample #	Cust #	Sample Completed	Analysis Completed	Activity Number
Moisture	12.9	%	950516-158	000851001060813	7-Jun-1995	6-Jun-1995	ASTM-D2216
Moisture	76.6	%	950516-165	000221001060813	7-Jun-1995	6-Jun-1995	ASTM-D2216
Moisture	0.9	%	950516-166	000885001060813	7-Jun-1995	6-Jun-1995	ASTM-D2216
Moisture	6.6	%	950516-167	000199001060813	7-Jun-1995	6-Jun-1995	ASTM-D2216
Moisture	31.6	%	950516-168	000884002060813	7-Jun-1995	6-Jun-1995	ASTM-D2216
Moisture	8.1*	%	950516-169	000884001060813	7-Jun-1995	6-Jun-1995	ASTM-D2216
Moisture	10.8	%	950516-170	000884003060813	7-Jun-1995	6-Jun-1995	ASTM-D2216
Moisture	6.7	%	950516-171	000884003608130	7-Jun-1995	6-Jun-1995	ASTM-D2216
Moisture	89.6	%	950516-172	00170900160813	7-Jun-1995	6-Jun-1995	ASTM-D2216
Petroleum Hydrocarbo	411000	mg/kg	950516-158	000851001060813	7-Jun-1995	6-Jun-1995	EPA 418.1
Petroleum Hydrocarbo	16200	mg/kg	950516-165	000221001060813	7-Jun-1995	6-Jun-1995	EPA 418.1
Petroleum Hydrocarbo	10600	mg/kg	950516-166	000885001060813	7-Jun-1995	6-Jun-1995	EPA 418.1
Petroleum Hydrocarbo	6100J	mg/kg	950516-167	000199001060813	7-Jun-1995	6-Jun-1995	EPA 418.1
Petroleum Hydrocarbo	7120	mg/kg	950516-168	000884002060813	7-Jun-1995	6-Jun-1995	EPA 418.1
Petroleum Hydrocarbo	31700	mg/kg	950516-169	000884001060813	7-Jun-1995	6-Jun-1995	EPA 418.1
Petroleum Hydrocarbo	1290000	mg/kg	950516-170	000884003060813	7-Jun-1995	6-Jun-1995	EPA 418.1
Petroleum Hydrocarbo	1270000	mg/kg	950516-171	000884003608130	7-Jun-1995	6-Jun-1995	EPA 418.1
Petroleum Hydrocarbo	110	mg/kg	950516-172	00170900160813	7-Jun-1995	6-Jun-1995	EPA 418.1
Sample Prep Metals	COMPLETE		950516-158	000851001060813	7-Jun-1995	6-Jun-1995	SW846-3050A
Sa[illegible] Metals	COMPLETE		950516-165	000221001060813	7-Jun-1995	6-Jun-1995	SW846-3050A
Sa[illegible] Metals	COMPLETE		950516-166	000885001060813	7-Jun-1995	6-Jun-1995	SW846-3050A
Sa[illegible] Prep Metals	COMPLETE		950516-167	000199001060813	7-Jun-1995	6-Jun-1995	SW846-3050A
Sample Prep Metals	COMPLETE		950516-168	000884002060813	7-Jun-1995	6-Jun-1995	SW846-3050A
Sample Prep Metals	COMPLETE		950516-169	000884001060813	7-Jun-1995	6-Jun-1995	SW846-3050A
Sample Prep Metals	COMPLETE		950516-170	000884003060813	7-Jun-1995	6-Jun-1995	SW846-3050A
Sample Prep Metals	COMPLETE		950516-171	000884003608130	7-Jun-1995	6-Jun-1995	SW846-3050A
Sample Prep Metals	COMPLETE		950516-172	00170900160813	7-Jun-1995	6-Jun-1995	SW846-3050A
Sample Prep AA Metal	COMPLETE		950516-158	000851001060813	7-Jun-1995	6-Jun-1995	SW846-3050AA
Sample Prep AA Metal	COMPLETE		950516-165	000221001060813	7-Jun-1995	6-Jun-1995	SW846-3050AA
Sample Prep AA Metal	COMPLETE		950516-166	000885001060813	7-Jun-1995	6-Jun-1995	SW846-3050AA
Sample Prep AA Metal	COMPLETE		950516-167	000199001060813	7-Jun-1995	6-Jun-1995	SW846-3050AA
Sample Prep AA Metal	COMPLETE		950516-168	000884002060813	7-Jun-1995	6-Jun-1995	SW846-3050AA
Sample Prep AA Metal	COMPLETE		950516-169	000884001060813	7-Jun-1995	6-Jun-1995	SW846-3050AA
Sample Prep AA Metal	COMPLETE		950516-170	000884003060813	7-Jun-1995	6-Jun-1995	SW846-3050AA
Sample Prep AA Metal	COMPLETE		950516-171	000884003608130	7-Jun-1995	6-Jun-1995	SW846-3050AA
Sample Prep AA Metal	COMPLETE		950516-172	00170900160813	7-Jun-1995	6-Jun-1995	SW846-3050AA
Barium	0.64	mg/kg	950516-158	000851001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Barium	3.3	mg/kg	950516-165	000221001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Barium	625	mg/kg	950516-166	000885001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Barium	27.4	mg/kg	950516-167	000199001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Barium	5.0	mg/kg	950516-168	000884002060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Barium	2.0	mg/kg	950516-169	000884001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Barium	0.64	mg/kg	950516-170	000884003060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Barium	0.18	mg/kg	950516-171	000884003608130	7-Jun-1995	6-Jun-1995	SW846-6010-1
Bar[illegible]	0.4	mg/kg	950516-172	00170900160813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Ca[illegible]	0.38	mg/kg	950516-158	000851001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Cadm	1.3	mg/kg	950516-165	000221001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1

Cadmium	1.8	mg/kg	950516-166	000885001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Cadmium	2.1U	mg/kg	950516-167	000199001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Cadmium	0.40	mg/kg	950516-168	000884002060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Cadmium	0.26U	mg/kg	950516-169	000884001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Cadmium	0.28U	mg/kg	950516-170	000884003060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Cadmium	0.22U	mg/kg	950516-171	000884003608130	7-Jun-1995	6-Jun-1995	SW846-6010-1
Cadmium	0.2U	mg/kg	950516-172	00170900160813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Chromium	1.2	mg/kg	950516-158	000851001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Chromium	4.5	mg/kg	950516-165	000221001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Chromium	3.1	mg/kg	950516-166	000885001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Chromium	3.8	mg/kg	950516-167	000199001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Chromium	47.9	mg/kg	950516-168	000884002060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Chromium	13.1	mg/kg	950516-169	000884001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Chromium	1.5	mg/kg	950516-170	000884003060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Chromium	0.22	mg/kg	950516-171	000884003608130	7-Jun-1995	6-Jun-1995	SW846-6010-1
Chromium	0.34	mg/kg	950516-172	00170900160813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Lead	5.4N	mg/kg	950516-158	000851001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Lead	28.4N	mg/kg	950516-165	000221001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Lead	182000N	mg/kg	950516-166	000885001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Lead	16.4N	mg/kg	950516-167	000199001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Lead	2130N	mg/kg	950516-168	000884002060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Lead	38.6N	mg/kg	950516-169	000884001060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Lead	184N	mg/kg	950516-170	000884003060813	7-Jun-1995	6-Jun-1995	SW846-6010-1
Lead	13.6N	mg/kg	950516-171	000884003608130	7-Jun-1995	6-Jun-1995	SW846-6010-1
Lead	1.5UN	mg/kg	950516-172	00170900160813	7-Jun-1995	6-Jun-1995	SW846-6010-1
	0.30U	mg/kg	950516-158	000851001060813	7-Jun-1995	6-Jun-1995	SW846-7060
	0.29U	mg/kg	950516-165	000221001060813	7-Jun-1995	6-Jun-1995	SW846-7060
Arsenic	27.7	mg/kg	950516-166	000885001060813	7-Jun-1995	6-Jun-1995	SW846-7060
Arsenic	7.5	mg/kg	950516-167	000199001060813	7-Jun-1995	6-Jun-1995	SW846-7060
Arsenic	3.7	mg/kg	950516-168	000884002060813	7-Jun-1995	6-Jun-1995	SW846-7060
Arsenic	1.1	mg/kg	950516-169	000884001060813	7-Jun-1995	6-Jun-1995	SW846-7060
Arsenic	0.30U	mg/kg	950516-170	000884003060813	7-Jun-1995	6-Jun-1995	SW846-7060
Arsenic	0.27U	mg/kg	950516-171	000884003608130	7-Jun-1995	6-Jun-1995	SW846-7060
Arsenic	0.30U	mg/kg	950516-172	00170900160813	7-Jun-1995	6-Jun-1995	SW846-7060
Mercury	118	mg/kg	950516-158	000851001060813	7-Jun-1995	6-Jun-1995	SW846-7470
Mercury	3.3	mg/kg	950516-165	000221001060813	7-Jun-1995	6-Jun-1995	SW846-7470
Mercury	0.25U	mg/kg	950516-166	000885001060813	7-Jun-1995	6-Jun-1995	SW846-7470
Mercury	313	mg/kg	950516-167	000199001060813	7-Jun-1995	6-Jun-1995	SW846-7470
Mercury	536	mg/kg	950516-168	000884002060813	7-Jun-1995	6-Jun-1995	SW846-7470
Mercury	6.8	mg/kg	950516-169	000884001060813	7-Jun-1995	6-Jun-1995	SW846-7470
Mercury	527	mg/kg	950516-170	000884003060813	7-Jun-1995	6-Jun-1995	SW846-7470
Mercury	269	mg/kg	950516-171	000884003608130	7-Jun-1995	6-Jun-1995	SW846-7470
Mercury	0.25U	mg/kg	950516-172	00170900160813	7-Jun-1995	6-Jun-1995	SW846-7470
Selenium	0.50U	mg/kg	950516-158	000851001060813	7-Jun-1995	6-Jun-1995	SW846-7740
Selenium	0.49U	mg/kg	950516-165	000221001060813	7-Jun-1995	6-Jun-1995	SW846-7740
Selenium	0.39U	mg/kg	950516-166	000885001060813	7-Jun-1995	6-Jun-1995	SW846-7740
Selenium	0.48U	mg/kg	950516-167	000199001060813	7-Jun-1995	6-Jun-1995	SW846-7740
Selenium	0.47U	mg/kg	950516-168	000884002060813	7-Jun-1995	6-Jun-1995	SW846-7740
Selenium	0.47U	mg/kg	950516-169	000884001060813	7-Jun-1995	6-Jun-1995	SW846-7740
Selenium	0.50U	mg/kg	950516-170	000884003060813	7-Jun-1995	6-Jun-1995	SW846-7740
Selenium	0.45U	mg/kg	950516-171	000884003608130	7-Jun-1995	6-Jun-1995	SW846-7740
Selenium	0.50U	mg/kg	950516-172	00170900160813	7-Jun-1995	6-Jun-1995	SW846-7740

	2.0U	mg/kg	950516-158	000851001060813	7-Jun-1995	6-Jun-1995	SW846-7760A
Silver	1.9U	mg/kg	950516-165	000221001060813	7-Jun-1995	6-Jun-1995	SW846-7760A
Silver	4.7	mg/kg	950516-166	000885001060813	7-Jun-1995	6-Jun-1995	SW846-7760A
Silver	4.8	mg/kg	950516-167	000199001060813	7-Jun-1995	6-Jun-1995	SW846-7760A
Silver	1.9U	mg/kg	950516-168	000884002060813	7-Jun-1995	6-Jun-1995	SW846-7760A
Silver	1.9U	mg/kg	950516-169	000884001060813	7-Jun-1995	6-Jun-1995	SW846-7760A
Silver	2.0U	mg/kg	950516-170	000884003060813	7-Jun-1995	6-Jun-1995	SW846-7760A
Silver	1.8U	mg/kg	950516-171	000884003608130	7-Jun-1995	6-Jun-1995	SW846-7760A
Silver	2.0U	mg/kg	950516-172	00170900160813	7-Jun-1995	6-Jun-1995	SW846-7760A
1,2-Dichloroethene	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichloroethene	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichloroethene	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichloroethene	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichloroethene	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
1,2-Dichloroethene	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
1,2-Dichloroethene	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichloroethene	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichloroethene	<20J	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichlorotetraflu	<40J	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichlorotetraflu	<40J	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichlorotetraflu	<40J	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichlorotetraflu	<4J	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichlorotetraflu	<40J	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
1,2-Dichlorotetraflu	<40J	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
1,2-Dichlorotetraflu	<40J	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichlorotetraflu	<40J	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
chlorotetraflu	<40J	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
ropropane	<500J	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
2-Nitropropane	<500J	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
2-Nitropropane	<500J	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
2-Nitropropane	<50J	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
2-Nitropropane	<500J	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
2-Nitropropane	<500J	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
2-Nitropropane	<500J	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
2-Nitropropane	<500J	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
2-Nitropropane	<500J	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Cyclohexanone	<500J	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Cyclohexanone	<500J	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Cyclohexanone	<500J	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Cyclohexanone	<50J	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Cyclohexanone	<500J	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Cyclohexanone	<500J	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Cyclohexanone	<500J	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Cyclohexanone	<500J	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Cyclohexanone	<500J	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Dichlorodifluorometh	<20J	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Dichlorodifluorometh	<20J	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Dichlorodifluorometh	<20J	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Dichlorodifluorometh	<2J	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Dichlorodifluorometh	<20J	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Dichlorodifluorometh	<2J	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Dichlorodifluorometh	<20J	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260

D . .uorometh	<20J	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Dichlorodifluorometh	<20J	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl Acetate	<200J	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl Acetate	<200J	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl Acetate	<200J	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl Acetate	<20J	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl Acetate	<200J	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Ethyl Acetate	<200J	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Ethyl Acetate	<200J	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl Acetate	<200J	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl Acetate	<200J	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl ether	<50J	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl ether	<50J	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl ether	<50J	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl ether	<5J	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl ether	<50J	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Ethyl ether	<50J	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Ethyl ether	<50J	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl ether	<50J	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl ether	<50J	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Isobutyl alcohol	<10000J	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Isobutyl alcohol	<10000J	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Isobutyl alcohol	<10000J	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Isobutyl alcohol	<1000J	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Isobuty' -lcohol	<10000J	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Isc :ohol	<10000J	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Iso. . ..cohol	<10000J	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Isobutyl alcohol	<10000J	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Isobutyl alcohol	<10000J	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
-Butyl Alcohol	<10000J	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
-Butyl Alcohol	<10000J	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
-Butyl Alcohol	<10000J	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
-Butyl Alcohol	<1000J	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
-Butyl Alcohol	<10000J	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
-Butyl Alcohol	<10000J	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
-Butyl Alcohol	<10000J	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
-Butyl Alcohol	<10000J	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
-Butyl Alcohol	<10000J	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
OC - -							
,1,1-Trichloroethan	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
,1,1-Trichloroethan	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
,1,1-Trichloroethan	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
,1,1-Trichloroethan	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
,1,1-Trichloroethan	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
,1,1-Trichloroethan	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
,1,1-Trichloroethan	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
,1,1-Trichloroethan	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
,1,1-Trichloroethan	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
,1,2,2-Tetrachloroe	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
,1,2,2-Tetrachloroe	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
,1, ichloroe	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
,1,2 .achloroe	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260

1 [illegible]rachloroe	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8268
1,1,2,2-Tetrachloroe	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
1,1,2,2-Tetrachloroe	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,1,2,2-Tetrachloroe	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
1,1,2,2-Tetrachloroe	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
1,1,2-Trichloroethan	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,1,2-Trichloroethan	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,1,2-Trichloroethan	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,1,2-Trichloroethan	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,1,2-Trichloroethan	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
1,1,2-Trichloroethan	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
1,1,2-Trichloroethan	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,1,2-Trichloroethan	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
1,1,2-Trichloroethan	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
1,1-Dichloroethane	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,1-Dichloroethane	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,1-Dichloroethane	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,1-Dichloroethane	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,1-Dichloroethane	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
1,1-Dichloroethane	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
1,1-Dichloroethane	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,1-Dichloroethane	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
1,1-Dichloroethane	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
1,1-Dichloroethene	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,1-[illegible]oethene	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,[illegible]oethene	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,[illegible]ntoroethene	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,1-Dichloroethene	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
1,1-Dichloroethene	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
1,1-Dichloroethene	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,1-Dichloroethene	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
1,1-Dichloroethene	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichlorobenzene	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichlorobenzene	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichlorobenzene	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichlorobenzene	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichlorobenzene	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
1,2-Dichlorobenzene	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
1,2-Dichlorobenzene	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichlorobenzene	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichlorobenzene	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichloroethane	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichloroethane	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichloroethane	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichloroethane	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichloroethane	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
1,2-Dichloroethane	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
1,2-Dichloroethane	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Dichloroethane	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
1,2-Di[illegible]oethane	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
1,3-[illegible]benzene	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,3-[illegible]orobenzene	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260

1 [illegible]benzene	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,3-Dichlorobenzene	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,3-Dichlorobenzene	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
1,3-Dichlorobenzene	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
1,3-Dichlorobenzene	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,3-Dichlorobenzene	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
1,3-Dichlorobenzene	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
1,4-Dichlorobenzene	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,4-Dichlorobenzene	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,4-Dichlorobenzene	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,4-Dichlorobenzene	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,4-Dichlorobenzene	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
1,4-Dichlorobenzene	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
1,4-Dichlorobenzene	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
1,4-Dichlorobenzene	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
1,4-Dichlorobenzene	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
2-Butanone	<1000	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
2-Butanone	<1000	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
2-Butanone	<1000	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
2-Butanone	<100	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
2-Butanone	<1000	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
2-Butanone	<1000	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
2-Butanone	<1000	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
2-Butanone	<1000	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
2-Butanone	<1000	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
4-M[illegible]entanone	<1000	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
4-M[illegible]-pentanone	<1000	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
4-Methyl-2-pentanone	<1000	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
4-Methyl-2-pentanone	<100	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
4-Methyl-2-pentanone	<1000	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
4-Methyl-2-pentanone	<1000	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
4-Methyl-2-pentanone	<1000	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
4-Methyl-2-pentanone	<1000	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
4-Methyl-2-pentanone	<1000	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Acetone	<1000	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Acetone	<1000	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Acetone	<1000	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Acetone	<100	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Acetone	<1000	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Acetone	<1000	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Acetone	<1000	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Acetone	<1000	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Acetone	<1000	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Benzene	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Benzene	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Benzene	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Benzene	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Benzene	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Benzene	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Benzene	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Benz[illegible]	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Benz	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260

[illegible]romethane	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
[illegible].oromethane	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Bromodichloromethane	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Bromodichloromethane	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Bromodichloromethane	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Bromodichloromethane	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Bromodichloromethane	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Bromodichloromethane	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Bromodichloromethane	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Bromoform	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Bromoform	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Bromoform	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Bromoform	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Bromoform	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Bromoform	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Bromoform	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Bromoform	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Bromoform	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Bromomethane	<40	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Bromomethane	<40	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Bromomethane	<40	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Bromomethane	<4	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Bromomethane	<40	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Bromomethane	<40	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Bromomethane	<40	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Br[illegible]e	<40	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Br[illegible]e	<40	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Car[illegible]Disulfide	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Carbon Disulfide	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Carbon Disulfide	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Carbon Disulfide	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Carbon Disulfide	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Carbon Disulfide	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Carbon Disulfide	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Carbon Disulfide	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Carbon Disulfide	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Carbon Tetrachloride	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Carbon Tetrachloride	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Carbon Tetrachloride	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Carbon Tetrachloride	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Carbon Tetrachloride	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Carbon Tetrachloride	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Carbon Tetrachloride	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Carbon Tetrachloride	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Carbon Tetrachloride	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Chlorobenzene	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chlorobenzene	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chlorobenzene	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chlorobenzene	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chlorobenzene	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Chlor[illegible]e	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Chl[illegible]	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260

ne	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Chlorobenzene	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloroethane	<40	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloroethane	<40	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloroethane	<40	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloroethane	<4	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloroethane	<40	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Chloroethane	<40	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Chloroethane	<40	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloroethane	<40	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Chloroethane	<40	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloroform	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloroform	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloroform	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloroform	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloroform	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Chloroform	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Chloroform	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloroform	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Chloroform	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloromethane	<40	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloromethane	<40	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloromethane	<40	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloromethane	<4	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloromethane	<40	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Ch ne	<40	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Ch ane	<40	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Chloromethane	<40	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Chloromethane	<40	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Dibromochloromethane	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Dibromochloromethane	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Dibromochloromethane	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Dibromochloromethane	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Dibromochloromethane	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Dibromochloromethane	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Dibromochloromethane	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Dibromochloromethane	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Dibromochloromethane	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl benzene	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl benzene	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl benzene	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl benzene	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl benzene	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Ethyl benzene	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Ethyl benzene	36J	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl benzene	25J	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Ethyl benzene	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
reon 113	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
reon 113	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
reon 113	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
rer	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
re	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260

F	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Fr 113	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Freon 113	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Freon 113	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Freon 114	<40J	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Freon 114	<40J	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Freon 114	<40J	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Freon 114	<4J	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Freon 114	<40J	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Freon 114	<40J	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Freon 114	<40J	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Freon 114	<40J	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Freon 114	<40J	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Methylene Chloride	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Methylene Chloride	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Methylene Chloride	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Methylene Chloride	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Methylene Chloride	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Methylene Chloride	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Methylene Chloride	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Methylene Chloride	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Methylene Chloride	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Tetrachloroethene	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Tetrachloroethene	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Tetrach ethene	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Tet thene	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Tet ethene	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Tetrachloroethene	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Tetrachloroethene	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Tetrachloroethene	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Tetrachloroethene	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Toluene	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Toluene	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Toluene	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Toluene	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Toluene	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Toluene	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Toluene	60	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Toluene	64	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Toluene	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Trichloroethene	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Trichloroethene	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Trichloroethene	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Trichloroethene	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Trichloroethene	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Trichloroethene	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Trichloroethene	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Trichloroethene	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Trichloroethene	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Trichlorofluorometha	<40	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Tric romethа	<40	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Tric oromethа	<40	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260

uorometha	<4	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Trichlorofluorometha	<40	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Trichlorofluorometha	<40	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Trichlorofluorometha	<40	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Trichlorofluorometha	<40	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Trichlorofluorometha	<40	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
Vinyl Chloride	<10	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Vinyl Chloride	<10	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Vinyl Chloride	<10	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Vinyl Chloride	<1	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
Vinyl Chloride	<10	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
Vinyl Chloride	<10	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
Vinyl Chloride	<10	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
Vinyl Chloride	<10	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
Vinyl Chloride	<10	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
cis-1,2-Dichloroethe	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
cis-1,2-Dichloroethe	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
cis-1,2-Dichloroethe	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
cis-1,2-Dichloroethe	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
cis-1,2-Dichloroethe	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
cis-1,2-Dichloroethe	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
cis-1,2-Dichloroethe	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
cis-1,2-Dichloroethe	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
cis-1,2-Dichloroethe	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
m,p-Xylene	39J	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
m,	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
m,p	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
m,p-Xylene	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
m,p-Xylene	59J	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
m,p-Xylene	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
m,p-Xylene	87J	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
m,p-Xylene	63J	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
m,p-Xylene	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
o-Xylene	18J	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
o-Xylene	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
o-Xylene	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
o-Xylene	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
o-Xylene	28J	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
o-Xylene	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
o-Xylene	68J	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
o-Xylene	50J	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
o-Xylene	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260
trans-1,2-Dichloroet	<20	ug/kg	950516-158	000851001060813	7-Jun-1995	5-Jun-1995	SW846-8260
trans-1,2-Dichloroet	<20	ug/kg	950516-165	000221001060813	7-Jun-1995	5-Jun-1995	SW846-8260
trans-1,2-Dichloroet	<20	ug/kg	950516-166	000885001060813	7-Jun-1995	5-Jun-1995	SW846-8260
trans-1,2-Dichloroet	<2	ug/kg	950516-167	000199001060813	7-Jun-1995	5-Jun-1995	SW846-8260
trans-1,2-Dichloroet	<20	ug/kg	950516-168	000884002060813	7-Jun-1995	25-May-1995	SW846-8260
trans-1,2-Dichloroet	<20	ug/kg	950516-169	000884001060813	7-Jun-1995	25-May-1995	SW846-8260
trans-1,2-Dichloroet	<20	ug/kg	950516-170	000884003060813	7-Jun-1995	5-Jun-1995	SW846-8260
trans-1,2-Dichloroet	<20	ug/kg	950516-171	000884003608130	7-Jun-1995	5-Jun-1995	SW846-8260
tra ichloroet	<20	ug/kg	950516-172	00170900160813	7-Jun-1995	5-Jun-1995	SW846-8260

(TPH)	COMPLETE		950516-158	000851001060813	7-Jun-1995	6-Jun-1995	SW846-9071A
p (TPH)	COMPLETE		950516-165	000221001060813	7-Jun-1995	6-Jun-1995	SW846-9071A
Sample Prep (TPH)	COMPLETE		950516-166	000885001060813	7-Jun-1995	6-Jun-1995	SW846-9071A
Sample Prep (TPH)	COMPLETE		950516-167	000199001060813	7-Jun-1995	6-Jun-1995	SW846-9071A
Sample Prep (TPH)	COMPLETE		950516-168	000884002060813	7-Jun-1995	6-Jun-1995	SW846-9071A
Sample Prep (TPH)	COMPLETE		950516-169	000884001060813	7-Jun-1995	6-Jun-1995	SW846-9071A
Sample Prep (TPH)	COMPLETE		950516-170	000884003060813	7-Jun-1995	6-Jun-1995	SW846-9071A
Sample Prep (TPH)	COMPLETE		950516-171	000884003608130	7-Jun-1995	6-Jun-1995	SW846-9071A
Sample Prep (TPH)	COMPLETE		950516-172	00170900160813	7-Jun-1995	6-Jun-1995	SW846-9071A
Uranium, Total	0.4	UG/G	950516-158	000851001060813	7-Jun-1995	7-Jun-1995	TSD515-500
Uranium, Total	0.3	UG/G	950516-165	000221001060813	7-Jun-1995	7-Jun-1995	TSD515-500
Uranium, Total	0.6	UG/G	950516-166	000885001060813	7-Jun-1995	7-Jun-1995	TSD515-500
Uranium, Total	1.9J	ug/g	950516-167	000199001060813	7-Jun-1995	7-Jun-1995	TSD515-500
Uranium, Total	2.9	UG/G	950516-168	000884002060813	7-Jun-1995	7-Jun-1995	TSD515-500
Uranium, Total	3.7	UG/G	950516-169	000884001060813	7-Jun-1995	7-Jun-1995	TSD515-500
Uranium, Total	0.3	UG/G	950516-170	000884003060813	7-Jun-1995	7-Jun-1995	TSD515-500
Uranium, Total	0.2	UG/G	950516-171	000884003608130	7-Jun-1995	7-Jun-1995	TSD515-500
Uranium, Total	<0.8	ug/g	950516-172	00170900160813	7-Jun-1995	7-Jun-1995	TSD515-500
Gross Alpha	<4	pCi/g	950516-158	000851001060813	7-Jun-1995	29-May-1995	TSD553-240
Gross Alpha	<4	pCi/g	950516-165	000221001060813	7-Jun-1995	29-May-1995	TSD553-240
Gross Alpha	<5	pCi/g	950516-166	000885001060813	7-Jun-1995	29-May-1995	TSD553-240
Gross Alpha	8	pCi/g	950516-167	000199001060813	7-Jun-1995	29-May-1995	TSD553-240
Gross Alpha	71	pCi/g	950516-168	000884002060813	7-Jun-1995	29-May-1995	TSD553-240
Gross Alpha	16	pCi/g	950516-169	000884001060813	7-Jun-1995	29-May-1995	TSD553-240
Gross Alpha	<4	pCi/g	950516-170	000884003060813	7-Jun-1995	29-May-1995	TSD553-240
Gro a	<4	pCi/g	950516-171	000884003608130	7-Jun-1995	29-May-1995	TSD553-240
Gr	<4	pCi/g	950516-172	00170900160813	7-Jun-1995	29-May-1995	TSD553-240
Gro ta	<10	pCi/g	950516-158	000851001060813	7-Jun-1995	29-May-1995	TSD553-240
Gross Beta	<10	pCi/g	950516-165	000221001060813	7-Jun-1995	29-May-1995	TSD553-240
Gross Beta	<10	pCi/g	950516-166	000885001060813	7-Jun-1995	29-May-1995	TSD553-240
Gross Beta	<10	pCi/g	950516-167	000199001060813	7-Jun-1995	29-May-1995	TSD553-240
Gross Beta	39	pCi/g	950516-168	000884002060813	7-Jun-1995	29-May-1995	TSD553-240
Gross Beta	19	pCi/g	950516-169	000884001060813	7-Jun-1995	29-May-1995	TSD553-240
Gross Beta	<10	pCi/g	950516-170	000884003060813	7-Jun-1995	29-May-1995	TSD553-240
Gross Beta	<10	pCi/g	950516-171	000884003608130	7-Jun-1995	29-May-1995	TSD553-240
Gross Beta	<10	pCi/g	950516-172	00170900160813	7-Jun-1995	29-May-1995	TSD553-240
Technetium-99	<0.5	pCi/g	950516-158	000851001060813	7-Jun-1995	29-May-1995	TSD553-340
Technetium-99	<0.4	pCi/g	950516-165	000221001060813	7-Jun-1995	29-May-1995	TSD553-340
Technetium-99	<0.5	pCi/g	950516-166	000885001060813	7-Jun-1995	29-May-1995	TSD553-340
Technetium-99	<0.2	pCi/g	950516-167	000199001060813	7-Jun-1995	29-May-1995	TSD553-340
Technetium-99	3.5	pCi/g	950516-168	000884002060813	7-Jun-1995	29-May-1995	TSD553-340
Technetium-99	8.4	pCi/g	950516-169	000884001060813	7-Jun-1995	29-May-1995	TSD553-340
Technetium-99	<0.4	pCi/g	950516-170	000884003060813	7-Jun-1995	29-May-1995	TSD553-340
Technetium-99	<0.5	pCi/g	950516-171	000884003608130	7-Jun-1995	29-May-1995	TSD553-340
Technetium-99	<0.2	pCi/g	950516-172	00170900160813	7-Jun-1995	29-May-1995	TSD553-340

Total = 558

Waste Stream Number: 608-2

Waste Stream Title: Oil

http://jupiter.ports/msds/data/5

PORTS MSDS #: 5505

PRODUCT: BENZENE

PART NUMBER:

FORMULA: C6H6

KEYWORD: SOLVENT

PORTS NUMBER: NNN

PORTS MISC INFO:
01-02-1000

PORTS RATING: HFR=430

MANUFACTURER:
AMERICAN BURDICK & JACKSON
1953 SOUTH HARVEY STREET
MUSKEGON
MI

49442
PHONE: PHONE: 616-726-3171
EMERGENCY PHONE: 616-726-3171

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 176 F	NOTE: 80'C, 760 MM HG.
Melting Point. . . .	NG	
Freezing Point . . .	EQ 41.9 F	NOTE: 5.5'C.
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .879	NOTE: @ 20'C.
Vapor Pressure . . .	EQ 74.6	NOTE: MM HG @ 20'C.
Vapor Density. . . .	EQ 2.8	
Percent Volatiles. .	~ 100	
Evaporation Rate . .	~ 3	NOTE: BUAC=1.
pH	NG	
Molecular Weight . .	EQ 78.11	
Viscosity.	NG	

Solubility in Water. @ 25C 0.18%.
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS LIQUID WITH A CHARACTERISTIC AROMATIC

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 12.2 F	NOTE: -11'C, TCC.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	EQ 1043.6 F	NOTE: 562'C.
Explosive/Flammable Limits		
Lower (LEL).	EQ 1.3	
Upper (UEL).	EQ 7.1	

Shipping Regulations

UN/NA Number.	UN1114
D.O.T. Hazard Class. . .	FLAMMABLE LIQUID
Label	NOT GIVEN
Proper Shipping Name . .	BENZENE

==========

Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 3/01/88

===== Component Information =====

NZENE
OSHA PEL (PPM): 1
OSHA PEL (MG/M3):
ACGIH TLV (PPM): 10
ACGIH TLV (MG/M3):
STEL (PPM): 25
STEL (MG/M3):
Product %: ~ 100
C.A.S. No.: 71432
Note:
OSHA AND ACGIH STEL / NIOSH: 10 PPM, TLV CEILING: NOT

===== IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

CHEMICAL NAME: Benzene

CHEMICAL FAMILY: Aromatic Hydrocarbon

SYNONYMS: Benzol

CAS NO.: 71-43-2

EMERGENCY TELEPHONE NO.: 312/973-3600 (American Scientific Products)

CHEMTREC TELEPHONE NO.: 800/424-9300

.NFORMATION TELEPHONE NO.: 616/726-3171 (American Burdick & Jackson)

MANUFACTURER'S NAME AND ADDRESS:

AMERICAN BURDICK & JACKSON
SUBSIDIARY OF AMERICAN HOSPITAL SUPPLY CORPORATION
1953 SOUTH HARVEY STREET
MUSKEGON, MI 49442

===== PHYSICAL AND CHEMICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Not expected to occur.

APPEARANCE AND ODOR: Clear, colorless liquid with a characteristic aromatic odor.

CONDITIONS TO AVOID: Heat, sparks, open flame, open containers, and poor ventilation.

MATERIALS TO AVOID: Strong oxidizing agents and strong acids.

'IAZARDOUS DECOMPOSITION PRODUCTS: Incomplete combustion can jenerate carbon monoxide and other toxic vapors.

===== FIRE AND EXPLOSION HAZARD DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

USUAL FIRE AND EXPLOSION HAZARDS: Volatile and flammable.

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical or foam.

SPECIAL FIRE FIGHTING PROCEDURES: Water will not be effective in extinguishing a fire and may spread it, but a water spray can be used to cool
exposed containers. Wear full protective clothing and self-contained
breathing apparatus. Heat will build pressure and rupture closed storage
containers.

===== HAZARDOUS COMPONENTS =====

SEE COMPONENT INFORMATION.

BENZENE

CARCINOGEN

===== HEALTH HAZARDS =====

OCCUPATIONAL EXPOSURE LIMITS:

OSHA:

PEL-TWA - 1 ppm
PEL-STEL - 25 ppm

ACGIH:

TLV-TWA - 10 ppm
TLV-STEL - 25 ppm

NIOSH:

TLV-TWA - 10 ppm
TLV-C - Not Listed

CONCENTRATION IMMEDIATELY DANGEROUS TO HEALTH:

OSHA/NIOSH 2,000 ppm

ODOR THRESHOLD:

NSC 2 ppm
NIOSH Not Listed
OHS 1.5-5 ppm

CARCINOGENIC, MUTAGENIC, TERATOGENIC DATA:

Human carcinogen (NTP, IARC, OSHA)
Suspect human carcinogen (ACGIH)
Mutagenic and teratogenic data (RTEC)
Animal carcinogen (IARC)

PRIMARY ROUTES OF ENTRY: Benzene may exert its effects through inhalation,
skin absorption, and ingestion.

INDUSTRIAL EXPOSURE: ROUTE OF EXPOSURE/SIGNS AND SYMPTOMS:

INHALATION: Exposure can cause dizziness, intoxication, excitement, headache, vomiting, delirium, drowsiness, and unconsciousness.

EYE CONTACT: Liquid and high vapor concentration can cause irritation, neuritis, atrophy, visual impairment, edema, and cataracts.

SKIN CONTACT: Prolonged or repeated skin contact can cause irritation and dermatitis through defatting of skin.

INGESTION: Can cause gastrointestinal tract discomfort.

EFFECTS OF OVEREXPOSURE: Benzene is a primary skin irritant, central nervous system depressant, bone marrow depressant, and leukemogen. Acute benzene exposure from inhalation or ingestion initially produces excitation and euphoria, followed by headache, drowsiness, dizziness, vomiting, delirium and unconsciousness. Respiratory irritation and pulmonary edema are possible. Severe exposure causes blurred vision, tremors, shallow and rapid respiration, ventricular fibrillation, paralysis, and convulsions. Liver and kidney damage may occur. Chronic exposure to benzene poses the most significant toxic effects. Symptoms are headache, anorexia, nervousness, weariness, anemia, pallor, bleeding under the skin and eyes, and reduced clotting ability. Bone marrow damage and leukemia may develop. Liver and kidney damage may occur.

MEDICAL CONDITION AGGRAVATED BY EXPOSURE: Preclude from exposure those individuals with diseases of the heart, lung, kidney, liver, nervous system, or the blood, and those susceptible to dermatitis.

EMERGENCY FIRST AID:

INHALATION: Immediately remove to fresh air. If not breathing, administer mouth-to-mouth rescue breathing. If there is no pulse administer cardiopulmonary resuscitation (CPR). Contact physician immediately.

EYE CONTACT: Rinse with copious amounts of water for at least 15 minutes. Get emergency medical assistance.

SKIN CONTACT: Flush thoroughly for at least 15 minutes. Wash affected skin with soap and water. Remove contaminated clothing and shoes. Wash clothing before re-use, and discard contaminated shoes. Get emergency medical assistance.

INGESTION: Call local Poison Control Center for assistance. Contact physician immediately. Aspiration Hazard - Do not induce vomiting.

===== SAFETY MEASURES AND EQUIPMENT =====

VENTILATION: Adequate ventilation is required to protect personnel

from
exposure to chemical vapors exceeding the PEL and to minimize fire hazards.
The choice of ventilation equipment, either local or general, will depend on
the conditions of use, quantity of material, and other operating parameters.

RESPIRATORY: Use approved respirator equipment. Follow NIOSH and equipment
manufacturer's recommendations to determine appropriate equipment (air-purifying, air-supplied, or self-contained breathing apparatus).

EYES: Safety glasses are considered minimum protection. Goggles or face
shield may be necessary depending on quantity of material and conditions of
use.

SKIN: Protective gloves and clothing are recommended. The choice of material
must be based on chemical resistance and other user requirements. Generally,
polyvinyl alcohol, viton(R) or nitrile latex offers acceptable chemical
resistance. Individuals who are acutely and specifically sensitive to benzene
may require additional protective equipment.

STORAGE: Benzene should be protected from temperature extremes and direct
sunlight. Proper storage of benzene must be determined based on other
materials stored and their hazards and potential chemical incompatibility. In
general, benzene should be stored in an acceptably protected and secure
flammable liquid storage room.

OTHER: Emergency eye wash fountains and safety showers should be available in
the vicinity of any potential exposure. Ground and bond metal containers to
minimize static sparks.

===== SPILL AND DISPOSAL DATA =====

SPILL CONTROL: Protect from ignition. Wear protective clothing and use
approved respirator equipment. Absorb spilled material in an absorbent
recommended for solvent spills and remove to a safe location for disposal by
approved methods. If released to the environment, comply with all regulatory
notification requirements.

WASTE DISPOSAL: Dispose of benzene as an EPA hazardous waste. Hazardous waste
numbers: U019 (Ignitable, Toxic); D001 (Ignitable).

===== SPECIAL NOTES =====

KEY:

CA: Approximately

NA: Not applicable
C: Ceiling
PEL: Permissible Exposure Level
STEL: Short Term Exposure Level
TLV: Threshold Limit Value
TWA: Time Weighted Average
BuAc: Butyl Acetate
NSC: National Safety Council ("Fundamentals of Industrial Hygiene", 1983)
OHS: Occupational Health Services ("Hazardline")

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Waste Stream Number: 608-3

Waste Stream Title: Mercury, Oil, Water, and Sand

W
4W

Portsmouth Gaseous Diffusion Plant
Quality and Technical Services Division
Results of Analyses

AnaLIS ID: 910201-013 Project: WMGT RFD Customer Sample ID: RFD-209-1
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 1-FEB-1991 Date Sample Received: 1-FEB-1991
Sampled By: SA MOORE Date Sample Completed: 18-MAR-1991
Material Description: MAY CONTAIN Hg CONTAMINATION!

Analytical Proc. No.	Analysis	Result	Units	Analyst	Date Completed
EC-013	Mercury (Water)	2.4	mg/L	EL SIMPSON	18-MAR-1991
TSD515-500	Uranium (Waste)	<1.0	ug/g	CJ HOLBROOK	4-MAR-1991

Laboratory Manager: W. R. Waugh (Environmental and Industrial Hygiene Laboratory)
Date Approved: 19-MAR-1991

W
4W

Portsmouth Gaseous Diffusion Plant
Quality and Technical Services Division
Results of Analyses

AnaLIS ID: 910201-014 Project: WMGT RFD Customer Sample ID: RFD-209-2
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 1-FEB-1991 Date Sample Received: 1-FEB-1991
Sampled By: SA MOORE Date Sample Completed: 18-MAR-1991
Material Description: MAY CONTAIN Hg CONTAMINATION!

Analytical Proc. No.	Analysis	Result	Units	Analyst	Date Completed
EC-013	Mercury (Water)	.10	mg/L	EL SIMPSON	18-MAR-1991
TSD515-500	Uranium (Waste)	<1.0	ug/g	CJ HOLBROOK	4-MAR-1991

Laboratory Manager: W. R. Waugh (Environmental and Industrial Hygiene Laboratory)
Date Approved: 19-MAR-1991

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Portsmouth Gaseous Diffusion Plant
Quality and Technical Services Division
Results of Analyses

AnaLIS ID: 910201-015 Project: WNGT RFD Customer Sample ID: RFD-209-3
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 1-FEB-1991 Date Sample Received: 1-FEB-1991
Sampled By: SA MOORE Date Sample Completed: 26-MAR-1991
Material Description: MAY CONTAIN Hg CONTAMINATION!

Analytical Proc. No.	Analysis	Result	Units	Analyst	Date Completed
EC-013	Mercury (Water)	.2	mg/L	EL SIMPSON	18-MAR-1991
TSD515-500	Uranium (Waste)	<1.0	ug/g	CJ HOLBROOK	4-MAR-1991

Laboratory Manager: W. R. Waugh (Environmental and Industrial Hygiene Laboratory)
Date Approved: 26-MAR-1991

Waste Stream Number: 611-1

Waste Stream Title: Oil and Filters

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Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 930827-064 Project: WMGT RFD Requisition Number: 002721
Customer Sample ID: RFD16460 Customer: ENV./WASTE MGT.
Date Sampled: 26-AUG-1993 Date Sample Received: 27-AUG-1993
Sampled By: BK KELLEY Date Sample Completed: 29-SEP-1993
Material Description: X611 FILTER HOUSE

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-6010	Arsenic	2.8U		MG/KG	TE SHOOK	7-SEP-1993	93080660
	Barium	1.1		MG/KG	TE SHOOK	7-SEP-1993	93080660
	Cadmium	1.4		MG/KG	TE SHOOK	7-SEP-1993	93080660
	Chromium	0.86U		MG/KG	TE SHOOK	7-SEP-1993	93080660
	Lead	11.1		MG/KG	TE SHOOK	7-SEP-1993	93080660
	Selenium	4.3U		MG/KG	TE SHOOK	7-SEP-1993	93080660
	Silver	0.92N		MG/KG	TE SHOOK	7-SEP-1993	93080660
SW846-7470	Mercury	<.025N		MG/KG	EK GILBERT	16-SEP-1993	93080697
TSD515-500	Uranium (Waste)	<1.0		UG/G	SK BENNINGTON	21-SEP-1993	93101062
1	Gross Alpha Activity	R <0.1		pCi/mL	JJ SISLER	8-SEP-1993	93071385
	Gross Beta Activity	R <0.3		pCi/mL	JJ SISLER	8-SEP-1993	93071385
TSD553-380	Technetium	<0.9		pCi/mL	JJ SISLER	7-SEP-1993	93071377

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
ARSENIC	35.09	31.3114	89.23
BARIUM	35.09	30.2807	86.29
CADMIUM	35.09	29.7254	84.71
CHROMIUM	35.09	29.4386	83.89
LEAD	35.09	27.0851	77.19
MERCURY	.144	0.049	34.03
SELENIUM	35.09	33.4412	95.30
SILVER	35.09	1.5756	4.49
URANIUM (WASTE)	9.96	7.78	78.15

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial

dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

fy data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

dol condensation product.

econdary dilution.

E - Exceeds initial calibration range.

Laboratory Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
D. E. Boyd (Spectrochemistry/ICP Laboratory)
D. K. Perez (Environmental and Industrial Hygiene Laboratory)

Date Approved: 29-SEP-1993

Waste Stream Number: 611-2

Waste Stream Title: Mercury

PORTS MSDS #: 341

PRODUCT: STANDARD, MERCURY 1000PPM IN 10% NITRIC

PART NUMBER:

FORMULA: Hg

KEYWORD: STANDARD

PORTS NUMBER: 00190035-100

PORTS MISC INFO:
NOT GIVEN

PORTS RATING: HFR=300

MANUFACTURER:
VHG LABS INC.
180 ZACHARY RD #5
MANCHESTER
NH

03109
PHONE: PHONE: 603-622-7660
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	~ 212 F	NOTE: ~100'C.
Melting Point. . . .	~ 32 F	NOTE: ~0'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	~ 1	
Vapor Pressure . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Vapor Density. . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Percent Volatiles. .	~ 99	NOTE: @ 21'C.
Evaporation Rate . .	NA	NOTE: NOT APPLI/NOT AVAIL.
pH	NA	NOTE: NOT APPLI/NOT AVAIL.
Molecular Weight . .	EQ 200.59	NOTE: FORMULA WT.
Viscosity.	NG	

Solubility in Water. COMPLETE (100%).
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID, ODORLESS / ODOR THRESHOLD: NOT APPLICABLE/NOT AVAILABLE.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	NA	NOTE: NOT APPLI/NOT AVAIL.
Explosive/Flammable Limits		
Lower (LEL).	NA	NOTE: NOT APPLI/NOT AVAIL.
Upper (UEL).	NA	NOTE: NOT APPLI/NOT AVAIL.

Shipping Regulations

UN/NA Number.	NG
D.O.T. Hazard Class. . .	NG
Label	NOT GIVEN
Proper Shipping Name . .	CHEMICALS, N.O.S. (NON-REGULATED)

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Preparer/Contact Information: QUALITY ASSURANCE DEPARTMENT

Date Prepared/Revised 1/29/93

===== Component Information =====

RCURY
OSHA PEL (PPM):
OSHA PEL (MG/M3): 0.05
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 0.05
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 1.0
C.A.S. No.: 7439976

NITRIC ACID
OSHA PEL (PPM):
OSHA PEL (MG/M3): 5
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 5
STEL (PPM):
STEL (MG/M3): 10
Product %: EQ 10
C.A.S. No.: 7697372
Note:
PEL & TLV: 2 PPM / STEL: 4 PPM.

WATER
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: BA
C.A.S. No.: 7732185
Note:
NE = NOT ESTABLISHED / BA = BALANCE.

===== SECTION I - PRODUCT IDENTIFICATION =====

PRODUCT NAME: Mercury Plasma Emission Standard - 10,000 g/ml

COMMON SYNONYMS: N/A

CHEMICAL FAMILY: Plasma Emission Standards

FORMULA: Hg

FORMULA WT.: 200.59

CAS NO.: N/A

PRODUCT USE: Laboratory Reagent

REVISION DATE: 01/29/93

TEL: (603) 622-7660

FAX: 622-5180

MANUFACTURER'S NAME AND ADDRESS:

VHG LABS, INC.
CHEMICAL PRODUCTS AND SERVICES
180 ZACHARY ROAD #5
MANCHESTER, NH 03109

http://jupiter.ports/msds/data/341

===== SECTION II - COMPONENTS =====

SEE COMPONENT INFORMATION.

===== SECTION III - PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

===== SECTION IV - FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT (CLOSED CUP): N/A

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS:

UPPER: N/A
LOWER: N/A

FIRE EXTINGUISHING MEDIA: Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE-FIGHTING PROCEDURES: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode.

UNUSUAL FIRE & EXPLOSION HAZARDS: Reacts with most metals to produce hydrogen gas, which can form an explosive mixture with air.

TOXIC GASES PRODUCED: Oxides of nitrogen.

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT: None identified.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE: None identified.

===== SECTION V - HEALTH HAZARD DATA =====

THRESHOLD LIMIT VALUE (TLV/TWA): 5 mg/m3 (2 ppm)

TLV is for Nitric acid.

SHORT-TERM EXPOSURE LIMIT (STEL): 10 mg/m3 (4 ppm)

STEL is for Nitric acid.

PERMISSIBLE EXPOSURE LIMIT (PEL): 5 mg/m3 (2 ppm)

PEL is for Nitric acid.

TOXICITY OF COMPONENTS:

INHALATION-1HR RAT LC50 FOR NITRIC ACID: 2500 ppm

INTRAPERITONEAL MOUSE LD50 FOR WATER: 190 g/kg

INTRAVENOUS MOUSE LD50 FOR WATER: 25 g/kg

CARCINOGENICITY: NTP: No IARC: No Z LIST: No OSHA REG: No

CARCINOGENICITY: None identified

REPRODUCTIVE EFFECTS: None identified

EFFECTS OF OVEREXPOSURE:

INHALATION: Headache, nausea, vomiting, dizziness, irritation of respiratory system

SKIN CONTACT: Severe irritation

EYE CONTACT: Severe irritation

SKIN ABSORPTION: None identified

INGESTION: Burns to mouth, throat, and stomach, kidney dysfunction

CHRONIC EFFECTS: None identified

TARGET ORGANS: Respiratory system, eyes, skin, teeth

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Damaged skin,eye disorders, cardiopulmonary disease

PRIMARY ROUTES OF ENTRY: Inhalation, ingestion, skin contact, eye contact

EMERGENCY AND FIRST AID PROCEDURES:

INGESTION: CALL A PHYSICIAN. If swallowed, do NOT induce vomiting If conscious, give water, milk, or milk of magnesia.

INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

SKIN CONTACT: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

EYE CONTACT: In case of eye contact, immediately flush with plenty of water for at least 15 minutes.

SARA/TITLE III HAZARD CATEGORIES AND LISTS:

ACUTE: Yes CHRONIC: Yes FLAMMABILITY: No PRESSURE: No REACTIVITY: No

EXTREMELY HAZARDOUS SUBSTANCE: Yes Contains Nitric Acid (RQ = 1,000 LBS, TPQ = 1,000 LBS)

CERCLA HAZARDOUS SUBSTANCE: Yes Contains Nitric Acid (RQ = 1,000 LBS)

SARA 313 TOXIC CHEMICALS: Yes Contains Nitric Acid

TSCA INVENTORY: Yes

===== SECTION VI - REACTIVITY DATA =====

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Heat

INCOMPATIBLES: Strong bases, strong reducing agents, alkalies, most common metals

DECOMPOSITION PRODUCTS: Oxides of nitrogen

===== SECTION VII - SPILL & DISPOSAL PROCEDURES =====

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE: Wear self-contained

breathing apparatus and full protective clothing. Stop leak if you can do so without risk. Ventilate area. Neutralize spill with soda ash or lime. With clean shovel, carefully place material into clean, dry container and cover; move from area. Flush spill area with water.

DISPOSAL PROCEDURE: Dispose in accordance with all applicable federal, state, and local environmental regulations.

EPA HAZARDOUS WASTE NUMBER: D002 (Corrosive Waste)

===== SECTION VIII - PROTECTION INFORMATION =====

EYE/FACE PROTECTION: Goggles & Shield

PROTECTIVE CLOTHING: Lab Coat & Apron

PROTECTIVE GLOVES: Rubber

VENTILATION REQUIREMENTS: Vent Hood

===== SECTION IX - STORAGE DATA AND ADDITIONAL INFORMATION =====

STORAGE REQUIREMENTS: Keep container tightly closed. Store in secure poison area. Isolate from incompatible materials.

===== SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION =====

DOMESTIC (D.O.T.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)

NTERNATIONAL (I.M.O.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)
MARINE POLLUTANTS: No

N/A = Not Applicable or Not Available
N/E = Not Established

The information in this Material Safety Data Sheet meets the requirements of the United States OCCUPATIONAL SAFETY AND HEALTH ACT and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) and the Canadian WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. This document is intended only as a guide to the appropriate precautionary handling of the material by a person trained in, or supervised by a person trained in, chemical handling. The user is responsible for determining the application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes.

Exposure to this product may have serious advérse health effects. This chemical may interact with other substances. Since the potential uses are so varied, VHG cannot warn of all of the potential dangers of user or interaction with other chemicals or materials. VHG warrants that the chemical meets the specifications set forth on the label. VHG DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.

The user should recognize that this product can cause severe injury and even death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION.

\pproved by Quality Assurance Department.

Waste Stream Number: 616-1

Waste Stream Title: Oil and Filters

PORTS MSDS #: 5505

PRODUCT: BENZENE

PART NUMBER:

FORMULA: C6H6

KEYWORD: SOLVENT

PORTS NUMBER: NNN

PORTS MISC INFO:
01-02-1000

PORTS RATING: HFR=430

MANUFACTURER:
AMERICAN BURDICK & JACKSON
1953 SOUTH HARVEY STREET
MUSKEGON
MI

49442
PHONE: PHONE: 616-726-3171
EMERGENCY PHONE: 616-726-3171

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 176 F	NOTE: 80'C, 760 MM HG.
Melting Point. . . .	NG	
Freezing Point . . .	EQ 41.9 F	NOTE: 5.5'C.
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .879	NOTE: @ 20'C.
Vapor Pressure . . .	EQ 74.6	NOTE: MM HG @ 20'C.
Vapor Density. . . .	EQ 2.8	
Percent Volatiles. .	~ 100	
Evaporation Rate . .	~ 3	NOTE: BUAC=1.
pH	NG	
Molecular Weight . .	EQ 78.11	
Viscosity.	NG	

Solubility in Water. @ 25C 0.18%.
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS LIQUID WITH A CHARACTERISTIC AROMATIC

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 12.2 F	NOTE: -11'C, TCC.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	EQ 1043.6 F	NOTE: 562'C.

Explosive/Flammable Limits

Lower (LEL).	EQ 1.3
Upper (UEL).	EQ 7.1

Shipping Regulations

UN/NA Number.	UN1114
D.O.T. Hazard Class. . .	FLAMMABLE LIQUID
Label	NOT GIVEN
Proper Shipping Name . .	BENZENE

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Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 3/01/88

===== Component Information =====

ENZENE
OSHA PEL (PPM): 1
OSHA PEL (MG/M3):
ACGIH TLV (PPM): 10
ACGIH TLV (MG/M3):
STEL (PPM): 25
STEL (MG/M3):
Product %: ~ 100
C.A.S. No.: 71432
Note:
OSHA AND ACGIH STEL / NIOSH: 10 PPM, TLV CEILING: NOT

===== IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

CHEMICAL NAME: Benzene

CHEMICAL FAMILY: Aromatic Hydrocarbon

SYNONYMS: Benzol

CAS NO.: 71-43-2

EMERGENCY TELEPHONE NO.: 312/973-3600 (American Scientific Products)

CHEMTREC TELEPHONE NO.: 800/424-9300

INFORMATION TELEPHONE NO.: 616/726-3171 (American Burdick & Jackson)

MANUFACTURER'S NAME AND ADDRESS:

AMERICAN BURDICK & JACKSON
SUBSIDIARY OF AMERICAN HOSPITAL SUPPLY CORPORATION
1953 SOUTH HARVEY STREET
MUSKEGON, MI 49442

===== PHYSICAL AND CHEMICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Not expected to occur.

APPEARANCE AND ODOR: Clear, colorless liquid with a characteristic aromatic odor.

CONDITIONS TO AVOID: Heat, sparks, open flame, open containers, and poor ventilation.

MATERIALS TO AVOID: Strong oxidizing agents and strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS: Incomplete combustion can generate carbon monoxide and other toxic vapors.

===== FIRE AND EXPLOSION HAZARD DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

/USUAL FIRE AND EXPLOSION HAZARDS: Volatile and flammable.

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical or foam.

SPECIAL FIRE FIGHTING PROCEDURES: Water will not be effective in extinguishing a fire and may spread it, but a water spray can be used to cool
exposed containers. Wear full protective clothing and self-contained
breathing apparatus. Heat will build pressure and rupture closed storage
containers.

===== HAZARDOUS COMPONENTS =====

SEE COMPONENT INFORMATION.

BENZENE

CARCINOGEN

===== HEALTH HAZARDS =====

OCCUPATIONAL EXPOSURE LIMITS:

OSHA:

PEL-TWA - 1 ppm
PEL-STEL - 25 ppm

ACGIH:

TLV-TWA - 10 ppm
TLV-STEL - 25 ppm

NIOSH:

TLV-TWA - 10 ppm
TLV-C - Not Listed

CONCENTRATION IMMEDIATELY DANGEROUS TO HEALTH:

OSHA/NIOSH 2,000 ppm

ODOR THRESHOLD:

NSC 2 ppm
NIOSH Not Listed
OHS 1.5-5 ppm

CARCINOGENIC, MUTAGENIC, TERATOGENIC DATA:

Human carcinogen (NTP, IARC, OSHA)
Suspect human carcinogen (ACGIH)
Mutagenic and teratogenic data (RTEC)
Animal carcinogen (IARC)

PRIMARY ROUTES OF ENTRY: Benzene may exert its effects through inhalation,
skin absorption, and ingestion.

INDUSTRIAL EXPOSURE: ROUTE OF EXPOSURE/SIGNS AND SYMPTOMS:

INHALATION: Exposure can cause dizziness, intoxication, excitement, headache, vomiting, delirium, drowsiness, and unconsciousness.

EYE CONTACT: Liquid and high vapor concentration can cause irritation, neuritis, atrophy, visual impairment, edema, and cataracts.

SKIN CONTACT: Prolonged or repeated skin contact can cause irritation and dermatitis through defatting of skin.

INGESTION: Can cause gastrointestinal tract discomfort.

EFFECTS OF OVEREXPOSURE: Benzene is a primary skin irritant, central nervous system depressant, bone marrow depressant, and leukemogen. Acute benzene exposure from inhalation or ingestion initially produces excitation and euphoria, followed by headache, drowsiness, dizziness, vomiting, delirium and unconsciousness. Respiratory irritation and pulmonary edema are possible. Severe exposure causes blurred vision, tremors, shallow and rapid respiration, ventricular fibrillation, paralysis, and convulsions. Liver and kidney damage may occur. Chronic exposure to benzene poses the most significant toxic effects. Symptoms are headache, anorexia, nervousness, weariness, anemia, pallor, bleeding under the skin and eyes, and reduced clotting ability. Bone marrow damage and leukemia may develop. Liver and kidney damage may occur.

MEDICAL CONDITION AGGRAVATED BY EXPOSURE: Preclude from exposure those individuals with diseases of the heart, lung, kidney, liver, nervous system, or the blood, and those susceptible to dermatitis.

EMERGENCY FIRST AID:

INHALATION: Immediately remove to fresh air. If not breathing, administer mouth-to-mouth rescue breathing. If there is no pulse administer cardiopulmonary resuscitation (CPR). Contact physician immediately.

EYE CONTACT: Rinse with copious amounts of water for at least 15 minutes. Get emergency medical assistance.

SKIN CONTACT: Flush thoroughly for at least 15 minutes. Wash affected skin with soap and water. Remove contaminated clothing and shoes. Wash clothing before re-use, and discard contaminated shoes. Get emergency medical assistance.

INGESTION: Call local Poison Control Center for assistance. Contact physician immediately. Aspiration Hazard - Do not induce vomiting.

===== SAFETY MEASURES AND EQUIPMENT =====

VENTILATION: Adequate ventilation is required to protect personnel

from
exposure to chemical vapors exceeding the PEL and to minimize fire hazards.
The choice of ventilation equipment, either local or general, will depend on
the conditions of use, quantity of material, and other operating parameters.

RESPIRATORY: Use approved respirator equipment. Follow NIOSH and equipment
manufacturer's recommendations to determine appropriate equipment (air-purifying, air-supplied, or self-contained breathing apparatus).

EYES: Safety glasses are considered minimum protection. Goggles or face
shield may be necessary depending on quantity of material and conditions of
use.

SKIN: Protective gloves and clothing are recommended. The choice of material
must be based on chemical resistance and other user requirements. Generally,
polyvinyl alcohol, viton(R) or nitrile latex offers acceptable chemical
resistance. Individuals who are acutely and specifically sensitive to benzene
may require additional protective equipment.

STORAGE: Benzene should be protected from temperature extremes and direct
sunlight. Proper storage of benzene must be determined based on other
materials stored and their hazards and potential chemical incompatibility. In
general, benzene should be stored in an acceptably protected and secure
flammable liquid storage room.

OTHER: Emergency eye wash fountains and safety showers should be available in
the vicinity of any potential exposure. Ground and bond metal containers to
minimize static sparks.

===== SPILL AND DISPOSAL DATA =====

SPILL CONTROL: Protect from ignition. Wear protective clothing and use
approved respirator equipment. Absorb spilled material in an absorbent
recommended for solvent spills and remove to a safe location for disposal by
approved methods. If released to the environment, comply with all regulatory
notification requirements.

WASTE DISPOSAL: Dispose of benzene as an EPA hazardous waste. Hazardous waste
numbers: U019 (Ignitable, Toxic); D001 (Ignitable).

===== SPECIAL NOTES =====

KEY:

CA: Approximately

NA: Not applicable
C: Ceiling
PEL: Permissible Exposure Level
STEL: Short Term Exposure Level
TLV: Threshold Limit Value
TWA: Time Weighted Average
BuAc: Butyl Acetate
NSC: National Safety Council ("Fundamentals of Industrial Hygiene", 1983)
OHS: Occupational Health Services ("Hazardline")

AMERICAN BURDICK & JACKSON'S DISCLAIMER: "The information and recommendations presented herein are based on sources believed to be reliable as of the date hereof. American Burdick & Jackson makes no representation as to the completeness or accuracy thereof. It is the user's responsibility to determine the product's suitability for its intended use, the product's safe use, and the product's proper disposal. No representations or warranties not expressly set forth herein are made hereunder, whether express or implied by operation of law or otherwise, including, but not limited to any implied warranties of MERCHANTABILITY OR FITNESS. American Burdick & Jackson neither assumes nor authorizes any other person to assume for it, any other or ADDITIONAL LIABILITY OR RESPONSIBILITY resulting from the use of, or reliance upon, this information."

Waste Stream Number: 616-2

Waste Stream Title: Soil/Sludge

616-2

W
4W

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 911215-042 Project: WMGT RFD Customer Sample ID: RFD-7818
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 6-DEC-1991 Date Sample Received: 9-DEC-1991
Sampled By: CP MOORE Date Sample Completed: 24-JUN-1992
Material Description: DIRT & GRASS

Analytical Proc. No.	Preparation Proc. No.	Analysis	Result	Limit Of Error	Units	Date Analyzed	QA File Number
		Assay (% U-235, Waste)	NA		% U-235	7-JAN-1992	NA
EC-006		Arsenic	ND		mg/L		
EC-013		Mercury	ND		mg/L		
EC-015		Selenium	ND		mg/L		
EC-016		Silver	ND		mg/L		
SW846-3050		Barium	49.0 *E		mg/kg	22-JAN-1992	92080032
		Cadmium	5.39 *		mg/kg	22-JAN-1992	92080032
		Chromium	866 *E		mg/kg	22-JAN-1992	92080032
		Lead	53.5 *E		mg/kg	22-JAN-1992	92080032
TSD515-500		Uranium (Waste)	1.2		UG/G	3-JAN-1992	92100002
TSD553-340		Technetium (Waste)	3.0		pci/g	14-JAN-1992	92070037

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
BARIUM	190	213.	112.11
CADMIUM	190	202.	106.11
CHROMIUM	190	181.	95.26
LEAD	190	153.	80.26
URANIUM (WASTE)	10	11.4	114.00

***** Comments from the Radiochemistry Laboratory *****

Uranium to low for assay determination by gamma

***** Comments from the Spectrochemistry/ICP Laboratory *****

* - Duplicate analysis not within control limits.
A[illegible] of duplicate aliquots reported.
E [illegible]s estimated. The E flag is the result of an ICP serial dilution
t[illegible] is not within control limits.

Inorganic Data Reporting Qualifiers and Flags:

C `ration Qualifiers:

B ..e reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but gr than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

P..ring "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

Laboratory Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
O. A. Vita (Spectrochemistry/ICP Laboratory)
D. K. Perez (Environmental and Industrial Hygiene Laboratory)

Date Approved: 24-JUN-1992

Waste Stream Number: 616-3

Waste Stream Title: Filter Cloth and PPE

W
4W

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 920112-010 Project: WMGT RFD Customer Sample ID: RFD-7836
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 9-JAN-1992 Date Sample Received: 9-JAN-1992
Sampled By: B KELLEY Date Sample Completed: 4-AUG-1992
Material Description: FILTER CLOTH MEDIA

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
	Assay (% U-235, Waste)	NA		% U-235	BW SHORT	24-FEB-1992	NA
	Barium	2.3		mg/kg	AL SHULTZ	20-JAN-1992	92080049
	Cadmium	0.01 U		mg/kg	AL SHULTZ	20-JAN-1992	92080049
	Chromium	159 R		mg/kg	AL SHULTZ	20-JAN-1992	92080049
	Lead	0.02 U		mg/kg	AL SHULTZ	20-JAN-1992	92080049
EC-006	Arsenic	ND		mg/L	EL SIMPSON	4-AUG-1992	ELS
EC-013	Mercury	ND		mg/L	EL SIMPSON	4-AUG-1992	ELS
EC-015	Selenium	ND		mg/L	EL SIMPSON	4-AUG-1992	ELS
	Silver	ND		mg/L	EL SIMPSON	4-AUG-1992	ELS
TSD515-500	Uranium (Waste)	<1.0		ug/g	CJ HOLBROOK	20-JAN-1992	92100205
TSD553-340	Technetium (Waste)	0.8		pci/g	BJ STANLEY	25-JAN-1992	92070055

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
URANIUM (WASTE)	50	55.5	110.97

***** Comments from the Radiochemistry Laboratory *****

Uranium to low for assay determination by gamma

***** Comments from the Spectrochemistry/ICP Laboratory *****

ND -- not done, past holding time.

Inorganic Data Reporting Qualifiers and Flags:
Concentration Qualifiers:
B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).
Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial lution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is ss than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

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* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

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Organic Data Reporting Qualifiers:

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B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND Not detected.
t reported.

NA Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

Laboratory Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
O. A. Vita (Spectrochemistry/ICP Laboratory)
D. K. Perez (Environmental and Industrial Hygiene Laboratory)

Date Approved: 4-AUG-1992

Waste Stream Number: Pump-1

Waste Stream Title: Mercury Spill Cleanup

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 971211-077 Project: ER 9762E Requisition Number: 53965
Customer Sample ID: VER07260001 Customer: ENV RESTORATION
Date Sampled: 11-DEC-1997 09:40 Pump 1 Date Sample Received: 11-DEC-1997
Sampled By: RJ STANLEY Date Sample Completed: 5-JAN-1998
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311/3010A	Sample Prep TCLP Metals	COMPLETE			LD DRYDEN	30-DEC-1997	123097-073
SW846-1311	TCLP Extraction	COMPLETE			LD DRYDEN	23-DEC-1997	97170126

Laboratory Manager: C. J. Van Meter (TCLP Laboratory)
Date Approved: 5-JAN-1998

********** COMMENT PAGE **********
********** 971211-077 **********

***** Comments from the TCLP Laboratory *****

TCLP_Method 1311/6010A

Selenium exhibited a zero percent spike recovery for the MS and MSD. However, the SW846-3010A prep spike was within limits.

Definition Page for Qualifiers/Flags

********** 971211-077 **********

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

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J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.
Correlation coefficient for MSA is less tha 0.995.

. - The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID:	971211-077	Customer Sample ID:	VER07260001
Laboratory:	TCLP Laboratory	Customer:	ENV RESTORATION
File ID:	97170126	Sample Matrix:	SOLID WASTE
Instrument ID:		Requisition Number:	53965
Authorized By:	C. J. Van Meter	Date Sample Received:	11-DEC-1997
		Date Sampled:	11-DEC-1997

TCLP_METALS_ICP_RPT

Date Extracted/Prepared:	23-DEC-1997	Date Analyzed:	30-DEC-1997
Analysis Procedure Number:	1311/6010A	QA File Number:	98080001
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	LD DRYDEN
Associated Blank:			

CAS		mg/L	CAS		mg/L
7440-38-2	Arsenic	0.234U			
7440-39-3	Barium	0.149BN*			
7440-43-9	Cadmium	0.028B			
7440-47-3	Chromium	0.100B			
7439-92-1	Lead	0.976B			
7782-49-2	Selenium	0.359U*			
7440-22-4	Silver	0.049U			

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID: 971211-077
Laboratory: TCLP Laboratory
File ID: 97170126
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: VER07260001
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 53965
Date Sample Received: 11-DEC-1997
Date Sampled: 11-DEC-1997

TCLP_HG_RPT

Date Extracted/Prepared: 23-DEC-1997
Analysis Procedure Number: 1311/7470
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 29-DEC-1997
QA File Number: 97080971
Dilution Factor: 1.0
Analyst: LD DRYDEN

CAS		mg/L	CAS		mg/L
7439-97-6	Mercury	0.139			

Waste Stream Number: Pump-2

Waste Stream Title: Cooling Tower Curtains

Waste stream Pump-2 consists of cooling tower curtains. This waste is historically hazardous for chromium.

♦ PORTS MSDS #: 335

PRODUCT: STANDARD, CHROMIUM 1000PPM IN 10% NITRIC

CAT NUMBER:

FORMULA: Cr

KEYWORD: STANDARD

PORTS NUMBER: 00190029-100

PORTS MISC INFO:
NOT GIVEN

PORTS RATING: HFR=300

MANUFACTURER:
VHG LABS INC.
180 ZACHARY RD #5
MANCHESTER
NH

03109
PHONE: PHONE: 603-622-7660
EMERGENCY PHONE:

=== Physical/Chemical Characteristics =====

Boiling Point. . . . ~ 212 F NOTE: ~100'C.
Melting Point. . . . ~ 32 F NOTE: ~0'C.
Freezing Point . . . NG
Pour Point . . . . . NG
Softening Point. . . NG

Specific Gravity . . ~ 1
Vapor Pressure . . . NA NOTE: NOT APPLI/NOT AVAIL.
Vapor Density. . . . NA NOTE: NOT APPLI/NOT AVAIL.
Percent Volatiles. . ~ 99 NOTE: @ 21'C.
Evaporation Rate . . NA NOTE: NOT APPLI/NOT AVAIL.
pH . . . . . NA NOTE: NOT APPLI/NOT AVAIL.
Molecular Weight . . EQ 52.00
Viscosity. . . . . NG
Solubility in Water. COMPLETE (100%).
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS LIQUID, HYDROCHLORIC ACID ODOR.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . . NA NOTE: NOT APPLI/NOT AVAIL.
Flash Point, Open Cup . . . NG
Fire Point. . . . . NG
Auto Ignition. . . . . NA NOTE: NOT APPLI/NOT AVAIL.
Explosive/Flammable Limits
Lower (LEL). . . . . NA NOTE: NOT APPLI/NOT AVAIL.
Upper (UEL). . . . . NA NOTE: NOT APPLI/NOT AVAIL.

Shipping Regulations

UN/NA Number. . . . . NG
D.O.T. Hazard Class. . . NG
Label . . . . . NOT GIVEN

Proper Shipping Name . . CHEMICALS, N.O.S. (NON-REGULATED)

==========

P[illegible]r/Contact Information: QUALITY ASSURANCE DEPARTMENT

Date Prepared/Revised 3/09/95

===== Component Information =====

CHROMIUM
OSHA PEL (PPM):
OSHA PEL (MG/M3): 1
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 1
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ .1
C.A.S. No.: 7440473

NITRIC ACID
OSHA PEL (PPM):
OSHA PEL (MG/M3): 5.2
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 5.2
STEL (PPM):
STEL (MG/M3): 10
Product %: EQ 5
C.A.S. No.: 7697372
N[illegible]e.
PEL & TLV: 2 PPM / STEL: 4 PPM.

WATER
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: BA
C.A.S. No.: 7732185
Note:
NE = NOT ESTABLISHED / BA = BALANCE.

===== SECTION I - PRODUCT IDENTIFICATION =====

PRODUCT NAME: Chromium Plasma Emission Standard - 1000 (micro)g/ml

COMMON SYNONYMS: N/A

PR[illegible]T NO.: PCRN-100, PCRN-500

CHEMICAL FAMILY: Plasma Emission Standards

FORMULA: Cr

FORMULA WT.: 52.00

CAS NO.: N/A

NIOSH/RTECS NO.: MW4025000

PRODUCT USE: Laboratory Reagent

REVISION DATE: 03/09/95

TEL: (603) 622-7660

FAX: 622-5180

MANUFACTURER'S NAME AND ADDRESS:

VHG LABS, INC.
CHEMICAL PRODUCTS AND SERVICES
180 ZACHARY ROAD #5
MANCHESTER, NH 03109

===== SECTION II - COMPONENTS =====

SEE COMPONENT INFORMATION.

===== SECTION III - PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

ODOR THRESHOLD (PPM): N/A

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

===== SECTION IV - FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT (CLOSED CUP): N/A

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS:

UPPER: N/A
LOWER: N/A

CARCINOGENICITY:

NTP: Yes
IARC: Yes
Z LIST: Yes
OSHA REG: Yes

FIRE EXTINGUISHING MEDIA: Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE-FIGHTING PROCEDURES: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode.

UNUSUAL FIRE & EXPLOSION HAZARDS: Reacts with most metals to produce hydrogen gas, which can form an explosive mixture with air.

TOXIC GASES PRODUCED: Oxides of nitrogen.

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT: None identified.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE: None identified.

===== SECTION V - HEALTH HAZARD DATA =====

T L LD LIMIT VALUE (TLV/TWA): 5.2 mg/m3 (2 ppm)

TLV is for Nitric acid.

SHORT-TERM EXPOSURE LIMIT (STEL): 10 mg/m3 (4 ppm)

STEL is for Nitric acid.

PERMISSIBLE EXPOSURE LIMIT (PEL): 5.2 mg/m3 (2 ppm)

PEL is for Nitric acid.

TOXICITY OF COMPONENTS:

INHALATION-1 HR RAT LC50 FOR NITRIC ACID: 2500 ppm

INTRAPERITONEAL MOUSE LD50 FOR WATER: 190 g/kg

INTRAVENOUS MOUSE LD50 FOR WATER: 25 g/kg

CARCINOGENICITY: This product contains Chromium, which is listed as a NTP human carcinogen and an IARC human carcinogen (Group 1).

REPRODUCTIVE EFFECTS: None identified

F S OF OVEREXPOSURE:

INHALATION: Headache, nausea, vomiting, dizziness, irritation of respiratory system, severe irritation or burns of respiratory system, pulmonary edema, lung inflammation

SKIN CONTACT: Severe irritation

EYE CONTACT: Severe irritation

SKIN ABSORPTION: None identified

INGESTION: Burns to mouth, throat, and stomach, may be fatal nausea, vomiting, kidney disfunction, paralysis

CHRONIC EFFECTS: None identified

TARGET ORGANS: Liver, kidneys, respiratory system, lungs, eyes, skin, teeth, lymphatic system

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: None identified

PRIMARY ROUTES OF ENTRY: Inhalation, ingestion, skin contact, eye contact

EMERGENCY AND FIRST AID PROCEDURES:

 STION: CALL A PHYSICIAN. If swallowed, and the victim is conscious, give large amounts of milk, milk of magnesia or whites of eggs beaten with H2O and induce vomiting.

INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

SKIN CONTACT: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Wash clothing before reuse.

EYE CONTACT: In case of eye contact, immediately flush with plenty of water for least 15 minutes.

SARA/TITLE III HAZARD CATEGORIES AND LISTS:

ACUTE: Yes
CHRONIC: Yes
FLAMMABILITY: No
PRESSURE: No
REACTIVITY: No

EXTREMELY HAZARDOUS SUBSTANCE: Yes Contains Nitric Acid (RQ = 1,000 LBS, TPQ = 1,000 LBS)

CERCLA HAZARDOUS SUBSTANCE: Yes Contains Chromium (RQ = 1 LB) and Nitric Acid (RQ = 1000 LBS)

SARA 313 TOXIC CHEMICALS: Yes Contains Chromium and Nitric Acid

TSCA INVENTORY: Yes

STATE LISTS: For products sold in the state of California, the state requires that we provide to users and their employees the following message: WARNING: THIS PRODUCT CONTAINS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

= SECTION VI - REACTIVITY DATA =====

STABILITY: Stable

CONDITIONS TO AVOID: Heat

INCOMPATIBLES: Strong bases, strong reducing agents, alkalies, most common metals

DECOMPOSITION PRODUCTS: Oxides of nitrogen

HAZARDOUS POLYMERIZATION: Will not occur

===== SECTION VII - SPILL & DISPOSAL PROCEDURES =====

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE: Wear self-contained breathing apparatus and full protective clothing. Stop leak if you can do so without risk. Ventilate area. Neutralize spill with soda ash or lime. With clean shovel, carefully place material into clean, dry container and cover; remove froam area. Flush spill area with water.

DISPOSAL PROCEDURE: Dispose in accordance with all applicable federal, state, and local environmental regulations.

EP ZARDOUS WASTE NUMBER: D002 (Corrosive Waste)

===== SECTION VIII - PROTECTION INFORMATION =====

EYE/FACE PROTECTION: Goggles & Shield

PROTECTIVE CLOTHING: Lab Coat & Apron

PROTECTIVE GLOVES: Rubber

VENTILATION REQUIREMENTS: Vent Hood

===== SECTION IX - STORAGE DATA AND ADDITIONAL INFORMATION =====

STORAGE REQUIREMENTS: Keep container tightly closed. Suitable for any general chemical storage area. Isolate from incompatible materials.

===== SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION =====

DOMESTIC (D.O.T.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)

INTERNATIONAL (I.M.O.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)

MARINE POLLUTANTS: No

N/A = Not Applicable or Not Available
N/E = Not Established

The information in this Material Safety Data Sheet meets the requirements of the United States OCCUPATIONAL SAFETY AND HEALTH ACT and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) and the Canadian WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. This document is intended only as a guide to the appropriate precautionary handling of the material by a person trained in, or supervised by a person trained in, chemical handling. The user is responsible for determining the application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes.

Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, VHG cannot warn of all of the potential dangers of user or interaction with other chemicals or materials. VHG warrants that the chemical meets the specifications set forth on the label. VHG DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.

The user should recognize that this product can cause severe injury and even death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION.

Approved by Quality Assurance Department.

Waste Stream Number: Pump-3

Waste Stream Title: Oil

PORTS MSDS #: 5505

PRODUCT: BENZENE

PART NUMBER:

FORMULA: C6H6

KEYWORD: SOLVENT

PORTS NUMBER: NNN

PORTS MISC INFO:
01-02-1000

PORTS RATING: HFR=430

MANUFACTURER:
AMERICAN BURDICK & JACKSON
1953 SOUTH HARVEY STREET
MUSKEGON
MI

49442
PHONE: PHONE: 616-726-3171
EMERGENCY PHONE: 616-726-3171

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 176 F	NOTE: 80'C, 760 MM HG.
Melting Point. . . .	NG	
Freezing Point . . .	EQ 41.9 F	NOTE: 5.5'C.
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .879	NOTE: @ 20'C.
Vapor Pressure . . .	EQ 74.6	NOTE: MM HG @ 20'C.
Vapor Density. . . .	EQ 2.8	
Percent Volatiles. .	~ 100	
Evaporation Rate . .	~ 3	NOTE: BUAC=1.
pH	NG	
Molecular Weight . .	EQ 78.11	
Viscosity.	NG	

Solubility in Water. @ 25C 0.18%.
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS LIQUID WITH A CHARACTERISTIC AROMATIC

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 12.2 F	NOTE: -11'C, TCC.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	EQ 1043.6 F	NOTE: 562'C.

Explosive/Flammable Limits

Lower (LEL).	EQ 1.3
Upper (UEL).	EQ 7.1

Shipping Regulations

UN/NA Number.	UN1114
D.O.T. Hazard Class. . .	FLAMMABLE LIQUID
Label	NOT GIVEN
Proper Shipping Name . .	BENZENE

==========

Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 3/01/88

===== Component Information =====

BENZENE
OSHA PEL (PPM): 1
OSHA PEL (MG/M3):
ACGIH TLV (PPM): 10
ACGIH TLV (MG/M3):
STEL (PPM): 25
STEL (MG/M3):
Product %: ~ 100
C.A.S. No.: 71432
Note:
OSHA AND ACGIH STEL / NIOSH: 10 PPM, TLV CEILING: NOT

===== IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

CHEMICAL NAME: Benzene

CHEMICAL FAMILY: Aromatic Hydrocarbon

SYNONYMS: Benzol

CAS NO.: 71-43-2

EMERGENCY TELEPHONE NO.: 312/973-3600 (American Scientific Products)

CHEMTREC TELEPHONE NO.: 800/424-9300

INFORMATION TELEPHONE NO.: 616/726-3171 (American Burdick & Jackson)

MANUFACTURER'S NAME AND ADDRESS:

AMERICAN BURDICK & JACKSON
SUBSIDIARY OF AMERICAN HOSPITAL SUPPLY CORPORATION
1953 SOUTH HARVEY STREET
MUSKEGON, MI 49442

===== PHYSICAL AND CHEMICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Not expected to occur.

APPEARANCE AND ODOR: Clear, colorless liquid with a characteristic aromatic odor.

CONDITIONS TO AVOID: Heat, sparks, open flame, open containers, and poor ventilation.

MATERIALS TO AVOID: Strong oxidizing agents and strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS: Incomplete combustion can generate carbon monoxide and other toxic vapors.

===== FIRE AND EXPLOSION HAZARD DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

USUAL FIRE AND EXPLOSION HAZARDS: Volatile and flammable.

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical or foam.

SPECIAL FIRE FIGHTING PROCEDURES: Water will not be effective in extinguishing a fire and may spread it, but a water spray can be used to cool
exposed containers. Wear full protective clothing and self-contained
breathing apparatus. Heat will build pressure and rupture closed storage
containers.

===== HAZARDOUS COMPONENTS =====

SEE COMPONENT INFORMATION.

BENZENE

CARCINOGEN

===== HEALTH HAZARDS =====

OCCUPATIONAL EXPOSURE LIMITS:

OSHA:

PEL-TWA - 1 ppm
PEL-STEL - 25 ppm

ACGIH:

TLV-TWA - 10 ppm
TLV-STEL - 25 ppm

NIOSH:

TLV-TWA - 10 ppm
TLV-C - Not Listed

CONCENTRATION IMMEDIATELY DANGEROUS TO HEALTH:

OSHA/NIOSH 2,000 ppm

ODOR THRESHOLD:

NSC 2 ppm
NIOSH Not Listed
OHS 1.5-5 ppm

CARCINOGENIC, MUTAGENIC, TERATOGENIC DATA:

Human carcinogen (NTP, IARC, OSHA)
Suspect human carcinogen (ACGIH)
Mutagenic and teratogenic data (RTEC)
Animal carcinogen (IARC)

PRIMARY ROUTES OF ENTRY: Benzene may exert its effects through inhalation,
skin absorption, and ingestion.

INDUSTRIAL EXPOSURE: ROUTE OF EXPOSURE/SIGNS AND SYMPTOMS:

INHALATION: Exposure can cause dizziness, intoxication, excitement, headache, vomiting, delirium, drowsiness, and unconsciousness.

EYE CONTACT: Liquid and high vapor concentration can cause irritation, neuritis, atrophy, visual impairment, edema, and cataracts.

SKIN CONTACT: Prolonged or repeated skin contact can cause irritation and dermatitis through defatting of skin.

INGESTION: Can cause gastrointestinal tract discomfort.

EFFECTS OF OVEREXPOSURE: Benzene is a primary skin irritant, central nervous system depressant, bone marrow depressant, and leukemogen. Acute benzene exposure from inhalation or ingestion initially produces excitation and euphoria, followed by headache, drowsiness, dizziness, vomiting, delirium and unconsciousness. Respiratory irritation and pulmonary edema are possible. Severe exposure causes blurred vision, tremors, shallow and rapid respiration, ventricular fibrillation, paralysis, and convulsions. Liver and kidney damage may occur. Chronic exposure to benzene poses the most significant toxic effects. Symptoms are headache, anorexia, nervousness, weariness, anemia, pallor, bleeding under the skin and eyes, and reduced clotting ability. Bone marrow damage and leukemia may develop. Liver and kidney damage may occur.

MEDICAL CONDITION AGGRAVATED BY EXPOSURE: Preclude from exposure those individuals with diseases of the heart, lung, kidney, liver, nervous system, or the blood, and those susceptible to dermatitis.

EMERGENCY FIRST AID:

INHALATION: Immediately remove to fresh air. If not breathing, administer mouth-to-mouth rescue breathing. If there is no pulse administer cardiopulmonary resuscitation (CPR). Contact physician immediately.

EYE CONTACT: Rinse with copious amounts of water for at least 15 minutes. Get emergency medical assistance.

SKIN CONTACT: Flush thoroughly for at least 15 minutes. Wash affected skin with soap and water. Remove contaminated clothing and shoes. Wash clothing before re-use, and discard contaminated shoes. Get emergency medical assistance.

INGESTION: Call local Poison Control Center for assistance. Contact physician immediately. Aspiration Hazard - Do not induce vomiting.

===== SAFETY MEASURES AND EQUIPMENT =====

VENTILATION: Adequate ventilation is required to protect personnel

from
exposure to chemical vapors exceeding the PEL and to minimize fire hazards.
e choice of ventilation equipment, either local or general, will pend on
the conditions of use, quantity of material, and other operating parameters.

RESPIRATORY: Use approved respirator equipment. Follow NIOSH and equipment
manufacturer's recommendations to determine appropriate equipment (air-purifying, air-supplied, or self-contained breathing apparatus).

EYES: Safety glasses are considered minimum protection. Goggles or face
shield may be necessary depending on quantity of material and conditions of
use.

SKIN: Protective gloves and clothing are recommended. The choice of material
must be based on chemical resistance and other user requirements. Generally,
polyvinyl alcohol, viton(R) or nitrile latex offers acceptable chemical
resistance. Individuals who are acutely and specifically sensitive to benzene
may require additional protective equipment.

STORAGE: Benzene should be protected from temperature extremes and direct
sunlight. Proper storage of benzene must be determined based on other
materials stored and their hazards and potential chemical incompatibility. In
general, benzene should be stored in an acceptably protected and secure
flammable liquid storage room.

OTHER: Emergency eye wash fountains and safety showers should be available in
the vicinity of any potential exposure. Ground and bond metal containers to
minimize static sparks.

===== SPILL AND DISPOSAL DATA =====

SPILL CONTROL: Protect from ignition. Wear protective clothing and use
approved respirator equipment. Absorb spilled material in an absorbent
recommended for solvent spills and remove to a safe location for disposal by
approved methods. If released to the environment, comply with all regulatory
notification requirements.

WASTE DISPOSAL: Dispose of benzene as an EPA hazardous waste. Hazardous waste
numbers: U019 (Ignitable, Toxic); D001 (Ignitable).

===== SPECIAL NOTES =====

KEY:

CA: Approximately

NA: Not applicable
C: Ceiling
PEL: Permissible Exposure Level
STEL: Short Term Exposure Level
TLV: Threshold Limit Value
TWA: Time Weighted Average
BuAc: Butyl Acetate
NSC: National Safety Council ("Fundamentals of Industrial Hygiene", 1983)
OHS: Occupational Health Services ("Hazardline")

AMERICAN BURDICK & JACKSON'S DISCLAIMER: "The information and recommendations presented herein are based on sources believed to be reliable as of the date hereof. American Burdick & Jackson makes no representation as to the completeness or accuracy thereof. It is the user's responsibility to determine the product's suitability for its intended use, the product's safe use, and the product's proper disposal. No representations or warranties not expressly set forth herein are made hereunder, whether express or implied by operation of law or otherwise, including, but not limited to any implied warranties of MERCHANTABILITY OR FITNESS. American Burdick & Jackson neither assumes nor authorizes any other person to assume for it, any other or ADDITIONAL LIABILITY OR RESPONSIBILITY resulting from the use of, or reliance upon, this information."

Waste Stream Number: 700-1

Waste Stream Title: Chromic Acid Tank Closure Waste

X-100 Effluent Neut Tank #1
Miscellaneous Closure Waste
SOW LXWM 0327

ES&H ANALYTICAL SERVICES
Data Summary Report
Project:ER SubProject: 9748E

Analysis	Procedure	Units	Detects	MIN	MAX	AVG	STD DEV
Barium	1311/6010-2	mg/L	10	0.04700	0.07300	0.05720	0.00830
Cadmium	1311/6010-2	mg/L	5	0.00200	0.02700	0.01600	0.01198
Chromium	1311/6010-2	mg/L	10	0.01500	44.80000	8.79710	17.78786
Copper	1311/6010-2	mg/L	7	0.01000	0.97100	0.27586	0.34000
Lead	1311/6010-2	mg/L	8	0.07100	652.00000	271.74938	295.80776
Nickel	1311/6010-2	mg/L	10	0.01000	1.08000	0.44810	0.44942
Silver	1311/6010-2	mg/L	3	0.00600	0.05400	0.02267	0.02715
Zinc	1311/6010-2	mg/L	8	0.09900	0.36000	0.15588	0.08601
Fluoride	EPA 340.2	ug/g	2	25.60000	30.50000	28.05000	3.46482
Aluminum	SW846-6010-5	MG/KG	4	62.10000	4540.00000	2248.77500	2453.89143
A[illegible]	SW846-6010-5	MG/KG	1	69.10000	69.10000	69.10000	0.00000
Ba[illegible]um	SW846-6010-5	MG/KG	4	0.53000	89.40000	44.60750	49.17416
Cadmium	SW846-6010-5	MG/KG	3	3.00000	57.40000	21.33333	31.23609
Calcium	SW846-6010-5	MG/KG	3	1310.00000	112000.00000	72103.33333	61473.75077
Chromium	SW846-6010-5	MG/KG	4	311.00000	6130.00000	3895.25000	2643.01159
Cobalt	SW846-6010-5	MG/KG	3	7.80000	38.50000	18.46667	17.36155
Copper	SW846-6010-5	MG/KG	4	53.20000	1370.00000	871.05000	618.62181
Iron	SW846-6010-5	MG/KG	4	181.00000	304000.00000	79405.25000	149761.74729
Lead	SW846-6010-5	MG/KG	3	282.00000	31000.00000	10529.66667	17727.83310
Lithium	SW846-6010-5	MG/KG	2	3.50000	3.50000	3.50000	0.00000
Magnesium	SW846-6010-5	MG/KG	4	222.00000	5020.00000	2663.50000	2511.38601
Manganese	SW846-6010-5	MG/KG	4	3.90000	1760.00000	508.22500	836.80695
Nickel	SW846-6010-5	MG/KG	4	25.00000	1010.00000	583.50000	471.01203

ES&H ANALYTICAL SERVICES
Data Summary Report
Project:ER SubProject: 9748E

Analysis	Procedure	Units	Detects	MIN	MAX	AVG	STD DEV
Potassium	SW846-6010-5	MG/KG	3	55.80000	1160.00000	761.93333	613.18285
Silver	SW846-6010-5	MG/KG	4	0.75000	64.50000	20.43750	29.59334
Sodium	SW846-6010-5	MG/KG	4	1090.00000	7090.00000	5432.50000	2898.80866
Thallium	SW846-6010-5	MG/KG	1	297.00000	297.00000	297.00000	0.00000
Titanium	SW846-6010-5	MG/KG	3	7.20000	275.00000	176.06667	146.95990
Vanadium	SW846-6010-5	MG/KG	3	10.70000	62.80000	28.20000	29.96515
Zinc	SW846-6010-5	MG/KG	4	15.50000	208.00000	136.62500	86.84793
Cr+6	SW846-7196M	mg/kg	2	555.00000	663.00000	609.00000	76.36753
Mercury	SW846-7470A	mg/kg	3	0.06200	0.09600	0.07500	0.01836
PCB-1254	SW846-8080-2	ug/g	2	4.10000	4.10000	4.10000	0.00000
D phthalate	SW846-8270B	ug/kg	3	501.00000	1070.00000	754.66667	289.46905
bis(2-Ethylhexyl)phthalate	SW846-8270B	ug/kg	1	2420.00000	2420.00000	2420.00000	0.00000
pH	SW846-9045C	pH units	10	5.75000	10.77000	7.72500	1.85399
Gross Alpha	TSD553-280	pCi/g	2	43.00000	43.00000	43.00000	0.00000
Gross Beta	TSD553-280	pCi/g	4	16.00000	113.00000	63.00000	48.15946
Technetium	TSD553-385	pCi/g	4	8.70000	76.90000	49.40000	31.61824
Ac-228	TSD553-440	pCi/g	2	1.04000	1.14000	1.09000	0.07071
Bi-214	TSD553-440	pCi/g	2	1.22000	1.32000	1.27000	0.07071
Pb-210	TSD553-440	pCi/g	2	1.48000	2.07000	1.77500	0.41719
Pb-212	TSD553-440	pCi/g	2	0.65000	0.73000	0.69000	0.05657
Pb-214	TSD553-440	pCi/g	2	1.34000	1.65000	1.49500	0.21920
Potassium-40	TSD553-440	pCi/g	1	2.06000	2.06000	2.06000	0.00000
Radium-224	TSD553-440	pCi/g	2	2.53000	3.62000	3.07500	0.77075

ES&H ANALYTICAL SERVICES
Data Summary Report
Project:ER SubProject: 9748E

Analysis	Procedure	Units	Detects	MIN	MAX	AVG	STD DEV
Radium-226	TSD553-440	pCi/g	2	1.34000	1.65000	1.49500	0.21920
Radium-228	TSD553-440	pCi/g	3	0.58000	1.14000	0.92000	0.29866
Th-230	TSD553-440	pCi/g	1	13.40000	13.40000	13.40000	0.00000
Th-231	TSD553-440	pCi/g	2	1.16000	1.17000	1.16500	0.00707
Th-232	TSD553-440	pCi/g	1	27.40000	27.40000	27.40000	0.00000
Th-234	TSD553-440	pCi/g	2	4.14000	4.68000	4.41000	0.38184
U-234	TSD553-440	pCi/g	1	30.60000	30.60000	30.60000	0.00000
U-235	TSD553-440	pCi/g	2	0.95000	1.04000	0.99500	0.06364
Np-237	TSD553-710T	pCi/g	2	0.09400	0.27000	0.18200	0.12445
Plutonium-239/240	TSD553-710T	pCi/g	1	0.03000	0.03000	0.03000	0.00000
Th [illegible]	TSD553-710TH	pCi/g	2	0.36000	0.38000	0.37000	0.01414
Thorium-230	TSD553-710TH	pCi/g	3	0.00500	1.90000	1.13500	0.99884
Thorium-231	TSD553-710TH	pCi/g	3	0.07700	0.73000	0.49233	0.36094
Thorium-232	TSD553-710TH	pCi/g	2	0.10000	0.10000	0.10000	0.00000
Thorium-234	TSD553-710TH	pCi/g	4	0.04000	4.30000	2.43500	1.94548
% U-235	TSD553-710U	%	3	2.20000	2.80000	2.53333	0.30551
U-234	TSD553-710U	pCi/g	4	0.13000	14.00000	6.93250	7.07905
U-235	TSD553-710U	pCi/g	3	0.07700	0.73000	0.49233	0.36094
U-236	TSD553-710U	pCi/g	2	0.09700	0.11000	0.10350	0.00919
U-238	TSD553-710U	pCi/g	4	0.04000	4.30000	2.14500	2.16557
Uranium	TSD553-710U	ug/g	4	0.12000	13.00000	6.45500	6.48681
TOX	XP4TS-OA7020	ug/g	3	15.00000	390.00000	248.33333	203.61320

Waste Stream Number: 700-2

Waste Stream Title: Cleaning Tank Solution

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950906-060 Project: P103 ACTA Customer Sample ID: RFD-1711-4

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: AQUEOUS WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 6-SEP-1995
Date Sample Approved: 12-SEP-1995
[] : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Limit of Error	Units	Analyst	QA File Number	Date Completed
***** Radiochemistry Laboratory *****								
ACD-160063.R1	Total Activity (Screen)	1.61E2		+/- 8.9E0	dpm/ml	TL DANIELS	TAS-4935	6-SEP-1995

Replicate Results of Analysis

Analysis	Results	Replicate Results	RPD
Total Activity (Screen)	1.61E2	1.88E2	15.5

Spike Recovery Data

Analysis	Unspike Result	Amount Spike	Spike Result	Units	Amount Recovered	Percent Recovered
***** Radiochemistry Laboratory *****						
TOTAL ACTIVITY (SCREEN)	321.78	376.60	693.01	dpm/ml	371.23	98.6

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 950906-001 Project: ER 9579C Customer Sample ID: RFD17114
Customer: ENV RESTORATION Requisition Number: 017878
Date Sampled: 31-AUG-1995 20:50 Date Sample Received: 5-SEP-1995
Sampled By: MB HAMEL Date Sample Completed: 18-SEP-1995
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-9040A	pH	10.05		pH	BJ STANLEY	8-SEP-1995	95101252
TSD553-380	Technetium	<0.9		pCi/ml	JP BREWSTER	13-SEP-1995	95071340
TSD553-700	% U-235	NA	NA	%	CD GOOD	11-SEP-1995	95071327
	Uranium	0.15	0.036	ppm	CD GOOD	11-SEP-1995	95071327
TSD554-015	Sample Prep Solvents	COMPLETE			PJ WARD	14-SEP-1995	9516091402

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)
Date Approved: 19-SEP-1995

********** COMMENT PAGE **********
********** 950906-001 **********

***** Comments from the Organic Analytical Services *****

SW846-8260

Sample was found to be unpreserved (pH=11).

Definition Page for Qualifiers/Flags

******** ******** 950906-001 **********

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.
relation coefficient for MSA is less tha 0.995.

+ - The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950906-001
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#3
Authorized By: J. J. Williams

Customer Sample ID: RFD17114
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 017878
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 12-SEP-1995
QA File Number: 95160912A3
Dilution Factor: 1.0
Analyst: MA NOVOTNY

CAS		ug/L	CAS		ug/L
67-64-1	Acetone	650	100-41-4	Ethyl benzene	2U
71-43-2	Benzene	2	76-13-1	Freon 113	2U
75-27-4	Bromodichloromethane	2U	76-14-2	Freon 114	4U
75-25-2	Bromoform	2U	108-10-1	4-Methyl-2-pentanone	100U
74-83-9	Bromomethane	4U	75-09-2	Methylene Chloride	5
78-93-3	2-Butanone	200	79-34-5	1,1,2,2-Tetrachloroethane	2U
75-15-0	Carbon Disulfide	2U	127-18-4	Tetrachloroethene	2U
56-23-5	Carbon Tetrachloride	2U	108-88-3	Toluene	2U
108-90-7	Chlorobenzene	2U	71-55-6	1,1,1-Trichloroethane	2U
75-00-3	Chloroethane	4U	79-00-5	1,1,2-Trichloroethane	2U
67-66-3	Chloroform	2U	79-01-6	Trichloroethene	2U
74-87-3	Chloromethane	4U	75-69-4	Trichlorofluoromethane	4U
124-48-1	Dibromochloromethane	2U	75-01-4	Vinyl Chloride	1U
106-46-7	1,4-Dichlorobenzene	2U	1330-20-7	m,p-Xylene	2U
95-50-1	1,2-Dichlorobenzene	2U	95-47-6	o-Xylene	2U
541-73-1	1,3-Dichlorobenzene	2U			
75-34-3	1,1-Dichloroethane	2U			
107-06-2	1,2-Dichloroethane	2U			
75-35-4	1,1-Dichloroethene	2U			
156-59-2	cis-1,2-Dichloroethene	2U			
156-60-5	trans-1,2-Dichloroethene	2U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

VOC ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 950906-001
Laboratory: Organic Analytical Services
Sample Matrix: LIQUID WASTE
Level: (low/med): LOW
Dilution Factor: 1.0

Customer Sample ID: RFD17114
Customer: ENV RESTORATION
File ID:
Date Received: 5-SEP-1995
Date Analyzed: 12-SEP-1995
Concentration Units: ug/L

Number TICs found: 9

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.	95-63-6	1,2,4-Trimethylbenzene		4	
2.		Octane	16.2	7	J
3.	2216-33-3	3-Methyloctane	16.5	7	J
4.		nonane	17.2	30	J
5.		3-methylnonane	19.0	10	J
6.		Diethylcyclohexane	19.3	8	J
7.		decane	19.6	800	J
8.		undecane	21.8	30	J
9.		nonadecane	20.1	30	J
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

ANALYSIS DATA REPORT

AnaLIS ID:	950906-001	Customer Sample ID:	RFD17114
Laboratory:	Organic Analytical Services	Customer:	ENV RESTORATION
File ID:		Sample Matrix:	LIQUID WASTE
Instrument ID:		Requisition Number:	017878
Authorized By:	J. J. Williams	Date Sample Received:	5-SEP-1995
		Date Sampled:	31-AUG-1995

Solvents_F001

Date Extracted/Prepared:		Date Analyzed:	14-SEP-1995
Analysis Procedure Number:	TSD554-019	QA File Number:	9516091402
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	PJ WARD
Associated Blank:			

CAS		ug/g	CAS		ug/g
56-23-5	Carbon Tetrachloride	1000U			
75-09-2	Methylene Chloride	100U			
127-18-4	Tetrachloroethene	100U			
71-55-6	1,1,1-Trichloroethane	100U			
79-01-6	Trichloroethene	100U			

Date Printed: 22-SEP-1995 15:43:04

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

Analysis ID: 950907-050 Project: P103 003 Customer Sample ID: RFD-1711-4

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 22-SEP-1995
Date Sample Approved: 22-SEP-1995
[] : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Units	Analyst	QA File Number	Date Completed
***** Organic Sample Preparation Laboratory *****							
ACD-1320	Prep (BNA- Option)	C			JR HUSKEY	9989	12-SEP-1995
***** Spectrochemistry Laboratory *****							
EPA-7060	Arsenic	866	R	ug/g	CB HAMMONDS	50912A	13-SEP-1995
EPA-7421	Lead	< 0.65	R	ug/g	CB HAMMONDS	50912B	13-SEP-1995
EPA-7740	Selenium	< 0.81	R	ug/g	CB HAMMONDS	50912C	13-SEP-1995
Q Qual:(R) Result was Revised after Approval.							
***** Inductively Coupled Plasma Laboratory *****							
EPA-6010 ACD-096010	Barium	< 0.81	d	ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 ACD-096010	Cadmium	< 2.4	d	ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 ACD-096010	Chromium	< 8.1	d	ug/g	SA BURGESS	50914X	14-SEP-19
EPA-6010 ACD-096010	Silver	< 4.9	d	ug/g	SA BURGESS	50914X	14-SEP-1995
Q Qual:(d) Dilution required for accurate determination of all analytes; reporting limits raised accordingly.							
***** Wet Instrumentation Laboratory *****							
EPA-1010	Flash Point Closed Cup	> 200		degrees F	CY CRANMORE	95-12	14-SEP-1995
***** Mercury Laboratory *****							
EPA-7470	Mercury	< 0.08		ug/gm	WW JOHNSON	50908H	13-SEP-1995

Prep (BNA- Option)

Analyst	= JR HUSKEY
Date Extracted	= 12-SEP-1995
Sample Weight Extracted (g)	= 1.00
Extraction Method	= ACD-1310
Extraction Solvent	= Methylene Chloride
Extraction Cleanup	= Sodium Sulfate
Final Volume of Extract (mL)	= 1
Associated Blank	= 950912-113

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-050 Project: P103 003 Customer Sample ID: RFD-1711-4

Laboratory: Organic Mass Spectroscopy Laboratory
File ID: D02599.D
Instrument ID: HP-5989
Authorized By: C MEEHAN

Customer: APPLEGATE
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 6-SEP-1995

BNA - Base/Neutral/Acid Compounds (TCLP)

Date Extracted/Prepared: 12-SEP-1995
Regulatory Procedure Number: EPA-8270
Percent Moisture:
Percent Moisture (decanted):
Associated Blank: 950912-113
[] : Result has been Corrected for Spike

Date Analyzed: 13-SEP-1995
ACD Procedure Number: ACD-240071
Dilution Factor: 1.0
Analyst: AK HEADRICK
QA File Number: AKH-5877

CAS	Analysis	ug/L	Q Qual	CAS	Analysis	ug/L	Q Qual
110-86-1	Pyridine	10000	U				
106-46-7	1,4-Dichlorobenzene	10000	U				
95-50-1	1,2-Dichlorobenzene	10000	U				
95-48-7	2-Methylphenol	10000	U				
106-44-5	4-Methylphenol	10000	2 U				
-72-1	Hexachloroethane	10000	U				
-95-3	Nitrobenzene	10000	U				
87-68-3	Hexachlorobutadiene	10000	U				
88-06-2	2,4,6-Trichlorophenol	10000	U				
95-95-4	2,4,5-Trichlorophenol	50000	U				
121-14-2	2,4-Dinitrotoluene	10000	U				
118-74-1	Hexachlorobenzene	10000	U				
87-86-5	Pentachlorophenol	50000	U				

Q Qual:(U) Compound was analyzed for but not detected.
(B) Analyte found in blank as well as sample.
(J) Indicates an estimated value.
(N) Presumptive evidence of a compound.
(A) TIC is a suspected aldol-condensation product.
(D) Compounds identified in an analysis at a secondary dilution factor.
(E) Concentrations exceed calibration range of the GC/MS instrum ent.
(Y) Undistinguisgable isomer components.
(2) Cannot be separated from 3-Methylphenol.

Date Printed: 22-SEP-1995 15:43:04

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-050 Project: P103 003 Customer Sample ID: RFD-1711-4

BNA (TCLP) ORGANICS ANALYSIS DATA SHEETS
SURROGATE SPIKE RECOVERY

AnaLIS ID: 950907-050
Laboratory: Organic Mass Spectroscopy Laboratory
Sample Matrix: WASTE
Level: (low/med): LOW
Dilution Factor: 1.0
% Moisture: not dec. _____ dec. _____
Extraction: (SepF/Cont/Sonc) ____
GPC Cleanup: (Y/N) N

Customer Sample ID: RFD-1711-4
Customer: APPLEGATE
File ID: D02599.D
Date Received: 6-SEP-1995
Date Analyzed: 13-SEP-1995
Date Extracted: 12-SEP-1995
pH: _____

Surrogate Compound	SPIKE ADDED (ug/L)	RESULT (ug/L)	% REC	#	QC LIMITS % REC
Nitrobenzene-d5	100.0	30.22	30.2	*	35 - 114
1,1'-Biphenyl, 2-fluoro	100.0	30.72	30.7	*	43 - 116
Terphenyl-d14	100.0	41.83	41.8		33 - 141
Phenol-d6	200.0	54.53	27.3		10 - 94
2-Fluorophenol	200.0	60.55	30.3		21 - 100
2,4,6-Tribromophenol	200.0	58.11	29.1		10 - 123

\# Column to be used to flag recovery values with an asterisk
* Values outside of QC limits

Spike Recovery: 2 out of 6 outside limits

COMMENTS: _____

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950906-059 Project: P103 ACTS Customer Sample ID: RFD-10131-4

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: SOLIDS/SOIL
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 7-SEP-1995
Date Sample Approved: 12-SEP-1995
[] : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Limit of Error	Units	Analyst	QA File Number	Date Completed
***** Radiochemistry Laboratory *****								
ACD-160063.R1	Total Activity (Screen)	6.33E2		+/- 4.8E2	dpm/g	TL DANIELS	TAS-4934	7-SEP-1995

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-014 Project: P103 003A Customer Sample ID: RFD-10131-4

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: DEBRIS
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 15-SEP-1995
Date Sample Approved: 15-SEP-1995
[] : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q	Qual	Units	Analyst	QA File Number	Date Completed
***** Organic Sample Preparation Laboratory *****								
ACD-1320	Prep (BNA- TCLP)	C				EN DANIEL	9512	9-SEP-199
***** Inductively Coupled Plasma Laboratory *****								
EPA-6010 ACD-096010	Arsenic (TCLP)	< 0.10	d		mg/L	N MUNIZ-MORALE	50915Z	15-SEP-199
EPA-6010 ACD-096010	Barium (TCLP)	0.97			mg/L	N MUNIZ-MORALE	50915Z	15-SEP-199
EPA-6010 ACD-096010	Cadmium (TCLP)	0.20			mg/L	N MUNIZ-MORALE	50915Z	15-SEP-199
EPA-6010 ACD-096010	Chromium (TCLP)	0.091			mg/L	N MUNIZ-MORALE	50915Z	15-SEP-199
EPA-60[illegible] A	Lead (TCLP)	0.18			mg/L	N MUNIZ-MORALE	50915Z	15-SEP-199
EPA-60[illegible] ACD-096010	Selenium (TCLP)	0.15			mg/L	N MUNIZ-MORALE	50915Z	15-S [illegible]
EPA-6010 ACD-096010	Silver (TCLP)	< 0.014	d		mg/L	N MUNIZ-MORALE	50915Z	15-SEP-199
Q Qual:(d) Dilution required for accurate determination of all analytes; reporting limits raised accordingly.								
***** Wet Instrumentation Laboratory *****								
EPA-1311	TCLP BNA Extraction	C				CA SEDLACEK	95-18	8-SEP-199
EPA-1311	TCLP Metals Extraction	C				CA SEDLACEK	95-18	8-SEP-199
***** Mercury Laboratory *****								
EPA-7470	Mercury (TCLP)	< 0.001			mg/L	WW JOHNSON	50908S	12-SEP-199

Prep (BNA- TCLP)

Analyst = EN DANIEL
pH = 5
Date Extracted = 9-SEP-1995
Sample Volume Extracted (mL) = 370
Extraction Method = ACD-1320-Separatory Funnel
Extraction Solvent = Methylene Chloride
Extraction Cleanup = Sodium Sulfate
Final Volume of Extract (mL) = 1
As[illegible]ed Blank = 950909-014

Spike Recovery Data

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-014 Project: P103 003A Customer Sample ID: RFD-10131-4

Analysis	Unspike Result	Amount Spike	Spike Result	Units	Amount Recovered	Percent Recovered
***** Inductively Coupled Plasma Laboratory *****						
ARSENIC (TCLP)	0.0679	1.00	1.02	mg/L	0.95	95.2
BARIUM (TCLP)	0.966	5.00	5.61	mg/L	4.64	92.9
CADMIUM (TCLP)	0.201	0.100	0.284	mg/L	0.083	83.0
CHROMIUM (TCLP)	0.0910	0.500	0.530	mg/L	0.439	87.8
LEAD (TCLP)	0.184	0.200	0.355	mg/L	0.171	Not Calc
SELENIUM (TCLP)	0.152	0.100	0.269	mg/L	0.117	Not Calc
SILVER (TCLP)	0.00720	0.200	0.265	mg/L	0.258	128.9
***** Mercury Laboratory *****						
MERCURY (TCLP)	0.0	20	14.34	UG/L	14.34	71.7

***** Comments from the Organic Mass Spectroscopy Laboratory *****

BNA ANALYSIS:

COMMENTS: THE SAMPLE FAILED ACCEPTANCE CRITERIA FOR FOUR (4) SURROGATE STANDARDS. THE ASSOCIATED QC CHECK SAMPLE PASSED CRITERIA FOR ALL SURROGATE STANDARDS. THE SAMPLE MAY BE RE-EXTRACTED AND RE-ANALYZED AT THE OPTION OF THE PROJECT MANAGER. (AKH.09/14/95)

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-014 Project: P103 003A Customer Sample ID: RFD-10131-4

Laboratory: Organic Mass Spectroscopy Laboratory
File ID: D02583.D
Instrument ID: HP-5989
Authorized By: C MEEHAN
Customer: APPLEGATE
Sample Matrix: SOIL
Requisition Number:
Date Sample Received: 6-SEP-1995

BNA - Base/Neutral/Acid Compounds (TCLP)

Date Extracted/Prepared: 9-SEP-1995
Regulatory Procedure Number: EPA-8270
Percent Moisture:
Percent Moisture (decanted):
Associated Blank: 950909-014
[] : Result has been Corrected for Spike
Date Analyzed: 12-SEP-1995
ACD Procedure Number: ACD-240071
Dilution Factor: 1.0
Analyst: AK HEADRICK
QA File Number: AKH-5873

CAS	Analysis	ug/L	Q Qual	CAS	Analysis	ug/L	Q Qual
110-86-1	Pyridine	27	U				
106-46-7	1,4-Dichlorobenzene	27	U				
95-50-1	1,2-Dichlorobenzene	27	U				
95-48-7	2-Methylphenol	27	U				
106-44-5	4-Methylphenol	27	2 U				
67-72-1	Hexachloroethane	27	U				
	Nitrobenzene	27	U				
87-68-3	Hexachlorobutadiene	27	U				
88-06-2	2,4,6-Trichlorophenol	27	U				
95-95-4	2,4,5-Trichlorophenol	140	U				
121-14-2	2,4-Dinitrotoluene	27	U				
118-74-1	Hexachlorobenzene	27	U				
87-86-5	Pentachlorophenol	140	U				

Q Qual:(U) Compound was analyzed for but not detected.
(B) Analyte found in blank as well as sample.
(J) Indicates an estimated value.
(N) Presumptive evidence of a compound.
(A) TIC is a suspected aldol-condensation product.
(D) Compounds identified in an analysis at a secondary dilution factor.
(E) Concentrations exceed calibration range of the GC/MS instrum ent.
(Y) Undistinguisgable isomer components.
(2) Cannot be separated from 3-Methylphenol.

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-014 Project: P103 003A Customer Sample ID: RFD-10131-4

BNA (TCLP) ORGANICS ANALYSIS DATA SHEETS
SURROGATE SPIKE RECOVERY

AnaLIS ID: 950907-014
Laboratory: Organic Mass Spectroscopy Laboratory
Sample Matrix: SOIL
Level: (low/med): LOW
Dilution Factor: 1.0
% Moisture: not dec. _____ dec. _____
Extraction: (SepF/Cont/Sonc) SepF
GPC Cleanup: (Y/N) N

Customer Sample ID: RFD-10131-4
Customer: APPLEGATE
File ID: D02583.D
Date Received: 6-SEP-1995
Date Analyzed: 12-SEP-1995
Date Extracted: 9-SEP-1995
pH: 5

Surrogate Compound	SPIKE ADDED (ug/L)	RESULT (ug/L)	% REC	#	QC LIMITS % REC
Nitrobenzene-d5	100.0	9.13	9.1	*	23 - 120
1,1'-Biphenyl, 2-Fluoro	100.0	73.33	73.3		30 - 115
Terphenyl-d14	100.0	110.48	110.5		18 - 137
Phenol-d6	200.0	1.26	0.6	*	24 - 113
2-Fluorophenol	200.0	5.24	2.6	*	25 - 121
2,4,6-Tribromophenol	200.0	14.55	7.3	*	19 - 122

\# Column to be used to flag recovery values with an asterisk
* Values outside of QC limits

Spike Recovery: 4 out of 6 outside limits

COMMENTS: _____

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-014 Project: P103 003A Customer Sample ID: RFD-10131-4

SOIL BNA (TCLP) MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Laboratory Name: Organic Mass Spectroscopy
AnaLIS Matrix Spike ID: 950909-012
AnaLIS Matrix Spike Duplicate ID:

Customer Name: APPLEGATE
Requisition Number:

Compound	SPIKE ADDED (ug/L)	SAMPLE CONC. (ug/L)	MS CONC. (ug/L)	MS % REC #	QC LIMITS REC.
Phenol	540.			NC *	26 - 90
2-Chlorophenol	540.			NC *	25 - 102
1,4-Dichlorobenzene	270.	0.0	0.0	0. *	28 - 104
N-Nitroso-di-n-propylamine	270.			NC *	41 - 126
1,2,4-Trichlorobenzene	270.			NC *	38 - 107
4-Chloro-3-methylphenol	540.			NC *	26 - 103
Acenaphthene	270.			NC *	31 - 137
4-Nitrophenol	540.			NC *	11 - 114
2,4-Dinitrotoluene	270.	0.0	0.0	0. *	28 - 89
Pentachlorophenol	540.	0.0	0.0	0. *	17 - 109
Pyrene	270.			NC *	35 - 142

Compound	SPIKE ADDED (ug/L)	MSD CONC. (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Phenol	540.		NC *	NC	35	26 - 90
2-Chlorophenol	540.		NC *	NC	50	25 - 102
1,4-Dichlorobenzene	270.		NC *	NC	27	28 - 104
N-Nitroso-di-n-propylamine	270.		NC *	NC	38	41 - 126
1,2,4-Trichlorobenzene	270.		NC *	NC	23	38 - 107

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-014 Project: P103 003A Customer Sample ID: RFD-10131-4

4-Chloro-3-methylphenol	540.		NC *	NC	33	26 - 103
Acenaphthene	270.		NC *	NC	19	31 - 137
4-Nitrophenol	540.		NC *	NC	50	11 - 114
2,4-Dinitrotoluene	270.		NC *	NC	47	28 - 89
Pentachlorophenol	540.		NC *	NC	47	17 - 109
Pyrene	270.		NC *	NC	36	35 - 142

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
NC -- Not Calculated (insufficient data for calculation)
NR -- Not Reported (ONLY recoveries for spikes reported)

RPD: 0 out of 11 outside limits
Spike Recovery: 22 out of 22 outside limits

COMMENTS: _____

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 950906-004 Project: ER 9579E Customer Sample ID: RFD101314
Customer: ENV RESTORATION Requisition Number: 017879
Date Sampled: 31-AUG-1995 21:00 Date Sample Received: 5-SEP-1995
Sampled By: MB HAMEL Date Sample Completed: 19-SEP-1995
Material Description:

** No comments were made for this sample. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
TSD553-385	Technetium	259		pCi/g	SC BARKER	13-SEP-1995	95071342
TSD553-710	% U-235	7.8	1.5	%	CD GOOD	11-SEP-1995	95071328
	Uranium	37	4.7	ppm	CD GOOD	11-SEP-1995	95071328
TSD554-015	Sample Prep Solvents	COMPLETE			PJ WARD	14-SEP-1995	9516091402

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
J. J. Williams (Organic Analytical Services)
J.J. Williams (TCLP Laboratory)
proved: 19-SEP-1995

I.. .nic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* ᐢuplicate analysis is not within control limits.

›rrelation coefficient for MSA is less tha 0.995.

ıhe value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950906-004
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD101314
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 017879
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

Solvents_F001

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-019
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 14-SEP-1995
QA File Number: 9516091402
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
56-23-5	Carbon Tetrachloride	200U			
75-09-2	Methylene Chloride	20U			
127-18-4	Tetrachloroethene	20U			
71-55-6	1,1,1-Trichloroethane	20U			
79-01-6	Trichloroethene	20U			

ANALYSIS DATA REPORT

AnaLIS ID:	950906-004	Customer Sample ID:	RFD101314
Laboratory:	TCLP Laboratory	Customer:	ENV RESTORATION
File ID:	95170181	Sample Matrix:	SOLID WASTE
Instrument ID:		Requisition Number:	017879
Authorized By:	J.J. Williams	Date Sample Received:	5-SEP-1995
		Date Sampled:	31-AUG-1995

TCLP_VOLATILES_RPT

Date Extracted/Prepared:	8-SEP-1995	Date Analyzed:	
Analysis Procedure Number:		QA File Number:	95170181
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	MR KELLEY
Associated Blank:			

CAS		mg/L	CAS		mg/L
71-43-2	Benzene	0.002U			
56-23-5	Carbon Tetrachloride	0.002U			
108-90-7	Chlorobenzene	0.002U			
67-66-3	Chloroform	0.002U			
106-46-7	1,4-Dichlorobenzene	0.002			
107-06-2	1,2-Dichloroethane	0.002U			
75-35-4	1,1-Dichloroethene	0.002U			
78-93-3	2-Butanone	0.100U			
127-18-4	Tetrachloroethene	0.002U			
79-01-6	Trichloroethene	0.004			
75-01-4	Vinyl Chloride	0.001U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

TCLP_VOLATILES_RPT ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 950906-004
Laboratory: TCLP Laboratory
Sample Matrix: SOLID WASTE
Level: (low/med): LOW
Dilution Factor: 1.0

Customer Sample ID: RFD101314
Customer: ENV RESTORATION
File ID: 95170181
Date Received: 5-SEP-1995
Date Analyzed:
Concentration Units: mg/L

Number TICs found: 7

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.	67-64-1	Acetone		0.200	
2.	75-15-0	Carbon Disulfide		0.002	
3.	108-88-3	Toluene		0.002	
4.	1330-20-7	m,p-Xylene		0.002	
5.	100-42-5	Styrene		0.002	
6.	95-63-6	1,2,4-Trimethylbenzene		0.002	
7.	541-73-1	1,3-Dichlorobenzene		0.003	
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

Waste Stream Number: 700-3

Waste Stream Title: Cleanup Debris

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 950906-023 Project: ER 9579E Customer Sample ID: RFD48601
Customer: ENV RESTORATION Requisition Number: 017715
Date Sampled: 31-AUG-1995 12:25 Date Sample Received: 5-SEP-1995
Sampled By: MB HAMEL Date Sample Completed: 19-SEP-1995
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
TSD553-385	Technetium	240		pCi/g	SC BARKER	13-SEP-1995	95071341
TSD553-710	% U-235	3.0	0.55	%	CD GOOD	11-SEP-1995	95071328
	Uranium	25	3.0	ppm	CD GOOD	11-SEP-1995	95071328

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
J. J. Williams (Organic Analytical Services)
J.J. Williams (TCLP Laboratory)
Date Approved: 19-SEP-1995

********** COMMENT PAGE **********
********** 950906-023 **********

' Comments from the TCLP Laboratory *****

TCLP_Method 1311/8260 : Spike recoveries for Chlorobenzene, Chloroform, 1,4-Dichlorobenzene, 1,2-Dichloroethane, 1,1-Dichloroethene, Trichloroethene and Vinyl chloride did not meet method criteria.

Definition Page for Qualifiers/Flags

********** 950906-023 **********

In [illegible]ca Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

[illegible]rrelation coefficient for MSA is less tha 0.995.

[illegible]e value is between the LC and the LLD.

[illegible]ntering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950906-023
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD48601
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 017715
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

Solvents_F001

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-019
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 14-SEP-1995
QA File Number: 9516091402
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
56-23-5	Carbon Tetrachloride	200U			
75-09-2	Methylene Chloride	20U			
127-18-4	Tetrachloroethene	20U			
71-55-6	1,1,1-Trichloroethane	20U			
79-01-6	Trichloroethene	20U			

ANALYSIS DATA REPORT

AnaLIS ID: 950906-023
Laboratory: TCLP Laboratory
File ID: 95170189
Instrument ID:
Authorized By: J.J. Williams

Customer Sample ID: RFD48601
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 017715
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

TCLP_VOLATILES_RPT

Date Extracted/Prepared: 11-SEP-1995
Analysis Procedure Number:
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed:
QA File Number: 95170189
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
71-43-2	Benzene	0.020U			
56-23-5	Carbon Tetrachloride	0.020U			
108-90-7	Chlorobenzene	0.020U			
67-66-3	Chloroform	0.020U			
106-46-7	1,4-Dichlorobenzene	0.020U			
107-06-2	1,2-Dichloroethane	0.020U			
75-35-4	1,1-Dichloroethene	0.020U			
78-93-3	2-Butanone	1.00JU			
127-18-4	Tetrachloroethene	0.020U			
79-01-6	Trichloroethene	0.300			
75-01-4	Vinyl Chloride	0.010U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

TCLP_VOLATILES_RPT ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 950906-023
Laboratory: TCLP Laboratory
Sample Matrix: SOLID WASTE
Level: (low/med): LOW
Dilution Factor: 1.0

Customer Sample ID: RFD48601
Customer: ENV RESTORATION
File ID: 95170189
Date Received: 5-SEP-1995
Date Analyzed:
Concentration Units: mg/L

Number TICs found: 1

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.		Isopropyl alcohol	6.4	0.020	J
2.					
3.					
4.					
5.					
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30.					

Waste Stream Number: 700-4

Waste Stream Title: Carbon Sludge

100-4

W
4w

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 921103-038 Project: WMGT RFD Customer Sample ID: RFD-13754
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 3-NOV-1992 Date Sample Received: 3-NOV-1992
Sampled By: BK KELLEY Date Sample Completed: 9-DEC-1992
Material Description: FILTERS

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-3051	Arsenic	20.3 U		mg/Kg	AL SHULTZ	2-NOV-1992	92080462
	Barium	121 *		mg/Kg	AL SHULTZ	2-NOV-1992	92080462
	Cadmium	26.3		mg/Kg	AL SHULTZ	2-NOV-1992	92080462
	Chromium	210 N*J		ug/L	AL SHULTZ	2-NOV-1992	92080462
	Lead	406 NJ		ug/L	AL SHULTZ	2-NOV-1992	92080462
	Selenium	29.7 U		mg/Kg	AL SHULTZ	2-NOV-1992	92080462
	Silver	3.6 N*R		mg/Kg	AL SHULTZ	2-NOV-1992	92080462
SW846-7470	Mercury	1.78*NJ		MG/KG	EK GILBERT	12-NOV-1992	92080449
TSD515-500	Uranium (Waste)	16.7		UG/G	CJ HOLBROOK	18-NOV-1992	92102281
.0	Gross Alpha Activity (Soil)	38		pCi/G	JJ SISLER	11-NOV-1992	92071183
	Gross Beta Activity (Soil)	80		pCi/G	JJ SISLER	11-NOV-1992	92071183
TSD553-385	Technetium (Waste)	2.9		pCi/g	BW SHORT	18-NOV-1992	92071281

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
MERCURY	.4	0.513	128.25
URANIUM (WASTE)	50	43.	86.00

***** Comments from the Organic Analytical Services *****

Method SW 846-8240: Sample failed to meet method criteria for internal standard area recovery for Chlorobenzene-d5. The sample was replicated on 11/9/92 and exhibited the same characteristics.

1 Data Reporting Qualifiers and Flags:
oncentration Qualifiers:
B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

Laboratory Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
O. A. Vita (Spectrochemistry/ICP Laboratory)
D. K. Perez (Environmental and Industrial Hygiene Laboratory)
D. E. Boyd (Organic Analytical Services)

Date Approved: 9-DEC-1992

ANALYSIS DATA REPORT

AnaLIS ID: 921103-038
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: D. E. Boyd

Customer Sample ID: RFD-13754
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 3-NOV-1992
Date Sampled: 3-NOV-1992

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8240
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 5-NOV-1992
QA File Number: 92160226
Dilution Factor: 10.0
Analyst: BD FUHR

CAS		ug/Kg	CAS		ug/Kg
67-64-1	Acetone	1000U	108-10-1	4-Methyl-2-pentanone	1000U
71-43-2	Benzene	20U	75-09-2	Methylene Chloride	20U
75-27-4	Bromodichloromethane	20U	79-34-5	1,1,2,2-Tetrachloroethane	20U
75-25-2	Bromoform	20U	127-18-4	Tetrachloroethene	20U
74-83-9	Bromomethane	40U	108-88-3	Toluene	20U
78-93-3	2-Butanone	1000U	71-55-6	1,1,1-Trichloroethane	20U
75-15-0	Carbon Disulfide	20U	79-00-5	1,1,2-Trichloroethane	20U
56-23-5	Carbon Tetrachloride	20U	79-01-6	Trichloroethene	50
108-90-7	Chlorobenzene	20U	75-69-4	Trichlorofluoromethane	40U
75-00-3	Chloroethane	40U	75-01-4	Vinyl Chloride	40U
67-66-3	Chloroform	20U	1330-20-7	Xylene (total)	20U
74-87-3	Chloromethane	40U			
124-48-1	Dibromochloromethane	20U			
	Dichlorobenzenes (Total)	20U			
75-34-3	1,1-Dichloroethane	20U			
107-06-2	1,2-Dichloroethane	20U			
75-35-4	1,1-Dichloroethene	20U			
	1,2-Dichloroethenes (cis & t)	220			
100-41-4	Ethyl benzene	20U			
76-13-1	Freon 113	20U			
	Freon 114	40U			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Waste Stream Number: 700-5

Waste Stream Title: Neutralization Pit Sludge

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 950828-017 Project: ER 9579E Requisition Number: 016667
Customer Sample ID: ESS091Z Customer: ENV RESTORATION
Date Sampled: 24-AUG-1995 14:15 Date Sample Received: 25-AUG-1995
Sampled By: MS ALIFF Date Sample Completed: 21-SEP-1995
Material Description: RFD1744-1,~~1788-1~~

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311/3010A	Sample Prep TCLP Metals	COMPLETE			MR KELLEY	11-SEP-1995	9080930
1311/3520	Sample Prep TCLP Semi-Volatile	COMPLETE			RK POWELL	11-SEP-1995	95160257
1311/6010A	Arsenic	0.056U		mg/L	MR KELLEY	7-SEP-1995	95170177
	Barium	0.449		mg/L	MR KELLEY	7-SEP-1995	95170177
	Cadmium	0.025J		mg/L	MR KELLEY	7-SEP-1995	95170177
	Chromium	0.014		mg/L	MR KELLEY	7-SEP-1995	95170177
	Lead	0.149		mg/L	MR KELLEY	7-SEP-1995	95170177
	Selenium	0.076U		mg/L	MR KELLEY	7-SEP-1995	95170177
1	Mercury	0.010U		mg/L	MR KELLEY	7-SEP-1995	95170177
1311/7760A	Silver	0.128		mg/L	MR KELLEY	7-SEP-1995	95170177
SW-846-1311	Sample Prep TCLP	COMPLETE			MR KELLEY	7-SEP-1995	95170177
SW846-1311	Sample Prep TCLP	COMPLETE			MR KELLEY	7-SEP-1995	95170177
TSD553-385	Technetium	85		pCi/g	SC BARKER	13-SEP-1995	95071342
TSD553-710	% U-235	1.8	0.44	%	CD GOOD	11-SEP-1995	95071328
	Uranium	42	6.3	ppm	CD GOOD	11-SEP-1995	95071328
TSD554-015	Sample Prep Solvents	COMPLETE			PJ WARD	14-SEP-1995	9516091402

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
J. J. Williams (Organic Analytical Services)
J.J. Williams (TCLP Laboratory)
Date Approved: 21-SEP-1995

********** COMMENT PAGE **********
********** 950828-017 **********

* Comments from the TCLP Laboratory *****

TCLP_Method 1311/6010 : Cadmium is qualified as estimated due to laboratory

control sample exceeding Q. C. limits.

Definition Page for Qualifiers/Flags

*** *** ******** 950828-017 **********

In ...ic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

+ - ...uplicate analysis is not within control limits.

...rrelation coefficient for MSA is less tha 0.995.

...he value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950828-017
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: ESS091Z
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 016667
Date Sample Received: 25-AUG-1995
Date Sampled: 24-AUG-1995

Solvents_F001

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-019
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 14-SEP-1995
QA File Number: 9516091402
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
56-23-5	Carbon Tetrachloride	200U			
75-09-2	Methylene Chloride	20U			
127-18-4	Tetrachloroethene	20U			
71-55-6	1,1,1-Trichloroethane	20U			
79-01-6	Trichloroethene	20U			

ANALYSIS DATA REPORT

AnaLIS ID: 950828-017
Laboratory: TCLP Laboratory
File ID: 95170177
Instrument ID:
Authorized By: J.J. Williams

Customer Sample ID: ESS091Z
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 016667
Date Sample Received: 25-AUG-1995
Date Sampled: 24-AUG-1995

TCLP_SV_ACIDS_RPT

Date Extracted/Prepared: 7-SEP-1995
Analysis Procedure Number: 1311/8270A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed:
QA File Number: 95170177
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
95-48-7	2-Methylphenol	0.040U			
108-39-4	m-Cresol	0.040U			
106-44-5	4-Methylphenol	0.040U			
87-86-5	Pentachlorophenol	0.080U			
95-95-4	2,4,5-Trichlorophenol	0.040U			
88-06-2	2,4,6-Trichlorophenol	0.040U			

ANALYSIS DATA REPORT

AnaLIS ID: 950828-017
Laboratory: TCLP Laboratory
File ID: 96170177
Instrument ID:
Authorized By: J.J. Williams

Customer Sample ID: ESS091Z
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 016667
Date Sample Received: 25-AUG-1995
Date Sampled: 24-AUG-1995

TCLP_SV_B/N_RPT

Date Extracted/Prepared: 7-SEP-1995
Analysis Procedure Number: 1311/8270A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed:
QA File Number: 95170177
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
121-14-2	2,4-Dinitrotoluene	0.080U			
118-74-1	Hexachlorobenzene	0.040U			
87-68-3	Hexachlorobutadiene	0.040U			
67-72-1	Hexachloroethane	0.040U			
98-95-3	Nitrobenzene	0.040U			
110-86-1	Pyridine	0.040U			

ANALYSIS DATA REPORT

AnaLIS ID:	950828-017	Customer Sample ID:	ESS091Z
Laboratory:	TCLP Laboratory	Customer:	ENV RESTORATION
File ID:	95170177	Sample Matrix:	SOLID WASTE
Instrument ID:		Requisition Number:	016667
Authorized By:	J.J. Williams	Date Sample Received:	25-AUG-1995
		Date Sampled:	24-AUG-1995

TCLP Volatiles Requested on SOW Port111

Date Extracted/Prepared:	7-SEP-1995	Date Analyzed:	
Analysis Procedure Number:	1311/8260	QA File Number:	95170177
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	MR KELLEY
Associated Blank:			

CAS		mg/L	CAS		mg/L
75-35-4	1,1-Dichloroethene	0.002U			
107-06-2	1,2-Dichloroethane	0.002U			
71-43-2	Benzene	0.002U			
56-23-5	Carbon Tetrachloride	0.002U			
108-90-7	Chlorobenzene	0.002U			
67-66-3	Chloroform	0.007			
78-93-3	2-Butanone	0.100U			
127-18-4	Tetrachloroethene	0.002U			
79-01-6	Trichloroethene	0.087			
75-01-4	Vinyl Chloride	0.001U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

TCLP_VOLATILES_RPT_9579 ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 950828-017
Laboratory: TCLP Laboratory
Sample Matrix: SOLID WASTE
Level: (low/med): LOW
Dilution Factor: 1.0

Customer Sample ID: ESS091Z
Customer: ENV RESTORATION
File ID: 95170177
Date Received: 25-AUG-1995
Date Analyzed:
Concentration Units:mg/L

Number TICs found: 6

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.	75-34-3	1,1-Dichloroethane	7.8	0.010	
2.	156-59-2	cis-1,2-Dichloroethene	8.7	0.002	
3.	71-55-6	1,1,1-Trichloroethane	9.1	0.400	E
4.	108-88-3	Toluene	12.8	0.003	
5.	123-91-1	1,4-Dioxane	11.4	0.005	J
6.	104-76-7	2-Ethyl-1-hexanol	19.7	0.016	J
7.					
8.					
9.					
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Waste Stream Number: 700-6

Waste Stream Title: Fuels or Oil with Water

PORTS MSDS #: 5505

PRODUCT: BENZENE

PART NUMBER:

FORMULA: C6H6

KEYWORD: SOLVENT

PORTS NUMBER: NNN

PORTS MISC INFO:
01-02-1000

PORTS RATING: HFR=430

MANUFACTURER:
AMERICAN BURDICK & JACKSON
1953 SOUTH HARVEY STREET
MUSKEGON
MI

49442
PHONE: PHONE: 616-726-3171
EMERGENCY PHONE: 616-726-3171

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 176 F	NOTE: 80'C, 760 MM HG.
Melting Point. . . .	NG	
Freezing Point . . .	EQ 41.9 F	NOTE: 5.5'C.
Sour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .879	NOTE: @ 20'C.
Vapor Pressure . . .	EQ 74.6	NOTE: MM HG @ 20'C.
Vapor Density. . . .	EQ 2.8	
Percent Volatiles. .	~ 100	
Evaporation Rate . .	~ 3	NOTE: BUAC=1.
pH	NG	
Molecular Weight . .	EQ 78.11	
Viscosity.	NG	

Solubility in Water. @ 25C 0.18%.
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS LIQUID WITH A CHARACTERISTIC AROMATIC

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 12.2 F	NOTE: -11'C, TCC.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	EQ 1043.6 F	NOTE: 562'C.

Explosive/Flammable Limits
Lower (LEL). . . . . EQ 1.3
Upper (UEL). . . . . EQ 7.1

Shipping Regulations
UN/NA Number. UN1114
D.O.T. Hazard Class. . . FLAMMABLE LIQUID
Label . . . . . NOT GIVEN
Proper Shipping Name . . BENZENE

==========

Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 3/01/88

===== Component Information =====

ENZENE
OSHA PEL (PPM): 1
OSHA PEL (MG/M3):
ACGIH TLV (PPM): 10
ACGIH TLV (MG/M3):
STEL (PPM): 25
STEL (MG/M3):
Product %: ~ 100
C.A.S. No.: 71432
Note:
OSHA AND ACGIH STEL / NIOSH: 10 PPM, TLV CEILING: NOT

===== IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

CHEMICAL NAME: Benzene

CHEMICAL FAMILY: Aromatic Hydrocarbon

SYNONYMS: Benzol

CAS NO.: 71-43-2

EMERGENCY TELEPHONE NO.: 312/973-3600 (American Scientific Products)

CHEMTREC TELEPHONE NO.: 800/424-9300

INFORMATION TELEPHONE NO.: 616/726-3171 (American Burdick & Jackson)

MANUFACTURER'S NAME AND ADDRESS:

AMERICAN BURDICK & JACKSON
SUBSIDIARY OF AMERICAN HOSPITAL SUPPLY CORPORATION
1953 SOUTH HARVEY STREET
MUSKEGON, MI 49442

===== PHYSICAL AND CHEMICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Not expected to occur.

APPEARANCE AND ODOR: Clear, colorless liquid with a characteristic aromatic odor.

CONDITIONS TO AVOID: Heat, sparks, open flame, open containers, and poor ventilation.

MATERIALS TO AVOID: Strong oxidizing agents and strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS: Incomplete combustion can generate carbon monoxide and other toxic vapors.

===== FIRE AND EXPLOSION HAZARD DATA =====

'E PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Volatile and flammable.

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical or foam.

SPECIAL FIRE FIGHTING PROCEDURES: Water will not be effective in extinguishing a fire and may spread it, but a water spray can be used to cool
exposed containers. Wear full protective clothing and self-contained
breathing apparatus. Heat will build pressure and rupture closed storage
containers.

===== HAZARDOUS COMPONENTS =====

SEE COMPONENT INFORMATION.

BENZENE

CARCINOGEN

===== HEALTH HAZARDS =====

OCCUPATIONAL EXPOSURE LIMITS:

OSHA:

PEL-TWA - 1 ppm
PEL-STEL - 25 ppm

ACGIH:

TLV-TWA - 10 ppm
TLV-STEL - 25 ppm

NIOSH:

TLV-TWA - 10 ppm
TLV-C - Not Listed

CONCENTRATION IMMEDIATELY DANGEROUS TO HEALTH:

OSHA/NIOSH 2,000 ppm

ODOR THRESHOLD:

NSC 2 ppm
NIOSH Not Listed
OHS 1.5-5 ppm

CARCINOGENIC, MUTAGENIC, TERATOGENIC DATA:

Human carcinogen (NTP, IARC, OSHA)
Suspect human carcinogen (ACGIH)
Mutagenic and teratogenic data (RTEC)
Animal carcinogen (IARC)

PRIMARY ROUTES OF ENTRY: Benzene may exert its effects through inhalation,
skin absorption, and ingestion.

INDUSTRIAL EXPOSURE: ROUTE OF EXPOSURE/SIGNS AND SYMPTOMS:

INHALATION: Exposure can cause dizziness, intoxication, excitement,
adache, vomiting, delirium, drowsiness, and unconsciousness.

EYE CONTACT: Liquid and high vapor concentration can cause irritation,
neuritis, atrophy, visual impairment, edema, and cataracts.

SKIN CONTACT: Prolonged or repeated skin contact can cause irritation and
dermatitis through defatting of skin.

INGESTION: Can cause gastrointestinal tract discomfort.

EFFECTS OF OVEREXPOSURE: Benzene is a primary skin irritant, central nervous
system depressant, bone marrow depressant, and leukemogen. Acute benzene
exposure from inhalation or ingestion initially produces excitation and
euphoria, followed by headache, drowsiness, dizziness, vomiting, delirium and
unconsciousness. Respiratory irritation and pulmonary edema are possible.
Severe exposure causes blurred vision, tremors, shallow and rapid
respiration, ventricular fibrillation, paralysis, and convulsions. Liver and
kidney damage may occur. Chronic exposure to benzene poses the most
significant toxic effects. Symptoms are headache, anorexia, nervousness,
weariness, anemia, pallor, bleeding under the skin and eyes, and reduced
clotting ability. Bone marrow damage and leukemia may develop.
iver and
idney damage may occur.

MEDICAL CONDITION AGGRAVATED BY EXPOSURE: Preclude from exposure those
individuals with diseases of the heart, lung, kidney, liver, nervous system,
or the blood, and those susceptible to dermatitis.

EMERGENCY FIRST AID:

INHALATION: Immediately remove to fresh air. If not breathing, administer
mouth-to-mouth rescue breathing. If there is no pulse administer
cardiopulmonary resuscitation (CPR). Contact physician immediately.

EYE CONTACT: Rinse with copious amounts of water for at least 15 minutes.
Get emergency medical assistance.

SKIN CONTACT: Flush thoroughly for at least 15 minutes. Wash affected skin
with soap and water. Remove contaminated clothing and shoes. Wash clothing
before re-use, and discard contaminated shoes. Get emergency medical
assistance.

INGESTION: Call local Poison Control Center for assistance. Contact
physician immediately. Aspiration Hazard - Do not induce vomiting.

===== SAFETY MEASURES AND EQUIPMENT =====

VENTILATION: Adequate ventilation is required to protect personnel

from
exposure to chemical vapors exceeding the PEL and to minimize fire
zards.
: choice of ventilation equipment, either local or general, will
pend on
the conditions of use, quantity of material, and other operating
parameters.

RESPIRATORY: Use approved respirator equipment. Follow NIOSH and
equipment
manufacturer's recommendations to determine appropriate equipment
(air-purifying, air-supplied, or self-contained breathing
apparatus).

EYES: Safety glasses are considered minimum protection. Goggles or
face
shield may be necessary depending on quantity of material and
conditions of
use.

SKIN: Protective gloves and clothing are recommended. The choice of
material
must be based on chemical resistance and other user requirements.
Generally,
polyvinyl alcohol, viton(R) or nitrile latex offers acceptable
chemical
resistance. Individuals who are acutely and specifically sensitive
to benzene
may require additional protective equipment.

STORAGE: Benzene should be protected from temperature extremes and
direct
sunlight. Proper storage of benzene must be determined based on
ther
aterials stored and their hazards and potential chemical
ıncompatibility. In
general, benzene should be stored in an acceptably protected and
secure
flammable liquid storage room.

OTHER: Emergency eye wash fountains and safety showers should be
available in
the vicinity of any potential exposure. Ground and bond metal
containers to
minimize static sparks.

===== SPILL AND DISPOSAL DATA =====

SPILL CONTROL: Protect from ignition. Wear protective clothing and
use
approved respirator equipment. Absorb spilled material in an
absorbent
recommended for solvent spills and remove to a safe location for
disposal by
approved methods. If released to the environment, comply with all
regulatory
notification requirements.

WASTE DISPOSAL: Dispose of benzene as an EPA hazardous waste.
Hazardous waste
numbers: U019 (Ignitable, Toxic); D001 (Ignitable).

===== SPECIAL NOTES =====

KEY:

CA: Approximately

NA: Not applicable
C: Ceiling
PEL: Permissible Exposure Level
STEL: Short Term Exposure Level
TLV: Threshold Limit Value
TWA: Time Weighted Average
BuAc: Butyl Acetate
NSC: National Safety Council ("Fundamentals of Industrial Hygiene", 1983)
OHS: Occupational Health Services ("Hazardline")

AMERICAN BURDICK & JACKSON'S DISCLAIMER: "The information and recommendations presented herein are based on sources believed to be reliable as of the date hereof. American Burdick & Jackson makes no representation as to the completeness or accuracy thereof. It is the user's responsibility to determine the product's suitability for its intended use, the product's safe use, and the product's proper disposal. No representations or warranties not expressly set forth herein are made hereunder, whether express or implied by operation of law or otherwise, including, but not limited to any implied warranties of MERCHANTABILITY OR FITNESS. American Burdick & Jackson neither assumes nor authorizes any other person to assume for it, any other or ADDITIONAL LIABILITY OR RESPONSIBILITY resulting from the use of, or reliance upon, this information."

Waste Stream Number: 700-7

Waste Stream Title: Caustic Solutions

700-7

Portsmouth Gaseous Diffusion Plant
Technical Operations Division
Analysis Results

AnaLIS ID: 930827-063 Project: WMGT RFD Requisition Number: 002720
Customer Sample ID: RFD11460 Customer: ENV./WASTE MGT.
Date Sampled: 26-AUG-1993 13:10 Date Sample Received: 27-AUG-1993
Sampled By: BK KELLEY Date Sample Completed: 29-SEP-1993
Material Description: X700 WELDING FLUX

** No comments were made for this sample. **

** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-6010	Arsenic	2.7UN		MG/KG	TE SHOOK	7-SEP-1993	93080660
	Barium	1.4N		MG/KG	TE SHOOK	7-SEP-1993	93080660
	Cadmium	0.31UN		MG/KG	TE SHOOK	7-SEP-1993	93080660
	Chromium	0.83UN		MG/KG	TE SHOOK	7-SEP-1993	93080660
	Lead	1.9UN		MG/KG	TE SHOOK	7-SEP-1993	93080660
	Selenium	4.1UN		MG/KG	TE SHOOK	7-SEP-1993	93080660
	Silver	9.4N		MG/KG	TE SHOOK	7-SEP-1993	93080660
SW846-7470	Mercury	<.025N		MG/KG	EK GILBERT	16-SEP-1993	93080697
TSD515-500	Uranium (Waste)	<1.0		UG/G	SK BENNINGTON	21-SEP-1993	93101062
TS	Gross Alpha Activity	J 1		pCi/mL	JJ SISLER	9-SEP-1993	93071395
	Gross Beta Activity	3		pCi/mL	JJ SISLER	9-SEP-1993	93071395
TSD553-370	Technetium	<1.7		pCi/mL	JJ SISLER	31-AUG-1993	93071331

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
ARSENIC	37.74	26.5255	70.28
BARIUM	37.74	22.8698	60.60
CADMIUM	37.74	22.2925	59.07
CHROMIUM	37.74	20.7547	54.99
LEAD	37.74	23.9991	63.59
MERCURY	.146	0.054	36.99
SELENIUM	37.74	27.6528	73.27
SILVER	37.74	14.5415	38.53
URANIUM (WASTE)	9.96	8.38	84.10

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
Approved: 29-SEP-1993

Definition Page for Qualifiers/Flags

*** * ****** 930827-063 **********

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

)licate analysis is not within control limits.

rrelation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

30-7

Portsmouth Gaseous Diffusion Plant
Technical Operations Division
Analysis Results

AnaLIS ID: 941102-059 Project: WMGT RFD Requisition Number: 011164
Customer Sample ID: RFD25112 Customer: ENV./WASTE MGT.
Date Sampled: 2-NOV-1994 10:40 Date Sample Received: 2-NOV-1994
Sampled By: TA SHERWOOD Date Sample Completed:
Material Description: H2O CLEANING SOLN X700

** See comment page for comments. **

** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-6010	Arsenic	3.1U		mg/kg	TE SHOOK	3-NOV-1994	94081319
	Barium	0.08U		mg/kg	TE SHOOK	3-NOV-1994	94081319
	Cadmium	0.29U		mg/kg	TE SHOOK	3-NOV-1994	94081319
	Chromium	0.26U		mg/kg	TE SHOOK	3-NOV-1994	94081319
	Lead	1.4U		mg/kg	TE SHOOK	3-NOV-1994	94081319
	Silver	0.35U		mg/kg	TE SHOOK	3-NOV-1994	94081319
SW846-7470	Mercury	.025U		mg/kg	KA DAYS	12-NOV-1994	94081336
SW846-7740	Selenium	1.0U		mg/kg	EL SIMPSON	3-NOV-1994	94S81319
TSD	Uranium	<1.2		ug/g	CJ HOLBROOK	3-NOV-1994	94101426
TSD553-230	Gross Alpha Activity	1		pCi/mL	JJ SISLER	17-DEC-1994	94072206
	Gross Beta Activity	1		pCi/mL	JJ SISLER	17-DEC-1994	94072206
TSD553-380	Technetium	1.4		pCi/mL	BW SHORT	13-DEC-1994	94072181
TSD553-440	% U-235	SEE COMM		% U-235	JD LITTERAL	26-NOV-1994	94072068

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
Arsenic	40	38.34	95.85
Barium	40	40.14	100.35
Cadmium	40	40.11	100.28
Chromium	40	40.82	102.05
Lead	40	39.44	98.60
Mercury	.148	0.143	96.62
Selenium	40	33.65	84.13
Silver	40	39.46	98.65
Uranium	100	96.3	96.29

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)

J. J. Williams (Organic Analytical Services)
Date Approved: 19-DEC-1994

********** COMMENT PAGE **********
********** 941102-059 **********

Comments from the Radiochemistry Laboratory *****

Uranium conc. too low for assay determination.

Definition Page for Qualifiers/Flags

941102-059

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

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J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

plicate analysis is not within control limits.

relation coefficient for MSA is less tha 0.995.

* - The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 941102-059
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890-2
Authorized By: J. J. Williams

Customer Sample ID: RFD25112
Customer: ENV./WASTE MGT.
Sample Matrix: WASTE
Requisition Number: 011164
Date Sample Received: 2-NOV-1994
Date Sampled: 2-NOV-1994

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8240A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 5-NOV-1994
QA File Number: 94161105A2
Dilution Factor: 2.0
Analyst: MA NOVOTNY

CAS		ug/L	CAS		ug/L
67-64-1	Acetone	200U	108-10-1	4-Methyl-2-pentanone	200U
71-43-2	Benzene	4U	75-09-2	Methylene Chloride	4U
75-27-4	Bromodichloromethane	4U	79-34-5	1,1,2,2-Tetrachloroethane	4U
75-25-2	Bromoform	4U	127-18-4	Tetrachloroethene	4U
74-83-9	Bromomethane	8U	108-88-3	Toluene	4U
78-93-3	2-Butanone	200U	71-55-6	1,1,1-Trichloroethane	4U
75-15-0	Carbon Disulfide	4U	79-00-5	1,1,2-Trichloroethane	4U
56-23-5	Carbon Tetrachloride	4U	79-01-6	Trichloroethene	4U
108-90-7	Chlorobenzene	4U	75-69-4	Trichlorofluoromethane	8U
75-00-3	Chloroethane	8U	75-01-4	Vinyl Chloride	2U
67-66-3	Chloroform	4U	1330-20-7	Xylene (total)	4U
74-87-3	Chloromethane	8U			
124-48-1	Dibromochloromethane	4U			
	Dichlorobenzenes (Total)	4U			
75-34-3	1,1-Dichloroethane	4U			
107-06-2	1,2-Dichloroethane	4U			
75-35-4	1,1-Dichloroethene	4U			
540-59-0	1,2-Dichloroethenes (cis & t)	4U			
100-41-4	Ethyl benzene	4U			
76-13-1	Freon 113	4U			
76-14-2	Freon 114	8U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

VOC ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 941102-059
Laboratory: Organic Analytical Services
Sample Matrix: WASTE
Level: (low/med): LOW
Dilution Factor: 2.0

Customer Sample ID: RFD25112
Customer: ENV./WASTE MGT.
File ID:
Date Received: 2-NOV-1994
Date Analyzed: 5-NOV-1994
Concentration Units: ug/L

Number TICs found: 1

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.		1-methylerther butanoic acid	15.1	10	J
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

Waste Stream Number: 700-8

Waste Stream Title: Nickel Stripping Solution

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 950828-012 Project: ER 9579C Customer Sample ID: ESL064
Customer: ENV RESTORATION Requisition Number: 016664
Date Sampled: 22-AUG-1995 14:45 Date Sample Received: 24-AUG-1995
Sampled By: R CAUDILL Date Sample Completed: 19-SEP-1995
Material Description: RFD21641 NI SOL.WASTE/STR.700-8

** See comment page for comments. **

** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-3015	Sample Prep Metals	COMPLETE			ML STEWART	29-AUG-1995	082995-076
SW846-3520	Sample Prep Semi-Volatiles	COMPLETE			RK POWELL	28-AUG-1995	95160232
SW846-6010A	Aluminum	2110U		ug/L	TE SHOOK	29-AUG-1995	95080932
	Arsenic	6220UJ		ug/L	TE SHOOK	29-AUG-1995	95080932
	Barium	121		ug/L	TE SHOOK	29-AUG-1995	95080932
	Beryllium	100U		ug/L	TE SHOOK	29-AUG-1995	95080932
	Bismuth	NA			TE SHOOK	29-AUG-1995	95080932
	Cadmium	10200000		ug/L	TE SHOOK	29-AUG-1995	95080932
	Calcium	11500J		ug/L	TE SHOOK	29-AUG-1995	95080932
	Chromium	70800		ug/L	TE SHOOK	29-AUG-1995	95080932
	Cobalt	22000		ug/L	TE SHOOK	29-AUG-1995	95080932
	Copper	845000		ug/L	TE SHOOK	29-AUG-1995	95080932
	Iron	4510000		ug/L	TE SHOOK	29-AUG-1995	95080932
	Lead	71000		ug/L	TE SHOOK	29-AUG-1995	95080932
	Magnesium	14900J		ug/L	TE SHOOK	29-AUG-1995	95080932
	Manganese	49900		ug/L	TE SHOOK	29-AUG-1995	95080932
	Nickel	10600000		ug/L	TE SHOOK	29-AUG-1995	95080932
	Potassium	26300U		ug/L	TE SHOOK	29-AUG-1995	95080932
	Selenium	8390U		ug/L	TE SHOOK	29-AUG-1995	95080932
	Silver	211U		ug/L	TE SHOOK	29-AUG-1995	95080932
	Sodium	17000J		ug/L	TE SHOOK	29-AUG-1995	95080932
	Thallium	9700UJ		ug/L	TE SHOOK	29-AUG-1995	95080932
	Tin	NA			TE SHOOK	29-AUG-1995	95080932
	Titanium	2000U		ug/L	TE SHOOK	29-AUG-1995	95080932
	Vanadium	233U		ug/L	TE SHOOK	29-AUG-1995	95080932
	Zinc	31000		ug/L	TE SHOOK	29-AUG-1995	95080932
SW846-7470	Mercury	73.7N		ug/L	RL POLK	8-SEP-1995	95080914
SW846-9040A	pH	1.03		pH	BJ STANLEY	28-AUG-1995	95101179
TSD553-380	Technetium	99.1		pCi/ml	JP BREWSTER	8-SEP-1995	95071317
TSD553-700	% U-235	21	4.5	%	CD GOOD	11-SEP-1995	95071327
	Uranium	18	2.5	ppm	CD GOOD	11-SEP-1995	95071327

Sp. Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
Ba.	2222.2	2470.1	111.16
Beryllium	2222.2	2281.1	102.65
Silver	2222.2	2061.1	92.75
Vanadium	2222.2	2285.6	102.85

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)

Date Approved: 21-SEP-1995

********** COMMENT PAGE **********
********** 950828-012 **********

Comments from the Organic Analytical Services *****

--Method SW846-8270A

This sample as well as ESL-063R were noted on the chain of custodies to be waste nickel plating solutions. These samples were very acidic and the amount of base needed to adjust the pH for the base/neutral side of the extraction mandated the use of a smaller than normal sample size. This is the reason for the quantitation limits reported for this sample being higher than normally reported.

This sample failed method criteria for acid surrogate compounds in the sample, MS, & MSD extracts. The MS & MSD failed method criteria for the recovery of acid matrix spiking compounds. This is the reason all of the acid compounds in the target compound list are flagged as an estimate.

***** Comments from the Spectrochemistry/ICP Laboratory *****

SW846-6010A Tl qualified as estiamte due to calibration verification not meeting acceptance limits.

SW846-6010A As qualified as estimate due to interference check not meeting acceptance limits.

SW846-6010A Ca, Mg & Na qualified as estimate due to LCS not meeting acceptance limits. (Control concentration too low for these elements).

NA = not analyzed for these elements since not on usual SW846-6010 scan.

SW[illegible] st spikes either diluted out or insufficient spike volume for sample.

Definition Page for Qualifiers/Flags

950828-012

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

elation coefficient for MSA is less tha 0.995.

value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950828-012
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#3
Authorized By: J. J. Williams

Customer Sample ID: ESL064
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 016664
Date Sample Received: 24-AUG-1995
Date Sampled: 22-AUG-1995

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 31-AUG-1995
QA File Number: 95160831A3
Dilution Factor: 200
Analyst: MA NOVOTNY

CAS		ug/L	CAS		ug/L
67-64-1	Acetone	20000U	100-41-4	Ethyl benzene	400U
71-43-2	Benzene	400U	76-13-1	Freon 113	400U
75-27-4	Bromodichloromethane	400U	76-14-2	Freon 114	800U
75-25-2	Bromoform	400U	108-10-1	4-Methyl-2-pentanone	20000U
74-83-9	Bromomethane	800U	75-09-2	Methylene Chloride	620
78-93-3	2-Butanone	20000U	79-34-5	1,1,2,2-Tetrachloroethane	400U
75-15-0	Carbon Disulfide	400U	127-18-4	Tetrachloroethene	400U
56-23-5	Carbon Tetrachloride	400U	108-88-3	Toluene	400U
108-90-7	Chlorobenzene	400U	71-55-6	1,1,1-Trichloroethane	400U
75-00-3	Chloroethane	800U	79-00-5	1,1,2-Trichloroethane	400U
67-66-3	Chloroform	400U	79-01-6	Trichloroethene	400U
74-87-3	Chloromethane	800U	75-69-4	Trichlorofluoromethane	800U
124-48-1	Dibromochloromethane	400U	75-01-4	Vinyl Chloride	200U
106-46-7	1,4-Dichlorobenzene	400U	1330-20-7	m,p-Xylene	400U
95-50-1	1,2-Dichlorobenzene	400U	95-47-6	o-Xylene	400U
541-73-1	1,3-Dichlorobenzene	400U			
75-34-3	1,1-Dichloroethane	400U			
107-06-2	1,2-Dichloroethane	400U			
75-35-4	1,1-Dichloroethene	400U			
156-59-2	cis-1,2-Dichloroethene	400U			
156-60-5	trans-1,2-Dichloroethene	400U			

ANALYSIS DATA REPORT

AnaLIS ID:	950828-012	Customer Sample ID:	ESL064
Laboratory:	Organic Analytical Services	Customer:	ENV RESTORATION
File ID:		Sample Matrix:	LIQUID WASTE
Instrument ID:	SV2	Requisition Number:	016664
Authorized By:	J. J. Williams	Date Sample Received:	24-AUG-1995
		Date Sampled:	22-AUG-1995

RCRA and TCLP Semi-Volatile Compounds

Date Extracted/Prepared:	28-AUG-1995	Date Analyzed:	1-SEP-1995
Analysis Procedure Number:	SW846-8270A	QA File Number:	95160901B02
Percent Moisture:		Dilution Factor:	2
Percent Moisture (decanted):		Analyst:	BD FUHR
Associated Blank:			

CAS		ug/L	CAS		ug/L
95-48-7	2-Methylphenol	400UJ			
108-39-4	m-Cresol	400UJ			
106-44-5	4-Methylphenol	400UJ			
87-86-5	Pentachlorophenol	800UJ			
95-95-4	2,4,5-Trichlorophenol	400UJ			
88-06-2	2,4,6-Trichlorophenol	400UJ			
	Total Cresol	NA			
106-46-7	1,4-Dichlorobenzene	400U			
121-14-2	2,4-Dinitrotoluene	800U			
18-74-1	Hexachlorobenzene	400U			
	Hexachloro-1,3-butadiene	400U			
67-72-1	Hexachloroethane	400U			
98-95-3	Nitrobenzene	400U			
110-86-1	Pyridine	400U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

RCRA_SEMIVOLATILES ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 950828-012
Laboratory: Organic Analytical Services
Sample Matrix: LIQUID WASTE
Level: (low/med): LOW
Dilution Factor: 2

Customer Sample ID: ESL064
Customer: ENV RESTORATION
File ID:
Date Received: 24-AUG-1995
Date Analyzed: 1-SEP-1995
Concentration Units: ug/L

Number TICs found: 4

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.		Propanoic acid	3.47	1500	J
2.		unknown	4.80	1600	J
3.		unknown	5.48	1500	J
4.		unknown	7.75	2400	J
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 950828-011 Project: ER 9579C Customer Sample ID: ESL063
Customer: ENV RESTORATION Requisition Number: 016663
Date Sampled: 22-AUG-1995 14:40 Date Sample Received: 24-AUG-1995
Sampled By: R CAUDILL Date Sample Completed: 19-SEP-1995
Material Description: RFD21642 NI SOL.700-8 WST\STREAM

** See comment page for comments. **

** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-3015	Sample Prep Metals	COMPLETE			ML STEWART	29-AUG-1995	082995-076
SW846-6010A	Aluminum	2110U		ug/L	TE SHOOK	29-AUG-1995	95080932
	Arsenic	6220UJ		ug/L	TE SHOOK	29-AUG-1995	95080932
	Barium	2440		ug/l	TE SHOOK	29-AUG-1995	95080932
	Beryllium	2440		ug/L	TE SHOOK	29-AUG-1995	95080932
	Bismuth	NA			TE SHOOK	29-AUG-1995	95080932
	Cadmium	2560		ug/L	TE SHOOK	29-AUG-1995	95080932
	Calcium	38100J		ug/L	TE SHOOK	29-AUG-1995	95080932
	Chromium	2440		ug/L	TE SHOOK	29-AUG-1995	95080932
	Cobalt	2110		ug/L	TE SHOOK	29-AUG-1995	95080932
	Copper	2780		ug/L	TE SHOOK	29-AUG-1995	95080932
	Iron	872000		ug/L	TE SHOOK	29-AUG-1995	95080932
	Lead	2480U		ug/L	TE SHOOK	29-AUG-1995	95080932
	Magnesium	631000J		ug/L	TE SHOOK	29-AUG-1995	95080932
	Manganese	6110		ug/L	TE SHOOK	29-AUG-1995	95080932
	Nickel	2560		ug/L	TE SHOOK	29-AUG-1995	95080932
	Potassium	55000		ug/L	TE SHOOK	29-AUG-1995	95080932
	Selenium	8390U		ug/L	TE SHOOK	29-AUG-1995	95080932
	Silver	2000		ug/L	TE SHOOK	29-AUG-1995	95080932
	Sodium	2240000J		ug/L	TE SHOOK	29-AUG-1995	95080932
	Thallium	9700UJ		ug/L	TE SHOOK	29-AUG-1995	95080932
	Tin	NA			TE SHOOK	29-AUG-1995	95080932
	Titanium	3330		ug/L	TE SHOOK	29-AUG-1995	95080932
	Vanadium	2560		ug/L	TE SHOOK	29-AUG-1995	95080932
	Zinc	14600		ug/L	TE SHOOK	29-AUG-1995	95080932
SW846-7470	Mercury	5UN		ug/L	RL POLK	8-SEP-1995	95080914
SW846-9040A	pH	0.97		pH	BJ STANLEY	28-AUG-1995	95101179
TSD553-380	Technetium	<.9		pCi/ml	JP BREWSTER	8-SEP-1995	95071317
TSD553-700	% U-235	4.9	3.6	%	CD GOOD	6-SEP-1995	95071302
	Uranium	0.033	0.012	ppm	CD GOOD	6-SEP-1995	95071302

Labor. Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)

R. E. Charles (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)
Date Approved: 19-SEP-1995

********** COMMENT PAGE **********
********** 950828-011 **********

Comments from the Spectrochemistry/ICP Laboratory *****

SW846-6010A Tl qualified as estimate due to calibration verification not meeting acceptance limits.

SW846-6010A As qualified as estimate due to interference check not meeting acceptance limits.

SW846-6010A Ca, Mg & Na qualified as estimate due to LCS not meeting acceptance limits
(control concentrations for these elements too low).

NA = not analyzed since these elements are not on usual SW846-6010 scan.

Definition Page for Qualifiers/Flags

950828-011

Inic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

relation coefficient for MSA is less tha 0.995.

e value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950828-011
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#3
Authorized By: J. J. Williams

Customer Sample ID: ESL063
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 016663
Date Sample Received: 24-AUG-1995
Date Sampled: 22-AUG-1995

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 31-AUG-1995
QA File Number: 95160831A3
Dilution Factor: 1.0
Analyst: MA NOVOTNY

CAS		ug/L	CAS		ug/L
67-64-1	Acetone	260	100-41-4	Ethyl benzene	2U
71-43-2	Benzene	2U	76-13-1	Freon 113	2U
75-27-4	Bromodichloromethane	2U	76-14-2	Freon 114	4U
75-25-2	Bromoform	2U	108-10-1	4-Methyl-2-pentanone	100U
74-83-9	Bromomethane	4U	75-09-2	Methylene Chloride	2U
78-93-3	2-Butanone	100U	79-34-5	1,1,2,2-Tetrachloroethane	2U
75-15-0	Carbon Disulfide	2U	127-18-4	Tetrachloroethene	2U
56-23-5	Carbon Tetrachloride	2U	108-88-3	Toluene	2U
108-90-7	Chlorobenzene	2U	71-55-6	1,1,1-Trichloroethane	2U
75-00-3	Chloroethane	4U	79-00-5	1,1,2-Trichloroethane	2U
67-66-3	Chloroform	2U	79-01-6	Trichloroethene	2U
74-87-3	Chloromethane	4U	75-69-4	Trichlorofluoromethane	4U
124-48-1	Dibromochloromethane	2U	75-01-4	Vinyl Chloride	1U
106-46-7	1,4-Dichlorobenzene	2U	1330-20-7	m,p-Xylene	2U
95-50-1	1,2-Dichlorobenzene	2U	95-47-6	o-Xylene	2U
541-73-1	1,3-Dichlorobenzene	2U			
75-34-3	1,1-Dichloroethane	2U			
107-06-2	1,2-Dichloroethane	2U			
75-35-4	1,1-Dichloroethene	2U			
156-59-2	cis-1,2-Dichloroethene	2U			
156-60-5	trans-1,2-Dichloroethene	2U			

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 950828-130 Project: ER 9579C Customer Sample ID: ESL063R
Customer: ENV RESTORATION Requisition Number: 016875
Date Sampled: 24-AUG-1995 14:00 Date Sample Received: 25-AUG-1995
Sampled By: MB HAMEL Date Sample Completed: 19-SEP-1995
Material Description: X-7725 NI PLATING SOLUTION

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-3520	Sample Prep Semi-Volatiles	COMPLETE			RK POWELL	28-AUG-1995	95160232

Laboratory Manager: J. J. Williams (Organic Analytical Services)
Date Approved: 19-SEP-1995

********** COMMENT PAGE **********
********** 950828-130 **********

Comments from the Organic Analytical Services *****

--Method SW846-8270A

Due to the acid content of this sample, the normal sample amount could not be used in the liquid/liquid extraction devices with the required adjusting of the pH. This resulted in the higher quantitation limits being reported.

This sample was identified on the Chain of Custody form as a nickel plating solution along with ESL-064. For this reason and the similarity of the pH of these two solutions they were grouped together as a matrix type. The MS & MSD extracts prepared from ESL-064, as well as the sample, exhibited recovery problems with all acid compounds (surrogates as well as matrix spike compounds). This sample although not spiked, did not show these problems.

This sample performed poorly with respect to the recovery of the third internal standard(Acenaphthene-d10). This was probably due to a large unknown that eluted at 17.6 minutes, shortly before the elution of this internal standard. This resulted in a retention time shift and poor chromatography. The inability to integrate this standard also led to the sample failing method criteria for a surrogate compound(2,4,6-Tribromophenol). Reinjection revealed the same problems, however chromatography was good enough to enable recovery of the internal standard and quantitation of the surrogate standard. The retention time shift was still present.

Definition Page for Qualifiers/Flags

950828-130

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

relation coefficient for MSA is less tha 0.995.

value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950828-130
Laboratory: Organic Analytical Services
File ID:
Instrument ID: SV1
Authorized By: J. J. Williams

Customer Sample ID: ESL063R
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 016875
Date Sample Received: 25-AUG-1995
Date Sampled: 24-AUG-1995

RCRA and TCLP Semi-Volatile Compounds

Date Extracted/Prepared: 28-AUG-1995
Analysis Procedure Number: SW846-8270A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 13-SEP-1995
QA File Number: 95160913B01
Dilution Factor: 2.5
Analyst: BD FUHR

CAS		ug/L	CAS		ug/L
95-48-7	2-Methylphenol	125U			
108-39-4	m-Cresol	125U			
106-44-5	4-Methylphenol	125U			
87-86-5	Pentachlorophenol	250U			
95-95-4	2,4,5-Trichlorophenol	125U			
88-06-2	2,4,6-Trichlorophenol	125U			
	Total Cresol	NA			
106-46-7	1,4-Dichlorobenzene	125U			
121-14-2	2,4-Dinitrotoluene	250U			
18-74-1	Hexachlorobenzene	125U			
	Hexachloro-1,3-butadiene	125U			
67-72-1	Hexachloroethane	125U			
98-95-3	Nitrobenzene	125U			
110-86-1	Pyridine	125U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

RCRA_SEMIVOLATILES ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 950828-130
Laboratory: Organic Analytical Services
Sample Matrix: LIQUID WASTE
Level: (low/med): LOW
Dilution Factor: 2.5

Customer Sample ID: ESL063R
Customer: ENV RESTORATION
File ID:
Date Received: 25-AUG-1995
Date Analyzed: 13-SEP-1995
Concentration Units: ug/L

Number TICs found: 10

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.		Unknown	15.58	50000	J
2.		Unknown	17.64	100000	J
3.		Unknown	19.14	5000	J
4.		Unknown	19.80	15000	J
5.		Unknown	20.21	5000	J
6.		Unknown	20.53	1000	J
7.		Unknown	21.71	7000	J
8.		Unknown	23.47	1000	J
9.		Unknown	26.24	2000	J
10.		Unknown	27.06	2000	J
11.					
12.					
13.					
14.					
15.					
16.					
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19.					
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22.					
23.					
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26.					
27.					
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29.					
30.					

Waste Stream Number: 700-9

Waste Stream Title: Solvents

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950906-065 Project: P103 ACTA Customer Sample ID: RFD-M84-3

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: AQUEOUS WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 7-SEP-1995
Date Sample Approved: 12-SEP-1995
[] : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Limit of Error	Units	Analyst	QA File Number	Date Completed
***** Radiochemistry Laboratory *****								
ACD-160063.R1	Total Activity (Screen)	3.87E2		+/- 1.7E1	dpm/ml	TL DANIELS	TAS-4935	7-SEP-1995

Date Printed: 22-SEP-1995 15:25:22

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-039 Project: P103 003 Customer Sample ID: RFD-M84-3

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 22-SEP-1995
Date Sample Approved: 22-SEP-1995
□ : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Units	Analyst	QA File Number	Date Completed
***** Organic Sample Preparation Laboratory *****							
ACD-1320	Prep (BNA- Option)	C			JR HUSKEY	9977	9-SEP-1995
***** Spectrochemistry Laboratory *****							
EPA-7060	Arsenic	< 0.83	R	ug/g	CB HAMMONDS	50912A	13-SEP-1995
EPA-7421	Lead	0.75	R	ug/g	CB HAMMONDS	50912B	13-SEP-1995
EPA-7740	Selenium	< 0.83	R	ug/g	CB HAMMONDS	50912C	13-SEP-1995
Q Qual:(R) Result was Revised after Approval.							
***** Inductively Coupled Plasma Laboratory *****							
EPA-6010 ACD-096010	Barium	< 0.17		ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 ACD-096010	Cadmium	< 0.50		ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 ACD-096010	Chromium	20		ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 ACD-096010	Silver	< 1.00		ug/g	SA BURGESS	50914X	14-SEP-1995
***** Wet Instrumentation Laboratory *****							
EPA-1010	Flash Point Closed Cup	< 78		degrees F	CY CRANMORE	95-11	8-SEP-1995
***** Mercury Laboratory *****							
EPA-7470	Mercury	0.19		ug/gm	WW JOHNSON	50908H	13-SEP-1995

Prep (BNA- Option)

Analyst = JR HUSKEY
Date Extracted = 9-SEP-1995
Sample Weight Extracted (g) = 1.10
Extraction Method = ACD-1310
Extraction Solvent = Methylene Chloride
Extraction Cleanup = Sodium Sulfate
Final Volume of Extract (mL) = 10
Associated Blank = 950911-034

Spike Recovery Data

Analysis	Unspike Result	Amount Spike	Spike Result	Units	Amount Recovered	Percent Recovered

Date Printed: 22-SEP-1995 15:25:22

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-039 Project: P103 003 Customer Sample ID: RFD-M84-3

***** Spectrochemistry Laboratory *****						
ARSENIC		1.000	1.069	MG/L	1.069	106.9
LEAD		1.000	1.011	MG/L	1.011	100.6
SELENIUM		1.000	1.023	MG/L	1.023	102.3
***** Inductively Coupled Plasma Laboratory *****						
BARIUM	0.000410	1.00	1.03 mg/L		1.03	103.0
CADMIUM	-.000400	1.00	1.04 mg/L		1.04	104.0
CHROMIUM	0.120	1.00	1.19 mg/L		1.07	107.0
SILVER	-.000100	1.00	0.248 mg/L		0.248	24.8
***** Mercury Laboratory *****						
MERCURY	1.1526	2.5	3.8925	UG/L	2.7399	109.6

**** Quality Control Data from: Spectrochemistry Laboratory ****

Batch Quality Control Data Sheet

QA File(s) 50912A-C

Spiked sample AnaLIS ID:950907-039

Analyte	(MS) Spike Recovery	(MSD) Dupl. Spike Recovery	MS/MSD %RPD	LCS Water Recovery	LCSD Dupl. Recovery	LCS/LCSD %RPD	LCS Solid Recovery
As	106.9%	106.6%	0.3%	106.7%	109.3%	2.4%	NA
Se	102.3%	101.9%	0.4%	101.2%	103.7%	2.4%	NA
Pb	100.7%	101.4%	0.7%	101.1%	104.0%	2.8%	NA

Comments:

***** Comments from the Mercury Laboratory *****

Spike duplicate recovery was 115.4%. Spike blank recovery was 103.7%. Spike blank duplicate recovery was 111.0%.

***** Comments from the Inductively Coupled Plasma Laboratory *****

POOR SILVER RECOVERY IN SAMPLE SPIKE DUE TO HPA PREP METHOD.
LAM
9-14-95

***** Comments from the Organic Mass Spectroscopy Laboratory *****

GMA ANALYSIS:

...IS: THE VALUE OF ONE (1) SURROGATE STANDARD IS OUTSIDE QC LIMITS DUE TO MATRIX EFFECT. THE QC CHECK SAMPLE HAD ALL SURROGATE STANDARDS

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-039 Project: P103 003 Customer Sample ID: RFD-M84-3

WITHIN QC RANGE. (CM.09/14/95)

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

MS - AnaLIS (Customer) No.: 950911-036 (RFD-M84-3MS)
MSD - AnaLIS (Customer) No.: 950911-037 (RFD-M84-3MSD)

Compound	Spike Added (ug/Kg)	Sample Conc. (ug/Kg)	MS Conc. (ug/Kg)	MS % REC.	QC Limits REC.
Phenol	196000	168000	300000	67.4	26- 90
2-Chlorophenol	196000	0	149000	75.8	25-102
1,4-Dichlorobenzene	98000	0	91800	93.7	28-104
N-Nitroso-di-n-prop. (1)	98000	0	105000	106.8	41-126
1,2,4-Trichlorobenzene	98000	0	99700	101.7	38-107
4-Chloro-3-methylphenol	196000	0	78600	80.2	26-103
Acenaphthene	98000	0	103000	104.8	31-137
4-Nitrophenol	196000	0	136000	69.4	11-114
2 initrotoluene	98000	0	129000	131.8*	28- 89
nlorophenol	196000	0	110000	56.0	17-109
Py. ne	98000	0	82800	84.5	35-142

Compound	SPIKE ADDED (ug/Kg)	MSD Conc. (ug/Kg)	MSD % REC.	% RPD	QC Limits RPD REC.
Phenol	196000	330000	82.6	20	26- 90
2-Chorophenol	196000	155000	80.0	5	25-102
1,4-Dichlorobenzene	89000	104000	107.6*	14	28-104
N-Nitroso-di-n-prop.(1)	89000	70000	72.1	39#	41-126
1,2,4-Trichlorobenzene	89000	137000	141.5*	33#	38-107
4-Chloro-3-methylphenol	196000	88300	45.5	55#	26-103
Acenaphthene	89000	122000	126.0	18	31-137
4-Nitrophenol	196000	197000	102.0	38	11-114
2,4-Dinitrotoluene	89000	104000	107.0*	21	28- 89
Pentachlorophenol	196000	151000	78.0	33	17-109
Pyrene	89000	100000	103.0	20	35-172

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of qc limits

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-039 Project: P103 003 Customer Sample ID: RFD-M84-3

Laboratory: Organic Mass Spectroscopy Laboratory
File ID: >16525
Instrument ID: 5970-3
Authorized By: C MEEHAN

Customer: APPLEGATE
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 6-SEP-1995

BNA - Base/Neutral/Acid Compounds (TCLP)

Date Extracted/Prepared: 9-SEP-1995
Regulatory Procedure Number: EPA-8270
Percent Moisture:
Percent Moisture (decanted):
Associated Blank: 950911-034

Date Analyzed: 12-SEP-1995
ACD Procedure Number: ACD-240071
Dilution Factor: 10
Analyst: C MEEHAN
QA File Number: CM-5871

[] : Result has been Corrected for Spike

CAS	Analysis	ug/kg	Q	Qual
110-86-1	Pyridine	91000		U
106-46-7	1,4-Dichlorobenzene	91000		U
95-50-1	1,2-Dichlorobenzene	91000		U
95-48-7	2-Methylphenol	91000		U
106-44-5	4-Methylphenol	91000	2	U
7-72-1	Hexachloroethane	91000		U
-95-3	Nitrobenzene	91000		U
87-68-3	Hexachlorobutadiene	91000		U
88-06-2	2,4,6-Trichlorophenol	91000		U
95-95-4	2,4,5-Trichlorophenol	450000		U
121-14-2	2,4-Dinitrotoluene	91000		U
118-74-1	Hexachlorobenzene	91000		U
87-86-5	Pentachlorophenol	450000		U

Q Qual: (U) Compound was analyzed for but not detected.
(B) Analyte found in blank as well as sample.
(J) Indicates an estimated value.
(N) Presumptive evidence of a compound.
(A) TIC is a suspected aldol-condensation product.
(D) Compounds identified in an analysis at a secondary dilution factor.
(E) Concentrations exceed calibration range of the GC/MS instrum ent.
(Y) Undistinguisgable isomer components.
(2) Cannot be separated from 3-Methylphenol.

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analysee Results

AnaLIS ID: 950907-039 Project: P103 003 Customer Sample ID: RFD-MB4-3

BNA (TCLP) ORGANICS ANALYSIS DATA SHEETS
SURROGATE SPIKE RECOVERY

AnaLIS ID: 950907-039
Laboratory: Organic Mass Spectroscopy Laboratory
Sample Matrix: WASTE
Level: (low/med): LOW
Dilution Factor: 10
% Moisture: not dec. _____ dec. _____
Extraction: (SepF/Cont/Sonc) ___
GPC Cleanup: (Y/N) N

Customer Sample ID: RFD-MB4-3
Customer: APPLEGATE
File ID: >16525
Date Received: 6-SEP-1995
Date Analyzed: 12-SEP-1995
Date Extracted: 9-SEP-1995
pH: _____

Surrogate Compound	SPIKE ADDED (ug/kg)	RESULT (ug/kg)	% REC	#	QC LIMITS % REC
Nitrobenzene-d5	100.0	675.15	675.2	*	35 - 114
1,1'-Biphenyl, 2-Fluoro	100.0	89.26	89.3		43 - 116
Terphenyl-d14	100.0	115.66	115.7		33 - 141
Phenol-d6	200.0	209.23	104.6	*	10 - 94
2-Fluorophenol	200.0	195.46	97.7		21 - 100
2,4,6-Tribromophenol	200.0	189.24	94.6		10 - 123

Column to be used to flag recovery values with an asterisk
* Values outside of QC limits

Spike Recovery: 2 out of 6 outside limits

COMMENTS: _____

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 950906-015 Project: ER 9579C Customer Sample ID: RFDM843
Customer: ENV RESTORATION Requisition Number: 017719
Date Sampled: 31-AUG-1995 14:40 Date Sample Received: 5-SEP-1995
Sampled By: MB HAMEL Date Sample Completed: 18-SEP-1995
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-9040A	pH	6.19		pH	BJ STANLEY	8-SEP-1995	95101252
TSD553-380	Technetium	3.7		pCi/ml	JP BREWSTER	13-SEP-1995	95071343
TSD553-700	% U-235	1.3	0.48	%	CD GOOD	11-SEP-1995	95071327
	Uranium	45	11	ppm	CD GOOD	11-SEP-1995	95071327
TSD554-015	Sample Prep Solvents	COMPLETE			PJ WARD	14-SEP-1995	9516091402

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)
Approved: 19-SEP-1995

********** COMMENT PAGE **********
********** 950906-015 **********

Comments from the Organic Analytical Services *****

SW846-8260

Results are reported in ug/mL (PPM).
A broad band of coeluting peaks was present on the GC chromatogram at a retention time range of 19 min to 26 min. These peaks showed poor separation and identification.
Due to carryover from previous sample which contained percentage amounts of Freon-113, the value reported for Freon-113 is an estimate value. The 300ppb of Freon-113 may be due to carryover. Due to the percentage amounts of 1,1,1-Trichloroethane in the sample matrix, the sample was unable to be reanalyzed for Freon-113 confirmation.
Due to the percentage amounts of 1,1,1-Trichloroethane in the sample the peak had a poor shape. The actual amounts of 1,1,1-Trichloroethane in the sample may be much higher.

Definition Page for Qualifiers/Flags

*** *** ******** 950906-015 **********

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

Correlation coefficient for MSA is less tha 0.995.

The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950906-015
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#3
Authorized By: J. J. Williams

Customer Sample ID: RFDM843
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 017719
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 13-SEP-1995
QA File Number: 95160913A3
Dilution Factor: 20
Analyst: MA NOVOTNY

CAS		ug/mL	CAS		ug/mL
67-64-1	Acetone	11000	100-41-4	Ethyl benzene	41
71-43-2	Benzene	40U	76-13-1	Freon 113	300J
75-27-4	Bromodichloromethane	40U	76-14-2	Freon 114	80U
75-25-2	Bromoform	40U	108-10-1	4-Methyl-2-pentanone	2000U
74-83-9	Bromomethane	80U	75-09-2	Methylene Chloride	40U
78-93-3	2-Butanone	3500B	79-34-5	1,1,2,2-Tetrachloroethane	40U
75-15-0	Carbon Disulfide	40U	127-18-4	Tetrachloroethene	100
56-23-5	Carbon Tetrachloride	40U	108-88-3	Toluene	2800U
108-90-7	Chlorobenzene	40U	71-55-6	1,1,1-Trichloroethane	39000E
75-00-3	Chloroethane	80U	79-00-5	1,1,2-Trichloroethane	170
67-66-3	Chloroform	40U	79-01-6	Trichloroethene	790
74-87-3	Chloromethane	80U	75-69-4	Trichlorofluoromethane	80U
124-48-1	Dibromochloromethane	40U	75-01-4	Vinyl Chloride	20U
106-46-7	1,4-Dichlorobenzene	40U	1330-20-7	m,p-Xylene	140
95-50-1	1,2-Dichlorobenzene	40U	95-47-6	o-Xylene	82
541-73-1	1,3-Dichlorobenzene	40U			
75-34-3	1,1-Dichloroethane	110			
107-06-2	1,2-Dichloroethane	360			
75-35-4	1,1-Dichloroethene	40U			
156-59-2	cis-1,2-Dichloroethene	40U			
156-60-5	trans-1,2-Dichloroethene	40U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

VOC ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 950906-015
Laboratory: Organic Analytical Services
Sample Matrix: LIQUID WASTE
Level: (low/med): LOW
Dilution Factor: 20

Customer Sample ID: RFDM843
Customer: ENV RESTORATION
File ID:
Date Received: 5-SEP-1995
Date Analyzed: 13-SEP-1995
Concentration Units: ug/mL

Number TICs found: 7

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.		undecane	21.9	3000	J
2.		dodecane	24.0	4000	J
3.		tridecane	26.0	2000	J
4.		1,2,3,4tetrahydro6methylnaphth	27.6	600	J
5.		tetradecane	27.8	2000	J
6.	91-57-6	2-Methylnaphthalene	28.8	700	J
7.	95-63-6	1,2,4-Trimethylbenzene		440	
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

ANALYSIS DATA REPORT

AnaLIS ID: 950906-015
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFDM843
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 017719
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

Solvents_F001

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-019
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 14-SEP-1995
QA File Number: 9516091402
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
56-23-5	Carbon Tetrachloride	10000U			
75-09-2	Methylene Chloride	1000U			
127-18-4	Tetrachloroethene	2600			
71-55-6	1,1,1-Trichloroethane	400000			
79-01-6	Trichloroethene	930			

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950906-062 Project: P103 ACTA Customer Sample ID: RFD-560-2

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: AQUEOUS WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 6-SEP-1995
Date Sample Approved: 12-SEP-1995
[] : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Limit of Error	Units	Analyst	QA File Number	Date Completed
***** Radiochemistry Laboratory *****								
ACD-160063.R1	Total Activity (Screen)	-2.62E0		+/- 5.5E0	dpm/ml	TL DANIELS	TAS-4935	6-SEP-1995

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-052 Project: P103 003 Customer Sample ID: RFD-560-2

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 22-SEP-1995
Date Sample Approved:
□ : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Units	Analyst	QA File Number	Date Completed
***** Organic Sample Preparation Laboratory *****							
	Prep (BNA- Option)	--------			JR HUSKEY	9977	9-SEP-1995
***** Spectrochemistry Laboratory *****							
EPA-7060	Arsenic	< 0.82	R	ug/g	CB HAMMONDS	50912A	13-SEP-1995
EPA-7421	Lead	< 0.66	R	ug/g	CB HAMMONDS	50912B	13-SEP-1995
EPA-7740	Selenium	< 0.82	R	ug/g	CB HAMMONDS	50912C	13-SEP-1995
Q Qual:(R) Result was Revised after Approval.							
***** Inductively Coupled Plasma Laboratory *****							
EPA-6010 ACD-096010	Barium	< 0.17		ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 ACD-096010	Cadmium	< 0.50		ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 ACD-096010	Chromium	< 1.7		ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 ACD-096010	Silver	< 0.99		ug/g	SA BURGESS	50914X	14-SEP-1995
***** Wet Instrumentation Laboratory *****							
EPA-1010	Flash Point Closed Cup	< 78		degrees F	CY CRANMORE	95-12	8-SEP-1995
***** Mercury Laboratory *****							
EPA-7470	Mercury	< 0.08		ug/gm	WW JOHNSON	50908M	13-SEP-1995

Prep (BNA- Option)

Analyst	= JR HUSKEY
Date Extracted	= 9-SEP-1995
Sample Weight Extracted (g)	= 1.55
Extraction Method	= ACD-1310
Extraction Solvent	= Methylene Chloride
Extraction Cleanup	= Sodium Sulfate
Final Volume of Extract (mL)	= 10
Associated Blank	= 950911-034

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-052 Project: P103 003 Customer Sample ID: RFD-560-2

Laboratory: Organic Mass Spectroscopy Laboratory
File ID: >16530
Instrument ID: 5970-3
Authorized By: C MEEHAN

Customer: APPLEGATE
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 6-SEP-1995

BNA - Base/Neutral/Acid Compounds (TCLP)

Date Extracted/Prepared: 9-SEP-1995
Regulatory Procedure Number: EPA-8270
Percent Moisture:
Percent Moisture (decanted):
Associated Blank: 950911-034
[] : Result has been Corrected for Spike

Date Analyzed: 12-SEP-1995
ACD Procedure Number: ACD-240071
Dilution Factor: 10
Analyst: C MEEHAN
QA File Number: CM-5871

CAS	Analysis	ug/kg	Q	Qual	CAS	Analysis	ug/kg	Q	Qual
110-86-1	Pyridine	65000		U					
106-46-7	1,4-Dichlorobenzene	65000		U					
95-50-1	1,2-Dichlorobenzene	65000		U					
95-48-7	2-Methylphenol	65000		U					
106-44-5	4-Methylphenol	65000	2	U					
67-72-1	Hexachloroethane	65000		U					
[illegible]5-3	Nitrobenzene	65000		U					
[illegible]8-3	Hexachlorobutadiene	65000		U					
88-06-2	2,4,6-Trichlorophenol	65000		U					
95-95-4	2,4,5-Trichlorophenol	320000		U					
121-14-2	2,4-Dinitrotoluene	65000		U					
118-74-1	Hexachlorobenzene	65000		U					
87-86-5	Pentachlorophenol	320000		U					

Q Qual:(U) Compound was analyzed for but not detected.
(B) Analyte found in blank as well as sample.
(J) Indicates an estimated value.
(N) Presumptive evidence of a compound.
(A) TIC is a suspected aldol-condensation product.
(D) Compounds identified in an analysis at a secondary dilution factor.
(E) Concentrations exceed calibration range of the GC/MS instrum ent.
(Y) Undistinguisgable isomer components.
(2) Cannot be separated from 3-Methylphenol.

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-052 Project: P103 003 Customer Sample ID: RFD-560-2

BNA (TCLP) ORGANICS ANALYSIS DATA SHEETS
SURROGATE SPIKE RECOVERY

AnaLIS ID: 950907-052
Laboratory: Organic Mass Spectroscopy Laboratory
Sample Matrix: WASTE
Level: (low/med): LOW
Dilution Factor: 10
% Moisture: not dec. _____ dec. _____
Extraction: (SepF/Cont/Sonc) ____
GPC Cleanup: (Y/N) N

Customer Sample ID: RFD-560-2
Customer: APPLEGATE
File ID: >16530
Date Received: 6-SEP-1995
Date Analyzed: 12-SEP-1995
Date Extracted: 9-SEP-1995
pH: _____

Surrogate Compound	SPIKE ADDED (ug/kg)	RESULT (ug/kg)	% REC	#	QC LIMITS % REC
Nitrobenzene-d5	100.0	101.35	101.3		35 - 114
1,1'-Biphenyl, 2-Fluoro	100.0	107.11	107.1		43 - 116
Terphenyl-d14	100.0	96.50	96.5		33 - 141
Phenol-d6	200.0	236.91	118.5	*	10 - 94
2-Fluorophenol	200.0	193.32	96.7		21 - 100
2,4,6-Tribromophenol	200.0	195.97	98.0		10 - 123

Column to be used to flag recovery values with an asterisk
* Values outside of QC limits

Spike Recovery: 1 out of 6 outside limits

COMMENTS: _____

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 950906-006 Project: ER 9579C Customer Sample ID: RFD5602
Customer: ENV RESTORATION Requisition Number: 017877
Date Sampled: 31-AUG-1995 20:30 Date Sample Received: 5-SEP-1995
Sampled By: MB HAMEL Date Sample Completed: 18-SEP-1995
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-9040A	pH	3.01		pH	BJ STANLEY	8-SEP-1995	95101252
TSD553-380	Technetium	<0.9		pCi/ml	JP BREWSTER	13-SEP-1995	95071340
TSD553-700	% U-235	11	9.7	%	CD GOOD	11-SEP-1995	95071327
	Uranium	0.025	0.012	ppm	CD GOOD	11-SEP-1995	95071327
TSD554-015	Sample Prep Solvents	COMPLETE			PJ WARD	14-SEP-1995	9516091402

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)
Approved: 19-SEP-1995

********** COMMENT PAGE **********
********** 950906-006 **********

Comments from the Organic Analytical Services *****

SW846-8260

Results are reported in ug/mL (PPM)
Due to sample matrix, sample was unable to be analyzed at a lesser dilution.

F001 Analysis

Sample consisted of two layers: Top Layer 80%
Bottom Layer 20%

Top Layer results were reported in the results section of this report.

Bottom Layer

Methylene Chloride	<1000ug/g
Tetrachloroethene	<1000ug/g
Carbon Tetrachloride	<10000ug/g
Trichloroethene	<1000ug/g
1,1,1-trichloroethane	<1000ug/g

Definition Page for Qualifiers/Flags

950906-006

In ic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

elation coefficient for MSA is less tha 0.995.

value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950906-006
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#3
Authorized By: J. J. Williams

Customer Sample ID: RFD5602
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 017877
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 14-SEP-1995
QA File Number: 95160914A3
Dilution Factor: 100
Analyst: MA NOVOTNY

CAS		ug/mL	CAS		ug/mL
67-64-1	Acetone	10000U	100-41-4	Ethyl benzene	200U
71-43-2	Benzene	200U	76-13-1	Freon 113	200U
75-27-4	Bromodichloromethane	200U	76-14-2	Freon 114	400U
75-25-2	Bromoform	200U	108-10-1	4-Methyl-2-pentanone	10000U
74-83-9	Bromomethane	400U	75-09-2	Methylene Chloride	200U
78-93-3	2-Butanone	10000B	79-34-5	1,1,2,2-Tetrachloroethane	200U
75-15-0	Carbon Disulfide	200U	127-18-4	Tetrachloroethene	200U
56-23-5	Carbon Tetrachloride	200U	108-88-3	Toluene	200U
108-90-7	Chlorobenzene	200U	71-55-6	1,1,1-Trichloroethane	200U
75-00-3	Chloroethane	400U	79-00-5	1,1,2-Trichloroethane	200U
67-66-3	Chloroform	200U	79-01-6	Trichloroethene	200U
74-87-3	Chloromethane	400U	75-69-4	Trichlorofluoromethane	400U
124-48-1	Dibromochloromethane	200U	75-01-4	Vinyl Chloride	100U
106-46-7	1,4-Dichlorobenzene	200U	1330-20-7	m,p-Xylene	200U
95-50-1	1,2-Dichlorobenzene	200U	95-47-6	o-Xylene	200U
541-73-1	1,3-Dichlorobenzene	200U			
75-34-3	1,1-Dichloroethane	200U			
107-06-2	1,2-Dichloroethane	200U			
75-35-4	1,1-Dichloroethene	200U			
156-59-2	cis-1,2-Dichloroethene	200U			
156-60-5	trans-1,2-Dichloroethene	200U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

VOC ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 950906-006
Laboratory: Organic Analytical Services
Sample Matrix: LIQUID WASTE
Level: (low/med): LOW
Dilution Factor: 100

Customer Sample ID: RFD5602
Customer: ENV RESTORATION
File ID:
Date Received: 5-SEP-1995
Date Analyzed: 14-SEP-1995
Concentration Units: ug/mL

Number TICs found: 1

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.	123-54-6	2,4-Pentanedione	15.7	3000	J
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

ANALYSIS DATA REPORT

AnaLIS ID: 950906-006
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD5602
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 017877
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

Solvents_F001

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-019
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 14-SEP-1995
QA File Number: 9516091402
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
56-23-5	Carbon Tetrachloride	1000U			
75-09-2	Methylene Chloride	NA			
127-18-4	Tetrachloroethene	11000			
71-55-6	1,1,1-Trichloroethane	100U			
79-01-6	Trichloroethene	100U			

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950906-070 Project: P103 ACTA Customer Sample ID: RFD-2166-1

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: AQUEOUS WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 7-SEP-1995
Date Sample Approved: 12-SEP-1995
[] : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Limit of Error	Units	Analyst	QA File Number	Date Completed
***** Radiochemistry Laboratory *****								
ACD-160063.R1	Total Activity (Screen)	3.59E1		+/- 7.3E0	dpm/ml	TL DANIELS	TAS-4935	7-SEP-199

Date Printed: 22-SEP-1995 15:29:54

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-044 Project: P103 003 Customer Sample ID: RFD-2166-1

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 22-SEP-1995
Date Sample Approved:
[] : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Units	Analyst	QA File Number	Date Completed
***** Organic Sample Preparation Laboratory *****							
	Prep (BNA- Option)	--------			JR HUSKEY	9977	9-SEP-1995
***** Spectrochemistry Laboratory *****							
EPA-7060	Arsenic	< 0.80	R	ug/g	CB HAMMONDS	50912A	13-SEP-1995
EPA-7421	Lead	0.77	R	ug/g	CB HAMMONDS	50912B	13-SEP-1995
EPA-7740	Selenium	< 0.80	R	ug/g	CB HAMMONDS	50912C	13-SEP-1995
Q Qual:(R) Result was Revised after Approval.							
***** Inductively Coupled Plasma Laboratory *****							
EPA-6010	Barium	0.75		ug/g	SA BURGESS	50914X	14-SEP-1995
ACD-096010							
EPA-6010	Cadmium	< 0.48		ug/g	SA BURGESS	50914X	14-SEP-1995
'010							
E J	Chromium	1.7		ug/g	SA BURGESS	50914X	14-SEP-15
ACD-096010							
EPA-6010	Silver	< 0.96		ug/g	SA BURGESS	50914X	14-SEP-1995
ACD-096010							
***** Wet Instrumentation Laboratory *****							
EPA-1010	Flash Point Closed Cup	80		degrees F	CY CRANMORE	95-13	14-SEP-1995
***** Mercury Laboratory *****							
EPA-7470	Mercury	< 0.08		ug/gm	WW JOHNSON	50908H	13-SEP-1995

Prep (BNA- Option)

Analyst	= JR HUSKEY
Date Extracted	= 9-SEP-1995
Sample Weight Extracted (g)	= 1.10
Extraction Method	= ACD-1310
Extraction Solvent	= Methylene Chloride
Extraction Cleanup	= Sodium Sulfate
Final Volume of Extract (mL)	= 10
Associated Blank	= 950911-034

***** Comments from the Wet Instrumentation Laboratory *****

1 MPLE PRODUCED FLAMMABLE FUMES AT 80 DEGREES AND BOILED AT
89 DEGREES FAHRENHEIT. 9-14-95 CC

Date Printed: 22-SEP-1995 15:29:54

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-044 Project: P103 003 Customer Sample ID: RFD-2166-1

***** Comments from the Organic Mass Spectroscopy Laboratory *****

BNA ANALYSIS:

COMMENTS: VALUES OF TWO (2) SURROGATE STANDARDS WERE OUTSIDE QC LIMITS DUE TO DILUTION AND MATRIX EFFECT. THE QC CHECK SAMPLE HAD ALL SURROGATE STANDARDS WITHIN QC RANGE. (CM.09/14/95)

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-044 Project: P103 003 Customer Sample ID: RFD-2166-1

Laboratory: Organic Mass Spectroscopy Laboratory
File ID: >16528
Instrument ID: 5970-3
Authorized By: C MEEHAN

Customer: APPLEGATE
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 6-SEP-1995

BNA - Base/Neutral/Acid Compounds (TCLP)

Date Extracted/Prepered: 9-SEP-1995
Regulatory Procedure Number: EPA-8270
Percent Moisture:
Percent Moisture (decanted):
Associated Blank: 950911-034

Date Analyzed: 12-SEP-1995
ACD Procedure Number: ACD-240071
Dilution Factor: 10
Analyst: C MEEHAN
QA File Number: CN-5871

[] : Result has been Corrected for Spike

CAS	Analysis	ug/kg	Q Qual	CAS	Analysis	ug/kg	Q Qual
110-86-1	Pyridine	91000	U				
106-46-7	1,4-Dichlorobenzene	91000	U				
95-50-1	1,2-Dichlorobenzene	91000	U				
95-48-7	2-Methylphenol	91000	U				
106-44-5	4-Methylphenol	91000	2 U				
67-72-1	Hexachloroethane	91000	U				
98-95-3	Nitrobenzene	91000	U				
87-68-3	Hexachlorobutadiene	91000	U				
88-06-2	2,4,6-Trichlorophenol	91000	U				
95-95-4	2,4,5-Trichlorophenol	450000	U				
121-14-2	2,4-Dinitrotoluene	91000	U				
118-74-1	Hexachlorobenzene	91000	U				
87-86-5	Pentachlorophenol	450000	U				

Q Qual:(U) Compound was analyzed for but not detected.
(B) Analyte found in blank as well as sample.
(J) Indicates an estimated value.
(N) Presumptive evidence of a compound.
(A) TIC is a suspected aldol-condensation product.
(D) Compounds identified in an analysis at a secondary dilution factor.
(E) Concentrations exceed calibration range of the GC/MS instrum ent.
(Y) Undistinguisgable isomer components.
(2) Cannot be separated from 3-Methylphenol.

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-044 Project: P103 003 Customer Sample ID: RFD-2166-1

BNA (TCLP) ORGANICS ANALYSIS DATA SHEETS
SURROGATE SPIKE RECOVERY

AnaLIS ID: 950907-044
Laboratory: Organic Mass Spectroscopy Laboratory
Sample Matrix: WASTE
Level: (low/med): LOW
Dilution Factor: 10
% Moisture: not dec. _____ dec. _____
Extraction: (SepF/Cont/Sonc) ___
GPC Cleanup: (Y/N) N

Customer Sample ID: RFD-2166-1
Customer: APPLEGATE
File ID: >16528
Date Received: 6-SEP-1995
Date Analyzed: 12-SEP-1995
Date Extracted: 9-SEP-1995
pH: _____

Surrogate Compound	SPIKE ADDED (ug/kg)	RESULT (ug/kg)	% REC #	QC LIMITS % REC
Nitrobenzene-d5	100.0	90.83	90.8	35 - 114
1,1'-Biphenyl, 2-Fluoro	100.0	106.49	106.5	43 - 116
Terphenyl-d14	100.0	167.21	167.2 *	33 - 141
Phenol-d6	200.0	239.66	119.8 *	10 - 94
2-Fluorophenol	200.0	212.06	106.0 *	21 - 100
2,4,6-Tribromophenol	200.0	212.45	106.2	10 - 123

\# Column to be used to flag recovery values with an asterisk
* Values outside of QC limits

Spike Recovery: 3 out of 6 outside limits

COMMENTS: _____

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 950906-010 Project: ER 9579C Customer Sample ID: RFD21661
Customer: ENV RESTORATION Requisition Number: 017893
Date Sampled: 31-AUG-1995 20:15 Date Sample Received: 5-SEP-1995
Sampled By: MB HAMEL Date Sample Completed: 18-SEP-1995
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
TSD553-380	Technetium	1.6		pCi/ml	JP BREWSTER	13-SEP-1995	95071340
TSD553-700	% U-235	0.73	0.29	%	CD GOOD	11-SEP-1995	95071327
	Uranium	27	6.6	ppm	CD GOOD	11-SEP-1995	95071327
TSD554-015	Sample Prep Solvents	COMPLETE			PJ WARD	14-SEP-1995	9516091402

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
J. J. Williams (Organic Analytical Services)
Date Approved: 19-SEP-1995

********** COMMENT PAGE **********
********** 950906-010 **********

Comments from the Organic Analytical Services *****

SW846-8260

Results are reported in ug/mL (PPM)

Definition Page for Qualifiers/Flags

********** 950906-010 **********

Inorganic .a Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

elation coefficient for MSA is less tha 0.995.

value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an anal.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950906-010
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#3
Authorized By: J. J. Williams

Customer Sample ID: RFD21661
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 017893
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 13-SEP-1995
QA File Number: 95160913A3
Dilution Factor: 20
Analyst: MA NOVOTNY

CAS		ug/mL	CAS		ug/mL
67-64-1	Acetone	15000	100-41-4	Ethyl benzene	40U
71-43-2	Benzene	40U	76-13-1	Freon 113	65000E
75-27-4	Bromodichloromethane	40U	76-14-2	Freon 114	80U
75-25-2	Bromoform	40U	108-10-1	4-Methyl-2-pentanone	2000U
74-83-9	Bromomethane	80U	75-09-2	Methylene Chloride	40U
78-93-3	2-Butanone	2000U	79-34-5	1,1,2,2-Tetrachloroethane	40U
75-15-0	Carbon Disulfide	40U	127-18-4	Tetrachloroethene	40U
56-23-5	Carbon Tetrachloride	40U	108-88-3	Toluene	40U
108-90-7	Chlorobenzene	40U	71-55-6	1,1,1-Trichloroethane	40U
75-00-3	Chloroethane	80U	79-00-5	1,1,2-Trichloroethane	40U
67-66-3	Chloroform	40U	79-01-6	Trichloroethene	40U
74-87-3	Chloromethane	80U	75-69-4	Trichlorofluoromethane	80U
124-48-1	Dibromochloromethane	40U	75-01-4	Vinyl Chloride	20U
106-46-7	1,4-Dichlorobenzene	40U	1330-20-7	m,p-Xylene	40U
95-50-1	1,2-Dichlorobenzene	40U	95-47-6	o-Xylene	40U
541-73-1	1,3-Dichlorobenzene	40U			
75-34-3	1,1-Dichloroethane	40U			
107-06-2	1,2-Dichloroethane	40U			
75-35-4	1,1-Dichloroethene	40U			
156-59-2	cis-1,2-Dichloroethene	40U			
156-60-5	trans-1,2-Dichloroethene	40U			

ANALYSIS DATA REPORT

AnaLIS ID:	950906-010	Customer Sample ID:	RFD21661
Laboratory:	Organic Analytical Services	Customer:	ENV RESTORATION
File ID:		Sample Matrix:	LIQUID WASTE
Instrument ID:		Requisition Number:	017893
Authorized By:	J. J. Williams	Date Sample Received:	5-SEP-1995
		Date Sampled:	31-AUG-1995

Solvents_F001

Date Extracted/Prepared:		Date Analyzed:	14-SEP-1995
Analysis Procedure Number:	TSD554-019	QA File Number:	9516091402
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	PJ WARD
Associated Blank:			

CAS		ug/g	CAS		ug/g
56-23-5	Carbon Tetrachloride	1000U			
75-09-2	Methylene Chloride	100U			
127-18-4	Tetrachloroethene	100U			
71-55-6	1,1,1-Trichloroethane	100U			
79-01-6	Trichloroethene	100U			

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950906-066 Project: P103 ACTA Customer Sample ID: RFD-1712-1

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: AQUEOUS WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 7-SEP-1995
Date Sample Approved: 12-SEP-1995
[] : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Limit of Error	Units	Analyst	QA File Number	Date Completed
***** Radiochemistry Laboratory *****								
ACD-160063.R1	Total Activity (Screen)	6.74E-1		+/- 3.7E0	dpm/ml	TL DANIELS	TAS-4935	7-SEP-1995

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-040 Project: P103 003 Customer Sample ID: RFD-1712-1

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 22-SEP-1995
Date Sample Approved:
[] : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Units	Analyst	QA File Number	Date Completed
***** Organic Sample Preparation Laboratory *****							
	Prep (BNA- Option)	--------			JR HUSKEY	9977	9-SEP-1995
***** Spectrochemistry Laboratory *****							
EPA-7060	Arsenic	< 0.81	R	ug/g	CB HAMMONDS	50912A	13-SEP-1995
EPA-7421	Lead	< 0.64	R	ug/g	CB HAMMONDS	50912B	13-SEP-1995
EPA-7740	Selenium	< 0.81	R	ug/g	CB HAMMONDS	50912C	13-SEP-1995
Q Qual:(R) Result was Revised after Approval.							
***** Inductively Coupled Plasma Laboratory *****							
EPA-6010 ACD-096010	Barium	< 0.16		ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 6010	Cadmium	< 0.48		ug/g	SA BURGESS	50914X	14-SEP-1995
E .10 ACD-096010	Chromium	< 1.6		ug/g	SA BURGESS	50914X	14-SEP-1
EPA-6010 ACD-096010	Silver	1.0		ug/g	SA BURGESS	50914X	14-SEP-1995
***** Wet Instrumentation Laboratory *****							
EPA-1010	Flash Point Closed Cup	< 78		degrees F	CY CRANMORE	95-11	8-SEP-1995
***** Mercury Laboratory *****							
EPA-7470	Mercury	< 0.08		ug/gm	WW JOHNSON	50908H	13-SEP-1995

Prep (BNA- Option)

Analyst = JR HUSKEY
Date Extracted = 9-SEP-1995
Sample Weight Extracted (g) = 1.02
Extraction Method = ACD-1310
Extraction Solvent = Methylene Chloride
Extraction Cleanup = Sodium Sulfate
Final Volume of Extract (mL) = .10
Associated Blank = 950911-034

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-040 Project: P103 003 Customer Sample ID: RFD-1712-1

Laboratory: Organic Mass Spectroscopy Laboratory
File ID: >16526
Instrument ID: 5970-3
Authorized By: C MEEHAN
Customer: APPLEGATE
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 6-SEP-1995

BNA - Base/Neutral/Acid Compounds (TCLP)

Date Extracted/Prepared: 9-SEP-1995
Regulatory Procedure Number: EPA-8270
Percent Moisture:
Percent Moisture (decanted):
Associated Blank: 950911-034
[] : Result has been Corrected for Spike
Date Analyzed: 12-SEP-1995
ACD Procedure Number: ACD-240071
Dilution Factor: .1
Analyst: C MEEHAN
QA File Number: CH-5871

CAS	Analysis	ug/kg	Q	Qual	CAS	Analysis	ug/kg	Q	Qual
110-86-1	Pyridine	98000		U					
106-46-7	1,4-Dichlorobenzene	98000		U					
95-50-1	1,2-Dichlorobenzene	98000		U					
95-48-7	2-Methylphenol	98000		U					
106-44-5	4-Methylphenol	98000	2	U					
67-72-1	Hexachloroethane	98000		U					
95-3	Nitrobenzene	98000		U					
-68-3	Hexachlorobutadiene	98000		U					
88-06-2	2,4,6-Trichlorophenol	98000		U					
95-95-4	2,4,5-Trichlorophenol	490000		U					
121-14-2	2,4-Dinitrotoluene	98000		U					
118-74-1	Hexachlorobenzene	98000		U					
87-86-5	Pentachlorophenol	490000		U					

Q Qual:(U) Compound was analyzed for but not detected.
(B) Analyte found in blank as well as sample.
(J) Indicates an estimated value.
(N) Presumptive evidence of a compound.
(A) TIC is a suspected aldol-condensation product.
(D) Compounds identified in an analysis at a secondary dilution factor.
(E) Concentrations exceed calibration range of the GC/MS instrum ent.
(Y) Undistinguisgable isomer components.
(2) Cannot be separated from 3-Methylphenol.

Date Printed: 22-SEP-1995 15:28:40

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-040 Project: P103 003 Customer Sample ID: RFD-1712-1

BNA (TCLP) ORGANICS ANALYSIS DATA SHEETS
SURROGATE SPIKE RECOVERY

AnaLIS ID: 950907-040
Laboratory: Organic Mass Spectroscopy Laboratory
Sample Matrix: WASTE
Level: (low/med): LOW
Dilution Factor: .1
% Moisture: not dec. _____ dec. _____
Extraction: (SepF/Cont/Sonc) ____
GPC Cleanup: (Y/N) N

Customer Sample ID: RFD-1712-1
Customer: APPLEGATE
File ID: >16526
Date Received: 6-SEP-1995
Date Analyzed: 12-SEP-1995
Date Extracted: 9-SEP-1995
pH: _____

Surrogate Compound	SPIKE ADDED (ug/kg)	RESULT (ug/kg)	% REC	#	QC LIMITS % REC
Nitrobenzene-d5	100.0	95.04	95.0		35 - 114
1,1'-Biphenyl, 2-Fluoro	100.0	106.32	106.3		43 - 116
Terphenyl-d14	100.0	103.78	103.8		33 - 141
Phenol-d6	200.0	244.16	122.1	*	10 - 94
2-Fluorophenol	200.0	214.68	107.3	*	21 - 100
2,4,6-Tribromophenol	200.0	196.42	98.2		10 - 123

Column to be used to flag recovery values with an asterisk
* Values outside of QC limits

Spike Recovery: 2 out of 6 outside limits

COMMENTS: _____

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 950906-007 Project: ER 9579C Customer Sample ID: RFD17121
Customer: ENV RESTORATION Requisition Number: 017892
Date Sampled: 31-AUG-1995 12:20 Date Sample Received: 5-SEP-1995
Sampled By: MB HAMEL Date Sample Completed: 18-SEP-1995
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-9040A	pH	8.85		pH	BJ STANLEY	8-SEP-1995	95101252
TSD553-380	Technetium	<0.9		pCi/ml	JP BREWSTER	13-SEP-1995	95071340
TSD553-700	% U-235	NA	NA	%	CD GOOD	11-SEP-1995	95071327
	Uranium	<0.01	NA	ppm	CD GOOD	11-SEP-1995	95071327
TSD554-015	Sample Prep Solvents	COMPLETE			PJ WARD	14-SEP-1995	9516091402

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)
Approved: 19-SEP-1995

********** COMMENT PAGE **********
********** 950906-007 **********

Comments from the Organic Analytical Services *****

SW846-8260

Results are reported in ug/mL (PPM)
Due to percentage amounts in matrix, 1,1,1-Trichloroethane had poor peak shape. Actual amount of 1,1,1-Trichloroethane in sample may be much higher than value reported.

Definition Page for Qualifiers/Flags

950906-007

I. Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* Duplicate analysis is not within control limits.

rrelation coefficient for MSA is less tha 0.995.

ne value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950906-007
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#3
Authorized By: J. J. Williams

Customer Sample ID: RFD17121
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 017892
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 14-SEP-1995
QA File Number: 95160914A3
Dilution Factor: 100
Analyst: MA NOVOTNY

CAS		ug/mL	CAS		ug/mL
67-64-1	Acetone	10000U	100-41-4	Ethyl benzene	200U
71-43-2	Benzene	200U	76-13-1	Freon 113	200U
75-27-4	Bromodichloromethane	200U	76-14-2	Freon 114	400U
75-25-2	Bromoform	200U	108-10-1	4-Methyl-2-pentanone	10000U
74-83-9	Bromomethane	400U	75-09-2	Methylene Chloride	200U
78-93-3	2-Butanone	10000U	79-34-5	1,1,2,2-Tetrachloroethane	200U
75-15-0	Carbon Disulfide	200U	127-18-4	Tetrachloroethene	200U
56-23-5	Carbon Tetrachloride	200U	108-88-3	Toluene	200U
108-90-7	Chlorobenzene	200U	71-55-6	1,1,1-Trichloroethane	220000E
75-00-3	Chloroethane	400U	79-00-5	1,1,2-Trichloroethane	200U
67-66-3	Chloroform	200U	79-01-6	Trichloroethene	370
74-87-3	Chloromethane	400U	75-69-4	Trichlorofluoromethane	400U
124-48-1	Dibromochloromethane	200U	75-01-4	Vinyl Chloride	100U
106-46-7	1,4-Dichlorobenzene	200U	1330-20-7	m,p-Xylene	200U
95-50-1	1,2-Dichlorobenzene	200U	95-47-6	o-Xylene	200U
541-73-1	1,3-Dichlorobenzene	200U			
75-34-3	1,1-Dichloroethane	200U			
107-06-2	1,2-Dichloroethane	460			
75-35-4	1,1-Dichloroethene	200U			
156-59-2	cis-1,2-Dichloroethene	200U			
156-60-5	trans-1,2-Dichloroethene	200U			

ANALYSIS DATA REPORT

AnaLIS ID: 950906-007
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD17121
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 017892
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

Solvents_F001

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-019
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 14-SEP-1995
QA File Number: 9516091402
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
56-23-5	Carbon Tetrachloride	10000U			
75-09-2	Methylene Chloride	1000U			
127-18-4	Tetrachloroethene	1000U			
71-55-6	1,1,1-Trichloroethane	1000000			
79-01-6	Trichloroethene	440J			

Waste Stream Number: 700-10

Waste Stream Title: Oil

PORTS MSDS #: 5505

PRODUCT: BENZENE

PART NUMBER:

FORMULA: C6H6

KEYWORD: SOLVENT

PORTS NUMBER: NNN

PORTS MISC INFO:
01-02-1000

PORTS RATING: HFR=430

MANUFACTURER:
AMERICAN BURDICK & JACKSON
1953 SOUTH HARVEY STREET
MUSKEGON
MI

49442
PHONE: PHONE: 616-726-3171
EMERGENCY PHONE: 616-726-3171

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 176 F	NOTE: 80'C, 760 MM HG.
Melting Point. . . .	NG	
Freezing Point . . .	EQ 41.9 F	NOTE: 5.5'C.
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .879	NOTE: @ 20'C.
Vapor Pressure . . .	EQ 74.6	NOTE: MM HG @ 20'C.
Vapor Density. . . .	EQ 2.8	
Percent Volatiles. .	~ 100	
Evaporation Rate . .	~ 3	NOTE: BUAC=1.
pH	NG	
Molecular Weight . .	EQ 78.11	
Viscosity.	NG	

Solubility in Water. @ 25C 0.18%.
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS LIQUID WITH A CHARACTERISTIC AROMATIC

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 12.2 F	NOTE: -11'C, TCC.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	EQ 1043.6 F	NOTE: 562'C.

Explosive/Flammable Limits

Lower (LEL).	EQ 1.3
Upper (UEL).	EQ 7.1

Shipping Regulations

UN/NA Number.	UN1114
D.O.T. Hazard Class. . .	FLAMMABLE LIQUID
Label	NOT GIVEN
Proper Shipping Name . .	BENZENE

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Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 3/01/88

===== Component Information =====

.NZENE
OSHA PEL (PPM): 1
OSHA PEL (MG/M3):
ACGIH TLV (PPM): 10
ACGIH TLV (MG/M3):
STEL (PPM): 25
STEL (MG/M3):
Product %: ~ 100
C.A.S. No.: 71432
Note:
OSHA AND ACGIH STEL / NIOSH: 10 PPM, TLV CEILING: NOT

===== IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

CHEMICAL NAME: Benzene

CHEMICAL FAMILY: Aromatic Hydrocarbon

SYNONYMS: Benzol

CAS NO.: 71-43-2

EMERGENCY TELEPHONE NO.: 312/973-3600 (American Scientific Products)

CHEMTREC TELEPHONE NO.: 800/424-9300

.NFORMATION TELEPHONE NO.: 616/726-3171 (American Burdick & Jackson)

MANUFACTURER'S NAME AND ADDRESS:

AMERICAN BURDICK & JACKSON
SUBSIDIARY OF AMERICAN HOSPITAL SUPPLY CORPORATION
1953 SOUTH HARVEY STREET
MUSKEGON, MI 49442

===== PHYSICAL AND CHEMICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Not expected to occur.

APPEARANCE AND ODOR: Clear, colorless liquid with a characteristic aromatic odor.

CONDITIONS TO AVOID: Heat, sparks, open flame, open containers, and poor ventilation.

MATERIALS TO AVOID: Strong oxidizing agents and strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS: Incomplete combustion can generate carbon monoxide and other toxic vapors.

===== FIRE AND EXPLOSION HAZARD DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

JSUAL FIRE AND EXPLOSION HAZARDS: Volatile and flammable.

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical or foam.

SPECIAL FIRE FIGHTING PROCEDURES: Water will not be effective in extinguishing a fire and may spread it, but a water spray can be used to cool
exposed containers. Wear full protective clothing and self-contained
breathing apparatus. Heat will build pressure and rupture closed storage
containers.

===== HAZARDOUS COMPONENTS =====

SEE COMPONENT INFORMATION.

BENZENE

CARCINOGEN

===== HEALTH HAZARDS =====

OCCUPATIONAL EXPOSURE LIMITS:

OSHA:

PEL-TWA - 1 ppm
PEL-STEL - 25 ppm

ACGIH:

TLV-TWA - 10 ppm
TLV-STEL - 25 ppm

NIOSH:

TLV-TWA - 10 ppm
TLV-C - Not Listed

CONCENTRATION IMMEDIATELY DANGEROUS TO HEALTH:

OSHA/NIOSH 2,000 ppm

ODOR THRESHOLD:

NSC 2 ppm
NIOSH Not Listed
OHS 1.5-5 ppm

CARCINOGENIC, MUTAGENIC, TERATOGENIC DATA:

Human carcinogen (NTP, IARC, OSHA)
Suspect human carcinogen (ACGIH)
Mutagenic and teratogenic data (RTEC)
Animal carcinogen (IARC)

PRIMARY ROUTES OF ENTRY: Benzene may exert its effects through nhalation,
kin absorption, and ingestion.

INDUSTRIAL EXPOSURE: ROUTE OF EXPOSURE/SIGNS AND SYMPTOMS:

INHALATION: Exposure can cause dizziness, intoxication, excitement, headache, vomiting, delirium, drowsiness, and unconsciousness.

EYE CONTACT: Liquid and high vapor concentration can cause irritation, neuritis, atrophy, visual impairment, edema, and cataracts.

SKIN CONTACT: Prolonged or repeated skin contact can cause irritation and dermatitis through defatting of skin.

INGESTION: Can cause gastrointestinal tract discomfort.

EFFECTS OF OVEREXPOSURE: Benzene is a primary skin irritant, central nervous system depressant, bone marrow depressant, and leukemogen. Acute benzene exposure from inhalation or ingestion initially produces excitation and euphoria, followed by headache, drowsiness, dizziness, vomiting, delirium and unconsciousness. Respiratory irritation and pulmonary edema are possible. Severe exposure causes blurred vision, tremors, shallow and rapid respiration, ventricular fibrillation, paralysis, and convulsions. Liver and kidney damage may occur. Chronic exposure to benzene poses the most significant toxic effects. Symptoms are headache, anorexia, nervousness, weariness, anemia, pallor, bleeding under the skin and eyes, and reduced clotting ability. Bone marrow damage and leukemia may develop. Liver and idney damage may occur.

MEDICAL CONDITION AGGRAVATED BY EXPOSURE: Preclude from exposure those individuals with diseases of the heart, lung, kidney, liver, nervous system, or the blood, and those susceptible to dermatitis.

EMERGENCY FIRST AID:

INHALATION: Immediately remove to fresh air. If not breathing, administer mouth-to-mouth rescue breathing. If there is no pulse administer cardiopulmonary resuscitation (CPR). Contact physician immediately.

EYE CONTACT: Rinse with copious amounts of water for at least 15 minutes. Get emergency medical assistance.

SKIN CONTACT: Flush thoroughly for at least 15 minutes. Wash affected skin with soap and water. Remove contaminated clothing and shoes. Wash clothing before re-use, and discard contaminated shoes. Get emergency medical assistance.

INGESTION: Call local Poison Control Center for assistance. Contact physician immediately. Aspiration Hazard - Do not induce vomiting.

===== SAFETY MEASURES AND EQUIPMENT =====

VENTILATION: Adequate ventilation is required to protect personnel

from
exposure to chemical vapors exceeding the PEL and to minimize fire hazards.
The choice of ventilation equipment, either local or general, will depend on
the conditions of use, quantity of material, and other operating parameters.

RESPIRATORY: Use approved respirator equipment. Follow NIOSH and equipment
manufacturer's recommendations to determine appropriate equipment (air-purifying, air-supplied, or self-contained breathing apparatus).

EYES: Safety glasses are considered minimum protection. Goggles or face
shield may be necessary depending on quantity of material and conditions of
use.

SKIN: Protective gloves and clothing are recommended. The choice of material
must be based on chemical resistance and other user requirements. Generally,
polyvinyl alcohol, viton(R) or nitrile latex offers acceptable chemical
resistance. Individuals who are acutely and specifically sensitive to benzene
may require additional protective equipment.

STORAGE: Benzene should be protected from temperature extremes and direct
sunlight. Proper storage of benzene must be determined based on other
materials stored and their hazards and potential chemical incompatibility. In
general, benzene should be stored in an acceptably protected and secure
flammable liquid storage room.

OTHER: Emergency eye wash fountains and safety showers should be available in
the vicinity of any potential exposure. Ground and bond metal containers to
minimize static sparks.

===== SPILL AND DISPOSAL DATA =====

SPILL CONTROL: Protect from ignition. Wear protective clothing and use
approved respirator equipment. Absorb spilled material in an absorbent
recommended for solvent spills and remove to a safe location for disposal by
approved methods. If released to the environment, comply with all regulatory
notification requirements.

WASTE DISPOSAL: Dispose of benzene as an EPA hazardous waste. Hazardous waste
numbers: U019 (Ignitable, Toxic); D001 (Ignitable).

===== SPECIAL NOTES =====

KEY:

CA: Approximately

NA: Not applicable
C: Ceiling
PEL: Permissible Exposure Level
STEL: Short Term Exposure Level
TLV: Threshold Limit Value
TWA: Time Weighted Average
BuAc: Butyl Acetate
NSC: National Safety Council ("Fundamentals of Industrial Hygiene", 1983)
OHS: Occupational Health Services ("Hazardline")

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Waste Stream Number: 700-11

Waste Stream Title: HEPA Filters

EcoTek LSI
Tek Laboratory Services Incorporated

TECHNETIUM

Client: GeoCon, Inc.
LSDG: 32344
Method: RL-2317

Client Reference No.: X231B
Date Received: 7/12/94

Lab Sample ID	Client Sample ID	Date Analyzed	Analyte	Matrix	Units	Result	2 Sigma Error	Detection Limit	Qualifier
3234401	22341	9/1/94	Tc - 99	NSS	nCi/kg	ND	NA	1.48E+00	
3234403	24009	9/1/94	Tc - 99	NSS	nCi/kg	3.18E+01	1.40E+00	1.69E+00	
3234404	22342	9/2/94	Tc - 99	NSS	nCi/kg	1.88E+00	8.56E-01	1.38E+00	
3234405	24010	9/2/94	Tc - 99	Soil	nCi/kg	6.88E+01	2.99E+00	2.88E+00	

ND = Not Detected Above MDA
NA = Not Applicable

EcoTek LSI
Ek Laboratory Services Incorporated

GROSS ALPHA / BETA

Client: GeoCon, Inc.
LSDG: 32344
Method: RL-2302

Client Reference No.: X231B
Date Received: 7/12/94

Lab Sample ID	Client Sample ID	Date Analyzed	Analyte	Matrix	Units	Result	2 Sigma Error	Detection Limit	Qualifier
3234401	22341	8/30/94	Gross Alpha	NSS	nCi/kg	9.13E-01	5.41E-01	7.83E-01	
3223403	24009	8/30/94	Gross Alpha	NSS	nCi/kg	1.17E+01	2.19E+00	1.51E+00	
3223404	22342	8/30/94	Gross Alpha	NSS	nCi/kg	1.13E+00	4.55E-01	5.81E-01	
3234405	24010	9/7/94	Gross Alpha	Soil	nCi/kg	3.06E+01	4.28E+00	3.31E+00	
3234401	22341	8/30/94	Gross Beta	NSS	nCi/kg	2.49E+00	7.05E-01	1.06E+00	
3223403	24009	8/30/94	Gross Beta	NSS	nCi/kg	1.51E+01	2.02E+00	1.98E+00	
3223404	22342	8/30/94	Gross Beta	NSS	nCi/kg	1.13E+00	4.19E-01	6.86E-01	
'405	24010	9/7/94	Gross Beta	Soil	nCi/kg	5.90E+01	4.74E+00	5.31E+00	

ND = Not Detected Above MDA
NA = Not Applicable

EcoTek LSI
ek Laboratory Services Incorporated

GROSS ALPHA / BETA

Client: GeoCon, Inc.
LSDG: 32344
Method: RL-2302

Client Reference No.: X231B
Date Received: 7/12/94

Lab Sample ID	Client Sample ID	Date Analyzed	Analyte	Matrix	Units	Result	2 Sigma Error	Detection Limit	Qualifier
3234401	22341	8/30/94	Gross Alpha	NSS	nCi/kg	9.13E-01	5.41E-01	7.83E-01	
3223403	24009	8/30/94	Gross Alpha	NSS	nCi/kg	1.17E+01	2.19E+00	1.51E+00	
3223404	22342	8/30/94	Gross Alpha	NSS	nCi/kg	1.13E+00	4.55E-01	5.81E-01	
3234405	24010	9/7/94	Gross Alpha	Soil	nCi/kg	3.06E+01	4.28E+00	3.31E+00	
3234401	22341	8/30/94	Gross Beta	NSS	nCi/kg	2.49E+00	7.05E-01	1.06E+00	
3223403	24009	8/30/94	Gross Beta	NSS	nCi/kg	1.51E+01	2.02E+00	1.98E+00	
3223404	22342	8/30/94	Gross Beta	NSS	nCi/kg	1.13E+00	4.19E-01	6.86E-01	
405	24010	9/7/94	Gross Beta	Soil	nCi/kg	5.90E+01	4.74E+00	5.31E+00	

U = Not Detected Above MDA
NA = Not Applicable

EcoTek LSI
ek Laboratory Services Incorporated

NATURAL URANIUM

Client: GeoCon, Inc.
LSDG: 32344
Method: RL-2323

Client Reference No.: X231B
Date Received: 7/12/94

Lab Sample ID	Client Sample ID	Date Analyzed	Analyte	Matrix	Units	Result	2 Sigma Error	Detection Limit	Qualifier
3234401	22341	9/1/94	U-NAT	NSS	ug/g	8.39E-01	2.81E-02	6.29E-03	
3234403	24009	9/1/94	U-NAT	NSS	ug/g	7.13E+00	2.73E-01	5.13E-02	
3234404	22342	9/1/94	U-NAT	NSS	ug/g	1.14E+00	3.99E-02	4.24E-03	
3234405	24010	9/1/94	U-NAT	NSS	ug/g	1.63E+01	5.27E-01	9.62E-03	

ND = Not Detected Above MDA
NA = Not Applicable

EcoTek LSI

EcoTek Laboratory Services Incorporated

General Chemistry
Ignitability

Client: GeoCon, Inc.
LSDG: 32344

Client Reference No.: X231B
Date Received: 7/12/94
Method: 261.21

Lab Sample ID	Client Sample ID	Date Analyzed	Matrix	Units	Flashpoint Result	Detection Limit	Flag
3234401	22341	7/17/94	NSS	NA	Positive	NA	
3234402	22349	7/17/94	NSS	NA	Negative	NA	
3234403	24009	7/17/94	NSS	NA	Positive	NA	
3234404	22342	7/17/94	NSS	NA	Negative	NA	
3234405	24010	7/17/94	NSS	NA	Negative	NA	

BQL = Below Quantitation Limit

EcoTek LSI
k Laboratory Services Incorporated

General Chemistry
Corrosivity by pH

Client: GeoCon, Inc.
LSDG: 32344

Client Reference No.: X231B
Date Received: 7/12/94
Method: 9045

Lab Sample ID	Client Sample ID	Matrix	Date Analyzed	Units	Final Result	Detection Limit	Flag
3234401	22341	NSS	7/27/94	S.U.	6.09	0.01	
3234402	22349	NSS	7/27/94	S.U.	9.37	0.01	
3234403	24009	NSS	7/27/94	S.U.	6.62	0.01	
3234404	22342	NSS	7/27/94	S.U.	5.70	0.01	
3234405	22342	NSS	7/27/94	S.U.	6.31	0.01	

EcoTek LSI
k Laboratory Services Incorporated

General Chemistry
Reactive Cyanide

Client: GeoCon, Inc.
LSDG: 32344
Matrix: NSS

Client Reference No.: X231B
Date Received: 7/12/94
Method: Section 7.3

Lab Sample ID	Client Sample ID	Date Analyzed	Units	Dilution Factor	Result	Detection Limit	Flag
3234401	22341	7/18/94	mg/kg	1.0	BQL	0.25	
3234402	22349	7/18/94	mg/kg	1.0	BQL	0.33	
3234403	24009	7/18/94	mg/kg	1.0	0.26	0.26	
3234404	22342	7/18/94	mg/kg	1.0	BQL	0.28	
3234405	24010	7/18/94	mg/kg	1.0	BQL	0.31	

BQL = Below Quantitation Limit

EcoTek LSI
ek Laboratory Services Incorporated

Pesticide TCLP Analytical Results
40 CFR 261, June 29, 1990

Client: GeoCon, Inc.
Lab Sample ID: 3234403
Matrix: Leachate

Client Sample ID: 24009
Client Project Code: X231B
Date Received: 7/12/94
Date of Extraction: 7/15/94

CAS Number	Compound	Dilution	Date of Analysis	Result mg/l	PQL mg/l	MCL mg/l	Note
58899	Gamma-BHC	1	8/9/94	BQL	0.000250	0.4	
76448	Heptachlor	1	8/9/94	BQL	0.000250	0.008	
72208	Endrin	1	8/9/94	BQL	0.000500	0.02	
72435	Methoxychlor	1	8/9/94	BQL	0.00250	10	
57749	Chlordane	1	8/9/94	BQL	0.00500	0.03	
8001352	Toxaphene	1	8/9/94	BQL	0.0250	0.5	

PQL = Practical Quantitation Limit
BQL = Below Quantitation Limit
MCL = Maximum Contaminant Level

EcoTek LSI
Tek Laboratory Services Incorporated

Semivolatile TCLP Analytical Results
40 CFR 261, June 29,1990

Client:	GeoCon,Inc	Client Reference No.:	X231B
Lab Sample ID:	3234403	Client Sample No.:	24009
Matrix:	Water	Date Received:	7/12/94
Date Leached:	7/13/94	Date Extracted:	7/15/94

CAS Number	Compound Name	Analysis Date	Dilution Factor	Result mg/l	PQL mg/l	MCL mg/l	Note
106467	1,4-Dichlorobenzene	8/5/94	1	BQL	0.100	7.5	
95487	2-Methylphenol	8/5/94	1	BQL	0.100	200	
108394	3-Methylphenol	8/5/94	1	BQL	0.100	200	
106445	4-Methylphenol	8/5/94	1	BQL	0.100	200	
NA	Total-Methylphenol	8/5/94	1	BQL	0.100	200	
67721	Hexachloroethane	8/5/94	1	BQL	0.100	3.0	
98953	Nitrobenzene	8/5/94	1	BQL	0.100	2.0	
87683	Hexachlorobutadiene	8/5/94	1	BQL	0.100	0.5	
88062	2,4,6-Trichlorophenol	8/5/94	1	BQL	0.100	2.0	
95954	2,4,5-Trichlorophenol	8/5/94	1	BQL	0.100	400	
121142	2,4-Dinitrotoluene	8/5/94	1	BQL	0.100	0.13	
118741	Hexachlorobenzene	8/5/94	1	BQL	0.100	0.13	
87865	Pentachlorophenol	8/5/94	1	BQL	0.500	100	
110861	Pyridine	8/5/94	1	BQL	0.100	5.0	

MCL = Maximum Concentration Limit
PQL = Practical Quantitation Limit
BQL = Below Quantitation Limit

EcoTek LSI
ek Laboratory Services Incorporated

Volatile Organic Analytical Results
SW-846 Method 8010

Client: GeoCon, Inc.
Lab Sample ID: 3234403
Matrix: NSS
Level: Medium

Client Sample No.: 24009
Client Project Code: X231B
Date Received: 7/12/94

CAS Number	Compound Name	Analysis Date	Dilution Factor	Result ug/kg	PQL ug/kg	Note
75694	Trichlorofluoromethane	7/22/94	1	BQL	25	
75354	1,1-Dichloroethene	7/22/94	1	BQL	10	
75092	Methylene Chloride	7/22/94	1	BQL	50	
156605	trans-1,2-Dichloroethene	7/22/94	1	BQL	10	
75343	1,1-Dichloroethane	7/22/94	1	BQL	10	
67663	Chloroform	7/22/94	1	BQL	10	
71556	1,1,1-Trichloroethane	7/22/94	1	26	10	
107062	1,2-Dichloroethane	7/22/94	1	BQL	10	
79016	Trichloroethene	7/22/94	1	130	10	
79005	1,1,2-Trichloroethane	7/22/94	1	BQL	10	

Waste Stream Number: 700-12

Waste Stream Title: Tank Residue

PORTS MSDS #: 5335

PRODUCT: TRICHLOROETHYLENE

PART NUMBER:

FORMULA: CHCL=CCL2

KEYWORD: DEGREASER

PORTS NUMBER: NNN

PORTS MISC INFO:
95-20-7820

PORTS RATING: HFR=210

MANUFACTURER:
PPG INDUSTRIES, INC.
ONE PPG PLACE
PITTSBURGH
PA

15272
PHONE: PHONE:
EMERGENCY PHONE: 304-843-1300

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	BT 187 190 F	NOTE: 86-88'C @ 760 MM HG.
Melting Point. . . .	EQ -123.5 F	NOTE: -86.4'C.
Freezing Point . . .	EQ -123.5 F	NOTE: -86.4'C.
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ 1.465	NOTE: @ 20/20'C.
Vapor Pressure . . .	EQ 57.8	NOTE: MM HG, @ 20'C.
Vapor Density. . . .	EQ 4.54	
Percent Volatiles. .	EQ 100	
Evaporation Rate . .	EQ .28	NOTE: ETHYL ETHER=1.
pH	BT 6.7 7.5	
Molecular Weight . .	NG	
Viscosity.	NG	

Solubility in Water. 0.11% BY WEIGHT.
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS LIQUID WITH ETHER-LIKE ODOR / BULK

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NO	NOTE: NONE.
Flash Point, Open Cup . . .	NO	NOTE: NONE.
Fire Point.	NG	
Auto Ignition.	NG	
Explosive/Flammable Limits		
Lower (LEL).	EQ 7.8	NOTE: VOLUME.
Upper (UEL).	EQ 52	NOTE: VOLUME.

Shipping Regulations

UN/NA Number.	UN1710
D.O.T. Hazard Class. . .	6.1
Label	NOT GIVEN
Proper Shipping Name . .	TRICHLOROETHYLENE

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Preparer/Contact Information: R. KENNETH LEE, MANAGER, PRODUCT SAFETY

Date Prepared/Revised 5/31/94

http://jupiter.ports/msds/data/5

===== Component Information =====

.ICHLOROETHYLENE
OSHA PEL (PPM): 50
OSHA PEL (MG/M3):
ACGIH TLV (PPM): 50
ACGIH TLV (MG/M3):
STEL (PPM): 200
STEL (MG/M3):
Product %: GT 99
C.A.S. No.: 79016
Note:
STABILIZED / OSHA STEL / ACGIH STEL: 100 PPM / PPG

===== IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

TRADE NAME: TRICHLOROETHYLENE

CHEMICAL NAME/SYNONYMS: TRICHLOROETHENE, TRICHLORETHYLENE, TRICHLOR

CHEMICAL FAMILY: HALOGENATED HYDROCARBONS

MSDS NUMBER: 0085

EDITION: 013

CAS NUMBER: 000079 01 6

S. DOT HAZARD CLASS: 6.1 (HARMFUL - STOW AWAY FROM FOODSTUFFS)

SUBSIDIARY RISK: N/A

PACKING GROUP: III

REPORTABLE QUANTITY: 100 LBS/45.4 KG

MSDS NUMBER: 0085

EDITION: 013

* DO NOT SHIP LIGHTLY STABILIZED GRADES IN ALUMINUM TRAILERS.

24-HOUR EMERGENCY ASSISTANCE: (304) 843-1300

MANUFACTURER'S NAME AND ADDRESS:

PPG INDUSTRIES, INC.
ONE PPG PLACE
PITTSBURGH, PA 15272

===== PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

HEAT OF SOLUTION: N/A

==== INGREDIENTS =====

SEE COMPONENT INFORMATION.

MATERIAL

TRICHLOROETHYLENE (STABILIZED)

OTE: TESTED MIXTURE

===== FIRE/EXPLOSION HAZARD DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

EXTINGUISHING MEDIA: WATER, DRY CHEMICALS OR CARBON DIOXIDE

SPECIAL FIRE FIGHTING PROCEDURES: FIRE FIGHTERS SHOULD WEAR NIOSH/MSHA-
APPROVED PRESSURE-DEMAND, SELF-CONTAINED BREATHING APPARATUS FOR POSSIBLE
EXPOSURE TO HYDROGEN CHLORIDE AND POSSIBLY TRACES OF PHOSGENE.

UNUSUAL FIRE AND EXPLOSION HAZARDS: VAPORS CONCENTRATED IN A CONFINED OR
POORLY VENTILATED AREA CAN BE IGNITED UPON CONTACT WITH A HIGH ENERGY SPARK,
FLAME, OR HIGH INTENSITY SOURCE OF HEAT. THIS CAN OCCUR AT CONCENTRATIONS
RANGING BETWEEN 7.8-52% BY VOL. DECOMPOSITION OR BURNING CAN PRODUCE HYDROGEN
CHLORIDE OR POSSIBLY TRACES OF PHOSGENE.

===== HEALTH HAZARD DATA =====

TOXICITY DATA:

LC50 INHALATION: LCLO(RATS) - 8000 PPM/4 HOUR
LD50 DERMAL: NOT DETERMINED
SKIN/EYE IRRITATION: SEE EFFECTS OF OVEREXPOSURE SECTION
LD50 INGESTION: (RAT) - 4900-7000 MG/KG
FISH, LC50 (LETHAL CONCENTRATION): SEE EFFECTS OF OVEREXPOSURE SECTION

CLASSIFICATION:

INHALATION: SLIGHTLY TOXIC
SKIN: NOT DETERMINED
SKIN/EYE: SKIN-MILDLY IRRITATING/EYE-IRRITANT
INGESTION: SLIGHTLY TO MODERATELY TOXIC
AQUATIC: SEE EFFECTS OF OVEREXPOSURE SECTION

===== EFFECTS OF OVEREXPOSURE =====

IS CHEMICAL LISTED AS A CARCINOGEN OR POTENTIAL CARCINOGEN:

NTP: NO
IARC: NO
OSHA: NO

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE KNOWN

PERMISSIBLE EXPOSURE LIMITS:

OSHA: 50 PPM, 8-HOUR TWA (TIME-WEIGHTED AVERAGE); 200 PPM, 15-MINUTE STEL
'SHORT-TERM EXPOSURE LIMIT); 29 CFR 1910.1000, TABLE Z.2, REV. '1/89.

NOTE: THE 1971 LIMIT IS 100 PPM, 8-HOUR TWA.

ACGIH: 50 PPM, 8 HOUR TWA; 100 PPM, 15-MINUTE STEL.

PPG INTERNAL PERMISSIBLE EXPOSURE LIMIT: 50 PPM, 8-HOUR TWA.

JTE:

INHALATION: TRICHLOROETHYLENE IS A CENTRAL NERVOUS SYSTEM DEPRESSANT WHICH CAN CAUSE IRRITATION OF THE RESPIRATORY TRACT, DIZZINESS, NAUSEA, HEADACHE, LOSS OF COORDINATION AND EQUILIBRIUM, POSSIBLE CENTRAL NERVOUS SYSTEM DAMAGE, UNCONSCIOUSNESS AND DEATH IN CONFINED OR POORLY VENTILATED AREAS. FATALITIES FOLLOWING SEVERE ACUTE EXPOSURE HAVE BEEN ATTRIBUTED TO VENTRICULAR FIBRILLATION RESULTING IN CARDIAC FAILURES.

EYE/SKIN: LIQUID SPLASHED IN THE EYE CAN RESULT IN DISCOMFORT, PAIN AND IRRITATION. PROLONGED OR REPEATED CONTACT WITH LIQUID ON THE SKIN CAN CAUSE IRRITATION AND DERMATITIS. THE PROBLEM MAY BE ACCENTUATED BY LIQUID BECOMING TRAPPED AGAINST THE SKIN BY CONTAMINATED CLOTHING AND SHOES, AND SKIN ABSORPTION CAN OCCUR.

INGESTION: SWALLOWING OF THIS MATERIAL MAY RESULT IN IRRITATION OF THE MOUTH AND GI TRACT ALONG WITH OTHER EFFECTS AS LISTED ABOVE FOR INHALATION. VOMITING AND SUBSEQUENT ASPIRATION INTO THE LUNGS MAY LEAD TO CHEMICAL PNEUMONIA AND PULMONARY EDEMA WHICH IS A POTENTIALLY FATAL ONDITION.

HRONIC: PROLONGED EXPOSURE ABOVE THE OSHA PERMISSIBLE LIMITS MAY RESULT IN LIVER AND KIDNEY DAMAGE. TRICHLOROETHYLENE HAS BEEN EXTENSIVELY STUDIED FOR CHRONIC EFFECTS IN ANIMALS. WHILE THERE ARE STUDIES IN WHICH TUMORS WERE INDUCED IN MICE, THERE IS NO EVIDENCE THAT TRICHLOROETHYLENE POSES A CARCINOGENIC RISK TO HUMANS. TRICHLOROETHYLENE IS LISTED IN GROUP 3 BY IARC AND IS NOT LISTED BY NTP OR OSHA.

TOXICITY DATA:

AQUATIC DATA:

SHEEPSHEAD MINNOWS: 96-HOUR LC50 - 52 MG/L SLIGHTLY TOXIC
MYSID SHRIMP: 96-HOUR LC50 - 14 MG/L SLIGHTLY TOXIC
MARINE ALGA: 96-HOUR EC50 - 95 MG/L SLIGHTLY TOXIC

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH-TO-MOUTH. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

EYE OR SKIN CONTACT: FLUSH EYES AND SKIN WITH PLENTY OF WATER SOAP AND ATER FOR SKIN) FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. IF IRRITATION OCCURS, CONSULT A PHYSICIAN. THOROUGHLY CLEAN

CONTAMINATED CLOTHING AND SHOES BEFORE REUSE OR DISCARD.

INGESTION:

IF CONSCIOUS: DRINK LARGE QUANTITIES OF WATER. DO NOT INDUCE VOMITING.
TAKE IMMEDIATELY TO A HOSPITAL OR PHYSICIAN.

IF UNCONSCIOUS: OR IN CONVULSIONS, TAKE IMMEDIATELY TO A HOSPITAL. DO NOT
ATTEMPT TO GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

NOTES TO PHYSICIAN (INCLUDES ANTIDOTES): ONLY ADMINISTER ADRENALINE AFTER
CAREFUL CONSIDERATION FOLLOWING TRICHLOROETHYLENE OVEREXPOSURE. INCREASED
SENSITIVITY OF THE HEART TO ADRENALINE MAY BE CAUSED BY OVEREXPOSURE TO
TRICHLOROETHYLENE.

===== REACTIVITY DATA =====

STABILITY: STABLE.

CONDITIONS TO AVOID: AVOID OPEN FLAMES, HOT GLOWING SURFACES OR ELECTRIC
ARCS.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

CONDITIONS TO AVOID: NONE.

NCOMPATIBILITY (MATERIALS TO AVOID): AVOID CONTAMINATION WITH AUSTIC SODA,
CAUSTIC POTASH OR OXIDIZING MATERIALS. SHOCK SENSITIVE COMPOUNDS MAY BE
FORMED.

HAZARDOUS DECOMPOSITION PRODUCTS: HYDROGEN CHLORIDE AND POSSIBLY TRACES OF
PHOSGENE.

===== SPILL OR LEAK PROCEDURES =====

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED: IMMEDIATELY EVACUATE
THE AREA AND PROVIDE MAXIMUM VENTILATION. UNPROTECTED PERSONNEL SHOULD MOVE
UPWIND OF SPILL. ONLY PERSONNEL EQUIPPED WITH PROPER RESPIRATORY AND SKIN/EYE
PROTECTION (SEE SPECIAL PROTECTION INFORMATION SECTION) SHOULD BE PERMITTED
IN AREA. DIKE AREA TO CONTAIN SPILL. TAKE PRECAUTIONS AS NECESSARY TO PREVENT
CONTAMINATION OF GROUND AND SURFACE WATERS. RECOVER SPILLED MATERIAL ON
ADSORBENTS, SUCH AS SAWDUST OR VERMICULITE, AND SWEEP INTO CLOSED CONTAINERS
FOR DISPOSAL. AFTER ALL VISIBLE TRACES, INCLUDING IGNITABLE VAPORS, HAVE BEEN
REMOVED, THOROUGHLY WET VACUUM THE AREA. DO NOT FLUSH TO SEWER. IF AREA OF
PILL IS POROUS, REMOVE AS MUCH CONTAMINATED EARTH, GRAVEL, ETC. AS NECESSARY
AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL.

WASTE DISPOSAL METHOD: CONTAMINATED SAWDUST, VERMICULITE OR POROUS

SURFACE
MUST BE DISPOSED OF IN A PERMITTED HAZARDOUS WASTE MANAGEMENT
CILITY.
:OVERED LIQUIDS MAY BE REPROCESSED OR INCINERATED OR MUST BE
EATED IN A
PERMITTED HAZARDOUS WASTE MANAGEMENT FACILITY. CARE MUST BE TAKEN
WHEN USING
OR DISPOSING OF CHEMICAL MATERIALS AND/OR THEIR CONTAINERS TO
PREVENT
ENVIRONMENTAL CONTAMINATION. IT IS YOUR DUTY TO DISPOSE OF THE
CHEMICAL
MATERIALS AND/OR THEIR CONTAINERS IN ACCORDANCE WITH THE CLEAN AIR
ACT, THE
CLEAN WATER ACT, THE RESOURCE CONSERVATION AND RECOVERY ACT, AS
WELL AS ANY
OTHER RELEVANT FEDERAL, STATE, OR LOCAL LAWS/REGULATIONS REGARDING
DISPOSAL.

===== SPECIAL PROTECTION INFORMATION =====

RESPIRATORY PROTECTION: USE A HALF OR FULL FACEPIECE ORGANIC VAPOR
CHEMICAL
CARTRIDGE OR CANISTER RESPIRATOR WHEN CONCENTRATIONS EXCEED THE
PERMISSIBLE
LIMITS. USE SELF-CONTAINED BREATHING APPARATUS (SCBA) OR FULL
FACEPIECE
AIRLINE RESPIRATOR WITH AUXILIARY SCBA OPERATED IN THE
PRESSURE-DEMAND MODE
FOR EMERGENCIES AND FOR ALL WORK PERFORMED IN STORAGE VESSELS,
POORLY
VENTILATED ROOMS, AND OTHER CONFINED AREAS. RESPIRATORS MUST BE
APPROVED BY
OSH/MSHA. THE RESPIRATOR USE LIMITATIONS MADE BY NIOSH/MSHA AND
THE
ANUFACTURER MUST BE OBSERVED. RESPIRATORY PROTECTION PROGRAMS MUST
BE IN
ACCORDANCE WITH 29CFR 1910.134.

VENTILATION (TYPE): USE LOCAL EXHAUST OR DILUTION VENTILATION AS
APPROPRIATE
TO CONTROL EXPOSURES TO BELOW PERMISSIBLE LIMITS.

EYE PROTECTION: SPLASHPROOF GOGGLES

GLOVES: VITON(R), SILVER SHIELD(R), POLYVINYL ALCOHOL (DEGRADES IN
WATER).

OTHER PROTECTIVE EQUIPMENT: BOOTS, APRONS, OR CHEMICAL SUITS SHOULD
BE USED
WHEN NECESSARY TO PREVENT SKIN CONTACT. PERSONAL PROTECTIVE
CLOTHING AND USE
OF EQUIPMENT MUST BE IN ACCORDANCE WITH 29 CFR 1910.132 AND 29 CFR
1910.133.

===== SPECIAL PRECAUTIONS =====

PRECAUTIONS TO BE TAKEN DURING HANDLING AND STORING:

DO NOT USE IN POORLY VENTILATED OR CONFINED SPACES WITHOUT PROPER
RESPIRATORY PROTECTION (SEE SPECIAL PROTECTION INFORMATION
SECTION).

TRICHLOROETHYLENE VAPORS ARE HEAVIER THAN AIR AND WILL COLLECT IN
OW
AREAS.

KEEP CONTAINER CLOSED WHEN NOT IN USE.

STORE ONLY IN CLOSED, PROPERLY LABELED CONTAINERS.

LIQUID OXYGEN OR OTHER STRONG OXIDANTS MAY FORM EXPLOSIVE MIXTURES WITH TRICHLOROETHYLENE.

THIS MATERIAL OR ITS VAPORS WHEN IN CONTACT WITH FLAMES, HOT GLOWING SURFACES OR ELECTRIC ARCS CAN DECOMPOSE TO FORM HYDROGEN CHLORIDE GAS AND TRACES OF PHOSGENE..

AVOID CONTAMINATION OF WATER SUPPLIES. HANDLING, STORAGE AND USE PROCEDURES MUST BE CAREFULLY MONITORED TO AVOID SPILLS OR LEAKS. ANY SPILL OR LEAK HAS THE POTENTIAL TO CAUSE UNDERGROUND WATER CONTAMINATION WHICH MAY, IF SUFFICIENTLY SEVERE, RENDER A DRINKING WATER SOURCE UNFIT FOR HUMAN CONSUMPTION. CONTAMINATION THAT DOES OCCUR CANNOT BE EASILY CORRECTED.

A CHLORINATED SOLVENT USED AS A FLASHPOINT SUPPRESSANT MUST BE ADDED IN SUFFICIENT QUANTITY OR THE RESULTANT MIXTURE MAY HAVE A FLASHPOINT LOWER THAN THE FLAMMABLE COMPONENT.

DO NOT USE CUTTING OR WELDING TORCHES ON DRUMS THAT CONTAINED TRICHLORO-ETHYLENE UNLESS PROPERLY PURGED AND CLEANED.

DO NOT SHIP LIGHTLY STABILIZED GRADES IN ALUMINUM TRAILERS. THE LY EXCEPTION IS TYPE 145 VAPOR DEGREASING GRADE.

OTHER PRECAUTIONS: DO NOT BREATHE VAPORS. HIGH VAPOR CONCENTRATIONS CAN CAUSE DIZZINESS, UNCONSCIOUSNESS OR DEATH. LONG-TERM OVEREXPOSURE MAY CAUSE LIVER/KIDNEY INJURY AND POSSIBLE CENTRAL NERVOUS SYSTEM DAMAGE.

USE ONLY WITH ADEQUATE VENTILATION. VENTILATION MUST BE SUFFICIENT TO LIMIT EMPLOYEE EXPOSURE TO TRICHLOR BELOW PERMISSIBLE EXPOSURE LIMITS. OBSERVANCE OF LOWER LIMITS IS ADVISABLE (OUTLINED IN EFFECTS OF OVEREXPOSURE SECTION). EYE IRRITATION, DIZZINESS AND/OR DRUNKENNESS ARE SIGNS OF OVEREXPOSURE.

AVOID CONTACT WITH EYES. WILL CAUSE IRRITATION AND PAIN.

AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. MAY CAUSE IRRITATION OR DERMATITIS.

DO NOT SWALLOW. SWALLOWING MAY CAUSE INJURY OR DEATH.

DO NOT EAT, DRINK, OR SMOKE IN WORK AREAS.

COMMENTS:

TSCA: TRICHLOROETHYLENE IS ON THE TSCA INVENTORY UNDER CAS 79-01-6.

SARA TITLE III: A) 311/312 CATEGORIES - ACUTE AND CHRONIC, B) LISTED IN

SECTION 313 UNDER TRICHLOROETHYLENE, C) NOT LISTED AS AN "EXTREMELY HAZARDOUS
BSTANCE" IN SECTION 302.

CERCLA: LISTED IN TABLE 302.4 OF 40 CFR PART 302 AS A HAZARDOUS SUBSTANCE
WITH A REPORTABLE QUANTITY OF 100 POUNDS. RELEASES TO AIR, LAND OR WATER
WHICH EXCEED THE RQ MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER,
800-424-8802.

RCRA: WASTE TRICHLOR AND CONTAMINATED SOILS/MATERIALS FROM SPILL CLEANUP
AND U228 HAZARDOUS WASTE AS PER 40 CFR 261.33 AND MUST BE DISPOSED OF
ACCORDINGLY UNDER RCRA. SEE 40 CFR 261.33(C) AND 261.7 (B) (3) FOR CLEANING
REQUIREMENTS FOR EMPTY CONTAINERS.

CALIFORNIA PROP. 65: THIS PRODUCT IS A CHEMICAL KNOWN TO THE STATE OF
CALIFORNIA TO CAUSE CANCER.

NEW JERSEY RIGHT-TO-KNOW: ALSO CONTAINS BUTYLENE OXIDE (CAS NO. 106-88-7)

CANADIAN WHMIS: A) SENSITIZATION TO PRODUCT: NONE KNOWN, B) REPRODUCTIVE
TOXICITY: NONE KNOWN, C) ODOR THRESHOLD: NOT KNOWN, D) PRODUCT USE:
DEGREASING SOLVENT, E) REQUIRES POISON SYMBOL (CLASS D.1).

REVISIONS MADE TO 7/12/93, 12TH EDITION: DATE, EDITION, NOTE
GARDING
JMINUM TRAILERS ADDED TO IDENTIFICATION SECTION AND HANDLING
RECAUTIONS
(SPECIAL PRECAUTIONS SECTION), UPDATED PERMISSIBLE EXPOSURE LIMITS
(EFFECTS
OF OVEREXPOSURE SECTION).

Waste Stream Number: 700-13

Waste Stream Title: Oil

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

Waste Stream 700-13

AnaLIS ID: 951113-141 Project: ER 9567D Requisition Number: 018844
Customer Sample ID: VER34230001 Customer: ENV RERSTORATION
Date Sampled: 9-NOV-1995 09:15 Date Sample Received: 10-NOV-1995
Sampled By: R CAUDILL Date Sample Completed: 9-JAN-1996
Material Description: WASTE OIL X-7725

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
ACD-5101	Density	0.88		g/mL	ML STEWART	27-NOV-1995	95081247
SW846-1010	Flash Point	>104		oC	ML STEWART	2-DEC-1995	95081275
SW846-3051	Sample Prep Metals	COMPLETE			ML STEWART	27-NOV-1995	112795-078
SW846-3580	Sample Prep PCB	COMPLETE			DK SCAGGS	13-NOV-1995	95160360
	Sample Prep Semi-Volatiles	COMPLETE			BD FUHR	22-NOV-1995	95160356
SW846-6010A	Arsenic	5.4UN*		ug/L	DA BOWDLE	27-NOV-1995	95081372
	Barium	.09UNJ		ug/L	DA BOWDLE	27-NOV-1995	95081372
	Cadmium	.28UN		ug/L	DA BOWDLE	27-NOV-1995	95081372
	Chromium	.41NJ		ug/L	DA BOWDLE	27-NOV-1995	95081372
	Lead	2.8NJ		ug/L	DA BOWDLE	27-NOV-1995	95081372
	Selenium	7.3U		ug/L	DA BOWDLE	27-NOV-1995	95081372
	Silver	.18UN		ug/L	DA BOWDLE	27-NOV-1995	95081372
SW846-7470	Mercury	25U		ug/L	RB COLLEY	20-NOV-1995	95081226
SW846-8080	PCB-1232	<2		ug/g	DH BLUE	18-DEC-1995	95161218M5
	PCB-1242	<2		ug/g	DH BLUE	18-DEC-1995	95161218M5
	PCB-1248	<2		ug/g	DH BLUE	18-DEC-1995	95161218M5
	PCB-1254	<2		ug/g	DH BLUE	18-DEC-1995	95161218M5
	PCB-1260	<2		ug/g	DH BLUE	18-DEC-1995	95161218M5
	PCB-1268	<2		ug/g	DH BLUE	18-DEC-1995	95161218M5
	Total PCB	<2		ug/g	DH BLUE	18-DEC-1995	95161218M5
SW846-9010A	Total Cyanide	1UNJ		mg/kg	SL LEMASTER	22-NOV-1995	95101648
SW846-9020A	TOX	< 10.0		ug/g	DE COLLINS	16-NOV-1995	9516111614
SW846-9031	Sulfide	3580		mg/kg	SL LEMASTER	21-DEC-1995	95101797
TSD553-230	Gross Alpha	<0.1		pCi/mL	SC BARKER	3-JAN-1996	96070001
	Gross Beta	<0.3		pCi/mL	SC BARKER	3-JAN-1996	96070001
T[illegible]	Technetium	<1.0		pCi/mL	JP BREWSTER	3-JAN-1996	96070005
TS[illegible]3-440	Cesium-134	<0.1	0.04	pCi/g	WC ZUEFLE	20-NOV-1995	95071755
	Cesium-137	<0.2	0.01	pCi/g	WC ZUEFLE	20-NOV-1995	95071755

	Cobalt-60	<0.3	0.01	pCi/g	WC ZUEFLE	20-NOV-1995	95071755
	Gross Gamma	0.0		pCi/g	WC ZUEFLE	20-NOV-1995	95071755
T	% U-235	ND		%	CD GOOD	13-DEC-1995	95071872
	Alpha Activity	<1		pCi/mL	BW SHORT	13-DEC-1995	95071872
	Americium-241	<0.029		pCi/mL	CD GOOD	13-DEC-1995	95071872
	Neptunium-237	<0.018		pCi/mL	CD GOOD	13-DEC-1995	95071872
	Plutonium-238	<0.018		pCi/mL	CD GOOD	13-DEC-1995	95071872
	Plutonium-239/240	<0.048		pCi/mL	CD GOOD	13-DEC-1995	95071872
	Protactinium-234	<0.023		pCi/mL	CD GOOD	13-DEC-1995	95071872
	Thorium-228	<0.21		pCi/mL	CD GOOD	13-DEC-1995	95071872
	Thorium-230	<0.13		pCi/mL	CD GOOD	13-DEC-1995	95071872
	Thorium-232	<0.13		pCi/mL	CD GOOD	13-DEC-1995	95071872
	Thorium-234	0.023	0.018	pCi/mL	CD GOOD	13-DEC-1995	95071872
	Uranium	0.068	0.052	ug/mL	CD GOOD	13-DEC-1995	95071872

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
Arsenic	36.36	19.64	54.02
Barium	36.36	26.18	72.00
Cadmium	36.36	27.06	74.42
Chromium	36.36	23.95	65.87
Lead	36.36	22.43	61.69
Selenium	36.36	37.96	104.40
Silver	36.36	25.99	71.48

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
C. J. Van Meter (Organic Analytical Services)

Date Approved: 12-JAN-1996

********** COMMENT PAGE **********
********** 951113-141 **********

***** Comments from the Environmental and Industrial Hygiene Laboratory *****

SW846-9010A cyanide result estimated due to low sample spike recovery: 43%.

***** Comments from the Spectrochemistry/ICP Laboratory *****

SW846-6010A Ba qualified as estimate due to calibration verification not meeting Q. C. limits.
SW846-6010A Ba, Cr, and Pb qualified as estimate due to lab control sample not meeting Q. C. limits.

***** Comments from the Organic Analytical Services *****

SW846-8260
A broad range of substituted benzenes and alkanes was present on the GC chromatogram at a retention time range of 22 min to 30 min and at a concentration range of 5000ppbJ to 10000ppbJ.
Due to oil matrix of sample, which is not conducive to Purge&Trap analysis, sample was unable to be analyzed at a lesser dilution.

SW846-9020A

Sample VER34230001 was analyzed by directly injecting sample into pyrolysis system. This method is outlined in "PROPOSED TEST METHOD FOR TOTAL CHLORINE BY OXIDATIVE COMBUSTION AND MICROCOULOMETRY". This method was obtained from the manufacturer and is enclosed with the data package.

--Method SW846-8270A

This sample was prepared by Waste Dilution (SW846-3580) which resulted in the quantitation limits reported.

In this sample, recovery for the surrogate 2-Fluorobiphenyl was slightly above established limits. This also occurred in the MS, MSD, and the waste dilution control prepared with this batch. These limits have been established on a small number of data points and will be updated.

There were 38 TIC's greater than 10% of internal standard areas detected in this sample. These TIC's were library searched, evaluated as to the validity of the search, and quantitation estimates made. The majority of these TIC's were alkanes and substituted alkanes, with many others being left as unknowns. There was also a broad multicomponent band of hydrocarbons eluting from 22 minutes until the end of the analyses. These TIC's are not reported due to the inability of the ANALIS LIMS system for reporting TIC's in an appropriate format. These can be made available in standard laboratory format upon request.

Definition Page for Qualifiers/Flags

********** 951113-141 **********

Inorgan, ,ta Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

relation coefficient for MSA is less tha 0.995.

value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 951113-141
Laboratory: Organic Analytical Services
File ID:
Instrument ID: SV1
Authorized By: C. J. Van Meter

Customer Sample ID: VER34230001
Customer: ENV RERSTORATION
Sample Matrix: OIL
Requisition Number: 018844
Date Sample Received: 10-NOV-1995
Date Sampled: 9-NOV-1995

RCRA_SEMIVOLATILES

Date Extracted/Prepared: 22-NOV-1995
Analysis Procedure Number: SW846-8270A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 18-DEC-1995
QA File Number: 95161218B01
Dilution Factor: 1.0
Analyst: BD FUHR

CAS		ug/kg	CAS		ug/kg
95-48-7	2-Methylphenol	48100U			
108-39-4	m-Cresol	48100U			
106-44-5	4-Methylphenol	48100U			
87-86-5	Pentachlorophenol	96200U			
95-95-4	2,4,5-Trichlorophenol	48100U			
88-06-2	2,4,6-Trichlorophenol	48100U			
	Total Cresol	NA			
106-46-7	1,4-Dichlorobenzene	48100U			
121-14-2	2,4-Dinitrotoluene	96200U			
118-74-1	Hexachlorobenzene	48100U			
	Hexachloro-1,3-butadiene	48100U			
67-72-1	Hexachloroethane	48100U			
98-95-3	Nitrobenzene	48100U			
110-86-1	Pyridine	48100U			

ANALYSIS DATA REPORT

AnaLIS ID:	951113-141	Customer Sample ID:	VER34230001
Laboratory:	Organic Analytical Services	Customer:	ENV RERSTORATION
File ID:		Sample Matrix:	OIL
Instrument ID:	5890#3	Requisition Number:	018844
Authorized By:	C. J. Van Meter	Date Sample Received:	10-NOV-1995
		Date Sampled:	9-NOV-1995

RCRA_VOLATILES

Date Extracted/Prepared:		Date Analyzed:	21-NOV-1995
Analysis Procedure Number:	SW846-8260	QA File Number:	95161121A3
Percent Moisture:		Dilution Factor:	1000
Percent Moisture (decanted):		Analyst:	MA NOVOTNY
Associated Blank:			

CAS		ug/kg	CAS		ug/kg
71-43-2	Benzene	2000U			
56-23-5	Carbon Tetrachloride	2000U			
108-90-7	Chlorobenzene	2000U			
67-66-3	Chloroform	2000U			
107-06-2	1,2-Dichloroethane	2000U			
75-35-4	1,1-Dichloroethene	2000U			
78-93-3	2-Butanone	100000U			
127-18-4	Tetrachloroethene	2000U			
79-01-6	Trichloroethene	2000U			
75-01-4	Vinyl Chloride	1000U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

RCRA_VOLATILES ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 951113-141
Laboratory: Organic Analytical Services
Sample Matrix: OIL
Level: (low/med): LOW
Dilution Factor: 1000

Customer Sample ID: VER34230001
Customer: ENV RERSTORATION
File ID:
Date Received: 10-NOV-1995
Date Analyzed: 21-NOV-1995
Concentration Units: ug/kg

Number TICs found: 9

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.	108-88-3	Toluene	18.0	2600	
2.	100-41-4	Ethyl benzene	20.5	2200	
3.	103-65-1	n-Propylbenzene	22.8	2900	
4.	108-67-8	1,3,5-Trimethylbenzene	23.0	19000	
5.	95-63-6	1,2,4-Trimethylbenzene	23.9	20000	
6.	135-98-8	sec-Butylbenzene	24.2	2300	
7.		p-Isopropylbenzene	24.3	3000	
8.	104-51-8	n-Butylbenzene	25.2	9100	
9.	91-20-3	Naphthalene	29.8	8800	
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

Waste Stream Number: U700-14

Waste Stream Title: Mercury Canisters

PORTS MSDS #: 341

PRODUCT: STANDARD, MERCURY 1000PPM IN 10% NITRIC

PART NUMBER:

FORMULA: Hg

KEYWORD: STANDARD

PORTS NUMBER: 00190035-100

PORTS MISC INFO:
NOT GIVEN

PORTS RATING: HFR=300

MANUFACTURER:
VHG LABS INC.
180 ZACHARY RD #5
MANCHESTER
NH

03109
PHONE: PHONE: 603-622-7660
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . . ~ 212 F NOTE: ~100'C.
Melting Point. . . . ~ 32 F NOTE: ~0'C.
Freezing Point . . . NG
Pour Point . . . . . NG
ftening Point. . . NG

Specific Gravity . . ~ 1
Vapor Pressure . . . NA NOTE: NOT APPLI/NOT AVAIL.
Vapor Density. . . . NA NOTE: NOT APPLI/NOT AVAIL.
Percent Volatiles. . ~ 99 NOTE: @ 21'C.
Evaporation Rate . . NA NOTE: NOT APPLI/NOT AVAIL.
pH . . . . . NA NOTE: NOT APPLI/NOT AVAIL.
Molecular Weight . . EQ 200.59 NOTE: FORMULA WT.
Viscosity. . . . . NG
Solubility in Water. COMPLETE (100%).
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID, ODORLESS / ODOR THRESHOLD: NOT APPLICABLE/NOT AVAILABLE.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . . NA NOTE: NOT APPLI/NOT AVAIL.
Flash Point, Open Cup . . . NG
Fire Point. . . . . NG
Auto Ignition. . . . . NA NOTE: NOT APPLI/NOT AVAIL.
Explosive/Flammable Limits
Lower (LEL). . . . . NA NOTE: NOT APPLI/NOT AVAIL.
Upper (UEL). . . . . NA NOTE: NOT APPLI/NOT AVAIL.

Shipping Regulations
UN/NA Number. . . . . NG
D.O.T. Hazard Class. . . NG
Label . . . . . NOT GIVEN
Proper Shipping Name . . CHEMICALS, N.O.S. (NON-REGULATED)

==========

reparer/Contact Information: QUALITY ASSURANCE DEPARTMENT

Date Prepared/Revised 1/29/93

===== Component Information =====

.CURY
OSHA PEL (PPM):
OSHA PEL (MG/M3): 0.05
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 0.05
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 1.0
C.A.S. No.: 7439976

NITRIC ACID
OSHA PEL (PPM):
OSHA PEL (MG/M3): 5
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 5
STEL (PPM):
STEL (MG/M3): 10
Product %: EQ 10
C.A.S. No.: 7697372
Note:
PEL & TLV: 2 PPM / STEL: 4 PPM.

WATER
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: BA
C.A.S. No.: 7732185
Note:
NE = NOT ESTABLISHED / BA = BALANCE.

===== SECTION I - PRODUCT IDENTIFICATION =====

PRODUCT NAME: Mercury Plasma Emission Standard - 10,000 g/ml

COMMON SYNONYMS: N/A

CHEMICAL FAMILY: Plasma Emission Standards

FORMULA: Hg

FORMULA WT.: 200.59

CAS NO.: N/A

PRODUCT USE: Laboratory Reagent

REVISION DATE: 01/29/93

TEL: (603) 622-7660

FAX: 622-5180

MANUFACTURER'S NAME AND ADDRESS:

VHG LABS, INC.
CHEMICAL PRODUCTS AND SERVICES
180 ZACHARY ROAD #5
MANCHESTER, NH 03109

==== SECTION II - COMPONENTS =====

E COMPONENT INFORMATION.

===== SECTION III - PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

===== SECTION IV - FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT (CLOSED CUP): N/A

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS:

UPPER: N/A
LOWER: N/A

FIRE EXTINGUISHING MEDIA: Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE-FIGHTING PROCEDURES: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode.

UNUSUAL FIRE & EXPLOSION HAZARDS: Reacts with most metals to produce hydrogen gas, which can form an explosive mixture with air.

TOXIC GASES PRODUCED: Oxides of nitrogen.

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT: None identified.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE: None identified.

===== SECTION V - HEALTH HAZARD DATA =====

THRESHOLD LIMIT VALUE (TLV/TWA): 5 mg/m3 (2 ppm)

TLV is for Nitric acid.

SHORT-TERM EXPOSURE LIMIT (STEL): 10 mg/m3 (4 ppm)

STEL is for Nitric acid.

PERMISSIBLE EXPOSURE LIMIT (PEL): 5 mg/m3 (2 ppm)

PEL is for Nitric acid.

TOXICITY OF COMPONENTS:

INHALATION-1HR RAT LC50 FOR NITRIC ACID: 2500 ppm

INTRAPERITONEAL MOUSE LD50 FOR WATER: 190 g/kg

INTRAVENOUS MOUSE LD50 FOR WATER: 25 g/kg

CARCINOGENICITY: NTP: No IARC: No Z LIST: No OSHA REG: No

CARCINOGENICITY: None identified

REPRODUCTIVE EFFECTS: None identified

EFFECTS OF OVEREXPOSURE:

INHALATION: Headache, nausea, vomiting, dizziness, irritation of spiratory system

SKIN CONTACT: Severe irritation

EYE CONTACT: Severe irritation

SKIN ABSORPTION: None identified

INGESTION: Burns to mouth, throat, and stomach, kidney dysfunction

CHRONIC EFFECTS: None identified

TARGET ORGANS: Respiratory system, eyes, skin, teeth

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Damaged skin,eye disorders, cardiopulmonary disease

PRIMARY ROUTES OF ENTRY: Inhalation, ingestion, skin contact, eye contact

EMERGENCY AND FIRST AID PROCEDURES:

INGESTION: CALL A PHYSICIAN. If swallowed, do NOT induce vomiting If conscious, give water, milk, or milk of magnesia.

INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

SKIN CONTACT: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

EYE CONTACT: In case of eye contact, immediately flush with plenty of water for at least 15 minutes.

SARA/TITLE III HAZARD CATEGORIES AND LISTS:

ACUTE: Yes CHRONIC: Yes FLAMMABILITY: No PRESSURE: No REACTIVITY: No

EXTREMELY HAZARDOUS SUBSTANCE: Yes Contains Nitric Acid (RQ = 1,000 LBS, TPQ = 1,000 LBS)

CERCLA HAZARDOUS SUBSTANCE: Yes Contains Nitric Acid (RQ = 1,000 LBS)

SARA 313 TOXIC CHEMICALS: Yes Contains Nitric Acid

TSCA INVENTORY: Yes

===== SECTION VI - REACTIVITY DATA =====

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Heat

INCOMPATIBLES: Strong bases, strong reducing agents, alkalies, most common metals

DECOMPOSITION PRODUCTS: Oxides of nitrogen

===== SECTION VII - SPILL & DISPOSAL PROCEDURES =====

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE: Wear self-contained

breathing apparatus and full protective clothing. Stop leak if you can do so without risk. Ventilate area. Neutralize spill with soda ash or lime. With clean shovel, carefully place material into clean, dry container and cover; move from area. Flush spill area with water.

DISPOSAL PROCEDURE: Dispose in accordance with all applicable federal, state, and local environmental regulations.

EPA HAZARDOUS WASTE NUMBER: D002 (Corrosive Waste)

===== SECTION VIII - PROTECTION INFORMATION =====

EYE/FACE PROTECTION: Goggles & Shield

PROTECTIVE CLOTHING: Lab Coat & Apron

PROTECTIVE GLOVES: Rubber

VENTILATION REQUIREMENTS: Vent Hood

===== SECTION IX - STORAGE DATA AND ADDITIONAL INFORMATION =====

STORAGE REQUIREMENTS: Keep container tightly closed. Store in secure poison area. Isolate from incompatible materials.

===== SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION =====

DOMESTIC (D.O.T.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)

INTERNATIONAL (I.M.O.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)
MARINE POLLUTANTS: No

N/A = Not Applicable or Not Available
N/E = Not Established

The information in this Material Safety Data Sheet meets the requirements of the United States OCCUPATIONAL SAFETY AND HEALTH ACT and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) and the Canadian WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. This document is intended only as a guide to the appropriate precautionary handling of the material by a person trained in, or supervised by a person trained in, chemical handling. The user is responsible for determining the application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes.

Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, VHG cannot warn of all of the potential dangers of user or interaction with other chemicals or materials. VHG warrants that the chemical meets the specifications set forth on the label. VHG DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.

The user should recognize that this product can cause severe injury and even death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION.

Approved by Quality Assurance Department.

Waste Stream Number: 705-1

Waste Stream Title: Alkaline Solution

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950906-073 Project: P103 ACTA Customer Sample ID: RFD-3013-1

Customer:	APPLEGATE	Requisition Number:	
Date Sampled:	31-AUG-1995	Date Sample Received:	6-SEP-1995
Sampled By:	JD/WF	Date Sample Completed:	7-SEP-1995
Material Description:	AQUEOUS WASTE	Date Sample Approved:	12-SEP-1995
Program Manager:	MH BARTLING (# 29893)	[] : Result has been Corrected for Spike	

Procedure No.	Analysis	Result	Q Qual	Limit of Error	Units	Analyst	QA File Number	Date Completed
***** Radiochemistry Laboratory *****								
ACD-160063.R1	Total Activity (Screen)	1.83E1		+/- 4.5E0	dpm/ml	TL DANIELS	TAS-4935	7-SEP-1995

Date Printed: 22-SEP-1995 15:31:15

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-047 Project: P103 003 Customer Sample ID: RFD-3013-1

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 22-SEP-1995
Date Sample Approved: 22-SEP-1995
□ : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Units	Analyst	QA File Number	Date Completed
***** Organic Sample Preparation Laboratory *****							
ACD-1320	Prep (BNA- Option)	C			JR HUSKEY	9986	14-SEP-1995
***** Spectrochemistry Laboratory *****							
EPA-7060	Arsenic	< 0.83	R	ug/g	CB HAMMONDS	50912A	13-SEP-1995
EPA-7421	Lead	13	R	ug/g	CB HAMMONDS	50912B	13-SEP-1995
EPA-7740	Selenium	< 0.83	R	ug/g	CB HAMMONDS	50912C	13-SEP-1995
Q Qual:(R) Result was Revised after Approval.							
***** Inductively Coupled Plasma Laboratory *****							
EPA-6010 ACD-096010	Barium	< 0.17		ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 6010	Cadmium	< 0.50		ug/g	SA BURGESS	50914X	14-SEP-1995
J10 ACD-096010	Chromium	2.2		ug/g	SA BURGESS	50914X	14-SEP-.
EPA-6010 ACD-096010	Silver	< 0.99		ug/g	SA BURGESS	50914X	14-SEP-1995
***** Wet Instrumentation Laboratory *****							
EPA-1010	Flash Point Closed Cup	125		degrees F	CY CRANMORE	95-13	14-SEP-1995
***** Mercury Laboratory *****							
EPA-7470	Mercury	< 0.08		ug/gm	WW JOHNSON	50908H	13-SEP-1995

Prep (BNA- Option)

Analyst	= JR HUSKEY
pH	= 13
Date Extracted	= 12-SEP-1995
Sample Volume Extracted (mL)	= 100
Extraction Method	= ACD-1311-Cont. Liq./Liq. Extractor
Extraction Solvent	= Methylene Chloride
Extraction Cleanup	= Sodium Sulfate
Final Volume of Extract (mL)	= 1
Associated Blank	= 950913-023

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-047 Project: P103 003 Customer Sample ID: RFD-3013-1

Laboratory:	Organic Mass Spectroscopy Laboratory	Customer:	APPLEGATE
File ID:	0916_04.D	Sample Matrix:	WASTE
Instrument ID:	5972-2	Requisition Number:	
Authorized By:	C MEEHAN	Date Sample Received:	6-SEP-1995

BNA - Base/Neutral/Acid Compounds (TCLP)

Date Extracted/Prepared:	12-SEP-1995	Date Analyzed:	16-SEP-1995
Regulatory Procedure Number:	EPA-8270	ACD Procedure Number:	ACD-240071
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	MF MCMYLER
Associated Blank:	950913-023	QA File Number:	MFM-5879

[] : Result has been Corrected for Spike

CAS	Analysis	ug/L	Q	Qual
110-86-1	Pyridine	100		U
106-46-7	1,4-Dichlorobenzene	100		U
95-50-1	1,2-Dichlorobenzene	100		U
95-48-7	2-Methylphenol	100		U
106-44-5	4-Methylphenol	100	2	U
[illegible]-72-1	Hexachloroethane	100		U
[illegible]5-3	Nitrobenzene	100		U
[illegible]-68-3	Hexachlorobutadiene	100		U
88-06-2	2,4,6-Trichlorophenol	100		U
95-95-4	2,4,5-Trichlorophenol	500		U
121-14-2	2,4-Dinitrotoluene	100		U
118-74-1	Hexachlorobenzene	100		U
87-86-5	Pentachlorophenol	500		U

Q Qual:(U) Compound was analyzed for but not detected.
(B) Analyte found in blank as well as sample.
(J) Indicates an estimated value.
(N) Presumptive evidence of a compound.
(A) TIC is a suspected aldol-condensation product.
(D) Compounds identified in an analysis at a secondary dilution factor.
(E) Concentrations exceed calibration range of the GC/MS instrum ent.
(Y) Undistinguisgable isomer components.
(2) Cannot be separated from 3-Methylphenol.

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-047 Project: P103 003 Customer Sample ID: RFD-3013-1

BNA (TCLP) ORGANICS ANALYSIS DATA SHEETS
SURROGATE SPIKE RECOVERY

AnaLIS ID: 950907-047
Laboratory: Organic Mass Spectroscopy Laboratory
Sample Matrix: WASTE
Level: (low/med): LOW
Dilution Factor: 1.0
% Moisture: not dec. _____ dec. _____
Extraction: (SepF/Cont/Sonc) Llex
GPC Cleanup: (Y/N) N

Customer Sample ID: RFD-3013-1
Customer: APPLEGATE
File ID: 0916 04.D
Date Received: 6-SEP-1995
Date Analyzed: 16-SEP-1995
Date Extracted: 12-SEP-1995
pH: 13

Surrogate Compound	SPIKE ADDED (ug/L)	RESULT (ug/L)	% REC	#	QC LIMITS % REC
Nitrobenzene-d5	100.0	63.42	63.4		35 - 114
1,1'-Biphenyl, 2-Fluoro	100.0	65.00	65.0		43 - 116
Terphenyl-d14	100.0	71.08	71.1		33 - 141
Phenol-d6	200.0	91.90	46.0		10 - 94
2-Fluorophenol	200.0	90.02	45.0		21 - 100
2,4,6-Tribromophenol	200.0	128.73	64.4		10 - 123

Column to be used to flag recovery values with an asterisk
* Values outside of QC limits

Spike Recovery: 0 out of 6 outside limits

COMMENTS: _____

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 950906-013 Project: ER 9579C Customer Sample ID: RFD30131
Customer: ENV RESTORATION Requisition Number: 017718
Date Sampled: 31-AUG-1995 14:30 Date Sample Received: 5-SEP-1995
Sampled By: MB HAMEL Date Sample Completed: 19-SEP-1995
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-9040A	pH	12.88		pH	BJ STANLEY	8-SEP-1995	95101252
TSD553-380	Technetium	2.8		pCi/mL	JP BREWSTER	13-SEP-1995	95071343
TSD553-700	% U-235	3.7	0.80	%	CD GOOD	11-SEP-1995	95071327
	Uranium	2.1	0.26	ppm	CD GOOD	11-SEP-1995	95071327
TSD554-015	Sample Prep Solvents	COMPLETE			PJ WARD	14-SEP-1995	9516091402

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)
Approved: 19-SEP-1995

********** COMMENT PAGE **********
********** 950906-013 **********

Comments from the Organic Analytical Services *****

SW846-8260

Sample was found to be unpreserved (pH=14).

Definition Page for Qualifiers/Flags

950906-013

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

elation coefficient for MSA is less tha 0.995.

value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950906-013
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#3
Authorized By: J. J. Williams

Customer Sample ID: RFD30131
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 017718
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 12-SEP-1995
QA File Number: 95160912A3
Dilution Factor: 1.0
Analyst: MA NOVOTNY

CAS		ug/L	CAS		ug/L
67-64-1	Acetone	200	100-41-4	Ethyl benzene	2U
71-43-2	Benzene	3	76-13-1	Freon 113	2U
75-27-4	Bromodichloromethane	2U	76-14-2	Freon 114	4U
75-25-2	Bromoform	2U	108-10-1	4-Methyl-2-pentanone	100U
74-83-9	Bromomethane	4U	75-09-2	Methylene Chloride	2U
78-93-3	2-Butanone	100U	79-34-5	1,1,2,2-Tetrachloroethane	2U
75-15-0	Carbon Disulfide	2U	127-18-4	Tetrachloroethene	2U
56-23-5	Carbon Tetrachloride	2U	108-88-3	Toluene	2U
108-90-7	Chlorobenzene	2U	71-55-6	1,1,1-Trichloroethane	6
75-00-3	Chloroethane	4U	79-00-5	1,1,2-Trichloroethane	2U
67-66-3	Chloroform	2U	79-01-6	Trichloroethene	2U
74-87-3	Chloromethane	4U	75-69-4	Trichlorofluoromethane	4U
124-48-1	Dibromochloromethane	2U	75-01-4	Vinyl Chloride	1U
106-46-7	1,4-Dichlorobenzene	2U	1330-20-7	m,p-Xylene	2U
95-50-1	1,2-Dichlorobenzene	2U	95-47-6	o-Xylene	2U
541-73-1	1,3-Dichlorobenzene	2U			
75-34-3	1,1-Dichloroethane	2U			
107-06-2	1,2-Dichloroethane	2U			
75-35-4	1,1-Dichloroethene	2U			
156-59-2	cis-1,2-Dichloroethene	2U			
156-60-5	trans-1,2-Dichloroethene	2U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

VOC ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 950906-013
Laboratory: Organic Analytical Services
Sample Matrix: LIQUID WASTE
Level: (low/med): LOW
Dilution Factor: 1.0

Customer Sample ID: RFD30131
Customer: ENV RESTORATION
File ID:
Date Received: 5-SEP-1995
Date Analyzed: 12-SEP-1995
Concentration Units: ug/L

Number TICs found: 2

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.		1-ethyl-2-hexanol	21.1	40	J
2.	91-20-3	Naphthalene	26.4	5	J
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

ANALYSIS DATA REPORT

AnaLIS ID: 950906-013
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD30131
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 017718
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

Solvents_F001

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-019
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 14-SEP-1995
QA File Number: 9516091402
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
56-23-5	Carbon Tetrachloride	1000U			
75-09-2	Methylene Chloride	100U			
127-18-4	Tetrachloroethene	100U			
71-55-6	1,1,1-Trichloroethane	100U			
79-01-6	Trichloroethene	100U			

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950906-061 Project: P103 ACTA Customer Sample ID: RFD-2161-1

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: AQUEOUS WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 6-SEP-1995
Date Sample Approved: 12-SEP-1995
[] : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Limit of Error	Units	Analyst	QA File Number	Date Completed
***** Radiochemistry Laboratory *****								
ACD-160063.R1	Total Activity (Screen)	2.07E2		+/- 3.9E1	dpm/ml	TL DANIELS	TAS-4935	6-SEP-1995

Date Printed: 22-SEP-1995 15:43:29

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-051 Project: P103 003 Customer Sample ID: RFD-2161-1

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 22-SEP-1995
Date Sample Approved: 22-SEP-1995
□ : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Units	Analyst	QA File Number	Date Completed
***** Organic Sample Preparation Laboratory *****							
ACD-1320	Prep (BNA- Option)	C			JR HUSKEY	9986	14-SEP-1995
***** Spectrochemistry Laboratory *****							
EPA-7060	Arsenic	13	R	ug/g	CB HAMMONDS	50912A	13-SEP-1995
EPA-7421	Lead	140	R	ug/g	CB HAMMONDS	50912B	13-SEP-1995
EPA-7740	Selenium	< 0.82	R	ug/g	CB HAMMONDS	50912C	13-SEP-1995
Q Qual:(R) Result was Revised after Approval.							
***** Inductively Coupled Plasma Laboratory *****							
EPA-6010 ACD-096010	Barium	41		ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 ACD-096010	Cadmium	< 0.49		ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 ACD-096010	Chromium	110		ug/g	SA BURGESS	50914X	14-SEP-
EPA-6010 ACD-096010	Silver	< 0.99		ug/g	SA BURGESS	50914X	14-SEP-1995
***** Wet Instrumentation Laboratory *****							
EPA-1010	Flash Point Closed Cup	> 200		degrees F	CY CRANMORE	95-12	14-SEP-1995
***** Mercury Laboratory *****							
EPA-7470	Mercury	< 0.08		ug/gm	WW JOHNSON	50908H	13-SEP-1995

Prep (BNA- Option)

Analyst = JR HUSKEY
pH = 12
Date Extracted = 12-SEP-1995
Sample Volume Extracted (mL) = 100
Extraction Method = ACD-1311-Cont. Liq./Liq. Extractor
Extraction Solvent = Methylene Chloride
Extraction Cleanup = Sodium Sulfate
Final Volume of Extract (mL) = 1
Associated Blank = 950913-023

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-051 Project: P103 003 Customer Sample ID: RFD-2161-1

Laboratory: Organic Mass Spectroscopy Laboratory
File ID: 0916_09.D
Instrument ID: 5972-2
Authorized By: C MEEHAN

Customer: APPLEGATE
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 6-SEP-1995

BNA - Base/Neutral/Acid Compounds (TCLP)

Date Extracted/Prepared: 12-SEP-1995
Regulatory Procedure Number: EPA-8270
Percent Moisture:
Percent Moisture (decanted):
Associated Blank: 950913-023
[] : Result has been Corrected for Spike

Date Analyzed: 16-SEP-1995
ACD Procedure Number: ACD-240071
Dilution Factor: 1.0
Analyst: MF MCMYLER
QA File Number: MFM-5879

CAS	Analysis	ug/L	Q Qual	CAS	Analysis	ug/L	Q Qual
110-86-1	Pyridine	100	U				
106-46-7	1,4-Dichlorobenzene	100	U				
95-50-1	1,2-Dichlorobenzene	100	U				
95-48-7	2-Methylphenol	100	U				
106-44-5	4-Methylphenol	380	2J				
[illegible]-72-1	Hexachloroethane	100	U				
[illegible]-3	Nitrobenzene	100	U				
[illegible]8-3	Hexachlorobutadiene	100	U				
88-06-2	2,4,6-Trichlorophenol	100	U				
95-95-4	2,4,5-Trichlorophenol	500	U				
121-14-2	2,4-Dinitrotoluene	100	U				
118-74-1	Hexachlorobenzene	100	U				
87-86-5	Pentachlorophenol	500	U				

Q Qual:(U) Compound was analyzed for but not detected.
(B) Analyte found in blank as well as sample.
(J) Indicates an estimated value.
(N) Presumptive evidence of a compound.
(A) TIC is a suspected aldol-condensation product.
(D) Compounds identified in an analysis at a secondary dilution factor.
(E) Concentrations exceed calibration range of the GC/MS instrum ent.
(Y) Undistinguisgable isomer components.
(2) Cannot be separated from 3-Methylphenol.

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-051 Project: P103 003 Customer Sample ID: RFD-2161-1

BNA (TCLP) ORGANICS ANALYSIS DATA SHEETS
SURROGATE SPIKE RECOVERY

AnaLIS ID: 950907-051
Laboratory: Organic Mass Spectroscopy Laboratory
Sample Matrix: WASTE
Level: (low/med): LOW
Dilution Factor: 1.0
% Moisture: not dec. _____ dec. _____
Extraction: (SepF/Cont/Sonc) Llex
GPC Cleanup: (Y/N) N

Customer Sample ID: RFD-2161-1
Customer: APPLEGATE
File ID: 0916 09.D
Date Received: 6-SEP-1995
Date Analyzed: 16-SEP-1995
Date Extracted: 12-SEP-1995
pH: 12

Surrogate Compound	SPIKE ADDED (ug/L)	RESULT (ug/L)	% REC	#	QC LIMITS % REC
Nitrobenzene-d5	100.0	37.74	37.7		35 - 114
1,1'-Biphenyl, 2-Fluoro	100.0	53.76	53.8		43 - 116
Terphenyl-d14	100.0	68.07	68.1		33 - 141
Phenol-d6	200.0	179.30	89.7		10 - 94
2-Fluorophenol	200.0	130.50	65.3		21 - 100
2,4,6-Tribromophenol	200.0	125.98	63.0		10 - 123

\# Column to be used to flag recovery values with an asterisk
* Values outside of QC limits

Spike Recovery: 0 out of 6 outside limits

COMMENTS: _____

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 950906-025 Project: ER 9579C Customer Sample ID: RFD21611
Customer: ENV RESTORATION Requisition Number: 017894
Date Sampled: 31-AUG-1995 12:30 Date Sample Received: 5-SEP-1995
Sampled By: MB HAMEL Date Sample Completed: 19-SEP-1995
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-9040A	pH	12.55		pH	BJ STANLEY	8-SEP-1995	95101252
TSD553-380	Technetium	5.5		pCi/ml	JP BREWSTER	13-SEP-1995	95071343
TSD553-700	% U-235	2.3	0.54	%	CD GOOD	11-SEP-1995	95071327
	Uranium	11	1.6	ppm	CD GOOD	11-SEP-1995	95071327
TSD554-015	Sample Prep Solvents	COMPLETE			PJ WARD	14-SEP-1995	9516091402

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)
Approved: 19-SEP-1995

********** COMMENT PAGE **********
********** 950906-025 **********

Comments from the Organic Analytical Services *****

SW846-8260

Due to sample matrix which contained a large amount of surfactant, the matrix was not able to be analyzed at a lesser dilution. When analyzed at a dilution of one, all internal standards and surrogate standards showed very poor recovery.

Definition Page for Qualifiers/Flags

*** *** ******** 950906-025 **********

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

+ - Duplicate analysis is not within control limits.

elation coefficient for MSA is less tha 0.995.

value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950906-025
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#3
Authorized By: J. J. Williams

Customer Sample ID: RFD21611
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 017894
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 12-SEP-1995
QA File Number: 95160912A3
Dilution Factor: 100
Analyst: MA NOVOTNY

CAS		ug/L	CAS		ug/L
67-64-1	Acetone	10000U	100-41-4	Ethyl benzene	200U
71-43-2	Benzene	200U	76-13-1	Freon 113	200U
75-27-4	Bromodichloromethane	200U	76-14-2	Freon 114	400U
75-25-2	Bromoform	200U	108-10-1	4-Methyl-2-pentanone	10000U
74-83-9	Bromomethane	400U	75-09-2	Methylene Chloride	200U
78-93-3	2-Butanone	10000U	79-34-5	1,1,2,2-Tetrachloroethane	200U
75-15-0	Carbon Disulfide	200U	127-18-4	Tetrachloroethene	200U
56-23-5	Carbon Tetrachloride	200U	108-88-3	Toluene	200U
108-90-7	Chlorobenzene	200U	71-55-6	1,1,1-Trichloroethane	200U
75-00-3	Chloroethane	400U	79-00-5	1,1,2-Trichloroethane	200U
67-66-3	Chloroform	200U	79-01-6	Trichloroethene	200U
74-87-3	Chloromethane	400U	75-69-4	Trichlorofluoromethane	400U
124-48-1	Dibromochloromethane	200U	75-01-4	Vinyl Chloride	100U
106-46-7	1,4-Dichlorobenzene	200U	1330-20-7	m,p-Xylene	200U
95-50-1	1,2-Dichlorobenzene	200U	95-47-6	o-Xylene	200U
541-73-1	1,3-Dichlorobenzene	200U			
75-34-3	1,1-Dichloroethane	200U			
107-06-2	1,2-Dichloroethane	200U			
75-35-4	1,1-Dichloroethene	200U			
156-59-2	cis-1,2-Dichloroethene	200U			
156-60-5	trans-1,2-Dichloroethene	200U			

ANALYSIS DATA REPORT

AnaLIS ID: 950906-025
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD21611
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 017894
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

Solvents_F001

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-019
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 14-SEP-1995
QA File Number: 9516091402
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
56-23-5	Carbon Tetrachloride	1000U			
75-09-2	Methylene Chloride	100U			
127-18-4	Tetrachloroethene	100U			
71-55-6	1,1,1-Trichloroethane	100U			
79-01-6	Trichloroethene	100U			

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950906-072 Project: P103 ACTA Customer Sample ID: RFD-2156-4

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: AQUEOUS WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 7-SEP-1995
Date Sample Approved: 12-SEP-1995
[] : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Limit of Error	Units	Analyst	QA File Number	Date Completed
***** Radiochemistry Laboratory *****								
ACD-160063.R1	Total Activity (Screen)	7.64E2		+/- 1.8E1	dpm/ml	TL DANIELS	TAS-4935	7-SEP-1995

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-046 Project: P103 003 Customer Sample ID: RFD-2156-4

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 22-SEP-1995
Date Sample Approved: 22-SEP-1995
[] : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Units	Analyst	QA File Number	Date Completed
***** Organic Sample Preparation Laboratory *****							
ACD-1320	Prep (BNA- Option)	C			JR HUSKEY	9989	12-SEP-1995
***** Spectrochemistry Laboratory *****							
EPA-7060	Arsenic	< 0.83	R	ug/g	CB HAMMONDS	50912A	13-SEP-1995
EPA-7421	Lead	0.96	R	ug/g	CB HAMMONDS	50912B	13-SEP-1995
EPA-7740	Selenium	< 0.83	R	ug/g	CB HAMMONDS	50912C	13-SEP-1995
Q Qual:(R) Result was Revised after Approval.							
***** Inductively Coupled Plasma Laboratory *****							
EPA-6010 ACD-096010	Barium	< 0.17		ug/g	SA BURGESS	50914X	14-SEP-1995
9 J10	Cadmium	< 0.50		ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 ACD-096010	Chromium	6.5		ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 ACD-096010	Silver	< 1.00		ug/g	SA BURGESS	50914X	14-SEP-1995
***** Wet Instrumentation Laboratory *****							
EPA-1010	Flash Point Closed Cup	> 200		degrees F	CY CRANMORE	95-13	14-SEP-1995
***** Mercury Laboratory *****							
EPA-7470	Mercury	< 0.08		ug/gm	WW JOHNSON	50908H	13-SEP-1995

Prep (BNA- Option)

Analyst	= JR HUSKEY
Date Extracted	= 12-SEP-1995
Sample Weight Extracted (g)	= 1.06
Extraction Method	= ACD-1310
Extraction Solvent	= Methylene Chloride
Extraction Cleanup	= Sodium Sulfate
Final Volume of Extract (mL)	= 1
Associated Blank	= 950912-113

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-046 Project: P103 003 Customer Sample ID: RFD-2156-4

Laboratory:	Organic Mass Spectroscopy Laboratory	Customer:	APPLEGATE
File ID:	D02598.D	Sample Matrix:	WASTE
Instrument ID:	HP-5989	Requisition Number:	
Authorized By:	C MEEHAN	Date Sample Received:	6-SEP-1995

BNA - Base/Neutral/Acid Compounds (TCLP)

Date Extracted/Prepared:	12-SEP-1995	Date Analyzed:	13-SEP-1995
Regulatory Procedure Number:	EPA-8270	ACD Procedure Number:	ACD-240071
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	AK HEADRICK
Associated Blank:	950912-113	QA File Number:	AKH-5877

[] : Result has been Corrected for Spike

CAS	Analysis	ug/L	Q Qual	CAS	Analysis	ug/L	Q Qual
110-86-1	Pyridine	9100	U				
106-46-7	1,4-Dichlorobenzene	9100	U				
95-50-1	1,2-Dichlorobenzene	9100	U				
95-48-7	2-Methylphenol	9100	U				
106-44-5	4-Methylphenol	9100	2 U				
72-1	Hexachloroethane	9100	U				
3-3	Nitrobenzene	9100	U				
87-68-3	Hexachlorobutadiene	9100	U				
88-06-2	2,4,6-Trichlorophenol	9100	U				
95-95-4	2,4,5-Trichlorophenol	45000	U				
121-14-2	2,4-Dinitrotoluene	9100	U				
118-74-1	Hexachlorobenzene	9100	U				
87-86-5	Pentachlorophenol	45000	U				

Q Qual:(U) Compound was analyzed for but not detected.
(B) Analyte found in blank as well as sample.
(J) Indicates an estimated value.
(N) Presumptive evidence of a compound.
(A) TIC is a suspected aldol-condensation product.
(D) Compounds identified in an analysis at a secondary dilution factor.
(E) Concentrations exceed calibration range of the GC/MS instrum ent.
(Y) Undistinguisgable isomer components.
(2) Cannot be separated from 3-Methylphenol.

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-046 Project: P103 003 Customer Sample ID: RFD-2156-4

BNA (TCLP) ORGANICS ANALYSIS DATA SHEETS
SURROGATE SPIKE RECOVERY

AnaLIS ID: 950907-046
Laboratory: Organic Mass Spectroscopy Laboratory
Sample Matrix: WASTE
Level: (low/med): LOW
Dilution Factor: 1.0
% Moisture: not dec. _____ dec. _____
Extraction: (SepF/Cont/Sonc) ___
GPC Cleanup: (Y/N) N

Customer Sample ID: RFD-2156-4
Customer: APPLEGATE
File ID: D02598.D
Date Received: 6-SEP-1995
Date Analyzed: 13-SEP-1995
Date Extracted: 12-SEP-1995
pH: _____

Surrogate Compound	SPIKE ADDED (ug/L)	RESULT (ug/L)	% REC #	QC LIMITS % REC
Nitrobenzene-d5	100.0	29.24	29.2 *	35 - 114
1,1'-Biphenyl, 2-Fluoro	100.0	31.20	31.2 *	43 - 116
Terphenyl-d14	100.0	34.35	34.3	33 - 141
Phenol-d6	200.0	37.21	18.6	10 - 94
2-Fluorophenol	200.0	18.74	9.4 *	21 - 100
2,4,6-Tribromophenol	200.0	52.04	26.0	10 - 123

Column to be used to flag recovery values with an asterisk
* Values outside of QC limits

Spike Recovery: 3 out of 6 outside limits

COMMENTS: _____

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 950906-014 Project: ER 9579C Customer Sample ID: RFD21564
Customer: ENV RESTORATION Requisition Number: 017717
Date Sampled: 31-AUG-1995 14:20 Date Sample Received: 5-SEP-1995
Sampled By: MB HAMEL Date Sample Completed: 18-SEP-1995
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-9040A	pH	12.21		pH	BJ STANLEY	8-SEP-1995	95101252
TSD553-380	Technetium	44.3		pCi/ml	JP BREWSTER	13-SEP-1995	95071343
TSD553-700	% U-235	4.9	1.8	%	CD GOOD	11-SEP-1995	95071327
	Uranium	81	21	ppm	CD GOOD	11-SEP-1995	95071327
TSD554-015	Sample Prep Solvents	COMPLETE			PJ WARD	14-SEP-1995	9516091402

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)
Date Approved: 19-SEP-1995

********** COMMENT PAGE **********
********** 950906-014 **********

Comments from the Organic Analytical Services *****

SW846-8260

Sample was found to be unpreserved (pH=14).

Definition Page for Qualifiers/Flags

950906-014

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950906-014
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#3
Authorized By: J. J. Williams

Customer Sample ID: RFD21564
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 017717
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 12-SEP-1995
QA File Number: 95160912A3
Dilution Factor: 10
Analyst: MA NOVOTNY

CAS		ug/L	CAS		ug/L
67-64-1	Acetone	1100	100-41-4	Ethyl benzene	20U
71-43-2	Benzene	20U	76-13-1	Freon 113	20U
75-27-4	Bromodichloromethane	20U	76-14-2	Freon 114	40U
75-25-2	Bromoform	20U	108-10-1	4-Methyl-2-pentanone	1000U
74-83-9	Bromomethane	40U	75-09-2	Methylene Chloride	310
78-93-3	2-Butanone	1000U	79-34-5	1,1,2,2-Tetrachloroethane	20U
75-15-0	Carbon Disulfide	20U	127-18-4	Tetrachloroethene	31
56-23-5	Carbon Tetrachloride	20U	108-88-3	Toluene	20U
108-90-7	Chlorobenzene	20U	71-55-6	1,1,1-Trichloroethane	20U
75-00-3	Chloroethane	40U	79-00-5	1,1,2-Trichloroethane	20U
67-66-3	Chloroform	20U	79-01-6	Trichloroethene	20U
74-87-3	Chloromethane	40U	75-69-4	Trichlorofluoromethane	40U
124-48-1	Dibromochloromethane	20U	75-01-4	Vinyl Chloride	10U
106-46-7	1,4-Dichlorobenzene	20U	1330-20-7	m,p-Xylene	20U
95-50-1	1,2-Dichlorobenzene	20U	95-47-6	o-Xylene	20U
541-73-1	1,3-Dichlorobenzene	20U			
75-34-3	1,1-Dichloroethane	20U			
107-06-2	1,2-Dichloroethane	20U			
75-35-4	1,1-Dichloroethene	20U			
156-59-2	cis-1,2-Dichloroethene	20U			
156-60-5	trans-1,2-Dichloroethene	20U			

ANALYSIS DATA REPORT

AnaLIS ID:	950906-014	Customer Sample ID:	RFD21564
Laboratory:	Organic Analytical Services	Customer:	ENV RESTORATION
File ID:		Sample Matrix:	LIQUID WASTE
Instrument ID:		Requisition Number:	017717
Authorized By:	J. J. Williams	Date Sample Received:	5-SEP-1995
		Date Sampled:	31-AUG-1995

Solvents_F001

Date Extracted/Prepared:		Date Analyzed:	14-SEP-1995
Analysis Procedure Number:	TSD554-019	QA File Number:	9516091402
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	PJ WARD
Associated Blank:			

CAS		ug/g	CAS		ug/g
56-23-5	Carbon Tetrachloride	1000U			
75-09-2	Methylene Chloride	100U			
127-18-4	Tetrachloroethene	100U			
71-55-6	1,1,1-Trichloroethane	100U			
79-01-6	Trichloroethene	100U			

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950906-064 Project: P103 ACTA Customer Sample ID: RFD-926-23

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: AQUEOUS WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 6-SEP-1995
Date Sample Approved: 12-SEP-1995
[] : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Limit of Error	Units	Analyst	QA File Number	Date Completed
***** Radiochemistry Laboratory *****								
ACD-160063.R1	Total Activity (Screen)	1.09E2		+/- 7.6E0	dpm/ml	TL DANIELS	TAS-4935	6-SEP-1995

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-054 Project: P103 003 Customer Sample ID: RFO-926-23

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 22-SEP-1995
Date Sample Approved: 22-SEP-1995
□ : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Units	Analyst	QA File Number	Date Completed
***** Organic Sample Preparation Laboratory *****							
ACD-1320	Prep (BNA- Option)	C			JR HUSKEY	9986	14-SEP-1995
***** Spectrochemistry Laboratory *****							
EPA-7060	Arsenic	< 0.82	R	ug/g	CB HAMMONDS	50912A	13-SEP-1995
EPA-7421	Lead	< 0.65	R	ug/g	CB HAMMONDS	50912B	13-SEP-1995
EPA-7740	Selenium	< 0.82	R	ug/g	CB HAMMONDS	50912C	13-SEP-1995
Q Qual:(R) Result was Revised after Approval.							
***** Inductively Coupled Plasma Laboratory *****							
EPA-6010 ACD-096010	Barium	< 0.16		ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 ACD-096010	Cadmium	< 0.49		ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 ACD-096010	Chromium	< 1.6		ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 ACD-096010	Silver	< 0.98		ug/g	SA BURGESS	50914X	14-SEP-1995
***** Wet Instrumentation Laboratory *****							
EPA-1010	Flash Point Closed Cup	> 170		degrees F	CY CRANMORE	95-12	14-SEP-1995
***** Mercury Laboratory *****							
EPA-7470	Mercury	< 0.08		ug/gm	MW JOHNSON	50908M	13-SEP-1995

Prep (BNA- Option)

Analyst = JR HUSKEY
pH = 12
Date Extracted = 12-SEP-1995
Sample Volume Extracted (mL) = 100
Extraction Method = ACD-1311-Cont. Liq./Liq. Extractor
Extraction Solvent = Methylene Chloride
Extraction Cleanup = Sodium Sulfate
Final Volume of Extract (mL) = 1
Associated Blank = 950913-023

***** Comments from the Wet Instrumentation Laboratory *****

THIS SAMPLE BOILED OVER AT 170 DEGREES FAHRENHEIT. 9-14-95 CC

Date Printed: 22-SEP-1995 15:44:24

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

Analis ID: 950907-054 Project: P103 003 Customer Sample ID: RFD-926-23

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-054 Project: P103 003 Customer Sample ID: RFD-926-23

Laboratory: Organic Mass Spectroscopy Laboratory
File ID: 0916_10.D
Instrument ID: 5972-2
Authorized By: C MEEHAN

Customer: APPLEGATE
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 6-SEP-1995

BNA - Base/Neutral/Acid Compounds (TCLP)

Date Extracted/Prepared: 12-SEP-1995
Regulatory Procedure Number: EPA-8270
Percent Moisture:
Percent Moisture (decanted):
Associated Blank: 950913-023
[] : Result has been Corrected for Spike

Date Analyzed: 16-SEP-1995
ACD Procedure Number: ACD-240071
Dilution Factor: 1.0
Analyst: MF MCMYLER
QA File Number: MFM-5879

CAS	Analysis	ug/L	Q	Qual	CAS	Analysis	ug/L	Q	Qual
110-86-1	Pyridine	100		U					
106-46-7	1,4-Dichlorobenzene	100		U					
95-50-1	1,2-Dichlorobenzene	100		U					
95-48-7	2-Methylphenol	100		U					
106-44-5	4-Methylphenol	100	2	U					
[illegible]2-1	Hexachloroethane	100		U					
[illegible]-3	Nitrobenzene	100		U					
[illegible]-68-3	Hexachlorobutadiene	100		U					
88-06-2	2,4,6-Trichlorophenol	100		U					
95-95-4	2,4,5-Trichlorophenol	500		U					
121-14-2	2,4-Dinitrotoluene	100		U					
118-74-1	Hexachlorobenzene	100		U					
87-86-5	Pentachlorophenol	500		U					

Q Qual:(U) Compound was analyzed for but not detected.
(B) Analyte found in blank as well as sample.
(J) Indicates an estimated value.
(N) Presumptive evidence of a compound.
(A) TIC is a suspected aldol-condensation product.
(D) Compounds identified in an analysis at a secondary dilution factor.
(E) Concentrations exceed calibration range of the GC/MS instrum ent.
(Y) Undistinguisgable isomer components.
(2) Cannot be separated from 3-Methylphenol.

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-054 Project: P103 003 Customer Sample ID: RFD-926-23

BNA (TCLP) ORGANICS ANALYSIS DATA SHEETS
SURROGATE SPIKE RECOVERY

AnaLIS ID: 950907-054
Laboratory: Organic Mass Spectroscopy Laboratory
Sample Matrix: WASTE
Level: (low/med): LOW
Dilution Factor: 1.0
% Moisture: not dec. _____ dec. _____
Extraction: (SepF/Cont/Sonc) Llex
GPC Cleanup: (Y/N) N

Customer Sample ID: RFD-926-23
Customer: APPLEGATE
File ID: 0916 10.D
Date Received: 6-SEP-1995
Date Analyzed: 16-SEP-1995
Date Extracted: 12-SEP-1995
pH: 12

Surrogate Compound	SPIKE ADDED (ug/L)	RESULT (ug/L)	% REC #	QC LIMITS % REC
Nitrobenzene-d5	100.0	38.30	38.3	35 - 114
1,1'-Biphenyl, 2-Fluoro	100.0	43.76	43.8	43 - 116
Terphenyl-d14	100.0	41.03	41.0	33 - 141
Phenol-d6	200.0	139.23	69.6	10 - 94
2-Fluorophenol	200.0	123.30	61.7	21 - 100
2,4,6-Tribromophenol	200.0	167.05	83.5	10 - 123

Column to be used to flag recovery values with an asterisk
* Values outside of QC limits

Spike Recovery: 0 out of 6 outside limits

COMMENTS: _____

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 950906-017 Project: ER 9579C Customer Sample ID: RFD92623
Customer: ENV RESTORATION Requisition Number: 017720
Date Sampled: 31-AUG-1995 14:50 Date Sample Received: 5-SEP-1995
Sampled By: MB HAMEL Date Sample Completed: 19-SEP-1995
Material Description:

** No comments were made for this sample. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-9040A	pH	12.95		ph	BJ STANLEY	7-SEP-1995	95101246
TSD553-380	Technetium	<0.9		pCi/ml	JP BREWSTER	13-SEP-1995	95071343
TSD553-700	% U-235	1.7	0.50	%	CD GOOD	11-SEP-1995	95071327
	Uranium	29	5.7	ppm	CD GOOD	11-SEP-1995	95071327
TSD554-015	Sample Prep Solvents	COMPLETE			PJ WARD	14-SEP-1995	9516091402

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)
Date Approved: 19-SEP-1995

Definition Page for Qualifiers/Flags

950906-017

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

lation coefficient for MSA is less tha 0.995.

value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950906-017
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#3
Authorized By: J. J. Williams

Customer Sample ID: RFD92623
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 017720
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 12-SEP-1995
QA File Number: 95160912A3
Dilution Factor: 1.0
Analyst: MA NOVOTNY

CAS		ug/L	CAS		ug/L
67-64-1	Acetone	370	100-41-4	Ethyl benzene	2U
71-43-2	Benzene	2U	76-13-1	Freon 113	2U
75-27-4	Bromodichloromethane	2U	76-14-2	Freon 114	4U
75-25-2	Bromoform	2U	108-10-1	4-Methyl-2-pentanone	100U
74-83-9	Bromomethane	4U	75-09-2	Methylene Chloride	2U
78-93-3	2-Butanone	100U	79-34-5	1,1,2,2-Tetrachloroethane	2U
75-15-0	Carbon Disulfide	2U	127-18-4	Tetrachloroethene	2U
56-23-5	Carbon Tetrachloride	2U	108-88-3	Toluene	2U
108-90-7	Chlorobenzene	2U	71-55-6	1,1,1-Trichloroethane	2U
75-00-3	Chloroethane	4U	79-00-5	1,1,2-Trichloroethane	2U
67-66-3	Chloroform	2U	79-01-6	Trichloroethene	2U
74-87-3	Chloromethane	4U	75-69-4	Trichlorofluoromethane	4U
124-48-1	Dibromochloromethane	2U	75-01-4	Vinyl Chloride	1U
106-46-7	1,4-Dichlorobenzene	2U	1330-20-7	m,p-Xylene	2U
95-50-1	1,2-Dichlorobenzene	2U	95-47-6	o-Xylene	2U
541-73-1	1,3-Dichlorobenzene	2U			
75-34-3	1,1-Dichloroethane	2U			
107-06-2	1,2-Dichloroethane	2U			
75-35-4	1,1-Dichloroethene	2U			
156-59-2	cis-1,2-Dichloroethene	2U			
156-60-5	trans-1,2-Dichloroethene	2U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

VOC ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 950906-017
Laboratory: Organic Analytical Services
Sample Matrix: LIQUID WASTE
Level: (low/med): LOW
Dilution Factor: 1.0

Customer Sample ID: RFD92623
Customer: ENV RESTORATION
File ID:
Date Received: 5-SEP-1995
Date Analyzed: 12-SEP-1995
Concentration Units: ug/L

Number TICs found: 2

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.		2-heptanone	18.1	10	J
2.		2-ethyl-1-hexanone	21.1	100	J
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

ANALYSIS DATA REPORT

AnaLIS ID: 950906-017
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD92623
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 017720
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

Solvents_F001

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-019
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 14-SEP-1995
QA File Number: 9516091402
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
56-23-5	Carbon Tetrachloride	1000U			
75-09-2	Methylene Chloride	100U			
127-18-4	Tetrachloroethene	100U			
71-55-6	1,1,1-Trichloroethane	100U			
79-01-6	Trichloroethene	100U			

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950906-071 Project: P103 ACTA Customer Sample ID: RFD-926-8

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: AQUEOUS WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 7-SEP-1995
Date Sample Approved: 12-SEP-1995
[] : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Limit of Error	Units	Analyst	QA File Number	Date Completed
***** Radiochemistry Laboratory *****								
ACD-160063.R1	Total Activity (Screen)	2.44E2		+/- 1.1E1	dpm/ml	TL DANIELS	TAS-4935	7-SEP-1995

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-045 Project: P103 003 Customer Sample ID: RFD-926-B

Customer: APPLEGATE
Date Sampled: 31-AUG-1995
Sampled By: JD/WF
Material Description: WASTE
Program Manager: MH BARTLING (# 29893)

Requisition Number:
Date Sample Received: 6-SEP-1995
Date Sample Completed: 22-SEP-1995
Date Sample Approved: 22-SEP-1995
□ : Result has been Corrected for Spike

Procedure No.	Analysis	Result	Q Qual	Units	Analyst	QA File Number	Date Completed
***** Organic Sample Preparation Laboratory *****							
ACD-1320	Prep (BNA- Option)	C			JR HUSKEY	9986	14-SEP-1995
***** Spectrochemistry Laboratory *****							
EPA-7060	Arsenic	< 0.78	R	ug/g	CB HAMMONDS	50912A	13-SEP-1995
EPA-7421	Lead	0.78	R	ug/g	CB HAMMONDS	50912B	13-SEP-1995
EPA-7740	Selenium	< 0.78	R	ug/g	CB HAMMONDS	50912C	13-SEP-1995
Q Qual:(R) Result was Revised after Approval.							
***** Inductively Coupled Plasma Laboratory *****							
EPA-6010 ACD-096010	Barium	< 0.16		ug/g	SA BURGESS	50914X	14-SEP-1995
EPA-6010 010	Cadmium	< 0.47		ug/g	SA BURGESS	50914X	14-SEP-1995
E .0 ACD-096010	Chromium	2.8		ug/g	SA BURGESS	50914X	14-SEP-1
EPA-6010 ACD-096010	Silver	0.95		ug/g	SA BURGESS	50914X	14-SEP-1995
***** Wet Instrumentation Laboratory *****							
EPA-1010	Flash Point Closed Cup	> 170		degrees F	CY CRANMORE	95-12	14-SEP-1995
***** Mercury Laboratory *****							
EPA-7470	Mercury	< 0.08		ug/gm	MW JOHNSON	50908H	13-SEP-1995

Prep (BNA- Option)

Analyst = JR HUSKEY
pH = 13
Date Extracted = 12-SEP-1995
Sample Volume Extracted (mL) = 100
Extraction Method = ACD-1311-Cont. Liq./Liq. Extractor
Extraction Solvent = Methylene Chloride
Extraction Cleanup = Sodium Sulfate
Final Volume of Extract (mL) = 1
Associated Blank = 950913-023

***** Comments from the Wet Instrumentation Laboratory *****

THIS SAMPLE BOILED OVER AT 170 DEGREES FAHRENHEIT. 9-14-95 CC

Date Printed: 22-SEP-1995 15:30:13

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-045 Project: P103 003 Customer Sample ID: RFD-926-8

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-045 Project: P103 003 Customer Sample ID: RFD-926-8

Laboratory: Organic Mass Spectroscopy Laboratory
File ID: 0916_08.D
Instrument ID: 5972-2
Authorized By: C MEEHAN

Customer: APPLEGATE
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 6-SEP-1995

BNA - Base/Neutral/Acid Compounds (TCLP)

Date Extracted/Prepared: 12-SEP-1995
Regulatory Procedure Number: EPA-8270
Percent Moisture:
Percent Moisture (decanted):
Associated Blank: 950913-023

Date Analyzed: 16-SEP-1995
ACD Procedure Number: ACD-240071
Dilution Factor: 1.0
Analyst: MF MCMYLER
QA File Number: MFM-5879

□ : Result has been Corrected for Spike

CAS	Analysis	ug/L	Q Qual		CAS	Analysis	ug/L	Q Qual
110-86-1	Pyridine	100		U				
106-46-7	1,4-Dichlorobenzene	100		U				
95-50-1	1,2-Dichlorobenzene	100		U				
95-48-7	2-Methylphenol	100		U				
106-44-5	4-Methylphenol	100	2	U				
[illegible]-72-1	Hexachloroethane	100		U				
[illegible]5-3	Nitrobenzene	100		U				
[illegible]-68-3	Hexachlorobutadiene	100		U				
88-06-2	2,4,6-Trichlorophenol	100		U				
95-95-4	2,4,5-Trichlorophenol	500		U				
121-14-2	2,4-Dinitrotoluene	100		U				
118-74-1	Hexachlorobenzene	100		U				
87-86-5	Pentachlorophenol	500		U				

Q Qual:(U) Compound was analyzed for but not detected.
(B) Analyte found in blank as well as sample.
(J) Indicates an estimated value.
(N) Presumptive evidence of a compound.
(A) TIC is a suspected aldol-condensation product.
(D) Compounds identified in an analysis at a secondary dilution factor.
(E) Concentrations exceed calibration range of the GC/MS instrum ent.
(Y) Undistinguisgable isomer components.
(2) Cannot be separated from 3-Methylphenol.

Analytical Services Organization @ K-25 Site
Oak Ridge, TN 37831
Sample Analyses Results

AnaLIS ID: 950907-045 Project: P103 003 Customer Sample ID: RFD-926-8

BNA (TCLP) ORGANICS ANALYSIS DATA SHEETS
SURROGATE SPIKE RECOVERY

AnaLIS ID: 950907-045
Laboratory: Organic Mass Spectroscopy Laboratory
Sample Matrix: WASTE
Level: (low/med): LOW
Dilution Factor: 1.0
% Moisture: not dec. _____ dec. _____
Extraction: (SepF/Cont/Sonc) Llex
GPC Cleanup: (Y/N) N

Customer Sample ID: RFD-926-8
Customer: APPLEGATE
File ID: 0916 08.D
Date Received: 6-SEP-1995
Date Analyzed: 16-SEP-1995
Date Extracted: 12-SEP-1995
pH: 13

Surrogate Compound	SPIKE ADDED (ug/L)	RESULT (ug/L)	% REC #	QC LIMITS % REC
Nitrobenzene-d5	100.0	60.01	60.0	35 - 114
1,1'-Biphenyl, 2-Fluoro	100.0	66.66	66.7	43 - 116
Terphenyl-d14	100.0	65.68	65.7	33 - 141
Phenol-d6	200.0	133.05	66.5	10 - 94
2-Fluorophenol	200.0	109.99	55.0	21 - 100
2,4,6-Tribromophenol	200.0	162.70	81.3	10 - 123

Column to be used to flag recovery values with an asterisk
* Values outside of QC limits

Spike Recovery: 0 out of 6 outside limits

COMMENTS: _____

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 950906-008 Project: ER 9579C Customer Sample ID: RFD9268
Customer: ENV RESTORATION Requisition Number: 017716
Date Sampled: 31-AUG-1995 14:10 Date Sample Received: 5-SEP-1995
Sampled By: MB HAMEL Date Sample Completed: 18-SEP-1995
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-9040A	pH	12.49		pH	BJ STANLEY	8-SEP-1995	95101252
TSD553-380	Technetium	7.6		pCi/ml	JP BREWSTER	13-SEP-1995	95071340
TSD553-700	% U-235	5.9	1.6	%	CD GOOD	11-SEP-1995	95071327
	Uranium	25	4.5	ppm	CD GOOD	11-SEP-1995	95071327
TSD554-015	Sample Prep Solvents	COMPLETE			PJ WARD	14-SEP-1995	9516091402

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
J. J. Williams (Organic Analytical Services)
Date Approved: 19-SEP-1995

********** COMMENT PAGE **********
********** 950906-008 **********

Comments from the Organic Analytical Services *****

SW846-8260

Sample was found to be unpreserved (pH=13)
Due to bsaic pH of sample, when the sample was spiked, the 1,1,2,2-Tetrachloroethane reacted (dehydrohalogenation) and was recovered as trichloroethene, which is a MS/MSD compound. Although the recovery of trichloroethene was high, it still met method criteria.

Definition Page for Qualifiers/Flags

950906-008

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - lation coefficient for MSA is less tha 0.995.

\# - value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 950906-008
Laboratory: Organic Analytical Services
File ID:
Instrument ID: 5890#3
Authorized By: J. J. Williams

Customer Sample ID: RFD9268
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 017716
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

VOC

Date Extracted/Prepared:
Analysis Procedure Number: SW846-8260
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 12-SEP-1995
QA File Number: 95160912A3
Dilution Factor: 1.0
Analyst: MA NOVOTNY

CAS		ug/L	CAS		ug/L
67-64-1	Acetone	770	100-41-4	Ethyl benzene	2U
71-43-2	Benzene	2U	76-13-1	Freon 113	2U
75-27-4	Bromodichloromethane	2U	76-14-2	Freon 114	4U
75-25-2	Bromoform	2U	108-10-1	4-Methyl-2-pentanone	100U
74-83-9	Bromomethane	4U	75-09-2	Methylene Chloride	6
78-93-3	2-Butanone	100U	79-34-5	1,1,2,2-Tetrachloroethane	2JU
75-15-0	Carbon Disulfide	2U	127-18-4	Tetrachloroethene	2U
56-23-5	Carbon Tetrachloride	2U	108-88-3	Toluene	2U
108-90-7	Chlorobenzene	2U	71-55-6	1,1,1-Trichloroethane	24
75-00-3	Chloroethane	4U	79-00-5	1,1,2-Trichloroethane	2U
67-66-3	Chloroform	2U	79-01-6	Trichloroethene	2U
74-87-3	Chloromethane	4U	75-69-4	Trichlorofluoromethane	4U
124-48-1	Dibromochloromethane	2U	75-01-4	Vinyl Chloride	1U
106-46-7	1,4-Dichlorobenzene	2U	1330-20-7	m,p-Xylene	2U
95-50-1	1,2-Dichlorobenzene	2U	95-47-6	o-Xylene	2U
541-73-1	1,3-Dichlorobenzene	2U			
75-34-3	1,1-Dichloroethane	2U			
107-06-2	1,2-Dichloroethane	2U			
75-35-4	1,1-Dichloroethene	4			
156-59-2	cis-1,2-Dichloroethene	2U			
156-60-5	trans-1,2-Dichloroethene	2U			

Portsmouth Gaseous Diffusion Plant
Analytical Chemistry Department

VOC ORGANICS ANALYSIS DATA SHEETS
TENTATIVELY IDENTIFIED COMPOUNDS

AnaLIS ID: 950906-008
Laboratory: Organic Analytical Services
Sample Matrix: LIQUID WASTE
Level: (low/med): LOW
Dilution Factor: 1.0

Customer Sample ID: RFD9268
Customer: ENV RESTORATION
File ID:
Date Received: 5-SEP-1995
Date Analyzed: 12-SEP-1995
Concentration Units: ug/L

Number TICs found: 3

	CAS NUMBER	COMPOUND NAME	RT (mins)	EST. CONC.	Q
1.		2-methyl-butanal	3.5	10	J
2.		3,3-dimethyl-2-butanone	13.2	10	J
3.	104-76-7	2-Ethyl-1-hexanol	21.1	90	J
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
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23.					
24.					
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26.					
27.					
28.					
29.					
30.					

ANALYSIS DATA REPORT

AnaLIS ID: 950906-008
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: J. J. Williams

Customer Sample ID: RFD9268
Customer: ENV RESTORATION
Sample Matrix: LIQUID WASTE
Requisition Number: 017716
Date Sample Received: 5-SEP-1995
Date Sampled: 31-AUG-1995

Solvents_F001

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-019
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 14-SEP-1995
QA File Number: 9516091402
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
56-23-5	Carbon Tetrachloride	1000U			
75-09-2	Methylene Chloride	100U			
127-18-4	Tetrachloroethene	100U			
71-55-6	1,1,1-Trichloroethane	100U			
79-01-6	Trichloroethene	100U			

Waste Stream Number: 705-2

Waste Stream Title: Heavy Metal Sludge

EcoTek LSI
Tek Laboratory Services Incorporated

Herbicide TCLP Analytical Results

40 CFR 261, June 29, 1990

Client: GeoCon, Inc.
Client Sample ID: 24009
Lab Sample ID: 3234403
Client Project Code: X231B
Matrix: Leachate
Date of Extraction: 7/18/94

CAS Number	Compound	Dilution	Date of Analysis	Result mg/l	PQL mg/l	MCL mg/l	Note
95757	2,4-D	1	7/21/94	BQL	0.0100	10.0	
93721	2,4,5-TP (Silvex)	1	7/21/94	BQL	0.00200	1.00	

PQL = Practical Quantitation Limit
BQL = Below Quantitation Limit
MCL = Maximum Contaminant Level

EcoTek LSI
k Laboratory Services Incorporated

Volatile TCLP Analytical Results
SW-846 Method 8240

Client: Geocon, Inc.
Lab Sample ID: 3234403
Matrix: Leachate

Client Sample No.: 24009
Client Reference No.: X231B
Date Received: 12-Jul-94
Date Leached: 13-Jul-94

CAS Number	Compound Name	Analysis Date	Dilution Factor	Result mg/L	MCL mg/L	PQL mg/L	Note
71432	Benzene	7/18/94	10	BQL	0.5	0.050	
56235	Carbon Tetrachloride	7/18/94	10	BQL	0.5	0.050	
108907	Chlorobenzene	7/18/94	10	BQL	100.0	0.050	
67663	Chloroform	7/18/94	10	BQL	6.0	0.050	
107062	1,2-Dichloroethane	7/18/94	10	BQL	0.5	0.050	
75354	1,1-Dichloroethene	7/18/94	10	BQL	0.7	0.050	
78933	Methyl ethyl ketone	7/18/94	10	BQL	200.0	1.000	
127184	Tetrachloroethene	7/18/94	10	BQL	0.7	0.050	
79016	Trichloroethene	7/18/94	10	BQL	0.5	0.050	
75014	Vinyl Chloride	7/18/94	10	BQL	0.2	0.100	

MCL = Maximum Contaminant Level

PQL = Practical Quantitation Limit

BQL = Below Quantitation Limit

EcoTek LSI
Laboratory Services Incorporated

Trace Metals Analytical Results - TCLP
Method SW-846

Client: GeoCon, Inc.
Client Reference No.: X231B
Client Sample No.: 24009
Date Collected: 7/8/94

Lab Sample ID: 3234403
Date Received: 7/12/94
Date Extracted: 7/13/94
Matrix: TCLP Extract

Analyte	Date Analyzed	Date Digested	Dilution Factor	Maximum Concentration Limit mg/L	Sample Result mg/L	Reporting Limit mg/L	Note
Arsenic	7/27/94	7/25/94	1	5.0	0.17	0.10	
Barium	7/27/94	7/25/94	1	100	<5.0	5.0	
Cadmium	7/27/94	7/25/94	1	1.0	<0.010	0.010	
Chromium	7/27/94	7/25/94	1	5.0	0.16	0.050	
Lead	7/27/94	7/25/94	1	5.0	0.089	0.050	
Mercury	7/20/94	7/20/94	5	0.20	<0.0050	0.0050	
Selenium	7/27/94	7/25/94	1	1.0	0.11	0.10	
Silver	7/27/94	7/25/94	1	5.0	<0.050	0.050	

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 971218-106 Project: ER 9668E Customer Sample ID: VER42633001
Customer: ENV RESTORATION Requisition Number: 54633
Date Sampled: 18-DEC-1997 09:45 Date Sample Received: 18-DEC-1997
Sampled By: B PYLES Date Sample Completed: 22-JAN-1998
Material Description: HEAVY METAL SLUDGE

** See comment page for comments. **

** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-3050A	Sample Prep Metals	COMPLETE			ML STEWART	30-DEC-1997	123097-071
SW846-3540B	Sample Prep Semi-Volatiles	COMPLETE			DK SCAGGS	31-DEC-1997	97160348
SW846-6010A	Aluminum	14800BJ		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Antimony	16.7U		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Arsenic	22.5UN		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Barium	7.2B		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Beryllium	1.1U		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Cadmium	7.6B		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Calcium	1100B		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Chromium	425B		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Cobalt	16.2B		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Copper	748O		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Iron	26800B		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Lead	614		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Magnesium	537B		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Manganese	696B		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Molybdenum	19.4B		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Nickel	348O		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Potassium	437B		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Selenium	34.5U		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Silver	7.7B		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Sodium	70300		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Thallium	23.4U		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Vanadium	22.6B		mg/kg	EL SIMPSON	30-DEC-1997	98080013
	Zinc	2630		mg/kg	EL SIMPSON	30-DEC-1997	98080013
TSD553-280	Gross Alpha	819		pCi/g	JP BREWSTER	15-JAN-1998	98070063
	Gross Beta	3719		pCi/g	JP BREWSTER	15-JAN-1998	98070063
TSD553-385	Technetium	3254		pCi/g	CD GOOD	15-JAN-1998	98070064
TSD553-440	Gross Gamma	COMMENT		pCi/g	WC ZUEFLE	17-JAN-1998	98070069
TSD553-710	% U-235	4.0	0.83	% U-235	CD GOOD	13-JAN-1998	98070040
	Uranium	118	14	ug/g	CD GOOD	13-JAN-1998	98070040

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
Ar[illegible]n	48.08	45.7	95.05
Ar[illegible]c	48.08	35.0	72.80
Ba[illegible]m	48.08	41.9	87.15
Beryllium	48.08	43.2	89.85
Cadmium	48.08	51.1	106.28
Cobalt	48.08	46.6	96.92
Molybdenum	48.08	44.2	91.93
Potassium	480.8	584.9	121.65
Selenium	48.08	56.6	117.72
Silver	48.08	39.4	81.95
Thallium	48.08	57.5	119.59
Vanadium	48.08	42.2	87.77

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
C. J. Van Meter (Organic Analytical Services)
Date Approved: 22-JAN-1998

********** COMMENT PAGE **********
********** 971218-106 **********

Comments from the Organic Analytical Services *****

Method SW846 8260A

Bromomethane did not pass the continuing calibration and the value is estimated.

Method SW846-8270B

4-Nitrophenol was not recovered in MS and MSD extracts for this sample and is not reported 'NR'. 4-Chloro-3-methylphenol had recoveries just below the acceptance criteria as well as established limits in the MS and MSD extracts and is reported as an estimate, "J'.

There were 3 compounds that exceeded the 15% RSD criteria for the initial calibration and are qualified as estimated values, 'J'. These compounds were:) 2,4-dinitrophenol(32%),4-nitrophenol(16%), 4,6-dinitro-2-methylphenol(21%). However, as mentioned in the above paragraph, 4-nitrophenol was not reported.

***** Comments from the Spectrochemistry/ICP Laboratory *****

SW846-6010A Al qualified as estimate due to possible contamination.

***** Comments from the Radiochemistry Laboratory *****

Th e was not on the chain of custody sheet. If information concerning the gamma scan is needed please call B. W. Short at ext.3857

Definition Page for Qualifiers/Flags

********** 971218-106 **********

Ir ı. ca Reporting Qualifiers and Flags:

oncentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

relation coefficient for MSA is less tha 0.995.

value is between the LC and the LLD.

cering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID:	971218-106	Customer Sample ID:	VER42633001
Laboratory:	Organic Analytical Services	Customer:	ENV RESTORATION
File ID:		Sample Matrix:	SOLID WASTE
Instrument ID:	5890-3	Requisition Number:	54633
Authorized By:	C. J. Van Meter	Date Sample Received:	18-DEC-1997
		Date Sampled:	18-DEC-1997

VOC

Date Extracted/Prepared:		Date Analyzed:	24-DEC-1997
Analysis Procedure Number:	SW846-8260A	QA File Number:	97161224A3
Percent Moisture:		Dilution Factor:	10
Percent Moisture (decanted):		Analyst:	JN STRICKLAND
Associated Blank:			

CAS		ug/Kg	CAS		ug/Kg
67-64-1	Acetone	500U	100-41-4	Ethyl benzene	20U
71-43-2	Benzene	20U	76-13-1	Freon 113	20U
75-27-4	Bromodichloromethane	20U	76-14-2	Freon 114	40U
75-25-2	Bromoform	20U	108-10-1	4-Methyl-2-pentanone	500U
74-83-9	Bromomethane	40UJ	75-09-2	Methylene Chloride	20U
78-93-3	2-Butanone	500U	79-34-5	1,1,2,2-Tetrachloroethane	20U
75-15-0	Carbon Disulfide	20U	127-18-4	Tetrachloroethene	20U
56-23-5	Carbon Tetrachloride	20U	108-88-3	Toluene	20U
108-90-7	Chlorobenzene	20U	71-55-6	1,1,1-Trichloroethane	20U
75-00-3	Chloroethane	40U	79-00-5	1,1,2-Trichloroethane	20U
67-66-3	Chloroform	20U	79-01-6	Trichloroethene	20U
74-87-3	Chloromethane	40U	75-69-4	Trichlorofluoromethane	40U
124-48-1	Dibromochloromethane	20U	75-01-4	Vinyl Chloride	10U
106-46-7	1,4-Dichlorobenzene	20U	1330-20-7	m,p-Xylene	20U
95-50-1	1,2-Dichlorobenzene	20U	95-47-6	o-Xylene	20U
541-73-1	1,3-Dichlorobenzene	20U			
75-34-3	1,1-Dichloroethane	20U			
107-06-2	1,2-Dichloroethane	20U			
75-35-4	1,1-Dichloroethene	20U			
156-59-2	cis-1,2-Dichloroethene	20U			
156-60-5	trans-1,2-Dichloroethene	20U			

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID: 971218-106
Laboratory: Organic Analytical Services
File ID:
Instrument ID: SV2
Authorized By: C. J. Van Meter

Customer Sample ID: VER42633001
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 54633
Date Sample Received: 18-DEC-1997
Date Sampled: 18-DEC-1997

Semi-Volatiles

Date Extracted/Prepared: 30-DEC-1997
Analysis Procedure Number: SW846-8270B
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 6-JAN-1998
QA File Number: 98160107B02
Dilution Factor: 1.0
Analyst: RJ WAWRO

CAS		ug/Kg	CAS		ug/Kg
59-50-7	4-Chloro-3-methylphenol	1000UJ	606-20-2	2,6-Dinitrotoluene	500U
95-57-8	2-Chlorophenol	500U	78-59-1	Isophorone	500U
120-83-2	2,4-Dichlorophenol	500U	98-95-3	Nitrobenzene	500U
105-67-9	2,4-Dimethylphenol	500U	83-32-9	Acenaphthene	500U
51-28-5	2,4-Dinitrophenol	2500UJ	208-96-8	Acenaphthylene	500U
534-52-1	4,6-Dinitro-2-methylphenol	2500UJ	120-12-7	Anthracene	500U
88-75-5	2-Nitrophenol	500U	56-55-3	Benzo(a)anthracene	500U
100-02-7	4-Nitrophenol	NR	50-32-8	Benzo(a)pyrene	500U
87-86-5	Pentachlorophenol	2500U	191-24-2	Benzo(g,h,i)perylene	500U
108-95-2	Phenol	920	207-08-9	Benzo(k)fluoranthene	500U
88-06-2	2,4,6-Trichlorophenol	500U	218-01-9	Chrysene	500U
117-81-7	bis(2-Ethylhexyl)phthalate	500U	53-70-3	Dibenz(a,h)anthracene	500U
85-68-7	Butylbenzylphthalate	500U	206-44-0	Fluoranthene	500U
84-74-2	Di-n-butylphthalate	6400	86-73-7	Fluorene	500U
84-66-2	Diethylphthalate	500U	193-39-5	Indeno(1,2,3-cd)pyrene	500U
131-11-3	Dimethylphthalate	500U	91-20-3	Naphthalene	500U
117-84-0	di-n-Octylphthalate	500U	85-01-8	Phenanthrene	500U
62-75-9	N-Nitrosodimethylamine	500U	129-00-0	Pyrene	500U
86-30-6	N-Nitrosodiphenylamine	500U	111-44-4	bis(2-Chloroethyl)ether	500U
621-64-7	N-Nitroso-di-n-propylamine	500U	111-91-1	bis(2-Chloroethoxy)methane	500U
121-14-2	2,4-Dinitrotoluene	500U	39638-32-9	bis(2-Chloroisopropyl)ether	500U

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID:	971218-106	Customer Sample ID:	VER42633001
Laboratory:	Organic Analytical Services	Customer:	ENV RESTORATION
File ID:		Sample Matrix:	SOLID WASTE
Instrument ID:	SV2	Requisition Number:	54633
Authorized By:	C. J. Van Meter	Date Sample Received:	18-DEC-1997
		Date Sampled:	18-DEC-1997

Semi-Volatiles

Date Extracted/Prepared:	30-DEC-1997	Date Analyzed:	6-JAN-1998
Analysis Procedure Number:	SW846-8270B	QA File Number:	98160107B02
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	RJ WAWRO
Associated Blank:			

CAS		ug/Kg	CAS		ug/Kg
101-55-3	4-Bromophenyl-phenylether	500U			
7005-72-3	4-Chlorophenyl-phenylether	500U			
91-58-7	2-Chloronaphthalene	500U			
95-50-1	1,2-Dichlorobenzene	500U			
541-73-1	1,3-Dichlorobenzene	500U			
106-46-7	1,4-Dichlorobenzene	500U			
118-74-1	Hexachlorobenzene	500U			
87-68-3	Hexachlorobutadiene	500U			
77-47-4	Hexachlorocyclopentadiene	500U			
67-72-1	Hexachloroethane	500U			
120-82-1	1,2,4-Trichlorobenzene	500U			
110-86-1	Pyridine	500U			
	2-Methylphenol (o-Cresol)	500U			
	3,4-Methylphenol (m,p-Cresol)	500U			
95-95-4	2,4,5-Trichlorophenol	500U			
103-33-3	Azobenzene	500U			
205-99-2	Benzo(b)fluoranthene	500U			

Waste Stream Number: 705-3

Waste Stream Title: Microfiltration Sludge and Filters

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 970407-055 Project: ER 9668E Requisition Number: 52361
Customer Sample ID: RFD34868W Customer: ENV RESTORATION
Date Sampled: 3-APR-1997 13:35 Date Sample Received: 7-APR-1997
Sampled By: BP Date Sample Completed:
Material Description: microsludge

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311/3010A	Sample Prep TCLP Metals	COMPLETE			MR KELLEY	2-MAY-1997	050297-008
SW846-1311	TCLP Extraction	COMPLETE			MR KELLEY	25-APR-1997	97170036
TSD553-385	Technetium	4288		pCi/g	JP BREWSTER	20-APR-1997	97070559
TSD553-710	% U-235	11	2.4	%	CD GOOD	8-APR-1997	97070498
	Uranium	2535	343	ug/g	CD GOOD	8-APR-1997	97070498

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
C. J. Van Meter (TCLP Laboratory)
Date Approved: 7-MAY-1997

********** COMMENT PAGE **********
********** 970407-055 **********

***** Comments from the TCLP Laboratory *****

Method

A below-range ambient air temperature excursion occurred for 12 hours during agitation. The minimum temperature was 20.1 degrees C (0.9 degrees C outside the required 23 + or - 2 degrees C range).

Definition Page for Qualifiers/Flags

********** 970407-055 **********

I an ata Reporting Qualifiers and Flags:

o: ation Qualifiers:

. reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

T - Indicates an estimated value.

detected.

reported.

analyzed.

.. - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID:	970407-055	Customer Sample ID:	RFD34868W
Laboratory:	TCLP Laboratory	Customer:	ENV RESTORATION
File ID:	97170036	Sample Matrix:	SOLID WASTE
Instrument ID:		Requisition Number:	52361
Authorized By:	C. J. Van Meter	Date Sample Received:	7-APR-1997
		Date Sampled:	3-APR-1997

TCLP_METALS_ICP_RPT

Date Extracted/Prepared:	25-APR-1997	Date Analyzed:	2-MAY-1997
Analysis Procedure Number:	1311/6010A	QA File Number:	97080297
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	MR KELLEY
Associated Blank:			

CAS		mg/L	CAS		mg/L
7440-38-2	Arsenic	0.023U			
7440-39-3	Barium	0.369			
7440-43-9	Cadmium	0.397			
7440-47-3	Chromium	0.003U			
7439-92-1	Lead	0.018U			
7782-49-2	Selenium	0.036U			
7440-22-4	Silver	0.064B			

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID:	970407-055	Customer Sample ID:	RFD34868W
Laboratory:	TCLP Laboratory	Customer:	ENV RESTORATION
File ID:	97170036	Sample Matrix:	SOLID WASTE
Instrument ID:		Requisition Number:	52361
Authorized By:	C. J. Van Meter	Date Sample Received:	7-APR-1997
		Date Sampled:	3-APR-1997

TCLP_HG_RPT

Date Extracted/Prepared:	25-APR-1997	Date Analyzed:	30-APR-1997
Analysis Procedure Number:	1311/7470	QA File Number:	97080281
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	MR KELLEY
Associated Blank:			

CAS		mg/L	CAS		mg/L
7439-97-6	Mercury	0.010U			

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 970407-053 Project: ER 9668E Requisition Number: 52361
Customer Sample ID: RFD35938W Customer: ENV RESTORATION
Date Sampled: 3-APR-1997 13:25 Date Sample Received: 7-APR-1997
Sampled By: BP Date Sample Completed:
Material Description: microsludge

** No comments were made for this sample. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311/3010A	Sample Prep TCLP Metals	COMPLETE			MR KELLEY	2-MAY-1997	050297-008
SW846-1311	TCLP Extraction	COMPLETE			MR KELLEY	24-APR-1997	97170036
TSD553-385	Technetium	3525		pCi/g	JP BREWSTER	20-APR-1997	97070559
TSD553-710	% U-235	6.8	1.4	%	CD GOOD	8-APR-1997	97070498
	Uranium	2636	340	ug/g	CD GOOD	8-APR-1997	97070498

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
C. J. Van Meter (TCLP Laboratory)
Date Approved: 7-MAY-1997

Definition Page for Qualifiers/Flags

********** 970407-053 **********

ata Reporting Qualifiers and Flags:

ration Qualifiers:

ne reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

- ndicates an estimated value.

detected.

reported.

- Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT
** See comment page for comments. **

AnaLIS ID: 970407-053
Laboratory: TCLP Laboratory
File ID: 97170036
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: RFD35938W
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 52361
Date Sample Received: 7-APR-1997
Date Sampled: 3-APR-1997

TCLP_METALS_ICP_RPT

Date Extracted/Prepared: 24-APR-1997
Analysis Procedure Number: 1311/6010A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 2-MAY-1997
QA File Number: 97080297
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L
7440-38-2	Arsenic	0.023U
7440-39-3	Barium	0.266
7440-43-9	Cadmium	0.002U
7440-47-3	Chromium	0.003U
7439-92-1	Lead	0.018U
7782-49-2	Selenium	0.036U
7440-22-4	Silver	0.066B

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID: 970407-053
Laboratory: TCLP Laboratory
File ID: 97170036
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: RFD35938W
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 52361
Date Sample Received: 7-APR-1997
Date Sampled: 3-APR-1997

TCLP_HG_RPT

Date Extracted/Prepared: 24-APR-1997
Analysis Procedure Number: 1311/7470
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 30-APR-1997
QA File Number: 97080281
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
7439-97-6	Mercury	0.010U			

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 970407-059 Project: ER 9668E Requisition Number: 52360
Customer Sample ID: RFD34871W Customer: ENV RESTORATION
Date Sampled: 3-APR-1997 13:15 Date Sample Received: 7-APR-1997
Sampled By: BP Date Sample Completed: 7-MAY-1997
Material Description: microsludge

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311/3010A	Sample Prep TCLP Metals	COMPLETE			MR KELLEY	2-MAY-1997	050297-008
SW846-1311	TCLP Extraction	COMPLETE			MR KELLEY	29-APR-1997	97170036
TSD553-385	Technetium	6303		pCi/g	JP BREWSTER	20-APR-1997	97070560
TSD553-710	% U-235	8.8	1.9	%	CD GOOD	8-APR-1997	97070498
	Uranium	3767	498	ug/g	CD GOOD	8-APR-1997	97070498

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
C. J. Van Meter (TCLP Laboratory)
Date Approved: 7-MAY-1997

********** COMMENT PAGE **********
********** 970407-059 **********

***** Comments from the TCLP Laboratory *****

d

A below-range ambient air temperature excursion occurred for 16.5 hours during agitation. The minimum temperature was 19.5 degrees C (1.5 degrees C outside the required 23 + or - 2 degrees C range).

Definition Page for Qualifiers/Flags

********** 970407-059 **********

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but gre than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

) - detected.

NR - reported.

NA - ot analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID: 970407-059
Laboratory: TCLP Laboratory
File ID: 97170036
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: RFD34871W
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 52360
Date Sample Received: 7-APR-1997
Date Sampled: 3-APR-1997

TCLP_METALS_ICP_RPT

Date Extracted/Prepared: 29-APR-1997
Analysis Procedure Number: 1311/6010A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 2-MAY-1997
QA File Number: 97080297
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
7440-38-2	Arsenic	0.023U			
7440-39-3	Barium	0.155			
7440-43-9	Cadmium	0.002U			
7440-47-3	Chromium	0.003U			
7439-92-1	Lead	0.018U			
7782-49-2	Selenium	0.036U			
7440-22-4	Silver	0.024B			

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID:	970407-059	Customer Sample ID:	RFD34871W
Laboratory:	TCLP Laboratory	Customer:	ENV RESTORATION
File ID:	97170036	Sample Matrix:	SOLID WASTE
Instrument ID:		Requisition Number:	52360
Authorized By:	C. J. Van Meter	Date Sample Received:	7-APR-1997
		Date Sampled:	3-APR-1997

TCLP_HG_RPT

Date Extracted/Prepared:	29-APR-1997	Date Analyzed:	5-MAY-1997
Analysis Procedure Number:	1311/7470	QA File Number:	97080295
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	MR KELLEY
Associated Blank:			

CAS		mg/L	CAS		mg/L
7439-97-6	Mercury	0.010U			

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 970407-057 Project: ER 9668E Requisition Number: 52360
Customer Sample ID: RFD35930W Customer: ENV RESTORATION
Date Sampled: 3-APR-1997 13:05 Date Sample Received: 7-APR-1997
Sampled By: BP Date Sample Completed: 7-MAY-1997
Material Description: microsludge

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311/3010A	Sample Prep TCLP Metals	COMPLETE			MR KELLEY	2-MAY-1997	050297-008
SW846-1311	TCLP Extraction	COMPLETE			MR KELLEY	29-APR-1997	97170036
TSD553-385	Technetium	2741		pCi/g	JP BREWSTER	20-APR-1997	97070560
TSD553-710	% U-235	7.1		%	CD GOOD	8-APR-1997	97070498
	Uranium	2114	270	ug/g	CD GOOD	8-APR-1997	97070498

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
C. J. Van Meter (TCLP Laboratory)
Date Approved: 7-MAY-1997

********** COMMENT PAGE **********
********** 970407-057 **********

***** Comments from the TCLP Laboratory *****

A low-range ambient air temperature excursion occurred for 12 hours during agitation. The minimum temperature was 19.5 degrees C (1.5 degrees C outside the required 23 + or - 2 degrees C range).

Definition Page for Qualifiers/Flags
970407-057

****

ga ata Reporting Qualifiers and Flags:

Co ration Qualifiers:

. ie reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

T - Indicates an estimated value.

detected.

reported.

- ot analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT
** See comment page for comments. **

AnaLIS ID: 970407-057
Laboratory: TCLP Laboratory
File ID: 97170036
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: RFD35930W
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 52360
Date Sample Received: 7-APR-1997
Date Sampled: 3-APR-1997

TCLP_METALS_ICP_RPT

Date Extracted/Prepared: 29-APR-1997
Analysis Procedure Number: 1311/6010A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 2-MAY-1997
QA File Number: 97080297
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
7440-38-2	Arsenic	0.023U			
7440-39-3	Barium	0.079			
7440-43-9	Cadmium	0.074			
7440-47-3	Chromium	0.003U			
7439-92-1	Lead	0.025B			
7782-49-2	Selenium	0.036U			
7440-22-4	Silver	0.080B			

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID:	970407-057	Customer Sample ID:	RFD35930W
Laboratory:	TCLP Laboratory	Customer:	ENV RESTORATION
File ID:	97170036	Sample Matrix:	SOLID WASTE
Instrument ID:		Requisition Number:	52360
Authorized By:	C. J. Van Meter	Date Sample Received:	7-APR-1997
		Date Sampled:	3-APR-1997

TCLP_HG_RPT

Date Extracted/Prepared:	29-APR-1997	Date Analyzed:	5-MAY-1997
Analysis Procedure Number:	1311/7470	QA File Number:	97080295
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	MR KELLEY
Associated Blank:			

CAS		mg/L	CAS		mg/L
7439-97-6	Mercury	0.010U			

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 970407-058 Project: ER 9668E Requisition Number: 52360
Customer Sample ID: RFD35934W Customer: ENV RESTORATION
Date Sampled: 3-APR-1997 13:10 Date Sample Received: 7-APR-1997
Sampled By: BP Date Sample Completed: 7-MAY-1997
Material Description: microsludge

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311/3010A	Sample Prep TCLP Metals	COMPLETE			MR KELLEY	2-MAY-1997	050297-008
SW846-1311	TCLP Extraction	COMPLETE			MR KELLEY	29-APR-1997	97170036
TSD553-385	Technetium	8986		pCi/g	JP BREWSTER	20-APR-1997	97070560
TSD553-710	% U-235	7.5		%	CD GOOD	8-APR-1997	97070498
	Uranium	4853	612	ug/g	CD GOOD	8-APR-1997	97070498

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
C. J. Van Meter (TCLP Laboratory)
Date Approved: 7-MAY-1997

********** COMMENT PAGE **********
********** 970407-058 **********

***** Comments from the TCLP Laboratory *****

d [illegible]

A below-range ambient air temperature excursion occurred for 16.5 hours during agitation. The minimum temperature was 19.5 degrees C (1.5 degrees C outside the required 23 + or - 2 degrees C range).

Definition Page for Qualifiers/Flags

********** 970407-058 **********

g Data Reporting Qualifiers and Flags:

C ration Qualifiers:

B .he reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but gr than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

? detected.

NR . reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID: 970407-058
Laboratory: TCLP Laboratory
File ID: 97170036
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: RFD35934W
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 52360
Date Sample Received: 7-APR-1997
Date Sampled: 3-APR-1997

TCLP_METALS_ICP_RPT

Date Extracted/Prepared: 29-APR-1997
Analysis Procedure Number: 1311/6010A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 2-MAY-1997
QA File Number: 97080297
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
7440-38-2	Arsenic	0.023U			
7440-39-3	Barium	0.064			
7440-43-9	Cadmium	0.002U			
7440-47-3	Chromium	0.003U			
7439-92-1	Lead	0.025B			
7782-49-2	Selenium	0.036U			
7440-22-4	Silver	0.042B			

ANALYSIS DATA REPORT
** See comment page for comments. **

AnaLIS ID: 970407-058
Laboratory: TCLP Laboratory
File ID: 97170036
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: RFD35934W
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 52360
Date Sample Received: 7-APR-1997
Date Sampled: 3-APR-1997

TCLP_HG_RPT

Date Extracted/Prepared: 29-APR-1997
Analysis Procedure Number: 1311/7470
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 5-MAY-1997
QA File Number: 97080295
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
7439-97-6	Mercury	0.010U			

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 970407-054 Project: ER 9668E Requisition Number: 52361
Customer Sample ID: RFD3593SW Customer: ENV RESTORATION
Date Sampled: 3-APR-1997 13:30 Date Sample Received: 7-APR-1997
Sampled By: BP Date Sample Completed:
Material Description: microsludge
** No comments were made for this sample. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311/3010A	Sample Prep TCLP Metals	COMPLETE			MR KELLEY	2-MAY-1997	050297-008
SW846-1311	TCLP Extraction	COMPLETE			MR KELLEY	24-APR-1997	97170036
TSD553-385	Technetium	6252		pCi/g	JP BREWSTER	20-APR-1997	97070559
TSD553-710	% U-235	7.7	1.6	%	CD GOOD	8-APR-1997	97070498
	Uranium	2192	281	ug/g	CD GOOD	8-APR-1997	97070498

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
C. J. Van Meter (TCLP Laboratory)
Date Approved: 7-MAY-1997

Definition Page for Qualifiers/Flags

********** 970407-054 **********

-ga- Data Reporting Qualifiers and Flags:

C ration Qualifiers:

B .e reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but gre than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injeccions was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

D t detected.

.f reported.

NA c analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

** See comment page for comments. **

AnaLIS ID: 970407-054
Laboratory: TCLP Laboratory
File ID: 97170036
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: RFD35935W
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 52361
Date Sample Received: 7-APR-1997
Date Sampled: 3-APR-1997

TCLP_METALS_ICP_RPT

Date Extracted/Prepared: 24-APR-1997
Analysis Procedure Number: 1311/6010A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 2-MAY-1997
QA File Number: 97080297
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
7440-38-2	Arsenic	0.023U			
7440-39-3	Barium	0.181			
7440-43-9	Cadmium	0.002U			
7440-47-3	Chromium	0.003U			
7439-92-1	Lead	0.018U			
7782-49-2	Selenium	0.036U			
7440-22-4	Silver	0.054B			

ANALYSIS DATA REPORT
** See comment page for comments. **

AnaLIS ID: 970407-054
Laboratory: TCLP Laboratory
File ID: 97170036
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: RFD35935W
Customer: ENV RESTORATION
Sample Matrix: SOLID WASTE
Requisition Number: 52361
Date Sample Received: 7-APR-1997
Date Sampled: 3-APR-1997

TCLP_HG_RPT

Date Extracted/Prepared: 24-APR-1997
Analysis Procedure Number: 1311/7470
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 30-APR-1997
QA File Number: 97080281
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
7439-97-6	Mercury	0.010U			

Waste Stream Number: 705-4

Waste Stream Title: Oil/Solvents

W
4W

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 920627-006 Project: WMGT RFD Customer Sample ID: RFD-10636
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 25-JUN-1992 Date Sample Received: 25-JUN-1992
Sampled By: B KELLEY Date Sample Completed: 7-DEC-1992
Material Description: VACUUM PUMP OIL

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-8080	PCB (TOTAL)	12U		ug/g	PA HUTCHINS	7-JUL-1992	92160140
TSD553-380	Technetium (Waste)	670.0		pCi/mL	JJ SISLER	1-SEP-1992	92070843
TSD553-440	Assay (% U-235, Waste)	3.12		% U-235	JD LITTERAL	22-SEP-1992	92070943
	Total Uranium	1804		PPM U	JD LITTERAL	22-SEP-1992	92070943

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
PCB (TOTAL)	34	34.	100.00

***** Comments from the Organic Analytical Services *****

PCB Analysis: The sample contained an aqueous layer(67% v/v) and an organic layer(33% v/v). The aqueous layer was prepared by SW846-3510 and analyzed by SW846-8080. The results of the analysis of the aqueous layer are as follows:

Total PCB, ug/mL: 0.3U
Amount spiked : 2.25
Spike result : 2.2
Percent recovery: 98%

Solvent Analysis: The sample was bi-layer with the same aqueous and organic layer percentage as mentioned in the PCB Analysis. The results of the aqueous layer are as follows:

	ug/ml
Benzene	<2
2-butanone	<3
Carbon tetrachloride	<.1
Chlorobenzene	<.2
Chloroform	2.5
llorobenzene	<.1
nloroethane	2.5
1,1-dichloroethene	.4

$\frac{296}{\frac{454}{E^6}} \Big/ 1804 \Big/ .0312 \Big) = 7.56 \text{ gm } U^{235}$

Tetrachloroethene	30
Trichloroethene	.8
Vinyl chloride	NA

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greate than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.
orrelation coefficient for MSA is less tha 0.995.

The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

Laboratory Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
D. E. Boyd (Organic Analytical Services)

Date Approved: 8-DEC-1992

AnaLIS ID: 920627-006
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: D. E. Boyd

Customer Sample ID: RFD-10636
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 25-JUN-1992
Date Sampled: 25-JUN-1992

Solvents_Volatiles

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 27-JUL-1992
QA File Number: 92160161
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
71-43-2	Benzene	160U			
	2-Butanone (MEK)	560			
56-23-5	Carbon Tetrachloride	.4U			
108-90-7	Chlorobenzene	.8U			
67-66-3	Chloroform	17			
	p-Dichlorobenzene	.4U			
107-06-2	1,2-Dichloroethane	17			
75-35-4	1,1-Dichloroethene	1.1			
127-18-4	Tetrachloroethene	90			
79-01-6	Trichloroethene	6.0			
75-01-4	Vinyl Chloride	NA			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

W
4W

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 920627-005 Project: WMGT RFD Customer Sample ID: RFD-10157
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 25-JUN-1992 Date Sample Received: 25-JUN-1992
Sampled By: B KELLEY Date Sample Completed: 7-DEC-1992
Material Description: WASTE WATER/OIL

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
TSD515-500	Uranium (Waste)	12.8		UG/G	CJ HOLBROOK	6-JUL-1992	92101202
TSD553-380	Technetium (Waste)	19.0		pCi/mL	JJ SISLER	1-SEP-1992	92070843
TSD553-440	Assay (% U-235, Waste)	6.05		% U-235	JD LITTERAL	28-AUG-1992	92070863

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
URANIUM (WASTE)	40	39.1	97.75

Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greate than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

- Correlation coefficient for MSA is less tha 0.995.

The value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an te

$\frac{716}{\frac{454}{66}} / \frac{12.8}{.0605} = 0.25$ gm U 235

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Laboratory Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
D. K. Perez (Environmental and Industrial Hygiene Laboratory)
D. E. Boyd (Organic Analytical Services)
Date Approved: 8-DEC-1992

AnaLIS ID: 920627-005
Laboratory: Organic Analytical Services
File ID:
Instrument ID:
Authorized By: D. E. Boyd

Customer Sample ID: RFD-10157
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 25-JUN-1992
Date Sampled: 25-JUN-1992

Solvents_Volatiles

Date Extracted/Prepared:
Analysis Procedure Number: TSD554-015
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 27-JUL-1992
QA File Number: 92160161
Dilution Factor: 1.0
Analyst: PJ WARD

CAS		ug/g	CAS		ug/g
71-43-2	Benzene	10			
	2-Butanone (MEK)	3			
56-23-5	Carbon Tetrachloride	.8			
108-90-7	Chlorobenzene	.2U			
67-66-3	Chloroform	.1U			
	p-Dichlorobenzene	.1U			
107-06-2	1,2-Dichloroethane	.1U			
75-35-4	1,1-Dichloroethene	.1U			
127-18-4	Tetrachloroethene	.1			
79-01-6	Trichloroethene	.1			
75-01-4	Vinyl Chloride	NA			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Waste Stream Number: 705-5

Waste Stream Title: Uranium Recovery Solvents

Customer Smpl Id: VER41895001
F t:X-04-WM BJC09824
L j Analyses:LIQUID
Customer:J A APPLEGATE
COC#: 059961
Sample Desc:
Customer Comments:
Lab Smpl Comments:

Matrix: LIQUID
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 07/09/98 11:00:00
Received: 07/10/98 09:39:51
Needed: 08/14/98 23:59:00
Approved: 08/14/98 15:44:17

Analy Meth:SW846-6010A | QC Batch: | Test:6010AMETALS5 | Rpt Basis:none | Date Approved
Prep Meth: | Analyzed:08/13/98 00:00:00 E L SIMPSON | Approver: D K PEREZ | 08/14/98 15:25

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Aluminum	6.7		ug/L	*J			1		
Antimony	4.0		ug/L	U			1		
Arsenic	2.9		ug/L	U			1		
Barium	0.14		ug/L	U			1		
Beryllium	0.02		ug/L	U			1		
Cadmium	0.23		ug/L	U			1		
Calcium	50.7		ug/L	N			1		
Chromium	1.2		ug/L	U			1		
Cobalt	1.9		ug/L	U			1		
Copper	0.65		ug/L				1		
Iron	1.3		ug/L	J			1		
Lead	2.9		ug/L	NU			1		
Magnesium	9.3		ug/L				1		
[illegible]nese	0.09		ug/L	U			1		
[illegible]denum	0.27		ug/L	U			1		
Nickel	0.69		ug/L	U			1		
Potassium	38.9		ug/L	JU			1		
Selenium	3.3		ug/L	JU			1		
Sodium	4.3		ug/L	J			1		
Thallium	3.8		ug/L	U			1		
Vanadium	0.25		ug/L	U			1		
Zinc	1.2		ug/L				1		

Comments: QC File: 98080624
K, Se and Na qualified as estimate due to calibration verification not meeting acceptance limits. Al and Fe qualified as estimate due to lab control samples exceeding acceptance limits.

Analy Meth:PORTS-CEM-OP-5 | QC Batch: | Test:DIESELPREP | Rpt Basis:none | Date Approved
Prep Meth: | Analyzed:08/11/98 00:00:00 K A DAYS | Approver: D K PEREZ | 08/14/98 15:21

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLP
·chloroethoxy)methane	130000		ug/kg	U		130000	2	P	
-chloroethyl) ether	130000		ug/kg	U		130000	2	P	
Bis(2-chloroisopropyl) ether	130000		ug/kg	U		130000	2	P	
Bis(2-ethylhexyl)phthalate	840000		ug/kg			130000	2	P	
Butylbenzylphthalate	130000		ug/kg	U		130000	2	P	
Chrysene	130000		ug/kg	U		130000	2	P	
Di-n-butylphthalate	130000		ug/kg	U		130000	2	P	
Di-n-octylphthlate	130000		ug/kg	U		130000	2	P	
Dibenz(a,h)anthracene	130000		ug/kg	U		130000	2	P	
Diethylphthalate	130000		ug/kg	U		130000	2	P	
Dimethylphthalate	130000		ug/kg	U		130000	2	P	
Diphenyldiazene	130000		ug/kg	U		130000	2	P	
Fluoranthene	130000		ug/kg	U		130000	2	P	
Fluorene	130000		ug/kg	U		130000	2	P	
Hexachlorobenzene	130000		ug/kg	U		130000	2	P	
Hexachlorobutadiene	130000		ug/kg	JU		130000	2	P	
Hexachlorocyclopentadiene	130000		ug/kg	U		130000	2	P	
Hexachloroethane	130000		ug/kg	U		130000	2	P	
Indeno(1,2,3-cd)pyrene	130000		ug/kg	U		130000	2	P	
Isophorone	130000		ug/kg	U		130000	2	P	
N-Nitroso-di-n-propylamine	130000		ug/kg	U		130000	2	P	
N-Nitrosodimethylamine	130000		ug/kg	U		130000	2	P	
N-Nitrosodiphenylamine	130000		ug/kg	U		130000	2	P	
Naphthalene	130000		ug/kg	U		130000	2	P	
Nitrobenzene	130000		ug/kg	U		130000	2	P	
F hlorophenol	650000		ug/kg	U		650000	2	P	
F threne	130000		ug/kg	U		130000	2	P	
Phenol	130000		ug/kg	U		130000	2	P	
Pyrene	130000		ug/kg	U		130000	2	P	
Pyridine	130000		ug/kg	U		130000	2	P	

Comments:

There were 4 compounds that exceeded the 15% RSD criteria for the initial calibration and are qualified as estimated values, 'J'. These compounds were: 2,4-dinitrophenol(27%), 4,6-dinitro-2-methylphenol(19%), hexachlorbutadiene(16%) and acenaphthylene(16%).

Because the sample appeared to be an oil, the waste dilution sample preparation was diluted by an additional factor of 2 to minimize sample matrix effects.

Recovery of the 2nd surrogate standard compound, phenol-d5, was slightly
below method criteria in the sample extract as well as in the MS and MSD extracts of this sample.

4-Nitrophenol is not reported for this sample because the presence of a highly abundant tentatively identified compound (TIC), tributylphosphate, completely masked its response. The mass spectra of the TIC obscurred the response of 4-nitrophenol so that no response was seen in the MS and MSD extracts of this sample.

Toluene-d8 failed the PORTS established Precision (%RPD range) between the method blank and the LCS. The value was 10.4%, while the upper range is 9.21%.

EPA Qualifiers:
J - Estimated value.
U - Analyte analyzed for but undetected. Analyte result was below the Limit of Quantitation (LOQ).

Analy Meth:PORTS-OA97333006	QC Batch:QC98205003 Test:AB-ACT-GPC	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:07/21/98 00:00:00 J P BREWSTER	Approver: B W SHORT	07/27/98 10:21

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Alpha activity	1700		pCi/ml			0.3	
Beta activity	149.4		pCi/ml			0.9	

Analy Meth:PORTS-XP4-TS-RL7380	QC Batch:QC98204003 Test:TC99-ACT-LS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:07/21/98 00:00:00 J P BREWSTER	Approver: B W SHORT	07/27/98 10:16

Analyte Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Technetium-99	49.4		pCi/ml			5.5	

Analy Meth:PORTS-XP4-TS-RL7720ug	QC Batch:QC98212001 Test:TOTAL-U-AS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:07/28/98 00:00:00 R J ANDRE	Approver: B W SHORT	08/03/98 15:08

ce Name	Result	+/-	Unit	Qual Fn	TPE	MDA	Dec Lvl
Uranium	285	37	ug/ml				
Uranium-235	10	2.1	wt %				

Waste Stream Number: 705-7

Waste Stream Title: Ion Exchange Resin

Portsmouth Analytical Laboratory
Official Report

X982240013

Customer Smpl Id: VER47035001
:X-04-WM BJC09825
Sub Analyses:SOLID
Customer:J A APPLEGATE
COC#: 061035
Sample Desc:
Customer Comments:
Lab Smpl Comments:

Matrix: SOLID
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 08/12/98 00:00:00
Received: 08/12/98 13:30:19
Needed: 09/16/98 23:59:00
Approved: 09/15/98 16:42:55

Analy Meth:SW846-3050A | QC Batch: | Test:3050APREP | Rpt Basis:none | Date Approved
Prep Meth: | Analyzed:08/18/98 00:00:00 K A DAYS | Approver: D K PEREZ | 09/15/98 15:30

Analy Meth:SW846-6010A | QC Batch: | Test:6010AMETALS5 | Rpt Basis:none | Date Approved
Prep Meth: SW846-3050A | Analyzed:08/27/98 00:00:00 E L SIMPSON | Approver: D K PEREZ | 09/04/98 15:41

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Aluminum	98.8		mg/kg	BN			1		
Antimony	4.0		mg/kg	*NU			1		
Arsenic	2.9		mg/kg	U			1		N
Barium	0.14		mg/kg	U			1		N
Beryllium	0.02		mg/kg	B			1		
Cadmium	0.23		mg/kg	U			1		N
Calcium	166		mg/kg	BN			1		
Chromium	1.2		mg/kg	U			1		N
[illegible]	2.0		mg/kg	U			1		
[illegible]	7.4		mg/kg	B			1		
Iron	28.6		mg/kg	BN			1		
Lead	2.9		mg/kg	U			1		N
Magnesium	13.4		mg/kg	B			1		
Manganese	0.73		mg/kg	B			1		
Molybdenum	0.55		mg/kg	BN			1		
Nickel	3.4		mg/kg	B			1		
Potassium	62.7		mg/kg	BJ			1		
Selenium	3.3		mg/kg	U			1		Y
Silver	1.7		mg/kg	B			1		N
Sodium	27400		mg/kg	J			1		
Thallium	3.9		mg/kg	NU			1		
Vanadium	0.26		mg/kg	U			1		
Zinc	23.6		mg/kg	B			1		

Comments: QC File: 98080676
Na and K qualified as estimate due to interference check not meeting acceptance limits. Si qualified as estimate due to calibration verification not meeting acceptance limits.

Meth:SW846-8260A | QC Batch:QC98232004 Test:VOA | Rpt Basis:none | Date Approve
Prep Meth: | Analyzed:08/19/98 00:00:00 J N STRICKLAND | Approver: C J VANMETER | 08/28/98

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,1,1-Trichloroethane	20		ug/kg	U	C	20	10		
1,1,2,2-Tetrachloroethane	20		ug/kg	U	C	20	10		
1,1,2-Trichloro-1,2,2-trifluoroethane	20		ug/kg	U	C	20	10		
1,1,2-Trichloroethane	20		ug/kg	U	C	20	10		
1,1-Dichloroethane	20		ug/kg	U	C	20	10		
1,1-Dichloroethene	20		ug/kg	U	C	20	10		
1,2-Dichloro-1,1,2,2-tetrafluoroethane	40		ug/kg	JU	C	40	10		
1,2-Dichlorobenzene	20		ug/kg	U	C	20	10		
1,2-Dichloroethane	20		ug/kg	U	C	20	10		
1,2-Dimethylbenzene	20		ug/kg	U	C	20	10		
1,3 (1,4)-Dimethylbenzene	20		ug/kg	U	C	20	10		
1,3-Dichlorobenzene	20		ug/kg	U	C	20	10		
1,4-Dichlorobenzene	20		ug/kg	U	C	20	10		
2-Butanone	500		ug/kg	U	C	500	10		
4-Methyl-2-pentanone	500		ug/kg	U	C	500	10		
Acetone	500		ug/kg	U	C	500	10		
Benzene	20		ug/kg	U	C	20	10		
Bromodichloromethane	20		ug/kg	U	C	20	10		
Bromoform	20		ug/kg	U	C	20	10		
Bromomethane	40		ug/kg	JU	C	40	10		
Carbon disulfide	20		ug/kg	U	C	20	10		
...n tetrachloride	20		ug/kg	U	C	20	10		
...obenzene	20		ug/kg	U	C	20	10		
Chloroethane	40		ug/kg	JU	C	40	10		
Chloroform	110		ug/kg		C	20	10		
Chloromethane	40		ug/kg	JU	C	40	10		
Dibromochloromethane	20		ug/kg	U	C	20	10		
Ethylbenzene	20		ug/kg	U	C	20	10		
Methylene chloride	20		ug/kg	U	C	20	10		
Tetrachloroethene	20		ug/kg	U	C	20	10		
Toluene	20		ug/kg	U	C	20	10		
Trichloroethene	20		ug/kg	U	C	20	10		
Trichlorofluoromethane	40		ug/kg	U	C	40	10		
Vinyl chloride	10		ug/kg	U	C	10	10		
cis-1,2-Dichloroethene	20		ug/kg	U	C	20	10		
trans-1,2-Dichloroethene	20		ug/kg	U	C	20	10		

Comments: The LCS (laboratory control solid) sample failed the established dibromofluoromethane surrogate recovery (110% -- upper limit=108%).

Freon-114, chloromethane, bromomethane, and chloroethane did not pass the daily continuing calibration and the values are estimated.

EPA Qualifiers:

J - Estimated value.

U - Analyte analyzed for but undetected. Analyte result was below the Limit of ...uantitation (LOQ).

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
a)pyrene	1900		ug/kg	U		1900	1		
b (b)fluoranthene	1900		ug/kg	U		1900	1		
Benzo(ghi)perylene	1900		ug/kg	JU		1900	1		
Benzo(k)fluoranthene	1900		ug/kg	U		1900	1		
Bis(2-chloroethoxy)methane	1900		ug/kg	U		1900	1		
Bis(2-chloroethyl) ether	1900		ug/kg	U		1900	1		
Bis(2-chloroisopropyl) ether	1900		ug/kg	U		1900	1		
Bis(2-ethylhexyl)phthalate	1900		ug/kg	U		1900	1		
Butylbenzylphthalate	1900		ug/kg	U		1900	1		
Chrysene	1900		ug/kg	U		1900	1		
Di-n-butylphthalate	1900		ug/kg	U		1900	1		
Di-n-octylphthlate	1900		ug/kg	U		1900	1		
Dibenz(a,h)anthracene	1900		ug/kg	JU		1900	1		
Diethylphthalate	1900		ug/kg	U		1900	1		
Dimethylphthalate	1900		ug/kg	U		1900	1		
Diphenyldiazene	1900		ug/kg	U		1900	1		
Fluoranthene	1900		ug/kg	U		1900	1		
Fluorene	1900		ug/kg	U		1900	1		
Hexachlorobenzene	1900		ug/kg	U		1900	1		
Hexachlorobutadiene	1900		ug/kg	U		1900	1		
Hexachlorocyclopentadiene	1900		ug/kg	JU		1900	1		
Hexachloroethane	1900		ug/kg	U		1900	1		
Indeno(1,2,3-cd)pyrene	1900		ug/kg	JU		1900	1		
Isophorone	1900		ug/kg	U		1900	1		
N-Nitroso-di-n-propylamine	1900		ug/kg	U		1900	1		
rosodimethylamine	1900		ug/kg	U		1900	1		
rosodiphenylamine	1900		ug/kg	U		1900	1		
Naphthalene	1900		ug/kg	U		1900	1		
Nitrobenzene	1900		ug/kg	U		1900	1		
Pentachlorophenol	9500		ug/kg	U		9500	1		
Phenanthrene	1900		ug/kg	U		1900	1		
Phenol	1900		ug/kg	U		1900	1		
Pyrene	1900		ug/kg	U		1900	1		
Pyridine	1900		ug/kg	U		1900	1		

Comments: 2,4-Dinitrophenol (23%) and hexachlorocyclopentadiene (22%) both failed established criteria for initial calibration %RSD of <15%, and both are qualified as estimates, 'J'.

The last internal perylene-d12 area recovery in the MS extract of this sample was >100% and failed established criteria. However the area did meet criteria in the 3x dilution of this sample.

Hexachlorocyclopentadiene recoveries in the MS extract and in a 3x dilution of the MS extract were below established criteria; therefore, this compound is also qualified as an estimate.

Analy Meth:SW846-7470A	QC Batch: Test:HG7470A	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:08/20/98 00:00:00 C J MAYNARD	Approver: D K PEREZ	09/02/98

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Mercury	2.92		mg/kg			0.024	40		Y

Comments: QC File: 98080628

EPA Qualifiers:

* - Duplicate analysis not within control limits.
B - Analyte result less than the Practical Quantitation Limit (PQL) and greater than or equal to the Instrument Detection Limit (IDL).
J - Qualify data for the sample as estimated.
N - Sample spike recovery not within control limits.
U - Analyte analyzed for but undetected. Analyte result was below the Instrument Detection Limit (IDL).

Analy Meth:SW846-3540	QC Batch:QC98252009 Test:ORGEXT-SVOC	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:08/13/98 00:00:00 D K SCAGGS	Approver: C J VANMETER	09/11/98 14:34

Analy Meth:SW846-8270B	QC Batch:QC98254000 Test:SVOC	Rpt Basis:none	Date Approved
Prep Meth: SW846-3540	Analyzed:09/08/98 00:00:00 R J WAWRO	Approver: C J VANMETER	09/11/98 14:37

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
-Trichlorobenzene	1900		ug/kg	U		1900	1		
1,2-Dichlorobenzene	1900		ug/kg	U		1900	1		
1,3-Dichlorobenzene	1900		ug/kg	U		1900	1		
1,4-Dichlorobenzene	1900		ug/kg	U		1900	1		
2,4,5-Trichlorophenol	1900		ug/kg	U		1900	1		
2,4,6-Trichlorophenol	1900		ug/kg	U		1900	1		
2,4-Dichlorophenol	1900		ug/kg	U		1900	1		
2,4-Dimethylphenol	1900		ug/kg	U		1900	1		
2,4-Dinitrophenol	9500		ug/kg	JU		9500	1		
2,4-Dinitrotoluene	1900		ug/kg	U		1900	1		
2,6-Dinitrotoluene	1900		ug/kg	U		1900	1		
2-Chloronaphthalene	1900		ug/kg	U		1900	1		
2-Chlorophenol	1900		ug/kg	U		1900	1		
2-Methyl-4,6-dinitrophenol	9500		ug/kg	U		9500	1		
2-Methylphenol	1900		ug/kg	U		1900	1		
2-Nitrophenol	1900		ug/kg	U		1900	1		
3(4)-Methylphenol	1900		ug/kg	U		1900	1		
4-Bromophenyl phenyl ether	1900		ug/kg	U		1900	1		
4-Chloro-3-methylphenol	3800		ug/kg	U		3800	1		
4-Chlorophenylphenyl ether	1900		ug/kg	U		1900	1		
4-Nitrophenol	9500		ug/kg	U		9500	1		
Acenaphthene	1900		ug/kg	U		1900	1		
Acenaphthylene	1900		ug/kg	U		1900	1		
Anthracene	1900		ug/kg	U		1900	1		
o(a)anthracene	1900		ug/kg	U		1900	1		

Anal Meth:PORTS-XP4-TS-RL7280	QC Batch:QC98229000 Test:AB-ACT-GPC	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:08/14/98 00:00:00 J P BREWSTER	Approver: B W SHORT	08/17/98 15:09

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Alpha activity	159		pCi/g				4	
Beta activity	33067		pCi/g	J			12	

Analy Meth:PORTS-XP4-TS-RL7385	QC Batch:QC98229001 Test:TC99-ACT-LS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:08/15/98 00:00:00 J P BREWSTER	Approver: B W SHORT	08/17/98 15:07

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Technetium-99	8105		pCi/g				14.3	

Analy Meth:PORTS-XP4-TS-RL7710ug	QC Batch:QC98233015 Test:TOTAL-U-AS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:08/17/98 00:00:00 S J JAMES	Approver: B W SHORT	08/21/98 15:30

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Uranium	0.70	0.33	ug/g				0.5	
Uranium-235	NA		wt %					

EPA Qualifiers:
J - Indicates an estimated value.

Footnotes:
C - Method SW846-5030A "Purge-and-Trap"

***** END OF REPORT *****

MARTIN MARIETTA ENERGY SYSTEMS
P.O.BOX 628
PIKETON, OHIO
45661

Corrosion Testing

Received: TSR#15614 Date: 2/27/91

Sample ID: WMS-599; RFD-1728-1; RFD-2174-1

Analysis Date: 3/6; 3/14; 3/18

Procedure: NACE Std TM-01-69

Notebook Code: #6046-132/33

Sample Results: Corrosion Rate, (mm/yr)

	Sample Vapor	Interface	Immersed
1/ Resin WMS-599	(a) 0.018	(b) 0.016	(c) 0.007
RFD-1728-1	(a) 0.554	(b) 0.537	(c) 0.579
RFD-2174-1	(a) 0.638	(b) 1.88	(c) 0.746

Charles J. Lux

Waste Stream Number: 705-8

Waste Stream Title: Mercury Waste

OFFICIAL REPORT

SAMPLE E942280079 Y-12 ANALYTICAL SERVICES ORGANIZATION

12672296	PCB1248	<10	ug/L
11097691	PCB1254	<10	ug/L
11096825	PCB1260	<10	ug/L
	PCB	NA	ug/L

TEST: PCB_UG PCB IN SOLID WASTE REPLICATE: 1 STATUS: CANCELLED
PREP MTH: PROC MTH: PHASE: TIME ANALYZED: APPROVER:
THIS TEST WAS CANCELLED

TEST: TC99_W Analysis of Technectium 99 in water REPLICATE: 1 STATUS: APPROVED
PREP MTH: PROC MTH: Y/P65-7154 PHASE: TIME ANALYZED: 08/25/94 00:00:00 APPROVER: E019888
COMMENTS: MDA = 0.134 PCI/ML

CAS NUMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
	Technetium-99		745	+/- 1.9	pC/mL

TEST: TOTAL_U Total U by Isotopic dilution REPLICATE: 1 STATUS: APPROVED
PREP MTH: PROC MTH: Y/P65-8044 PHASE: TIME ANALYZED: APPROVER: E013506
COMMENTS: DUPLICATE ANALYSIS: TOTAL U: 1.5 PPM; WT % 235U: 5.8 +/- .2

CAS NUMBER	DETERMINATION	DT	RESULT	CONFIDENCE	UNIT
7440611	Uranium		1.4		ug/g
15	Uranium-235		6.0	+/- .2	Weight %

*** LAST PAGE ***

Waste Stream Number: 705-9

Waste Stream Title: Bag Filters

W
4W

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 920310-043 Project: WMGT RFD Customer Sample ID: RFD-8444
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 10-MAR-1992 Date Sample Received: 10-MAR-1992
Sampled By: B KELLEY Date Sample Completed: 27-OCT-1992
Material Description: RECOVERY MATERIAL

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311	Arsenic	2.7		mg/L	MR KELLEY	31-MAR-1992	RFD-8444
	Barium	0.29		mg/L	MR KELLEY	31-MAR-1992	RFD-8444
	Cadmium	1.4		mg/L	MR KELLEY	31-MAR-1992	RFD-8444
	Chromium	0.75		mg/L	MR KELLEY	31-MAR-1992	RFD-8444
	Lead	< 0.03		mg/L	MR KELLEY	31-MAR-1992	RFD-8444
	Mercury	0.98		mg/L	MR KELLEY	31-MAR-1992	RFD-8444
	Selenium	2.1		mg/L	MR KELLEY	31-MAR-1992	RFD-8444
	Silver	8.3		mg/L	MR KELLEY	31-MAR-1992	RFD-8444
TSD553-340	Technetium (Waste)	51059		pCi/g	JJ SISLER	24-MAR-1992	92070192
T[illegible]	Assay (% U-235, Waste)	5.38		% U-235	JD LITTERAL	25-MAR-1992	92070316
	Total Uranium	287.1		ppm U	JD LITTERAL	25-MAR-1992	92070316

***** Comments from the Chemical Technology Department *****

Cadmium exceeded the regulatory limit of 1.0 mg/L.

Mercury exceeded the regulatory limit of 0.2 mg/L.

Selenium exceeded the regulatory limit of 1.0 mg/L.

Silver exceeded the regulatory limit of 5.0 mg/L.

Inorganic Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

[illegible]ify data for the sample as estimated.

- Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.
R - reported value is unusable. The value is for informational purposes only.
reported value was obtained by the Method of Standard Additions (MSA).
UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.
* - Duplicate analysis is not within control limits.
+ - Correlation coefficient for MSA is less tha 0.995.
# - The value is between the LC and the LLD.
Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Unit Manager: Wayne J. Spetnagel (Radiochemistry Laboratory)
A. J. Saraceno (Chemical Technology Department)
Date Approved: 30-OCT-1992

Waste Stream Number: 705-10

Waste Stream Title: Incinerator Ash

Incinerator Ash

Waste Stream 705-10

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 951025-012 Project: ER 9567E Requisition Number: 018836
Customer Sample ID: VER35353001 Customer: ENV RETORATION
Date Sampled: 17-OCT-1995 13:00 Date Sample Received: 18-OCT-1995
Sampled By: MB HAMEL Date Sample Completed: 11-JAN-1996
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311/3010A	Sample Prep TCLP Metals	COMPLETE			MR KELLEY	3-NOV-1995	110395-010
1311/3520	Sample Prep TCLP Semi-Volatile	COMPLETE			DG OPALINSKI	2-NOV-1995	95160322
ACD-5101	Density	0.76		g/mL	ML STEWART	19-OCT-1995	95081105
ASTM-D2216	Moisture	1.0		%	ML STEWART	19-OCT-1995	95081104
SW-846-1311	Sample Prep TCLP	COMPLETE			MR KELLEY	31-OCT-1995	95170230
SW846-1311	Sample Prep TCLP	COMPLETE			MR KELLEY	31-OCT-1995	95170230
SW[illegible]	Sample Prep Metals	COMPLETE			ML STEWART	23-OCT-1995	102395-066
[illegible]846-3540	Sample Prep PCB	COMPLETE			DH BLUE	31-OCT-1995	95160327
SW846-6010A	Aluminum	540		mg/kg	RL POLK	23-OCT-1995	95R81167
	Antimony	3.6U		mg/kg	RL POLK	23-OCT-1995	95R81167
	Arsenic	5.5U		mg/kg	RL POLK	23-OCT-1995	95R81167
	Barium	25.3		mg/kg	RL POLK	23-OCT-1995	95R81167
	Beryllium	0.090U		mg/kg	RL POLK	23-OCT-1995	95R81167
	Cadmium	29.4N		mg/kg	RL POLK	23-OCT-1995	95R81167
	Calcium	391		mg/kg	RL POLK	23-OCT-1995	95R81167
	Chromium	1.9		mg/kg	RL POLK	23-OCT-1995	95R81167
	Cobalt	1.7		mg/kg	RL POLK	23-OCT-1995	95R81167
	Copper	19.4N		mg/kg	RL POLK	23-OCT-1995	95R81167
	Iron	298		mg/kg	RL POLK	23-OCT-1995	95R81167
	Lead	67.9N		mg/kg	RL POLK	23-OCT-1995	95R81167
	Magnesium	70.0N		mg/kg	RL POLK	23-OCT-1995	95R81167
	Manganese	6.2		mg/kg	RL POLK	23-OCT-1995	95R81167
	Molybdenum	0.98U		mg/kg	RL POLK	23-OCT-1995	95R81167
	Nickel	6.3N		mg/kg	RL POLK	23-OCT-1995	95R81167
	Potassium	210N		mg/kg	RL POLK	23-OCT-1995	95R81167
	Selenium	7.4U		mg/kg	RL POLK	23-OCT-1995	95R81167
	Silver	0.48		mg/kg	RL POLK	23-OCT-1995	95R81167
	Sodium	346		mg/kg	RL POLK	23-OCT-1995	95R81167
	Thallium	8.6UJ		mg/kg	RL POLK	23-OCT-1995	95R81167
	Titanium	NR		mg/kg	RL POLK	23-OCT-1995	95R81167
	Vanadium	2.2		mg/kg	RL POLK	23-OCT-1995	95R81167
	Zinc	709		mg/kg	RL POLK	23-OCT-1995	95R81167

SW846-8080	PCB-1232	<.5		ug/g	DH BLUE	2-DEC-1995	95161201M1
	PCB-1242	<.5		ug/g	DH BLUE	2-DEC-1995	95161201M1
	PCB-1248	<.5		ug/g	DH BLUE	2-DEC-1995	95161201M1
	PCB-1254	<.5		ug/g	DH BLUE	2-DEC-1995	95161201M1
	PCB-1260	<.5		ug/g	DH BLUE	2-DEC-1995	95161201M1
	PCB-1268	<.5		ug/g	DH BLUE	2-DEC-1995	95161201M1
	Total PCB	<.5		ug/g	DH BLUE	2-DEC-1995	95161201M1
SW846-9010A	Total Cyanide	0.3U		mg/kg	SL LEMASTER	30-OCT-1995	95101513
SW846-9020A	TOX	< 10.0		ug/g	DE COLLINS	10-NOV-1995	9516111OT3
SW846-9030A	Sulfide	16,564J		mg/kg	SL LEMASTER	30-OCT-1995	95101570
SW846-9045	pH	6.07			AR CLAUSING	24-OCT-1995	95101491
SW846-9095	Paint Filter Test	PASS			LD DRYDEN	30-OCT-1995	95170228
TSD553-240	Gross Alpha	3178		pCi/G	JP BREWSTER	3-NOV-1995	95071648
	Gross Beta	680		pCi/G	JP BREWSTER	3-NOV-1995	95071648
TSD553-340	Technetium	72.1		pCi/g	JP BREWSTER	4-NOV-1995	95071657
TSD553-440	Cesium-134	<0.7		pCi/g	WC ZUEFLE	31-OCT-1995	95071631
	Cesium-137	0.9		pCi/g	WC ZUEFLE	31-OCT-1995	95071631
	Cobalt-60	<0.7			WC ZUEFLE	31-OCT-1995	95071631
	Gross Gamma	260		pCi/g	WC ZUEFLE	31-OCT-1995	95071631
TSD553-710	% U-235	7.5	1.4	%	CD GOOD	3-NOV-1995	95071647
	Alpha Activity	829	92	pCi/g	CD GOOD	3-NOV-1995	95071647
	Americium-241	<0.04		pCi/g	CD GOOD	3-NOV-1995	95071647
	Neptunium-237	0.15	0.096	pCi/g	CD GOOD	3-NOV-1995	95071647
	Plutonium-238	<0.091		pCi/g	CD GOOD	3-NOV-1995	95071647
	Plutonium-239/240	<0.12		pCi/g	CD GOOD	3-NOV-1995	95071647
	Protactinium-234	<0.10		pCi/g	CD GOOD	3-NOV-1995	95071647
	Thorium-228	<0.37		pCi/g	CD GOOD	3-NOV-1995	95071647
	Thorium-230	3.1	0.62	pCi/g	CD GOOD	3-NOV-1995	95071647
	Thorium-232	<0.15		pCi/g	CD GOOD	3-NOV-1995	95071647
	Thorium-234	73	9.6	pCi/g	CD GOOD	3-NOV-1995	95071647
	Uranium	235	29	ug/g	CD GOOD	3-NOV-1995	95071647

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
Antimony	50	47.49	94.98
Arsenic	50	51.43	102.86
Barium	50	40.34	80.68
Beryllium	50	46.90	93.80
Cadmium	50	141.02	282.04
Chromium	50	50.99	101.98
Cobalt	50	51.51	103.02
Copper	50	95.84	191.68

ANALYSIS DATA REPORT

AnaLIS ID:	951025-012	Customer Sample ID:	VER35353001
Laboratory:	TCLP Laboratory	Customer:	ENV RETORATION
File ID:	95170230	Sample Matrix:	SOLID WASTE
Instrument ID:		Requisition Number:	018836
Authorized By:	C. J. Van Meter	Date Sample Received:	18-OCT-1995
		Date Sampled:	17-OCT-1995

TCLP_METALS_ICP_RPT

Date Extracted/Prepared:	31-OCT-1995	Date Analyzed:	3-NOV-1995
Analysis Procedure Number:	1311/6010A	QA File Number:	95081355
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	MR KELLEY
Associated Blank:			

CAS		mg/L	CAS		mg/L
7440-38-2	Arsenic	0.560U			
7440-39-3	Barium	0.435			
7440-43-9	Cadmium	0.088			
7440-47-3	Chromium	0.022U			
7439-92-1	Lead	0.223JU			
7782-49-2	Selenium	0.755JU			

ANALYSIS DATA REPORT

AnaLIS ID: 951025-012
Laboratory: TCLP Laboratory
File ID: 95170230
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: VER35353001
Customer: ENV RETORATION
Sample Matrix: SOLID WASTE
Requisition Number: 018836
Date Sample Received: 18-OCT-1995
Date Sampled: 17-OCT-1995

TCLP_HG_RPT

Date Extracted/Prepared: 31-OCT-1995
Analysis Procedure Number: 1311/7470
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 7-NOV-1995
QA File Number: 95081176
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
7439-97-6	Mercury	0.010U			

ANALYSIS DATA REPORT

AnaLIS ID: 951025-012
Laboratory: TCLP Laboratory
File ID: 95170230
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: VER35353001
Customer: ENV RETORATION
Sample Matrix: SOLID WASTE
Requisition Number: 018836
Date Sample Received: 18-OCT-1995
Date Sampled: 17-OCT-1995

TCLP_AG_RPT

Date Extracted/Prepared: 31-OCT-1995
Analysis Procedure Number: 1311/7760A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 9-NOV-1995
QA File Number: 95081187
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
7440-22-4	Silver	0.160			

Refractory Material

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960930-099 Project: ER 9567D Customer Sample ID: VER36558010
Customer: ENV RESTORATION Requisition Number: 22861
Date Sampled: 27-SEP-1996 10:00 Date Sample Received: 30-SEP-1996
Sampled By: M MCROBERTS Date Sample Completed: 4-NOV-1996
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
W846-3050A	Sample Prep Metals	COMPLETE			RK POWELL	8-OCT-1996	100896-019
W846-3540	Sample Prep PCB	COMPLETE			SL EWING	8-OCT-1996	96160295
W846-6010A	Aluminum	20800B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Antimony	59.1BN		MG/KG	KA DAYS	8-OCT-1996	96080892
	Arsenic	23.4U		MG/KG	KA DAYS	8-OCT-1996	96080892
	Barium	560B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Beryllium	2.0B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Bismuth	NR		mf/kf	KA DAYS	8-OCT-1996	96080892
	Cadmium	24.8B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Calcium	116000N		MG/KG	KA DAYS	8-OCT-1996	96080892
	Chromium	436B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Cobalt	19.5B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Copper	125B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Iron	54000BN		MG/KG	KA DAYS	8-OCT-1996	96080892
	Lead	534B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Magnesium	18200BN		MG/KG	KA DAYS	8-OCT-1996	96080892
	Manganese	2160BN		MG/KG	KA DAYS	8-OCT-1996	96080892
	Nickel	335B*		MG/KG	KA DAYS	8-OCT-1996	96080892
	Selenium	35.9U		MG/KG	KA DAYS	8-OCT-1996	96080892
	Silver	10.0BJ		MG/KG	KA DAYS	8-OCT-1996	96080892
	Sodium	860B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Thallium	28.2BN		MG/KG	KA DAYS	8-OCT-1996	96080892
	Tin	NR		mg/kg	KA DAYS	8-OCT-1996	96080892
	Titanium	NR		mg/kg	KA DAYS	8-OCT-1996	96080892
	Vanadium	33.5B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Zinc	731B		MG/KG	KA DAYS	8-OCT-1996	96080892
846-8080	PCB-1232	< 0.5		ug/g	DH BLUE	19-OCT-1996	96161017M5R
	PCB-1242	< 0.5		ug/g	DH BLUE	19-OCT-1996	96161017M5R
	PCB-1248	< 0.5		ug/g	DH BLUE	19-OCT-1996	96161017M5R
	PCB-1254	2.7		ug/g	DH BLUE	19-OCT-1996	96161017M5R
	PCB-1260	< 0.5		ug/g	DH BLUE	19-OCT-1996	96161017M5R
	PCB-1268	< 0.5		ug/g	DH BLUE	19-OCT-1996	96161017M5R
	Total PCB	2.7		ug/g	DH BLUE	19-OCT-1996	96161017M5R
0551	Gross Alpha	J 5544		pCi/g	JP BREWSTER	18-OCT-1996	96071432
	Gross Beta	1500		pCi/g	JP BREWSTER	18-OCT-1996	96071432

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960930-098 Project: ER 9567D Customer Sample ID: VER36558005
Customer: ENV RESTORATION Requisition Number: 22861
Date Sampled: 27-SEP-1996 09:15 Date Sample Received: 30-SEP-1996
Sampled By: M MCROBERTS Date Sample Completed: 4-NOV-1996
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-3050A	Sample Prep Metals	COMPLETE			RK POWELL	8-OCT-1996	100896-019
SW846-3540	Sample Prep PCB	COMPLETE			SL EWING	8-OCT-1996	96160295
SW846-6010A	Aluminum	19700B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Antimony	117BN		MG/KG	KA DAYS	8-OCT-1996	96080892
	Arsenic	26.5B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Barium	533B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Beryllium	1.1B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Bismuth	NR		mg/kg	KA DAYS	8-OCT-1996	96080892
	Cadmium	37.6B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Calcium	85500N		MG/KG	KA DAYS	8-OCT-1996	96080892
	Chromium	625B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Cobalt	24.1B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Copper	148B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Iron	57700BN		MG/KG	KA DAYS	8-OCT-1996	96080892
	Lead	791		MG/KG	KA DAYS	8-OCT-1996	96080892
	Magnesium	15700BN		MG/KG	KA DAYS	8-OCT-1996	96080892
	Manganese	675BN		MG/KG	KA DAYS	8-OCT-1996	96080892
	Nickel	413B*		MG/KG	KA DAYS	8-OCT-1996	96080892
	Selenium	35.5U		MG/KG	KA DAYS	8-OCT-1996	96080892
	Silver	12.2BJ		MG/KG	KA DAYS	8-OCT-1996	96080892
	Sodium	981B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Thallium	24.8BN		MG/KG	KA DAYS	8-OCT-1996	96080892
	Tin	NR		mg/kg	KA DAYS	8-OCT-1996	96080892
	Titanium	NR		mg/kg	KA DAYS	8-OCT-1996	96080892
	Vanadium	37.5B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Zinc	989B		MG/KG	KA DAYS	8-OCT-1996	96080892
W846-8080	PCB-1232	< 1		ug/g	DH BLUE	21-OCT-1996	96161017M5R
	PCB-1242	< 1		ug/g	DH BLUE	21-OCT-1996	96161017M5R
	PCB-1248	< 1		ug/g	DH BLUE	21-OCT-1996	96161017M5R
	PCB-1254	2.9		ug/g	DH BLUE	21-OCT-1996	96161017M5R
	PCB-1260	< 1		ug/g	DH BLUE	21-OCT-1996	96161017M5R
	PCB-1268	< 1		ug/g	DH BLUE	21-OCT-1996	96161017M5R
	Total PCB	2.9		ug/g	DH BLUE	21-OCT-1996	96161017M5R
D553-280	Gross Alpha	8102		pCi/g	JP BREWSTER	10-OCT-1996	96071398
	Gross Beta	2291		pCi/g	JP BREWSTER	10-OCT-1996	96071398

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960930-103 Project: ER 9567D Customer Sample ID: VER36558007
Customer: ENV RESTORATION Requisition Number: 22863
Date Sampled: 27-SEP-1996 10:10 Date Sample Received: 30-SEP-1996
Sampled By: M MCROBERTS Date Sample Completed: 4-NOV-1996
Material Description:

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

alytical oc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
146-3050A	Sample Prep Metals	COMPLETE			RK POWELL	8-OCT-1996	100896-019
146-3540	Sample Prep PCB	COMPLETE			SL EWING	8-OCT-1996	96160295
46-3540B	Sample Prep Semi-Volatiles	COMPLETE			DK SCAGGS	10-OCT-1996	96160315
46-6010A	Aluminum	19200B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Antimony	76.4BN		MG/KG	KA DAYS	8-OCT-1996	96080892
	Arsenic	28.3B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Barium	514B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Beryllium	1.1U		MG/KG	KA DAYS	8-OCT-1996	96080892
	Bismuth	NR		mg/kg	KA DAYS	8-OCT-1996	96080892
	Cadmium	34.0B		MG/KG	KA DAYS	8-OCT-1996	96080892
	lcium	92400N		MG/KG	KA DAYS	8-OCT-1996	96080892
	romium	927		MG/KG	KA DAYS	8-OCT-1996	96080892
	Cobalt	23.1B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Copper	134B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Iron	62300BN		MG/KG	KA DAYS	8-OCT-1996	96080892
	Lead	532B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Magnesium	17300BN		MG/KG	KA DAYS	8-OCT-1996	96080892
	Manganese	829BN		MG/KG	KA DAYS	8-OCT-1996	96080892
	Nickel	383B*		MG/KG	KA DAYS	8-OCT-1996	96080892
	Selenium	35.5U		MG/KG	KA DAYS	8-OCT-1996	96080892
	Silver	12.2BJ		MG/KG	KA DAYS	8-OCT-1996	96080892
	Sodium	853B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Thallium	40.9BN		MG/KG	KA DAYS	8-OCT-1996	96080892
	Tin	NR		mg/kg	KA DAYS	8-OCT-1996	96080892
	Titanium	NR		mg/kg	KA DAYS	8-OCT-1996	96080892
	Vanadium	42.0B		MG/KG	KA DAYS	8-OCT-1996	96080892
	Zinc	851B		MG/KG	KA DAYS	8-OCT-1996	96080892
5-8080	PCB-1232	< 0.5		ug/g	DH BLUE	19-OCT-1996	96161017M5R
	PCB-1242	< 0.5		ug/g	DH BLUE	19-OCT-1996	96161017M5R
	PCB-1248	< 0.5		ug/g	DH BLUE	19-OCT-1996	96161017M5R
	PCB-1254	2.3		ug/g	DH BLUE	19-OCT-1996	96161017M5R
	PCB-1260	< 0.5		ug/g	DH BLUE	19-OCT-1996	96161017M5R
	PCB-1268	< 0.5		ug/g	DH BLUE	19-OCT-1996	96161017M5R
	Total PCB	2.3		ug/g	DH BLUE	19-OCT-1996	96161017M5R
3-280	oss Alpha	J 8576		pCi/g	JP BREWSTER	18-OCT-1996	96071432

Waste Stream Number: 705-11

Waste Stream Title: Filter Table Gunk

W
4W

WSID - 705.11

Portsmouth Gaseous Diffusion Plant
Technical Services Division
Analysis Results

AnaLIS ID: 920129-040 Project: WMGT WMS Customer Sample ID: WMS-720
Customer: WASTE MANAGEMENT Requisition Number:
Date Sampled: 24-JAN-1992 Date Sample Received: 24-JAN-1992
Sampled By: AR SELBEE Date Sample Completed: 22-JAN-1993
Material Description: GUNK from X705 Handtables

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311	1,1-Dichloroethene	< 0.002X		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	1,2-Dichloroethane	< 0.002X		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	1,4-Dichlorobenzene	< 0.002X		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	Arsenic	0.17		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	Barium	0.49		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	Benzene	< 0.002X		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	Cadmium	0.04		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	Carbon Tetrachloride	< 0.002X		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	Chlorobenzene	< 0.002X		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	Chloroform	< 0.002X		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	Chromium	0.14		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	Lead	< 0.01		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	Mercury	0.26		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	Methy ethyl ketone	< 0.17X		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	Selenium	0.09		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	Silver	0.19		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	Tetrachloroethene	< 0.002X		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	Trichloroethene	< 0.002X		mg/L	MR KELLEY	29-JAN-1992	WMS-720
	Vinyl Chloride	< 0.004X		mg/L	MR KELLEY	29-JAN-1992	WMS-720

***** Comments from the TCLP Laboratory *****

Method 1311 - X- The values for volatile organics are for informational purposes only and corrected for matrix spike recovery. The analyses were performed after the holding time expired.

Mercury exceeded the regulatory limit of 0.2 mg/L. The result was not corrected for matrix spike recovery.

TCLP_SV_ACIDS_RPT - Data corrected for matrix spike recovery. Recovery of the semivolatile [acids] surrogate compounds did not meet QC requirements.

TCLP_SV_B/N_RPT - Data corrected for matrix spike recovery.

T[illegible]ly identified compounds were also found.
[illegible]nic compounds and concentration values can be found in POEF-554-
[illegible] November 24, 1992.

Inorganic Data Reporting Qualifiers and Flags:

ıtion Qualifiers:

B reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

+ - Correlation coefficient for MSA is less tha 0.995.

- The value is between the LC and the LLD.

ıg "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte.

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

Laboratory Manager: J.J. Williams (TCLP Laboratory)

Date Approved: 22-JAN-1993

AnaLIS ID: 920129-040
Laboratory: TCLP Laboratory
File ID: WMS-720
Instrument ID:
Authorized By: J.J. Williams

Customer Sample ID: WMS-720
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 24-JAN-1992
Date Sampled: 24-JAN-1992

TCLP_SV_ACIDS_RPT

Date Extracted/Prepared: 29-JAN-1992
Analysis Procedure Number: 1311
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed:
QA File Number: WMS-720
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
95-48-7	2-Methylphenol	0.063U			
108-39-4	m-Cresol	0.028U			
106-44-5	4-Methylphenol	0.063U			
87-86-5	Pentachlorophenol	0.020U			
95-95-4	2,4,5-Trichlorophenol	0.020U			
88-06-2	2,4,6-Trichlorophenol	0.020U			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

AnaLIS ID: 920129-040
Laboratory: TCLP Laboratory
File ID: WMS-720
Instrument ID:
Authorized By: J.J. Williams

Customer Sample ID: WMS-720
Customer: WASTE MANAGEMENT
Sample Matrix: WASTE
Requisition Number:
Date Sample Received: 24-JAN-1992
Date Sampled: 24-JAN-1992

TCLP_SV_B/N_RPT

Date Extracted/Prepared: 29-JAN-1992
Analysis Procedure Number: 1311
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed:
QA File Number: WMS-720
Dilution Factor: 1.0
Analyst: MR KELLEY

CAS		mg/L	CAS		mg/L
121-14-2	2,4-Dinitrotoluene	0.026U			
118-74-1	Hexachlorobenzene	0.020U			
87-68-3	Hexachlorobutadiene	0.020U			
67-72-1	Hexachloroethane	0.022U			
98-95-3	Nitrobenzene	0.021U			
110-86-1	Pyridine	0.027U			

Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.
B - Analyte was found in the reagent blank as well as the sample.
J - Indicates an estimated value.
ND - Not detected.
NR - Not reported.
NA - Not analyzed.
A - Aldol condensation product.
D - Secondary dilution.
E - Exceeds initial calibration range.

Waste Stream Number: 705-12

Waste Stream Title: Laboratory Waste

mer Smpl Id: VER46290001
t:X-04-WM BJC09825
Subproj Analyses:LIQUID
Customer:J A APPLEGATE
COC#: 54815
Sample Desc:
Customer Comments:
Lab Smpl Comments:

705-12

Matrix: LIQUID
Protocol:RCRA
Status: APPROVED
Location:

Sampled: 04/03/98 13:20:00
Received: 04/06/98 08:40:50
Needed: 05/11/98 00:00:00
Approved: 05/11/98 16:38:24

Analy Meth:SW846-3015 | QC Batch: | Test:3015PREP | Rpt Basis:none | Date Approved
Prep Meth: | Analyzed:04/24/98 00:00:00 K A DAYS | Approver: D K PEREZ | 05/02/98 13:12

Analy Meth:SW846-6010A | QC Batch: | Test:6010AMETALS2 | Rpt Basis:none | Date Approved
Prep Meth: SW846-3015 | Analyzed:05/03/98 00:00:00 E L SIMPSON | Approver: D K PEREZ | 05/11/98 14:01

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Arsenic	234		ug/L	JU			10		
Barium	55.5		ug/L	B			10		
Cadmium	76.8		ug/L	B			10		
Chromium	7050		ug/L				10		
Lead	178		ug/L	JNU			10		
Selenium	359		ug/L	NU			10		
Silver	106		ug/L	BN			10		

Comments: QC File: 98080358

As qualified as estimate due to interference check not meeting acceptance limits. Pb qualified as estimate due to lab control reading greater than acceptance limits.

Analy Meth:SW846-1010 | QC Batch: | Test:FLASHPOINT | Rpt Basis:none | Date Approved
Prep Meth: | Analyzed:04/16/98 00:00:00 M L STEWART | Approver: D K PEREZ | 04/21/98 16:03

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
Flash Point Closed Cup	26.0		deg C				1		

Comments: QC File: 981100013

EPA Qualifiers:

B - Analyte result less than the Practical Quantitation Limit (PQL) and greater than or equal to the Instrument Detection Limit (IDL).
J - Qualify data for the sample as estimated.
N - Sample spike recovery not within control limits.
U - Analyte analyzed for but undetected. Analyte result was below the Instrument Detection Limit (IDL).

leth:SW846-3520	QC Batch:QC98127002 Test:ORGEXT-SVOC	Rpt Basis:none	Date Appro
Prep Meth:	Analyzed:04/15/98 00:00:00 D K SCAGGS	Approver: C J VANMETER	05/08/98 1

Analy Meth:SW846-8270B	QC Batch:QC98131002 Test:SVOC	Rpt Basis:none	Date Approved
Prep Meth: SW846-3520	Analyzed:05/05/98 00:00:00 R J WAWRO	Approver: C J VANMETER	05/11/98 16:36

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,2,4-Trichlorobenzene	500		ug/L	U		500	5	P	
1,2-Dichlorobenzene	500		ug/L	U		500	5	P	
1,3-Dichlorobenzene	500		ug/L	U		500	5	P	
1,4-Dichlorobenzene	500		ug/L	U		500	5	P	
2,4,5-Trichlorophenol	500		ug/L	U		500	5	P	
2,4,6-Trichlorophenol	500		ug/L	U		500	5	P	
2,4-Dichlorophenol	500		ug/L	U		500	5	P	
2,4-Dimethylphenol	500		ug/L	U		500	5	P	
2,4-Dinitrophenol	2500		ug/L	JU		2500	5	P	
2,4-Dinitrotoluene	500		ug/L	U		500	5	P	
2,6-Dinitrotoluene	500		ug/L	U		500	5	P	
2-Chloronaphthalene	500		ug/L	U		500	5	P	
2-Chlorophenol	500		ug/L	U		500	5	P	
2-Methyl-4,6-dinitrophenol	2500		ug/L	JU		2500	5	P	
2-Methylphenol	500		ug/L	U		500	5	P	
2-Nitrophenol	500		ug/L	U		500	5	P	
Methylphenol	500		ug/L	U		500	5	P	
mophenyl phenyl ether	500		ug/L	U		500	5	P	
4-Chloro-3-methylphenol	1000		ug/L	U		1000	5	P	
4-Chlorophenylphenyl ether	500		ug/L	U		500	5	P	
4-Nitrophenol	2500		ug/L	U		2500	5	P	
Acenaphthene	500		ug/L	U		500	5	P	
Acenaphthylene	500		ug/L	U		500	5	P	
Anthracene	500		ug/L	U		500	5	P	
Benzo(a)anthracene	500		ug/L	U		500	5	P	
Benzo(a)pyrene	500		ug/L	U		500	5	P	
Benzo(b)fluoranthene	500		ug/L	U		500	5	P	
Benzo(ghi)perylene	500		ug/L	JU		500	5	P	
Benzo(k)fluoranthene	500		ug/L	U		500	5	P	
Bis(2-chloroethoxy)methane	500		ug/L	U		500	5	P	
Bis(2-chloroethyl) ether	500		ug/L	U		500	5	P	
Bis(2-chloroisopropyl) ether	500		ug/L	U		500	5	P	
Bis(2-ethylhexyl)phthalate	1500		ug/L			500	5	P	
Butylbenzylphthalate	500		ug/L	U		500	5	P	
Chrysene	500		ug/L	U		500	5	P	
Di-n-butylphthalate	500		ug/L	U		500	5	P	
Di-n-octylphthlate	500		ug/L	U		500	5	P	
Dibenz(a,h)anthracene	500		ug/L	JU		500	5	P	
Diethylphthalate	500		ug/L	U		500	5	P	
Dimethylphthalate	500		ug/L	U		500	5	P	
Diphenyldiazene	500		ug/L	U		500	5	P	
Fluoranthene	500		ug/L	U		500	5	P	

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
ene	500		ug/L	U		500	5	P	
Hexachlorobenzene	500		ug/L	U		500	5	P	
Hexachlorobutadiene	500		ug/L	U		500	5	P	
Hexachlorocyclopentadiene	NR		ug/L				5	P	
Hexachloroethane	500		ug/L	U		500	5	P	
Indeno(1,2,3-cd)pyrene	500		ug/L	JU		500	5	P	
Isophorone	500		ug/L	U		500	5	P	
N-Nitroso-di-n-propylamine	500		ug/L	U		500	5	P	
N-Nitrosodimethylamine	500		ug/L	U		500	5	P	
N-Nitrosodiphenylamine	500		ug/L	U		500	5	P	
Naphthalene	500		ug/L	U		500	5	P	
Nitrobenzene	500		ug/L	U		500	5	P	
Pentachlorophenol	2500		ug/L	U		2500	5	P	
Phenanthrene	500		ug/L	U		500	5	P	
Phenol	500		ug/L	U		500	5	P	
Pyrene	500		ug/L	U		500	5	P	
Pyridine	500		ug/L	U		500	5	P	

Comments: The results are from a 5x dilution of the extract concentrate of this sample. The undiluted extract injection on 05/05/98 exhibited several QC problems. The first surrogate recovery, 2-fluorophenol, was below method criteria as were several matrix spike acid compounds in the MS extract. The only QC problem not rectified in the diluted reinjection was the low recovery of 4,6-dinitro-2-methylphenol. The result for this compound is therefore qualified as an estimate, 'J'. These problems appear to be the result of several large TICs that coelute with these target compounds. The 2 largest TICs were tributyl phosphate and trimethyl citrate.

There were 3 compounds that exceeded the 15% RSD criteria for the initial calibration and are qualified as estimated values, 'J'. These compounds were: 2,4-dinitrophenol(32.7%), 4,6-dinitro-2-methylphenol(17.4%), and hexachlorocyclopentadiene(22.1%).

Three compounds exceeded %RSD (30%) criteria for the continuing calibration check and are also qualified with a 'J'. These compounds are indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene and benzo(g,h,i)perylene.

Hexachlorocyclopentadiene is not reported (NR) because of continuing difficulties in the liquid/liquid extraction procedure for this compound. Recoveries of hexachlorocyclopentadiene from laboratory control and matrix spiked samples have historically been very poor.

Analy Meth:SW846-8260A QC Batch:QC98112016 Test:VOA Rpt Basis:none Date Approved
Prep Meth: Analyzed:04/16/98 00:00:00 D E COLLINS Approver: C J VANMETER 04/30/98 15:36

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,1,1-Trichloroethane	200000		ug/L	U		200000	100000		
1,1,2,2-Tetrachloroethane	200000		ug/L	U		200000	100000		
1,1,2-Trichloro-1,2,2-trifluoroethane	200000		ug/L	U		200000	100000		

Analyte Name	Result	+/-	Unit	Qual	Fn	LCR	Dilu	HT	CLF
1,1,1-Trichloroethane	200000		ug/L	U		200000	100000		
1,1-Dichloroethane	200000		ug/L	U		200000	100000		
1,1-Dichloroethene	200000		ug/L	U		200000	100000		
1,2-Dichloro-1,1,2,2-tetrafluoroethane	400000		ug/L	U		400000	100000		
1,2-Dichlorobenzene	200000		ug/L	U		200000	100000		
1,2-Dichloroethane	200000		ug/L	U		200000	100000		
1,2-Dimethylbenzene	200000		ug/L	U		200000	100000		
1,3 (1,4)-Dimethylbenzene	200000		ug/L	U		200000	100000		
1,3-Dichlorobenzene	200000		ug/L	U		200000	100000		
1,4-Dichlorobenzene	200000		ug/L	U		200000	100000		
2-Butanone	5000000		ug/L	U		5000000	100000		
4-Methyl-2-pentanone	5000000		ug/L	U		5000000	100000		
Acetone	5000000		ug/L	U		5000000	100000		
Benzene	200000		ug/L	U		200000	100000		
Bromodichloromethane	200000		ug/L	U		200000	100000		
Bromoform	200000		ug/L	U		200000	100000		
Bromomethane	400000		ug/L	U		400000	100000		
Carbon disulfide	200000		ug/L	U		200000	100000		
Carbon tetrachloride	200000		ug/L	U		200000	100000		
Chlorobenzene	200000		ug/L	U		200000	100000		
Chloroethane	400000		ug/L	U		400000	100000		
Chloroform	3800000		ug/L			200000	100000		
Chloromethane	400000		ug/L	U		400000	100000		
Dibromochloromethane	200000		ug/L	U		200000	100000		
Ethylbenzene	200000		ug/L	U		200000	100000		
Methylene chloride	200000		ug/L	U		200000	100000		
Tetrachloroethene	200000		ug/L	U		200000	100000		
Toluene	200000		ug/L	U		200000	100000		
Trichloroethene	200000		ug/L	U		200000	100000		
Trichlorofluoromethane	400000		ug/L	U		400000	100000		
Vinyl chloride	100000		ug/L	U		100000	100000		
cis-1,2-Dichloroethene	200000		ug/L	U		200000	100000		
trans-1,2-Dichloroethene	200000		ug/L	U		200000	100000		

Comments: The sample contained air bubbles greater tha 1/4" which violates the headspace requirements of SW846-8260A. We were advised by the customer run the sample as is.

EPA Qualifiers:

J - Estimated value.

U - Analyte analyzed for but undetected. Analyte result was below the Limit of Quantitation (LOQ).

Analy Meth:PORTS-OA97333006 QC Batch:QC98116001 Test:AB-ACT-GPC Rpt Basis:none Date Approved

Prep Meth: Analyzed:04/24/98 00:00:00 J P BREWSTER Approver: B W SHORT 05/01/98 12:28

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Alpha activity	92		pCi/ml	J				
Beta activity	58		pCi/ml					

Meth:PORTS-XP4-TS-RL7380	QC Batch:QC98112009 Test:TC99-ACT-LS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:04/21/98 00:00:00 J P BREWSTER	Approver: B W SHORT	04/22/98 13:28

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Technetium-99	12.8		pCi/ml				0.8	

Analy Meth:PORTS-XP4-TS-RL7720ug	QC Batch:QC98129000 Test:TOTAL-U-AS	Rpt Basis:none	Date Approved
Prep Meth:	Analyzed:05/06/98 00:00:00 R J ANDRE	Approver: B W SHORT	05/11/98 13:13

Analyte Name	Result	+/-	Unit	Qual	Fn	TPE	MDA	Dec Lvl
Uranium	56	7.5	ug/ml					
Uranium-235	3.0	0.6	wt %					

EPA Qualifiers:
J - Indicates an estimated value.

Waste Stream Number: 705-15

Waste Stream Title: Oil and Grease Filter Cake

I.S. 705-15

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960307-145 Project: ER 9567D Requisition Number: 20243
Customer Sample ID: VER35946001 Customer: ENV RERSTORATION
Date Sampled: 6-MAR-1996 14:00 Date Sample Received: 7-MAR-1996
Sampled By: R CAUDILL Date Sample Completed: 19-APR-1996
Material Description: X-705 OIL\GREASE SLUDGE

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
SW846-1010	Flash Point	>80		oC	ML STEWART	1-APR-1996	96110022
SW846-3010A	Sample Prep Metals	COMPLETE			TE SHOOK	18-MAR-1996	96080306
SW846-6010A	Aluminum	1050NJ		ug/L	TE SHOOK	18-MAR-1996	96080306
	Barium	552		ug/L	TE SHOOK	18-MAR-1996	96080306
	Beryllium	11.0U		ug/L	TE SHOOK	18-MAR-1996	96080306
	Bismuth	NA		ug/L	TE SHOOK	18-MAR-1996	96080306
	Cadmium	18.0U		ug/L	TE SHOOK	18-MAR-1996	96080306
	Calcium	557000J		ug/L	TE SHOOK	18-MAR-1996	96080306
	Chromium	875		ug/L	TE SHOOK	18-MAR-1996	96080306
	Cobalt	34.0U		ug/L	TE SHOOK	18-MAR-1996	96080306
	Copper	42.8		ug/L	TE SHOOK	18-MAR-1996	96080306
	Iron	4130		ug/L	TE SHOOK	18-MAR-1996	96080306
	Lead	178U		ug/L	TE SHOOK	18-MAR-1996	96080306
	Magnesium	1270000		ug/L	TE SHOOK	18-MAR-1996	96080306
	Manganese	1920		ug/L	TE SHOOK	18-MAR-1996	96080306
	Nickel	620		ug/L	TE SHOOK	18-MAR-1996	96080306
	Silver	372N		ug/L	TE SHOOK	18-MAR-1996	96080306
	Sodium	2260000J		ug/L	TE SHOOK	18-MAR-1996	96080306
	Tin	NA		ug/L	TE SHOOK	18-MAR-1996	96080306
	Titanium	NA		ug/L	TE SHOOK	18-MAR-1996	96080306
	Vanadium	92.1		ug/L	TE SHOOK	18-MAR-1996	96080306
	Zinc	242		ug/L	TE SHOOK	18-MAR-1996	96080306
SW846-7470	Mercury	10UJ		ug/L	RL POLK	26-MAR-1996	96080292
SW846-9010A	Total Cyanide	0.09		MG/L	CJ HOLBROOK	8-MAR-1996	96100318
SW846-9030A	Sulfide	<5.0NJ		MG/L	CJ HOLBROOK	13-MAR-1996	96100391
TSD553-230	Gross Alpha	3.2		pCi/mL	JP BREWSTER	24-MAR-1996	96070394
	Gross Beta	7.0		pCi/mL	JP BREWSTER	24-MAR-1996	96070394
TSD553-380	Technetium	14.9		pCi/mL	JP BREWSTER	24-MAR-1996	96070393
TSD553-440	Cesium-134	<0.1J		pCi/ml	WC ZUEFLE	16-APR-1996	96070490
	Cesium-137	<0.2J		pCi/ml	WC ZUEFLE	16-APR-1996	96070490
	Cobalt-60	<0.2J		pCi/ml	WC ZUEFLE	16-APR-1996	96070490
	Gross Gamma	2.8J		pCi/ml	WC ZUEFLE	16-APR-1996	96070490

TSD553-700	% U-235	4.1	1.9	%	SJ JAMES	9-APR-1996	96070458
	Alpha Activity	<2		pCi/mL	SJ JAMES	9-APR-1996	96070458
	Americium-241	<0.011		pCi/mL	SJ JAMES	9-APR-1996	96070458
	Neptunium-237	<0.022		pCi/mL	SJ JAMES	9-APR-1996	96070458
	Plutonium-238	<0.006		pCi/mL	SJ JAMES	9-APR-1996	96070458
	Plutonium-239/240	<0.015		pCi/mL	SJ JAMES	9-APR-1996	96070458
	Thorium-228	<0.025		pCi/mL	SJ JAMES	9-APR-1996	96070458
	Thorium-230	<0.016		pCi/mL	SJ JAMES	9-APR-1996	96070458
	Thorium-232	<0.012		pCi/mL	SJ JAMES	9-APR-1996	96070458
	Thorium-234	0.14	0.03	pCi/mL	SJ JAMES	9-APR-1996	96070458
	Uranium	0.44	0.09	ug/mL	SJ JAMES	9-APR-1996	96070458

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
Aluminum	400	637.	159.25
Arsenic	400	308.4	77.10
Barium	400	394.9	98.73
Beryllium	400	308.4	77.10
Cadmium	400	377.7	94.43
Chromium	400	392.1	98.02
Cobalt	400	350.8	87.70
Copper	400	367.4	91.85
Lead	400	337.6	84.40
Mercury	40.0	44.9	112.25
N	400	380.8	95.20
Selenium	400	0.	0.00
Silver	400	290.6	72.65
Sulfide	25	12.6	50.40
Vanadium	400	342.3	85.57
Zinc	400	344.8	86.20

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
Date Approved: 19-APR-1996

********** COMMENT PAGE **********
********** 960307-145 **********

** Comments from the Environmental and Industrial Hygiene Laboratory *****

SW846-9010A Cyanide - This sample contained a layer of oil and solids; therefore, it was prepared by SW846-9013. A smaller aliquot was analyzed along with the batch with a result of 0.03 mg/L.

SW846-9030A Sulfide - This sample contained a layer of oil and was therefore extracted by SW846-9031. The result is reported as an estimate due to low spike recovery. Low spike recovery can indicate acid-insoluble sulfides. Three lab control standards were analyzed along with the batch resulting in 77%, 78% and 89% recovery, respectively. The sample was analyzed in duplicate with a result of <5.0 mg/L.

***** Comments from the Radiochemistry Laboratory *****

GAMMA RESULTS FOR 960307-145 ARE:

Analyte	Result(pCi/g)	+/-
K-40	2.8J	2.6J

** Comments from the Spectrochemistry/ICP Laboratory *****

SW846-6010A Al and Nq qualified as estimate due to calibration verification not meeting acceptance limits.

SW846-6010A Ca and Na qualified as estimate due to lab control sample not meeting acceptance limits.

SW846-7470 Hg qualified as estimate due to initial calibration verification not meeting Q. C. limits.

Definition Page for Qualifiers/Flags

********** 960307-145 **********

Inorg. Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greate than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.'

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

orrelation coefficient for MSA is less tha 0.995.

he value is between the LC and the LLD.

Entering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an ana.yte

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

Waste Stream 705-15

Lockheed Martin Utility Services
ES&H Laboratory
Analysis Results

AnaLIS ID: 960111-036 Project: ER 9567E Requisition Number: 19263
Customer Sample ID: VER32290001 Customer: ENV RETORATION
Date Sampled: 10-JAN-1996 13:35 Date Sample Received: 11-JAN-1996
Sampled By: T BARR Date Sample Completed: 23-FEB-1996
Material Description: X-7725 SOLID WASTE

** See comment page for comments. **
** See definition page for qualifiers/flags definitions. **

Analytical Proc. No.	Analysis	Result	Limit Of Error	Units	Analyst	Date Analyzed	QA File Number
1311/3010A	Sample Prep TCLP Metals	COMPLETE			LD DRYDEN	29-JAN-1996	012996-070
1311/3520	Sample Prep TCLP Semi-Volatile	COMPLETE			MR KELLEY	24-JAN-1996	96160040
ACD-5101	Density	0.94		%	ML STEWART	16-JAN-1996	96110002
ASTM-D2216	Moisture	76.0		%	ML STEWART	16-JAN-1996	96110003
SW846-1311	Sample Prep TCLP	COMPLETE			LD DRYDEN	23-JAN-1996	96170015
	Sample Prep TCLP	COMPLETE			LD DRYDEN	23-JAN-1996	96170015
	Sample Prep TCLP	COMPLETE			LD DRYDEN	23-JAN-1996	96170015
SI	Sample Prep Metals	COMPLETE			ML STEWART	17-JAN-1996	011796-041
SW846-3540	Sample Prep PCB	COMPLETE			DH BLUE	17-JAN-1996	96160017
SW846-6010A	Aluminum	3580		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Antimony	3.5UN		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Arsenic	5.3U		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Barium	28.6		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Beryllium	0.36		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Cadmium	1.3		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Calcium	25300		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Chromium	1.7		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Cobalt	0.88		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Copper	71.8N		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Iron	1670		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Lead	15.1		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Magnesium	7460		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Manganese	152		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Molybdenum	0.95UN		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Nickel	2.5		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Potassium	741N		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Selenium	7.2U		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Silver	1.2J		mg/kg	EL SIMPSON	26-JAN-1996	96080128
	Sodium	2750J		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Thallium	8.3UNJ		mg/kg	EL SIMPSON	26-JAN-1996	96080128
	Vanadium	1.5		MG\KG	EL SIMPSON	26-JAN-1996	96080128
	Zinc	33.4N		MG\KG	EL SIMPSON	26-JAN-1996	96080128

SW846-8080	PCB-1232	< 0.5J		ug/g	DH BLUE	6-FEB-1996	96160205M5
	PCB-1242	< 0.5J		ug/g	DH BLUE	6-FEB-1996	96160205M5
	PCB-1248	< 0.5J		ug/g	DH BLUE	6-FEB-1996	96160205M5
	PCB-1254	< 0.5J		ug/g	DH BLUE	6-FEB-1996	96160205M5
	PCB-1260	< 0.5J		ug/g	DH BLUE	6-FEB-1996	96160205M
	PCB-1268	< 0.5J		ug/g	DH BLUE	6-FEB-1996	96160205M5
	Total PCB	< 0.5J		ug/g	DH BLUE	6-FEB-1996	96160205M5
SW846-9010A	Total Cyanide	1UNJ		mg/kg	SL LEMASTER	17-JAN-1996	96100097
SW846-9020A	TOX	< 10.0		ug/g	DE COLLINS	7-FEB-1996	96160207T3
SW846-9030A	Sulfide	50.3		mg/kg	CJ HOLBROOK	22-FEB-1996	96100274
SW846-9045C	pH	8.15		pH units	SL LEMASTER	12-JAN-1996	96100065
SW846-9095	Paint Filter Test	FAIL			MR KELLEY	19-JAN-1996	96170014
TSD553-280	Gross Alpha	22		pCi/g	JP BREWSTER	17-JAN-1996	96070066
	Gross Beta	15		pCi/g	JP BREWSTER	17-JAN-1996	96070066
TSD553-385	Technetium	6.7		pCi/g	JP BREWSTER	17-JAN-1996	96070067
TSD553-440	Cesium-134	<1.2J		pCi/g	JD LITTERAL	17-JAN-1996	96070112
	Cesium-137	<1.3J		pCi/g	JD LITTERAL	17-JAN-1996	96070112
	Cobalt-60	<2.2J		pCi/g	JD LITTERAL	17-JAN-1996	96070112
	Gross Gamma	58.8J	19.8	pCi/g	JD LITTERAL	17-JAN-1996	96070112
T	% U-235	1.8	0.47	%	CD GOOD	7-FEB-1996	96070168
	Alpha Activity	20		pCi/g	BW SHORT	7-FEB-1996	96070168
	Americium-241	<0.049	N/A	pCi/g	CD GOOD	7-FEB-1996	96070168
	Neptunium-237	0.044	0.026	pCi/g	CD GOOD	7-FEB-1996	96070168
	Plutonium-238	<0.010	N/A	pCi/g	CD GOOD	7-FEB-1996	96070168
	Plutonium-239/240	0.033	0.022	pCi/g	CD GOOD	7-FEB-1996	96070168
	Thorium-228	0.33	0.093	pCi/g	CD GOOD	7-FEB-1996	96070168
	Thorium-230	0.30	0.092	pCi/g	CD GOOD	7-FEB-1996	96070168
	Thorium-232	0.36	0.090	pCi/g	CD GOOD	7-FEB-1996	96070168
	Thorium-234	4.8	0.62	pCi/g	CD GOOD	7-FEB-1996	96070168
	Uranium	15	1.9	ug/g	CD GOOD	7-FEB-1996	96070168

Spike Recovery Data

Analysis	Amount Spiked	Amount Recovered	Percent Recovered
Antimony	19.8	0.	0.00
Arsenic	19.8	21.94	110.81
Barium	19.8	17.83	90.05
Beryllium	19.8	18.58	93.84
Cadmium	19.8	19.53	98.64
Chromium	19.8	17.79	89.85
Cobalt	19.8	18.09	91.36
Copper	19.8	14.64	73.94
L	19.8	15.56	78.59
Mo.,	19.8	12.12	61.21

Nickel	19.8	19.01	96.01
Potassium	198.02	108.06	54.57
Selenium	19.8	17.81	89.95
S	19.8	14.95	75.51
	19.8	0.	0.00
Vanadium	19.8	16.21	81.87
Zinc	19.8	12.55	63.38

Laboratory Manager: B. W. Short (Radiochemistry Laboratory)
D. K. Perez (AA/ICP) (Spectrochemistry/ICP Laboratory)
R. E. Charles (Environmental and Industrial Hygiene Laboratory)
C. J. Van Meter (Organic Analytical Services)
C. J. Van Meter (TCLP Laboratory)

Date Approved: 23-FEB-1996

********** COMMENT PAGE **********
********** 960111-036 **********

*** Comments from the Environmental and Industrial Hygiene Laboratory *****

SW846-9010A cyanide result reported as an estimate due to sample spike recovery outside acceptable range: 16% and 17% (RPD= -8.6%).

***** Comments from the Organic Analytical Services *****

SW846-9020A (Proposed SW846-9023)

Sample VER32290001 contained an aqueous layer on top of the solid matrix. This aqueous layer was analyzed according to Section 7.11 of proposed method SW846-9023. The result reported is the corrected value of EOX. However, both the aqueous layer, and the solid layer were below detection limits.

SW846-8080:

The sample result was estimated due to the TCMX surrogate recovering exceeding method limits on the continuing calibration. However, the PCB recovery was with in the method limits.

***** Comments from the TCLP Laboratory *****

TCLP_Method 1311/6010A : Silver was qualified as an estimate due to calibration verification not meeting Q.C. limits.

Arsenic and lead were qualified as estimates due interference check not meeting acceptance limits.

***** Comments from the Spectrochemistry/ICP Laboratory *****

ASTM-D2216 Moisture duplicate result is 75.7 %.

SW846-6010A Na qualified as estimate due to calibration verification not meeting Q.C. limits.

SW846-6010A Ag & Tl qualified as estimate due to calibration verification and interference check not meeting acceptance limits. Will try these two analytes by AA.

SW846-7760 Ag result was 1.9U* mg/kg with a post-digestion spike of 102% recovery.

SW846-7841 Tl result was 0.97U mg/kg with a matrix spike of 94% recovery.

Definition Page for Qualifiers/Flags

960111-036

Data Reporting Qualifiers and Flags:

Concentration Qualifiers:

B - The reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL) but greater than or equal to the Instrument Detection Limit (IDL).

U - Analyte was not detected. The value reported is the IDL corrected for any dilution in the sample preparation and for sample weight if the sample is a solid.

Flag Qualifiers:

E - The reported value is estimated because of the presence of interferences. The E flag is the result of an ICP serial dilution that is not within control limits or if the analytical (post-digestion) spike recovery for graphite furnace is less than 40% on both the original and the diluted sample.

J - Qualify data for the sample as estimated.

M - Duplicate injection precision for graphite furnace was not met. This flag is present if the result is greated than the CRDL and the relative standard deviation of the duplicate injections was greater than 20% for both the orginal and the repeated analysis.

N - Spike sample recovery is not within control limits.

R - The reported value is unusable. The value is for informational purposes only.

S - The reported value was obtained by the Method of Standard Additions (MSA).

UJ - Qualify data for the sample as estimated.

W - Analytical (post-digestion) spike recovery for graphite furnace analysis is out control limits (85-115%), while sample concentration is less than 50% of the spike concentration.

* - Duplicate analysis is not within control limits.

orrelation coefficient for MSA is less tha 0.995.

ıe value is between the LC and the LLD.

ıntering "S", "W", OR "+" is mutually exclusive. No combination of these qualifiers can appear in the same field for an analyte

Organic Data Reporting Qualifiers:

U - Compound was analyzed for but not detected. The number is the attainable detection limit for the sample.

B - Analyte was found in the reagent blank as well as the sample.

J - Indicates an estimated value.

ND - Not detected.

NR - Not reported.

NA - Not analyzed.

A - Aldol condensation product.

D - Secondary dilution.

E - Exceeds initial calibration range.

P - Probable Identification.

ANALYSIS DATA REPORT

AnaLIS ID: 960111-036
Laboratory: TCLP Laboratory
File ID: 96170015
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: VER32290001
Customer: ENV RETORATION
Sample Matrix: SOLID WASTE
Requisition Number: 19263
Date Sample Received: 11-JAN-1996
Date Sampled: 10-JAN-1996

TCLP_SV_ACIDS_RPT

Date Extracted/Prepared: 24-JAN-1996
Analysis Procedure Number: 1311/8270A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 5-FEB-1996
QA File Number: 96160205B02
Dilution Factor: 1.0
Analyst: LD DRYDEN

CAS		mg/L	CAS		mg/L
95-48-7	2-Methylphenol	0.020U			
108-39-4	m-Cresol	0.020U			
106-44-5	4-Methylphenol	0.020U			
87-86-5	Pentachlorophenol	0.040U			
95-95-4	2,4,5-Trichlorophenol	0.020U			
88-06-2	2,4,6-Trichlorophenol	0.020U			

ANALYSIS DATA REPORT

AnaLIS ID: 960111-036
Laboratory: TCLP Laboratory
File ID: 96170015
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: VER32290001
Customer: ENV RETORATION
Sample Matrix: SOLID WASTE
Requisition Number: 19263
Date Sample Received: 11-JAN-1996
Date Sampled: 10-JAN-1996

TCLP_SV_B/N_RPT

Date Extracted/Prepared: 24-JAN-1996
Analysis Procedure Number: 1311/8270A
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 5-FEB-1996
QA File Number: 96160205802
Dilution Factor: 1.0
Analyst: LD DRYDEN

CAS		mg/L	CAS		mg/L
121-14-2	2,4-Dinitrotoluene	0.040U			
118-74-1	Hexachlorobenzene	0.020U			
87-68-3	Hexachlorobutadiene	0.020U			
67-72-1	Hexachloroethane	0.020U			
98-95-3	Nitrobenzene	0.020U			
110-86-1	Pyridine	0.020U			

ANALYSIS DATA REPORT

AnaLIS ID: 960111-036
Laboratory: TCLP Laboratory
File ID: 96170015
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: VER32290001
Customer: ENV RETORATION
Sample Matrix: SOLID WASTE
Requisition Number: 19263
Date Sample Received: 11-JAN-1996
Date Sampled: 10-JAN-1996

TCLP_VOLATILES_RPT

Date Extracted/Prepared: 23-JAN-1996
Analysis Procedure Number: 1311/8260
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 29-JAN-1996
QA File Number: 96160129A2
Dilution Factor: 1.0
Analyst: LD DRYDEN

CAS		mg/L	CAS		mg/L
71-43-2	Benzene	0.002U			
56-23-5	Carbon Tetrachloride	0.002U			
108-90-7	Chlorobenzene	0.002U			
67-66-3	Chloroform	0.002U			
106-46-7	1,4-Dichlorobenzene	0.002U			
107-06-2	1,2-Dichloroethane	0.002U			
75-35-4	1,1-Dichloroethene	0.002U			
78-93-3	2-Butanone	0.100U			
127-18-4	Tetrachloroethene	0.002U			
79-01-6	Trichloroethene	0.014			
75-01-4	Vinyl Chloride	0.001U			

ANALYSIS DATA REPORT

AnaLIS ID:	960111-036	Customer Sample ID:	VER32290001
Laboratory:	TCLP Laboratory	Customer:	ENV RETORATION
File ID:	96170015	Sample Matrix:	SOLID WASTE
Instrument ID:		Requisition Number:	19263
Authorized By:	C. J. Van Meter	Date Sample Received:	11-JAN-1996
		Date Sampled:	10-JAN-1996

TCLP_METALS_ICP_RPT

Date Extracted/Prepared:	23-JAN-1996	Date Analyzed:	29-JAN-1996
Analysis Procedure Number:	1311/6010A	QA File Number:	96080125
Percent Moisture:		Dilution Factor:	1.0
Percent Moisture (decanted):		Analyst:	MR KELLEY
Associated Blank:			

CAS		mg/L	CAS		mg/L
7440-38-2	Arsenic	0.560UJ			
7440-39-3	Barium	0.198			
7440-43-9	Cadmium	0.029U			
7440-47-3	Chromium	0.038			
7439-92-1	Lead	0.223UJ			
7782-49-2	Selenium	0.755U			
7440-22-4	Silver	0.034J			

ANALYSIS DATA REPORT

AnaLIS ID: 960111-036
Laboratory: TCLP Laboratory
File ID: 96170015
Instrument ID:
Authorized By: C. J. Van Meter

Customer Sample ID: VER32290001
Customer: ENV RETORATION
Sample Matrix: SOLID WASTE
Requisition Number: 19263
Date Sample Received: 11-JAN-1996
Date Sampled: 10-JAN-1996

TCLP_HG_RPT

Date Extracted/Prepared: 23-JAN-1996
Analysis Procedure Number: 1311/7470
Percent Moisture:
Percent Moisture (decanted):
Associated Blank:

Date Analyzed: 30-JAN-1996
QA File Number: 96080112
Dilution Factor: 1.0
Analyst: LD DRYDEN

CAS		mg/L	CAS		mg/L
7439-97-6	Mercury	0.010UN			

Waste Stream Number: U705-16

Waste Stream Title: Grease

PORTS MSDS #: 5505

PRODUCT: BENZENE

PART NUMBER:

FORMULA: C6H6

KEYWORD: SOLVENT

PORTS NUMBER: NNN

PORTS MISC INFO:
01-02-1000

PORTS RATING: HFR=430

MANUFACTURER:
AMERICAN BURDICK & JACKSON
1953 SOUTH HARVEY STREET
MUSKEGON
MI

49442
PHONE: PHONE: 616-726-3171
EMERGENCY PHONE: 616-726-3171

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 176 F	NOTE: 80'C, 760 MM HG.
Melting Point. . . .	NG	
Freezing Point . . .	EQ 41.9 F	NOTE: 5.5'C.
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .879	NOTE: @ 20'C.
Vapor Pressure . . .	EQ 74.6	NOTE: MM HG @ 20'C.
Vapor Density. . . .	EQ 2.8	
Percent Volatiles. .	~ 100	
Evaporation Rate . .	~ 3	NOTE: BUAC=1.
pH	NG	
Molecular Weight . .	EQ 78.11	
Viscosity.	NG	

Solubility in Water. @ 25C 0.18%.
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS LIQUID WITH A CHARACTERISTIC AROMATIC

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 12.2 F	NOTE: -11'C, TCC.
Flash Point, Open Cup. . . .	NG	
Fire Point.	NG	
Auto Ignition.	EQ 1043.6 F	NOTE: 562'C.

Explosive/Flammable Limits

Lower (LEL).	EQ 1.3
Upper (UEL).	EQ 7.1

Shipping Regulations

UN/NA Number.	UN1114
D.O.T. Hazard Class. . .	FLAMMABLE LIQUID
Label	NOT GIVEN
Proper Shipping Name . .	BENZENE

==========

Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 3/01/88

===== Component Information =====

ENZENE
OSHA PEL (PPM): 1
OSHA PEL (MG/M3):
ACGIH TLV (PPM): 10
ACGIH TLV (MG/M3):
STEL (PPM): 25
STEL (MG/M3):
Product %: ~ 100
C.A.S. No.: 71432
Note:
OSHA AND ACGIH STEL / NIOSH: 10 PPM, TLV CEILING: NOT

===== IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

CHEMICAL NAME: Benzene

CHEMICAL FAMILY: Aromatic Hydrocarbon

SYNONYMS: Benzol

CAS NO.: 71-43-2

EMERGENCY TELEPHONE NO.: 312/973-3600 (American Scientific Products)

CHEMTREC TELEPHONE NO.: 800/424-9300

INFORMATION TELEPHONE NO.: 616/726-3171 (American Burdick & Jackson)

MANUFACTURER'S NAME AND ADDRESS:

AMERICAN BURDICK & JACKSON
SUBSIDIARY OF AMERICAN HOSPITAL SUPPLY CORPORATION
1953 SOUTH HARVEY STREET
MUSKEGON, MI 49442

===== PHYSICAL AND CHEMICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Not expected to occur.

APPEARANCE AND ODOR: Clear, colorless liquid with a characteristic aromatic odor.

CONDITIONS TO AVOID: Heat, sparks, open flame, open containers, and poor ventilation.

MATERIALS TO AVOID: Strong oxidizing agents and strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS: Incomplete combustion can generate carbon monoxide and other toxic vapors.

===== FIRE AND EXPLOSION HAZARD DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Volatile and flammable.

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical or foam.

SPECIAL FIRE FIGHTING PROCEDURES: Water will not be effective in extinguishing a fire and may spread it, but a water spray can be used to cool
exposed containers. Wear full protective clothing and self-contained
breathing apparatus. Heat will build pressure and rupture closed storage
containers.

===== HAZARDOUS COMPONENTS =====

SEE COMPONENT INFORMATION.

BENZENE

CARCINOGEN

===== HEALTH HAZARDS =====

OCCUPATIONAL EXPOSURE LIMITS:

OSHA:

PEL-TWA - 1 ppm
PEL-STEL - 25 ppm

ACGIH:

TLV-TWA - 10 ppm
TLV-STEL - 25 ppm

NIOSH:

TLV-TWA - 10 ppm
TLV-C - Not Listed

CONCENTRATION IMMEDIATELY DANGEROUS TO HEALTH:

OSHA/NIOSH 2,000 ppm

ODOR THRESHOLD:

NSC 2 ppm
NIOSH Not Listed
OHS 1.5-5 ppm

CARCINOGENIC, MUTAGENIC, TERATOGENIC DATA:

Human carcinogen (NTP, IARC, OSHA)
Suspect human carcinogen (ACGIH)
Mutagenic and teratogenic data (RTEC)
Animal carcinogen (IARC)

PRIMARY ROUTES OF ENTRY: Benzene may exert its effects through inhalation,
skin absorption, and ingestion.

INDUSTRIAL EXPOSURE: ROUTE OF EXPOSURE/SIGNS AND SYMPTOMS:

INHALATION: Exposure can cause dizziness, intoxication, excitement, headache, vomiting, delirium, drowsiness, and unconsciousness.

EYE CONTACT: Liquid and high vapor concentration can cause irritation, neuritis, atrophy, visual impairment, edema, and cataracts.

SKIN CONTACT: Prolonged or repeated skin contact can cause irritation and dermatitis through defatting of skin.

INGESTION: Can cause gastrointestinal tract discomfort.

EFFECTS OF OVEREXPOSURE: Benzene is a primary skin irritant, central nervous system depressant, bone marrow depressant, and leukemogen. Acute benzene exposure from inhalation or ingestion initially produces excitation and euphoria, followed by headache, drowsiness, dizziness, vomiting, delirium and unconsciousness. Respiratory irritation and pulmonary edema are possible. Severe exposure causes blurred vision, tremors, shallow and rapid respiration, ventricular fibrillation, paralysis, and convulsions. Liver and kidney damage may occur. Chronic exposure to benzene poses the most significant toxic effects. Symptoms are headache, anorexia, nervousness, weariness, anemia, pallor, bleeding under the skin and eyes, and reduced clotting ability. Bone marrow damage and leukemia may develop. Liver and kidney damage may occur.

MEDICAL CONDITION AGGRAVATED BY EXPOSURE: Preclude from exposure those individuals with diseases of the heart, lung, kidney, liver, nervous system, or the blood, and those susceptible to dermatitis.

EMERGENCY FIRST AID:

INHALATION: Immediately remove to fresh air. If not breathing, administer mouth-to-mouth rescue breathing. If there is no pulse administer cardiopulmonary resuscitation (CPR). Contact physician immediately.

EYE CONTACT: Rinse with copious amounts of water for at least 15 minutes. Get emergency medical assistance.

SKIN CONTACT: Flush thoroughly for at least 15 minutes. Wash affected skin with soap and water. Remove contaminated clothing and shoes. Wash clothing before re-use, and discard contaminated shoes. Get emergency medical assistance.

INGESTION: Call local Poison Control Center for assistance. Contact physician immediately. Aspiration Hazard - Do not induce vomiting.

===== SAFETY MEASURES AND EQUIPMENT =====

VENTILATION: Adequate ventilation is required to protect personnel

from
exposure to chemical vapors exceeding the PEL and to minimize fire hazards.
The choice of ventilation equipment, either local or general, will depend on
the conditions of use, quantity of material, and other operating parameters.

RESPIRATORY: Use approved respirator equipment. Follow NIOSH and equipment
manufacturer's recommendations to determine appropriate equipment (air-purifying, air-supplied, or self-contained breathing apparatus).

EYES: Safety glasses are considered minimum protection. Goggles or face
shield may be necessary depending on quantity of material and conditions of
use.

SKIN: Protective gloves and clothing are recommended. The choice of material
must be based on chemical resistance and other user requirements. Generally,
polyvinyl alcohol, viton(R) or nitrile latex offers acceptable chemical
resistance. Individuals who are acutely and specifically sensitive to benzene
may require additional protective equipment.

STORAGE: Benzene should be protected from temperature extremes and direct
sunlight. Proper storage of benzene must be determined based on other
materials stored and their hazards and potential chemical incompatibility. In
general, benzene should be stored in an acceptably protected and secure
flammable liquid storage room.

OTHER: Emergency eye wash fountains and safety showers should be available in
the vicinity of any potential exposure. Ground and bond metal containers to
minimize static sparks.

===== SPILL AND DISPOSAL DATA =====

SPILL CONTROL: Protect from ignition. Wear protective clothing and use
approved respirator equipment. Absorb spilled material in an absorbent
recommended for solvent spills and remove to a safe location for disposal by
approved methods. If released to the environment, comply with all regulatory
notification requirements.

WASTE DISPOSAL: Dispose of benzene as an EPA hazardous waste. Hazardous waste
numbers: U019 (Ignitable, Toxic); D001 (Ignitable).

===== SPECIAL NOTES =====

KEY:

CA: Approximately

NA: Not applicable
C: Ceiling
PEL: Permissible Exposure Level
STEL: Short Term Exposure Level
TLV: Threshold Limit Value
TWA: Time Weighted Average
BuAc: Butyl Acetate
NSC: National Safety Council ("Fundamentals of Industrial Hygiene", 1983)
OHS: Occupational Health Services ("Hazardline")

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SUBMISSION DATE: FEBRUARY 21, 2000

APPENDIX C-2

MATERIAL SAFETY DATA SHEETS

MSDS - Supporting the Process Knowledge Waste Identification Reports

This volume contains the Material Safety Data Sheets which apply to the hazardous waste streams covered by the RCRA Part B Permit and referenced in the individual waste stream reports.

Material	MSDS Number/CAS Number
1,1,1-Trichloroethane	5994
1,2-Dichloroethane	107-06-2
1,2-Dichloroethylene	540-59-0
1-Methoxy-2-Propanol	6412
2-Propanol	6779
Acetic Acid	64-19-7
Acetone	5711
Acetylene	403
Ammonia	238
Ammonium Citrate	3012-65-5
Arsenic	346
Barium	342
Benzene	5505
Blanket Cleaning Solvent	Q334 / 64742-48-9
Boric Acid	10043-35-3
Cadmium	384
Carbon Disulfide	350
Carbon Tetrachloride	5250
Chlorine Trifluoride	5301
Chlorobenzene	366
Chloroform	5121
Chromium	335
Copper Cyanide	12
Cresol	409
Cresol Red	6330
Cresylic Acid	BHBYK / 108-95-2
CS Ink	6608
Cyanide	309
Cyclohexanone	5713
Deglazing Solvent	Q362 / BJMBQ / 71-55-6
Electrostatic Solution	5809
Endrin	BSTJG / 72-20-8
Ethanol	BNKTC / 64-17-5
Ethyl Ether	5996
Freon 113	5488

Gasoline	1050 / AD1
Heptachlor	BVBVF / 76-44-8
Hexane	161
Hydrochloric Acid	49
Hydrogen Fluoride	7664-39-3
Isopropyl Alcohol	5012
Kerosene, 1-K	1025
Kerosene,BP	1294
Lead	347
Mercury	341
Methanol	107
Methyl Ethyl Ketone	5370
Methyl Isobutyl Ketone	BPJBD / 108-10-1
Methylene Chloride	129
Multigraphics Cleaning Sol.	Q375 / BJRJQ
Multigraphics Electrostatic Solution	Q344 / BCHHW / 13943-58-3
Multilith Cylinder Cleaner	Q361 / BPDWV / 7697-37-2+C11+C27
Naphtha	64742-89-8
Nitric Acid	5423
Phosphoric Acid	5259
Potassium Ferricyanide	625
Propanol	CBDCW / 123-38-6
Pyridine	110-86-1
Selenium	348
Silver	6215
Sodium	BPSNG / 7440-23-5
Sodium Hydroxide	5604
Sulfamic Acid	05329-14-6
Sulfuric Acid	5150
Tetrachloroethylene	00127-18-4
Toluene	5454
Toner, Pre-mixed	Q351 / BMQXG
Trichloroethylene	5335
Universal Blanket Wash	BGCZQ
Xylene	892

PORTS MSDS #: 5994

PRODUCT: 1,1,1-TRICHLOROETHANE

PART NUMBER: T39120

FORMULA: C2-H3-CL3

KEYWORD: ORGANIC

PORTS NUMBER: 66-020-2316

PORTS MISC INFO:

PORTS RATING: HFR=210

MANUFACTURER:
FISHER SCIENTIFIC CO.
1 REAGENT LANE, P.O. BOX 375
FAIR LAWN
NJ

07410
PHONE: PHONE: 201-796-7100
EMERGENCY PHONE: 201-796-7100

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 165 F	NOTE: 74'C.
Melting Point. . . .	EQ -36 F	NOTE: -32'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ 1.32	
Vapor Pressure . . .	EQ 100	NOTE: MMHG @ 20'C.
Vapor Density. . . .	EQ 4.55	
Percent Volatiles. .	NG	
Evaporation Rate . .	EQ 1	NOTE: CCL4=1.
pH	NG	
Molecular Weight . .	EQ 133.40	
Viscosity.	NG	

Solubility in Water. 0.09%.
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID WITH A MILD CHLOROFORM-LIKE ODOR / ODOR THRESH: 100 PPM.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NA	NOTE: NOT AVAILABLE.
Flash Point, Open Cup . . .	NA	NOTE: NOT AVAILABLE.
Fire Point.	NG	
Auto Ignition.	EQ 932 F	NOTE: 500'C.

Explosive/Flammable Limits
Lower (LEL). . . . . EQ 7.5
Upper (UEL). . . . . EQ 12.5

Shipping Regulations
UN/NA Number. UN2831
D.O.T. Hazard Class. . . 6.1-POISONOUS MATL.
Label . . . . . KEEP AWAY FROM FOOD
Proper Shipping Name . . 1,1,1-TRICHLOROETHANE

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Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 7/13/95

===== Component Information =====

1,1-TRICHLOROETHANE
OSHA PEL (PPM):
OSHA PEL (MG/M3): 1910
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 1910
STEL (PPM):
STEL (MG/M3): 2460
Product %: EQ 96.50
C.A.S. No.: 71556
Note:
PEL & TLV: 350 PPM / OSHA & ACGIH STEL: 450 PPM / NIOSH:350 PPM 15 MIN-CEIL

1,4-DIOXANE
OSHA PEL (PPM):
OSHA PEL (MG/M3): 90
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 90
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 2.5
C.A.S. No.: 123911
Note:
PEL & TLV: 25 PPM SKIN / NIOSH: 1 PPM (3.6 MG/M3) RECOMMENDED 30-MIN CEIL.

1,2-BUTYLENE OXIDE
OSHA PEL (PPM): NG
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NG
CGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ .47
C.A.S. No.: 106887

NITROMETHANE
OSHA PEL (PPM): NG
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NG
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ .34
C.A.S. No.: 75525

===== SUBSTANCE IDENTIFICATION =====

SUBSTANCE: 1,1,1-TRICHLOROETHANE

CAS NUMBER: 71-55-6

TRADE NAMES/SYNONYMS: ALPHA-TRICHLOROETHANE; CHLOROTHENE; AEROTHENE TT; ETHYLIDINE CHLORIDE; METHYLTRICHLOROMETHANE; METHYLCHLOROFORM; TRICHLOROMETHYLMETHANE; TRICHLOROETHANE; T-391; T-398; RCRA U226; UN 2831; STCC 4941176; C2H3CL3; ACC14370

CHEMICAL FAMILY: HALOGEN COMPOUND, ALIPHATIC

MOLECULAR FORMULA: C2-H3-CL3

MOLECULAR WEIGHT: 133.40

CAT NO: T39120

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=1 REACTIVITY=0 PERSISTENCE=3

PA RATINGS (SCALE 0-4): HEALTH=2 FIRE=1 REACTIVITY=0

DATE: 09/13/95

EMERGENCY NUMBER: (201) 796-7100

CHEMTREC ASSISTANCE: (800) 424-9300

TELEPHONE NUMBER: (201) 796-7100

MANUFACTURER'S NAME AND ADDRESS:

FISHER SCIENTIFIC
CHEMICAL DIVISION
1 REAGENT LANE
FAIR LAWN NJ 07410

===== COMPONENTS AND CONTAMINANTS =====

SEE COMPONENT INFORMATION.

COMPONENT: 1,1,1-TRICHLOROETHANE

COMPONENT: 1,4-DIOXANE

COMPONENT: 1,2 BUTYLENE OXIDE

COMPONENT: NITROMETHANE

OTHER CONTAMINANTS: NONE

XPOSURE LIMITS:

METHYL CHLOROFORM (1,1,1-TRICHLOROETHANE):

350 PPM (1910 MG/M3) NIOSH RECOMMENDED 15 MINUTE CEILING
200 PPM (1080 MG/M3) DFG MAK TWA;
1000 PPM (5400 MG/M3) DFG MAK 30 MINUTE PEAK, AVERAGE VALUE, 2 TIMES/SHIFT

MEASUREMENT METHOD: CHARCOAL TUBE; CARBON DISULFIDE; GAS CHROMATOGRAPHY WITH FLAME IONIZATION DETECTION; (NIOSH VOL. III # 1003, HALOGENATED HYDROCARBONS).

1000 POUNDS CERCLA SECTION 103 REPORTABLE QUANTITY.

SUBJECT TO SARA SECTION 313 ANNUAL TOXIC CHEMICAL RELEASE REPORTING

1,4-DIOXANE:

1 PPM (3.6 MG/M3) NIOSH RECOMMENDED 30 MINUTE CEILING
50 PPM (180 MG/M3) DFG MAK TWA (SKIN);
100 PPM (360 MG/M3) DFG MAK 30 MINUTE PEAK, AVERAGE VALUE, 4 TIMES/SHIFT

MEASUREMENT METHOD: CHARCOAL TUBE; CARBON DISULFIDE; GAS CHROMATOGRAPHY WITH FLAME IONIZATION DETECTION; (NIOSH III # 1602).

100 POUND CERCLA SECTION 103 REPORTABLE QUANTITY

SUBJECT TO SARA SECTION 313 ANNUAL TOXIC CHEMICAL RELEASE REPORTING

SUBJECT TO CALIFORNIA PROPOSITION 65 CANCER AND/OR REPRODUCTIVE TOXICITY WARNING AND RELEASE REQUIREMENTS - (JANUARY 1, 1988)

OSHA REVOKED THE FINAL RULE LIMITS OF JANUARY 19, 1989 IN RESPONSE TO THE 11TH CIRCUIT COURT OF APPEALS DECISION (AFL-CIO v. OSHA) EFFECTIVE JUNE 30,

1993. SEE 29 CFR 1910.1000 (58 FR 35338)

=== PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

ODOR THRESHOLD: 100 ppm

SOLVENT SOLUBILITY: ACETONE, BENZENE, METHANOL, ETHER, CARBON TETRACHLORIDE, CARBON DISULFIDE, N-HEPTANE, ETHANOL, CHLOROFORM

===== FIRE AND EXPLOSION DATA =====

FIRE AND EXPLOSION HAZARD: SLIGHT FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

THIS MATERIAL IS NEARLY NONFLAMMABLE. HIGH ENERGY, SUCH AS AN ELECTRIC ARC, IS NEEDED FOR IGNITION, AND THE FLAME TENDS TO GO OUT WHEN THE IGNITION SOURCE IS REMOVED.

FLASH POINT: NOT AVAILABLE

UPPER EXPLOSIVE LIMIT: 12.5%

LOWER EXPLOSIVE LIMIT: 7.5%

AUTOIGNITION TEMP.: 932 F (500 C)

FIREFIGHTING MEDIA: DRY CHEMICAL OR CARBON DIOXIDE (1993 EMERGENCY RESPONSE GUIDEBOOK, RSPA P 5800.6).

FOR LARGER FIRES, USE WATER SPRAY, FOG OR REGULAR FOAM (1993 EMERGENCY ESPONSE GUIDEBOOK, RSPA P 5800.6).

FIREFIGHTING: APPLY COOLING WATER TO SIDES OF CONTAINERS THAT ARE EXPOSED TO FLAMES UNTIL WELL AFTER FIRE IS OUT. STAY AWAY FROM ENDS OF TANKS. ISOLATE FOR 1/2 MILE IN ALL DIRECTIONS IF TANK, RAIL CAR OR TANK TRUCK IS INVOLVED IN FIRE (1993 EMERGENCY RESPONSE GUIDEBOOK, RSPA P 5800.6, GUIDE PAGE 74).

EXTINGUISH USING AGENTS FOR SURROUNDING FIRE. COOL FIRE-EXPOSED CONTAINERS WITH FLOODING AMOUNTS OF WATER APPLIED FROM AS FAR A DISTANCE AS POSSIBLE. DO NOT ALLOW RUN-OFF WATER INTO SEWERS AND WATER SOURCES. AVOID BREATHING VAPORS.

===== TRANSPORTATION DATA =====

U.S. DEPARTMENT OF TRANSPORTATION SHIPPING NAME-ID NUMBER, 49 CFR 172.101: 1,1,1-TRICHLOROETHANE-UN 2831

U.S. DEPARTMENT OF TRANSPORTATION HAZARD CLASS OR DIVISION, 49 CFR 172.101: 6.1 - POISONOUS MATERIALS

U.S. DEPARTMENT OF TRANSPORTATION PACKING GROUP, 49 CFR 172.101: PG III

U.S. DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS 49 CFR 172.101 AND SUBPART E: KEEP AWAY FROM FOOD

U.S. DEPARTMENT OF TRANSPORTATION PACKAGING AUTHORIZATIONS:

EXCEPTIONS: 49-CFR 173.153
NON-BULK PACKAGING: 49 CFR 173.203
BULK PACKAGING: 49 CFR 173.241

U.S. DEPARTMENT OF TRANSPORTATION QUANTITY LIMITATIONS 49 CFR 172.101:

PASSENGER AIRCRAFT OR RAILCAR: 60 L
CARGO AIRCRAFT ONLY: 220 L

===== TOXICITY =====

ETHYL CHLOROFORM (1,1,1-TRICHLOROETHANE):

IRRITATION DATA: 450 PPM/8 HOURS EYE-MAN; 5 GM/12 DAYS INTERMITTENT SKIN-RABBIT MILD; 20 MG/24 HOURS SKIN-RABBIT MODERATE; 100 MG EYE-RABBIT MILD; 2 MG/24 HOURS EYE-RABBIT SEVERE.

TOXICITY DATA: 350 PPM INHALATION-MAN TCLO; 200 PPM/4 HOURS INHALATION-MAN TCLO; 920 PPM/70 MINUTES INHALATION-HUMAN TCLO; 18000 PPM/4 HOURS INHALATION-RAT LC50; 10000 PPM/1 HOUR/13 WEEKS INTERMITTENT INHALATION-RAT TCLO; 3911 PPM/2 HOURS INHALATION-MOUSE LC50; 1000 PPM/1 HOUR/13 WEEKS INTERMITTENT INHALATION-GUINEA PIG TCLO; 24400 MG/M3 INHALATION-CAT LC50; 15800 MG/KG SKIN-RABBIT LD50 (EPA-600/8-82-003F, 1084); 670 MG/KG ORAL-HUMAN TDLO; 9600 MG/KG ORAL-RAT LD50; 6 GM/KG ORAL-MOUSE LD50; 5660 MG/KG ORAL-RABBIT LD50; 9470 MG/KG ORAL-GUINEA PIG LD50; 750 MG/KG ORAL-DOG LD50; 16 GM/KG SUBCUTANEOUS-MOUSE LD50; 500 MG/KG SUBCUTANEOUS- RABBIT LDLO; 95 MG/KG INTRAVENOUS-DOG LDLO; 3593 MG/KG INTRAPERITONEAL-RAT LD50; 3636 MG/KG INTRAPERITONEAL-MOUSE LD50; 3100 MG/KG INTRAPERITONEAL-DOG LD50; MUTAGENIC DATA (RTECS); REPRODUCTIVE EFFECTS DATA (RTECS).

CARCINOGEN STATUS: ANIMAL INADEQUATE EVIDENCE (IARC GROUP-3).

LOCAL EFFECTS: IRRITANT- INHALATION, SKIN, EYE.

ACUTE TOXICITY LEVEL: SLIGHTLY TOXIC BY INHALATION, DERMAL ABSORPTION AND INGESTION.

TARGET EFFECTS: CENTRAL NERVOUS SYSTEM DEPRESSANT. POISONING MAY ALSO AFFECT THE HEART, LIVER AND KIDNEYS.

AT INCREASED RISK FROM EXPOSURE: PERSONS WITH PRE-EXISTING SKIN DISORDERS OR LIVER, KIDNEY, OR CARDIOVASCULAR DISEASE.

ADDITIONAL DATA: ALCOHOL MAY ENHANCE THE TOXIC EFFECTS. STIMULANTS SUCH AS EPINEPHRINE MAY INDUCE VENTRICULAR FIBRILLATION.

1,4-DIOXANE:

IRRITATION DATA: 515 MG OPEN SKIN-RABBIT MILD; 300 PPM/15 MINUTES EYE-HUMAN; 100 MG EYE-RABBIT SEVERE; 100 MG/24 HOURS EYE-RABBIT MODERATE; 10 UG EYE- GUINEA PIG MODERATE.

TOXICITY DATA: 470 PPM INHALATION-HUMAN TCLO; 5500 PPM/1 MINUTE INHALATION-HUMAN TCLO; 470 PPM/3 DAYS INHALATION-HUMAN LCLO; 46 GM/M3/2 HOURS INHALATION-RAT LC50; 37 GM/M3/2 HOURS INHALATION-MOUSE LC50; 44 GM/M3/7 HOURS INHALATION-CAT LCLO; 20500 MG/M3 INHALATION-MAMMAL LC50; 6000 PPM/4 HOURS/2 WEEKS-INTERMITTENT INHALATION-RAT TCLO; 7600 MG/KG SKIN-RABBIT LD50; 2 GM/KG ORAL-RABBIT LD50; 5700 MG/KG ORAL-MOUSE LD50; 2 GM/KG ORAL-CAT LD50; 3150 MG/KG ORAL-GUINEA PIG LD50; 1500 MG/KG INTRAVENOUS-RABBIT LDLO; 1500 MG/KG INTRAVENOUS-CAT LDLO; 790 MG/KG INTRAPERITONEAL-MOUSE LD50; 799 MG/KG INTRAPERITONEAL-RAT LD50; MUTAGENIC DATA (RTECS); REPRODUCTIVE EFFECTS DATA (RTECS); TUMORIGENIC DATA (RTECS).

CARCINOGEN STATUS: ANTICIPATED HUMAN CARCINOGEN (NTP); HUMAN INADEQUATE EVIDENCE, ANIMAL SUFFICIENT EVIDENCE (IARC GROUP-2B). ORAL ADMINISTRATION PRODUCED ADENOMAS AND CARCINOMAS IN THE LIVER AND CARCINOMAS OF THE NASAL CAVITY IN RATS AND HEMATOMAS AND CARCINOMAS OF THE GALL BLADDER IN GUINEA PIGS.

LOCAL EFFECTS: IRRITANT - INHALATION, SKIN, EYES.

ACUTE TOXICITY LEVEL: MODERATELY TOXIC BY INHALATION; SLIGHTLY TOXIC BY DERMAL ABSORPTION AND INGESTION.

TARGET EFFECTS: HEPATOTOXIN; CENTRAL NERVOUS SYSTEM DEPRESSANT; NEPHROTOXIN. POISONING MAY AFFECT THE BRAIN.

AT INCREASED RISK FROM EXPOSURE: PERSONS WITH PRE-EXISTING LIVER, KIDNEY, PULMONARY OR SKIN DISORDERS.

ADDITIONAL DATA: ALCOHOL MAY ENHANCE THE TOXIC EFFECTS.

===== HEALTH EFFECTS AND FIRST AID =====

INHALATION:

METHYL CHLOROFORM (1,1,1-TRICHLOROETHANE): IRRITANT/NARCOTIC. 1000 PPM IMMEDIATELY DANGEROUS TO LIFE OR HEALTH.

ACUTE EXPOSURE: EXPOSURE TO 500 PPM FOR 60 MINUTES SHOULD CAUSE NO EFFECT EXCEPT FOR A DISTINCTIVE ODOR WHILE 900-1000 PPM FOR 20 MINUTES MAY CAUSE MILD RESPIRATORY TRACT IRRITATION AND PROMPT BUT MINIMAL IMPAIRMENT OF EQUILIBRIUM WHICH MAY BE ACCOMPANIED BY HEADACHE, LASSITUDE AND ATAXIA. IMPAIRED PERFORMANCE OF BEHAVIORAL TESTS WAS ALSO REPORTED AT 1000 PPM. HIGHER LEVELS OF 2000-5000 PPM MAY CAUSE INCOORDINATION, ANESTHESIA, EUPHORIA, LOSS OF CONSCIOUSNESS, COMA AND DEATH DUE TO CENTRAL NERVOUS SYSTEM DEPRESSION, RESPIRATORY ARREST, OR CARDIAC ARRYTHMIA.

CARDIAC SENSITIZATION MAY BE A CONTRIBUTING FACTOR. OTHER EFFECTS MAY INCLUDE NAUSEA, VOMITING, DIARRHEA, DROWSINESS, CONVULSIONS, FALL OF BLOOD PRESSURE, LIVER AND KIDNEY DAMAGE, BRADYCARDIA AND BLOOD CLOTTING CHANGES.

CHRONIC EXPOSURE: NO ADVERSE EFFECTS RELATED TO EXPOSURE WERE REPORTED IN VOLUNTEERS EXPOSED TO 500 PPM FOR 7 HOURS A DAY FOR 5 DAYS, OR IN WORKERS EXPOSED TO 200 PPM FOR SEVERAL MONTHS TO 6 YEARS. THERE IS SOME EVIDENCE FROM HUMAN CASE REPORTS THAT REPEATED EXPOSURE TO HIGH CONCENTRATIONS MAY CAUSE LASTING DAMAGE TO THE HEART. EXPOSURE OF ANIMALS FOR 3 MONTHS AT CONCENTRATIONS FROM 1000 TO 10,000 PPM CAUSED SYMPTOMS OF CENTRAL NERVOUS SYSTEM DEPRESSION AND SOME PATHOLOGICAL CHANGES IN THE LIVERS AND LUNGS OF SOME SPECIES. REPRODUCTIVE EFFECTS HAVE BEEN REPORTED IN ANIMALS.

1,4-DIOXANE: IRRITANT/NARCOTIC/HEPATOTOXIN/NEPHROTOXIN. 500 PPM IMMEDIATELY DANGEROUS TO LIFE OR HEALTH.

ACUTE EXPOSURE: MAY BE IRRITATING TO THE NOSE, THROAT AND RESPIRATORY TRACT AT 220 PPM. THIS COMPOUND HAS POOR WARNING PROPERTIES AND CAN BE INHALED IN AMOUNTS THAT MAY CAUSE SERIOUS SYSTEMIC INJURY. SYMPTOMS OF SYSTEMIC TOXICITY MAY INCLUDE HEADACHE, VERTIGO, DROWSINESS, DYSPNEA, NAUSEA, AND VOMITING. INHALATION CAUSED INCREASED SALIVATION, LACRIMATION, NARCOSIS, BEHAVIORAL CHANGES, AND DEATH IN ANIMALS. AUTOPSY REVEALED LUNG, LIVER AND KIDNEY DAMAGE, CONGESTION AND EDEMA OF THE LUNGS, AND INCREASED BLOOD COUNTS.

CHRONIC EXPOSURE: REPEATED EXPOSURE CAUSED MUCOUS MEMBRANE IRRITATION, DYSPNEA, HEADACHE, VERTIGO, LOSS OF APPETITE, NAUSEA AND VOMITING, PAIN AND TENDERNESS IN THE ABDOMEN AND LUMBAR REGION, DROWSINESS, MALAISE, LIVER ENLARGEMENT AND DAMAGE, OLIGURIA, ANURIA, UREMIA, COMA, AND DEATH FROM ACUTE RENAL FAILURE. AUTOPSIES REVEALED LUNG AND BRAIN CONGESTION, CENTRAL NERVOUS SYSTEM DAMAGE, LIVER NECROSIS, HEMORRHAGIC NEPHRITIS AND NECROSIS, LEUKOCYTOSIS, AND BRONCHOPNEUMONIA.

FIRST AID: REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP PERSON WARM AND AT REST. DO NOT GIVE EPINEPHRINE OR OTHER STIMULANTS THAT MAY CAUSE VENTRICULAR ARRHYTHMIAS. (DREISBACH, HANDBOOK OF POISONING, 11TH ED.). GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT:

METHYL CHLOROFORM (1,1,1-TRICHLOROETHANE): IRRITANT.

ACUTE EXPOSURE: DIRECT CONTACT MAY CAUSE IRRITATION AND REDNESS. VAPORS ARE POORLY ABSORBED, BUT THE LIQUID, ESPECIALLY IF CONFINED UNDER AN IMPERMEABLE BARRIER MAY BE ABSORBED TO SOME EXTENT. THIS ALONE IS UNLIKELY TO RESULT IN TOXIC EFFECTS, BUT MAY ADD TO THE EFFECTS OF INHALATION EXPOSURE.

CHRONIC EXPOSURE: REPEATED SKIN CONTACT MAY PRODUCE A DRY, SCALY, FISSURED DERMATITIS DUE TO THE DEFATTING PROPERTIES OF THE LIQUID, AND POSSIBLY BURNS.

1,4-DIOXANE: IRRITANT/NARCOTIC/HEPATOTOXIN/NEPHROTOXIN.

ACUTE EXPOSURE: MAY CAUSE IRRITATION WITH REDNESS AND PAIN. ALLERGIC CONTACT DERMATITIS HAS BEEN REPORTED. SKIN ABSORPTION MAY OCCUR AND CAUSE HEADACHE, NAUSEA AND VOMITING. SKIN ABSORPTION PRODUCED SIGNS OF UNSTEADINESS, INCOORDINATION, NARCOSIS, ERYTHEMA, AND LIVER AND KIDNEY DAMAGE IN ANIMALS.

CHRONIC EXPOSURE: PROLONGED OR REPEATED CONTACT MAY CAUSE DRYING AND CRACKING OF THE SKIN, DERMATITIS, AND ECZEMA. SKIN ABSORPTION MAY HAVE CONTRIBUTED TO THE DEATH OF A WORKER FOLLOWING SKIN AND INHALATION EXPOSURE FOR ONE WEEK. ANIMAL STUDIES INDICATE REPEATED SKIN APPLICATION MAY RESULT IN LIVER AND KIDNEY DAMAGE. TUMOR PROMOTER ACTIVITY HAS BEEN REPORTED IN MICE.

FIRST AID: REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (AT LEAST 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT:

METHYL CHLOROFORM (1,1,1-TRICHLOROETHANE): IRRITANT.

ACUTE EXPOSURE: EXPOSURE TO 500 PPM MAY CAUSE IRRITATION AND REDNESS. DIRECT CONTACT WITH THE LIQUID MAY CAUSE TEMPORARY INJURY WITH COMPLETE RECOVERY EXPECTED IN 48 HOURS. DIRECT APPLICATION TO THE EYES OF RABBITS HAS CAUSED CONJUNCTIVAL IRRITATION, BUT NO CORNEAL DAMAGE.

CHRONIC EXPOSURE: REPEATED OR PROLONGED CONTACT MAY CAUSE CONJUNCTIVITIS.

1,4-DIOXANE: IRRITANT.

ACUTE EXPOSURE: VAPORS MAY CAUSE IRRITATION AT CONCENTRATIONS ABOVE 220 PPM. NO SERIOUS DISTURBANCES HAVE BEEN REPORTED BY EXTERNAL CONTACT. DIRECT APPLICATION TO RABBIT EYES CAUSED TRANSIENT CORNEAL INJURY.

CHRONIC EXPOSURE: REPEATED OR PROLONGED EXPOSURE MAY RESULT IN CONJUNCTIVITIS.

FIRST AID: WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (AT LEAST 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:

METHYL CHLOROFORM (1,1,1-TRICHLOROETHANE): NARCOTIC.

ACUTE EXPOSURE: MAY CAUSE NAUSEA, VOMITING, DIARRHEA, GASTROINTESTINAL DISTURBANCES AND ABDOMINAL PAIN FOLLOWED BY CENTRAL NERVOUS SYSTEM DEPRESSION WITH HEADACHE, DIZZINESS, WEAKNESS, INCOORDINATION, MENTAL CONFUSION AND UNCONSCIOUSNESS. DEATH MAY OCCUR FROM CHRONIC RESPIRATORY FAILURE. OTHER SYMPTOMS AS DESCRIBED IN ACUTE INHALATION MAY ALSO OCCUR. MYOCARDIAL SENSITIZATION TO EPINEPHRINE AND SUBSEQUENT DEATH DUE TO CARDIAC ARREST MAY OCCUR. ASPIRATION MAY RESULT IN PULMONARY EDEMA OR CHEMICAL PNEUMONITIS.

CHRONIC EXPOSURE: REPRODUCTIVE EFFECTS HAVE BEEN REPORTED IN ANIMALS.

1,4-DIOXANE: NARCOTIC/HEPATOTOXIN/NEPHROTOXIN/CARCINOGEN.

ACUTE EXPOSURE: MAY CAUSE LIGHT BURNING SENSATION ON CONTACT WITH ORAL MUCOUS MEMBRANES. LARGE DOSES RESULTED IN WEAKNESS, INCOORDINATION, DEPRESSION, COMA AND DEATH IN ANIMALS. AUTOPSY REVEALED HEMORRHAGIC AREAS IN THE PYLORIC REGION OF THE STOMACH, BLADDERS DISTENDED WITH URINE, SLIGHT PROTEINURIA AND ENLARGED KIDNEYS. ASPIRATION MAY RESULT IN PNEUMONIA.

CHRONIC EXPOSURE: IN ANIMAL FEEDING STUDIES, THIS COMPOUND PRODUCED VER AND KIDNEY DEGENERATION AND NECROSIS, ULCERATION OF THE STOMACH, PATOMAS, CARCINOMA OF THE NASAL CAVITY, CARCINOMA OF THE KIDNEY PELVIS, LEUKEMIA, LYMPHOSARCOMA, CHOLANGIOMAS, GALL BLADDER CARCINOMAS, AND TUMORS OF THE LUNG. REPRODUCTIVE EFFECTS HAVE BEEN REPORTED IN ANIMALS.

FIRST AID: TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION AND ADVICE ON WHETHER TO USE GASTRIC LAVAGE. EXTREME CARE MUST BE TAKEN TO PREVENT ASPIRATION. A CUFFED ENDOTRACHEAL TUBE USED BY QUALIFIED MEDICAL PERSONNEL MIGHT BE ADVISABLE. KEEP HEAD LOWER THAN HIPS TO PREVENT ASPIRATION SHOULD VOMITING OCCUR.

ANTIDOTE: NO SPECIFIC ANTIDOTE. TREAT SYMPTOMATICALLY AND SUPPORTIVELY.

===== REACTIVITY =====

REACTIVITY: SLOWLY DECOMPOSES OVER TIME YIELDING HYDROGEN CHLORIDE. AN INHIBITOR MAY BE ADDED TO SCAVENGE THE ACID THAT IS FORMED AND PREVENT CORROSION TO METALS. WATER MAY REACT WITH THE INHIBITOR AND ALLOW THE NATURAL DECOMPOSITION TO OCCUR.

INCOMPATIBILITIES:

METHYL CHLOROFORM (1,1,1-TRICHLOROETHANE):

ACETONE: EXOTHERMIC REACTION.
ALKALI (STRONG): POSSIBLE VIOLENT REACTION.
ALUMINUM AND ALLOYS: MAY DECOMPOSE VIOLENTLY.
BARIUM: FIRE AND EXPLOSION HAZARD.
MAGNESIUM: VIOLENT DECOMPOSITION WITH EVOLUTION OF HYDROGEN CHLORIDE.
METALS (POWDERED): FIRE AND EXPLOSION HAZARD.
NITROGEN TETROXIDE: FORMS EXPLOSIVE MIXTURE.
OXIDIZERS (STRONG): POSSIBLE VIOLENT REACTION.
OXYGEN (GAS): POSSIBLE EXPLOSION WHEN HEATED @ 100 C.
OXYGEN (LIQUID): POSSIBLE VIOLENT EXPLOSION.
POTASH: FORMS FLAMMABLE OR EXPLOSIVE PRODUCT.
POTASSIUM AND ALLOYS: FORMS SHOCK-SENSITIVE MIXTURE.
POTASSIUM HYDROXIDE: FORMATION OF SPONTANEOUSLY FLAMMABLE PRODUCT.
RUBBER, PLASTICS, COATINGS: MAY BE ATTACKED.
SODIUM AND ALLOYS: FIRE AND EXPLOSION HAZARD.
SODIUM HYDROXIDE: FORMS SPONTANEOUSLY FLAMMABLE PRODUCT.
SODIUM-POTASSIUM ALLOY: POSSIBLE EXPLOSION.
TIN AND ALLOYS: INCOMPATIBLE.
ZINC AND ALLOYS: INCOMPATIBLE.

1,4-DIOXANE:

DECABORANE: FORMS SHOCK-SENSITIVE MIXTURE.
NICKEL (RANEY CATALYST): POSSIBLE EXPLOSIVE REACTION ABOVE 210 C.
NITRIC ACID + PERCHLORIC ACID: POSSIBLE EXPLOSIVE REACTION.
OXIDIZERS (STRONG): FIRE AND EXPLOSION HAZARD.
SILVER PERCHLORATE: MAY FORM EXPLOSIVE COMPOUND.
SULFUR TRIOXIDE: VIOLENT DECOMPOSITION ON STORAGE.
TRIETHYNYLALUMINUM: MAY EXPLODE WHEN HEATED.

SEE ALSO ETHERS.

ETHERS:

BORON TRIIODIDE: VIGOROUS REACTION.

DECOMPOSITION: THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE TOXIC AND CORROSIVE FUMES OF CHLORIDES, TOXIC FUMES OF PHOSGENE AND CHLOROACETYLENES, AND OXIDES OF CARBON.

POLYMERIZATION: HAZARDOUS POLYMERIZATION HAS NOT BEEN REPORTED TO OCCUR UNDER NORMAL TEMPERATURES AND PRESSURES.

=== STORAGE AND DISPOSAL =====

OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE.

STORAGE:

STORE IN A COOL, DRY, WELL-VENTILATED LOCATION (NFPA 49, HAZARDOUS CHEMICALS DATA, 1991).

STORE AWAY FROM INCOMPATIBLE SUBSTANCES.

DISPOSAL: DISPOSAL MUST BE IN ACCORDANCE WITH STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE, 40CFR 262. EPA HAZARDOUS WASTE NUMBER U226.

CONDITIONS TO AVOID: MAY BURN BUT DOES NOT IGNITE READILY. AVOID CONTACT WITH STRONG OXIDIZERS, EXCESSIVE HEAT, SPARKS, OR OPEN FLAME.

===== SPILL AND LEAK PROCEDURES =====

SOIL SPILL: DIG A PIT, POND, LAGOON OR HOLDING AREA TO CONTAIN LIQUID OR SOLID MATERIAL. DIKE SURFACE FLOW USING SOIL, SANDBAGS, FOAMED POLYURETHANE OR FOAMED CONCRETE. ABSORB BULK LIQUID WITH FLY ASH OR CEMENT POWDER.

WATER SPILL:

NATURAL BARRIERS OR OIL SPILL CONTROL BOOMS SHOULD BE USED TO LIMIT SPILL TRAVEL.

NATURAL DEEP WATER POCKETS, EXCAVATED LAGOONS, OR SAND BAG BARRIERS SHOULD E USED TO TRAP MATERIAL AT BOTTOM.

SUCTION HOSES SHOULD BE USED TO REMOVE TRAPPED MATERIAL.

THE CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (PROPOSITION 65) PROHIBITS CONTAMINATING ANY KNOWN SOURCE OF DRINKING WATER WITH SUBSTANCES KNOWN TO CAUSE CANCER AND/OR REPRODUCTIVE TOXICITY.

OCCUPATIONAL SPILL: SHUT OFF IGNITION SOURCES. STOP LEAK IF YOU CAN DO IT WITHOUT RISK. FOR SMALL LIQUID SPILLS, TAKE UP WITH SAND, EARTH OR OTHER ABSORBENT MATERIAL. FOR LARGER SPILLS, DIKE FAR AHEAD OF SPILL FOR LATER DISPOSAL. NO SMOKING, FLAMES OR FLARES IN HAZARD AREA! KEEP UNNECESSARY PEOPLE AWAY.

REPORTABLE QUANTITY (RQ): 1000 POUNDS

THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) SECTION 304 REQUIRES THAT A RELEASE EQUAL TO OR GREATER THAN THE REPORTABLE QUANTITY FOR THIS SUBSTANCE BE IMMEDIATELY REPORTED TO THE LOCAL EMERGENCY PLANNING COMMITTEE AND THE STATE EMERGENCY RESPONSE COMMISSION (40 CFR 355.40). IF THE RELEASE OF THIS SUBSTANCE IS REPORTABLE UNDER CERCLA SECTION 103, THE NATIONAL RESPONSE CENTER MUST BE NOTIFIED IMMEDIATELY AT (800) 424-8802 OR (202) 426-2675 IN THE METROPOLITAN WASHINGTON, D.C. AREA (40 CFR 302.6).

===== PROTECTIVE EQUIPMENT =====

VENTILATION: PROVIDE LOCAL EXHAUST OR PROCESS ENCLOSURE VENTILATION TO MEET THE PUBLISHED EXPOSURE LIMITS. VENTILATION EQUIPMENT SHOULD BE EXPLOSION-PROOF IF EXPLOSIVE CONCENTRATIONS OF DUST, VAPOR OR FUME ARE PRESENT.

RESPIRATOR: THE FOLLOWING RESPIRATORS AND MAXIMUM USE CONCENTRATIONS ARE RECOMMENDATIONS BY THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, NIOSH POCKET GUIDE TO CHEMICAL HAZARDS; NIOSH CRITERIA DOCUMENTS OR BY THE U.S. DEPARTMENT OF LABOR, 29 CFR 1910 SUBPART Z.

THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAMINATION LEVELS FOUND IN THE WORK PLACE, MUST NOT EXCEED THE WORKING LIMITS OF THE RESPIRATOR AND BE JOINTLY APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH AND THE MINE SAFETY AND HEALTH ADMINISTRATION (NIOSH-MSHA).

METHYL CHLOROFORM (1,1,1-TRICHLOROETHANE):

1000 PPM - ANY SUPPLIED-AIR RESPIRATOR. ANY SELF-CONTAINED BREATHING APPARATUS.

ESCAPE - ANY AIR-PURIFYING, FULL FACEPIECE RESPIRATOR (GAS MASK) WITH A CHIN-STYLE, FRONT OR BACK-MOUNTED ORGANIC VAPOR CANISTER. ANY APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

ANY SELF-CONTAINED BREATHING APPARATUS THAT HAS A FULL FACEPIECE AND IS OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE.

ANY SUPPLIED-AIR RESPIRATOR THAT HAS A FULL FACEPIECE AND IS OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE IN COMBINATION WITH AN AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

CLOTHING: EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE (IMPERVIOUS) CLOTHING AND EQUIPMENT TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE.

GLOVES: EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT CONTACT WITH THIS SUBSTANCE.

EYE PROTECTION: EMPLOYEE MUST WEAR SPLASH-PROOF OR DUST-RESISTANT SAFETY GOGGLES TO PREVENT EYE CONTACT WITH THIS SUBSTANCE.

EMERGENCY EYE WASH: WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES MAY BE EXPOSED TO THIS SUBSTANCE, THE EMPLOYER SHALL PROVIDE AN EYE WASH FOUNTAIN WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

===== SPECIAL NOTES =====

AUTHORIZED - FISHER SCIENTIFIC, INC.

CREATION DATE: 10/25/84

REVISION DATE: 07/13/95

ADDITIONAL INFORMATION:

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MSDS for 1,2-DICHLOROETHANE Page 1

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1 - PRODUCT IDENTIFICATION

PRODUCT NAME: 1,2-DICHLOROETHANE
FORMULA: CLCH2CH2CL
FORMULA WT: 98.96
CAS NO.: 107-06-2
NIOSH/RTECS NO.: KL0525000
COMMON SYNONYMS: ETHYLENE DICHLORIDE; 1,2-BICHLOROETHANE; ETHYLENE CHLORIDE
PRODUCT CODES: H076,9302
EFFECTIVE: 01/22/87
REVISION #04

PRECAUTIONARY LABELLING

BAKER SAF-T-DATA(TM) SYSTEM

HEALTH	-	3	SEVERE (CANCER CAUSING)
FLAMMABILITY	-	3	SEVERE (FLAMMABLE)
REACTIVITY	-	1	SLIGHT
CONTACT	-	2	MODERATE

HAZARD RATINGS ARE 0 TO 4 (0 = NO HAZARD; 4 = EXTREME HAZARD).

LABORATORY PROTECTIVE EQUIPMENT

GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER

PRECAUTIONARY LABEL STATEMENTS

WARNING
FLAMMABLE
CAUSES IRRITATION
HARMFUL IF SWALLOWED OR INHALED

NOTE: REPORTED AS CAUSING CANCER IN LABORATORY ANIMALS. EXERCISE DUE CARE. KEEP AWAY FROM HEAT, SPARKS, FLAME. AVOID CONTACT WITH EYES, SKIN, CLOTHING. AVOID BREATHING VAPOR. KEEP IN TIGHTLY CLOSED CONTAINER. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING. IN CASE OF FIRE, USE ALCOHOL FOAM, DRY CHEMICAL, CARBON DIOXIDE - WATER MAY BE INEFFECTIVE. FLUSH SPILL AREA WITH WATER SPRAY.

SAF-T-DATA(TM) STORAGE COLOR CODE: RED (FLAMMABLE)

CAS# 107-06-2

2 - HAZARDOUS COMPONENTS

COMPONENT	%	CAS NO.
1,2-DICHLOROETHANE	90-100	107-06-2

3 - PHYSICAL DATA

BOILING POINT: 84 C (183 F)

VAPOR PRESSURE(MM HG): 62

MELTING POINT: -36 C (-33 F)

VAPOR DENSITY(AIR=1): 3.4

SPECIFIC GRAVITY: 1.25 (H2O=1)

EVAPORATION RATE: 6.5 (BUTYL ACETATE=1)

SOLUBILITY(H2O): SLIGHT (0.1 TO 1 %)

% VOLATILES BY VOLUME: 100

APPEARANCE & ODOR: CLEAR LIQUID WITH SWEET ODOR LIKE CHLOROFORM.

4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (CLOSED CUP 13 C (56 F)

NFPA 704M RATING: 2-3-0

FLAMMABLE LIMITS: UPPER - 15.9 % LOWER - 6.2 %

FIRE EXTINGUISHING MEDIA
USE ALCOHOL FOAM, DRY CHEMICAL OR CARBON DIOXIDE.
(WATER MAY BE INEFFECTIVE.)

SPECIAL FIRE-FIGHTING PROCEDURES
FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE. MOVE CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK. USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL.

UNUSUAL FIRE & EXPLOSION HAZARDS
VAPORS MAY FLOW ALONG SURFACES TO DISTANT IGNITION SOURCES AND FLASH BACK. CLOSED CONTAINERS EXPOSED TO HEAT MAY EXPLODE. CONTACT WITH STRONG OXIDIZERS MAY CAUSE FIRE.

TOXIC GASES PRODUCED
HYDROGEN CHLORIDE, PHOSGENE, CARBON MONOXIDE, CARBON DIOXIDE

---

5 - HEALTH HAZARD DATA

THIS SUBSTANCE IS LISTED AS AN NTP ANTICIPATED HUMAN CARCINOGEN, IARC ANIMAL CARCINOGEN. ACCEPTABLE MAXIMUM PEAK ABOVE THE ACCEPTANCE CEILING CONCENTRATION FOR AN EIGHT-HOUR SHIFT = 200 PPM FOR 5 MINUTES IN ANY 3 HOURS. (PEL) CEILING = 100 PPM.

THRESHOLD LIMIT VALUE (TLV/TWA): 40 MG/M3 (10 PPM)

SHORT-TERM EXPOSURE LIMIT (STEL): 60 MG/M3 (15 PPM)

PERMISSIBLE EXPOSURE LIMIT (PEL): MG/M3 (50 PPM)

TOXICITY: LD50 (ORAL-RAT)(MG/KG) - 670

CARCINOGENICITY: NTP: YES IARC: NO Z LIST: NO OSHA REG: NO

EFFECTS OF OVEREXPOSURE
INHALATION AND INGESTION ARE HARMFUL AND MAY BE FATAL.
INHALATION MAY CAUSE HEADACHE, NAUSEA, VOMITING, DIZZINESS, NARCOSIS, SUFFOCATION, LOWER BLOOD PRESSURE, CENTRAL NERVOUS SYSTEM DEPRESSION.
INHALATION OF VAPORS MAY CAUSE PULMONARY EDEMA.
CONTACT WITH SKIN OR EYES MAY CAUSE SEVERE IRRITATION OR BURNS. PROLONGED CONTACT MAY CAUSE SKIN SENSITIZATION. SUBSTANCE IS READILY ABSORBED THROUGH THE SKIN.
INGESTION MAY CAUSE NAUSEA, VOMITING, HEADACHES, DIZZINESS, GASTROINTESTINAL IRRITATION.
CHRONIC EFFECTS OF OVEREXPOSURE MAY INCLUDE DAMAGE TO KIDNEYS, LIVER, LUNGS, BLOOD, OR CENTRAL NERVOUS SYSTEM.

TARGET ORGANS
KIDNEYS, LIVER, EYES, SKIN, CENTRAL NERVOUS SYSTEM

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
BRONCHITIS, KIDNEY, LIVER, OR BLOOD DISORDERS, HEART DISORDERS, ASTHMA, CIRCULATOY DISORDERS

ROUTES OF ENTRY
INGESTION, INHALATION, ABSORPTION, EYE CONTACT, SKIN CONTACT

EMERGENCY AND FIRST AID PROCEDURES
CALL A PHYSICIAN.
IF SWALLOWED, DO NOT INDUCE VOMITING.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. FLUSH SKIN WITH WATER.

---

6 - REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: HEAT, FLAME, OTHER SOURCES OF IGNITION

INCOMPATIBLES: STRONG OXIDIZING AGENTS, ALUMINUM, MAGNESIUM, AMMONIA, STRONG BASES, NITRIC ACID, POTASSIUM METAL

DECOMPOSITION PRODUCTS: HYDROGEN CHLORIDE, PHOSGENE, CARBON MONOXIDE, CARBON DIOXIDE

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7 - SPILL AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE
WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING.
SHUT OFF IGNITION SOURCES; NO FLARES, SMOKING OR FLAMES IN AREA. STOP LEAK IF YOU CAN DO SO WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. TAKE UP WITH SAND OR OTHER NON-COMBUSTIBLE ABSORBENT MATERIAL AND PLACE INTO

CONTAINER FOR LATER DISPOSAL. FLUSH AREA WITH WATER.

J. T. BAKER SOLUSORB(R) SOLVENT ADSORBENT IS RECOMMENDED FOR SPILLS OF THIS PRODUCT.

DISPOSAL PROCEDURE
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS.

EPA HAZARDOUS WASTE NUMBER: D001 (IGNITABLE WASTE)

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8 - PROTECTIVE EQUIPMENT

VENTILATION:	USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET TLV REQUIREMENTS.
RESPIRATORY PROTECTION:	RESPIRATORY PROTECTION REQUIRED IF AIRBORNE CONCENTRATION EXCEEDS TLV. AT CONCENTRATIONS ABOVE 10 PPM, A SELF-CONTAINED BREATHING APPARATUS IS ADVISED.
EYE/SKIN PROTECTION:	SAFETY GOGGLES AND FACE SHIELD, UNIFORM, PROTECTIVE SUIT, NEOPRENE GLOVES ARE RECOMMENDED.

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9 - STORAGE AND HANDLING PRECAUTIONS

SAF-T-DATA(TM) STORAGE COLOR CODE: RED (FLAMMABLE)

SPECIAL PRECAUTIONS
BOND AND GROUND CONTAINERS WHEN TRANSFERRING LIQUID. KEEP CONTAINER TIGHTLY CLOSED. STORE IN A COOL, DRY, WELL-VENTILATED, FLAMMABLE LIQUID STORAGE AREA.

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10 - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC (D.O.T.)

PROPER SHIPPING NAME	ETHYLENE DICHLORIDE
HAZARD CLASS	FLAMMABLE LIQUID
UN/NA	UN1184

LABELS	FLAMMABLE LIQUID
REPORTABLE QUANTITY	5000 LBS.

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME	ETHYLENE DICHLORIDE
HAZARD CLASS	3.2, 6.1
UN/NA	UN1184
LABELS	FLAMMABLE LIQUID, POISON

Use Web Browser "Back" key to return to previous topic

ACC97772

****** MATERIAL SAFETY DATA SHEET **** **** MATERIAL SAFETY DATA SHEET ******

1,2-Dichloroethylene, 99%, mixture of isomers
97772

****** SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ******

MSDS Name: **1,2-Dichloroethylene, 99%, mixture of isomers**

```
Company Identification:  Acros Organics N.V.
                         Janssen Pharmaceuticalaan 3a
                         2440 Geel, Belgium
For information in North America, call:   800-ACROS-01
For information in Europe, call:          0032(0) 14575211
For emergencies in the US, call CHEMTREC: 800-424-9300
For emergencies outside the US, call:     0032(0) 14575299
```

****** SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS ******

CAS#	Chemical Name	%	EINECS#
540-59-0	1,2-Dichloroethylene		208-750-2

Hazard Symbols: XN F

CAS# 540-59-0
1,2 Dichloroethylene
9/28/97 11

**** SECTION 3 - HAZARDS IDENTIFICATION ****

EMERGENCY OVERVIEW

Not available.
Appearance: Not available. Flash Point: 6°C.
Not available.
Target Organs: Central nervous system, respiratory system, eyes.

Potential Health Effects

Eye:
May cause eye irritation.

Skin:
Causes moderate skin irritation.

Ingestion:
Harmful if swallowed. May cause nausea and vomiting.

Inhalation:
Harmful if inhaled. May cause narcotic effects.

Chronic:
Not available.

**** SECTION 4 - FIRST AID MEASURES ****

Eyes:
Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids. Get medical aid.

Skin:
Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion:
Get medical aid. Wash mouth out with water.

Inhalation:
Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:
Treat symptomatically and supportively.

**** SECTION 5 - FIRE FIGHTING MEASURES ****

General Information:
As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors can travel to a source of ignition and flash back. Will burn if involved in a fire.

Extinguishing Media:
Use water spray to cool fire-exposed containers. In case of fire use

water spray, dry chemical, carbon dioxide, or chemical foam.
Autoignition Temperature: Not available.
Flash Point: 6°C (42.80°F)
NFPA Rating: health-2; flammability-3; reactivity-2
Explosion Limits, Lower: Not available.
Upper: Not available.

**** SECTION 6 - ACCIDENTAL RELEASE MEASURES ****

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:

Absorb spill with inert material, (e.g., dry sand or earth), then place into a chemical waste container. Remove all sources of ignition. Use a spark-proof tool.

**** SECTION 7 - HANDLING and STORAGE ****

Handling:

Use spark-proof tools and explosion proof equipment. Avoid breathing dust, vapor, mist, or gas. Avoid contact with skin and eyes. Use only in a chemical fume hood.

Storage:

Keep away from sources of ignition. Store in a cool, dry place. Store in a tightly closed container. Flammables-area.

**** SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION ****

Engineering Controls:

Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
1,2-Dichloroethylene	200 ppm ; 793 mg/m3	200 ppm TWA; 790 mg/m3 TWA	200 ppm TWA; 790 mg/m3 TWA

OSHA Vacated PELs:

1,2-Dichloroethylene:
200 ppm TWA; 790 mg/m3 TWA

Personal Protective Equipment

Eyes:

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

Follow the OSHA respirator regulations found in 29CFR 1910.134. Always use a NIOSH-approved respirator when necessary.

**** SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES ****

Physical State:	Liquid
Appearance:	Not available.
Odor:	Pleasant odor
pH:	Not available.
Vapor Pressure:	Not available.
Vapor Density:	Not available.
Evaporation Rate:	Not available.
Viscosity:	Not available.
Boiling Point:	48 - 60°C @ 760.00mm Hg
Freezing/Melting Point:	-57°C
Decomposition Temperature:	Not available.
Solubility:	slightly soluble
Specific Gravity/Density:	1.2650g/cm3
Molecular Formula:	C2H2Cl2
Molecular Weight:	96.94

**** SECTION 10 - STABILITY AND REACTIVITY ****

Chemical Stability:

Stable under normal temperatures and pressures.

Conditions to Avoid:

Incompatible materials, light, ignition sources, exposure to air, exposure to moist air or water.

Incompatibilities with Other Materials:

Oxidizing agents, bases.

Hazardous Decomposition Products:

Hydrogen chloride, carbon monoxide, carbon dioxide.

Hazardous Polymerization: Will not occur.

**** SECTION 11 - TOXICOLOGICAL INFORMATION ****

RTECS#:
CAS# 540-59-0: KV9360000
LD50/LC50:
CAS# 540-59-0: Oral, rat: LD50 = 770 mg/kg.
Carcinogenicity:
1,2-Dichloroethylene -
Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
Epidemiology:
No data available.
Teratogenicity:
No data available.
Reproductive Effects:
No data available.
Neurotoxicity:
No data available.
Mutagenicity:
See actual entry in RTECS for complete information.
Other Studies:
No data available.

**** SECTION 12 - ECOLOGICAL INFORMATION ****

Ecotoxicity:
Not available.
Environmental Fate:
Not available.
Physical/Chemical:
Not available.
Other:
Not available.

**** SECTION 13 - DISPOSAL CONSIDERATIONS ****

Dispose of in a manner consistent with federal, state, and local regulations.
RCRA D-Series Maximum Concentration of Contaminants: Not listed.
RCRA D-Series Chronic Toxicity Reference Levels: Not listed.
RCRA F-Series: Not listed.
RCRA P-Series: Not listed.
RCRA U-Series: Not listed.
Not listed as a material banned from land disposal according to RCRA.

**** SECTION 14 - TRANSPORT INFORMATION ****

US DOT
No information available

IMO
Shipping Name: DICHLOROETHYLENE
Hazard Class: 3.2
UN Number: 1150
Packing Group: II
IATA
Shipping Name: 1,2-DICHLOROETHYLENE
Hazard Class: 3
UN Number: 1150
Packing Group: II
RID/ADR
Shipping Name: 1,2-DICHLOROETHYLENE
Dangerous Goods Code: 3(3B)
UN Number: 1150
Canadian TDG
No information available.

**** SECTION 15 - REGULATORY INFORMATION ****

FEDERAL
TSCA
CAS# 540-59-0 is listed on the TSCA inventory.
Health & Safety Reporting List
CAS# 540-59-0: Effective Date: March 11, 1994; Sunset Date: March 11
Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.
Section 12b
None of the chemicals are listed under TSCA Section 12b.
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
SARA
Section 302 (RQ)
None of the chemicals in this material have an RQ.
Section 302 (TPQ)
None of the chemicals in this product have a TPQ.
Section 313
This chemical is not at a high enough concentration to be reportable under Section 313.
No chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

None of the chemicals in this product are listed Priority Pollutants under the CWA.
CAS# 540-59-0 is listed as a Toxic Pollutant under the Clean Water Act.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

1,2-Dichloroethylene can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.
California No Significant Risk Level:
None of the chemicals in this product are listed.

INTERNATIONAL

European Labeling in Accordance with EC Directives

Hazard Symbols: XN F
Risk Phrases:
Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.
S 29 Do not empty into drains.
S 7 Keep container tightly closed.
S 61 Avoid release to the environment. Refer to special instructions/Safety data sheets.

Canada

CAS# 540-59-0 is listed on Canada's DSL/NDSL List.
CAS# 540-59-0 is listed on Canada's Ingredient Disclosure List.

Exposure Limits:

CAS# 540-59-0:. OEL-AUSTRALIA:TWA 200 ppm (790 mg/m3). OEL-AUSTRIA:TWA 200 ppm (790 mg/m3). OEL-BELGIUM:TWA 200 ppm (793 mg/m3). OEL-DENMARK:TWA 200 ppm (790 mg/m3). OEL-FINLAND:TWA 200 ppm (790 mg/m3);STEL 250 ppm (990 mg/m3). OEL-GERMANY:TWA 200 ppm (790 mg/m3). OEL-HUNGARY:TWA 80 mg/m3;STEL 160 mg/m3. OEL-JAPAN:TWA 150 ppm (590 mg/m3). OEL-THE NETHERLANDS:TWA 200 ppm (790 mg/m3). OEL-THE PHILIPPINES:TWA 200 ppm (790 mg/m3). OEL-POLAND:TWA 50 mg/m3. OEL-RUSSIA:TWA 150 ppm ERLAND:TWA 200 ppm (790 mg/m3);STEL 400 ppm. OEL-TURKEY:TWA 200 ppm (790 mg/m3). OEL-UNITED KINGDOM:TWA 200 ppm (790 mg/m3);STEL 250 ppm. OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV. OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

**** SECTION 16 - ADDITIONAL INFORMATION ****

Additional Information:

No additional information available.

MSDS Creation Date: 10/17/1996 Revision #0 Date: Original.

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

PORTS MSDS #: 6412

PRODUCT: 1-METHOXY-2-PROPANOL, 98%

PART NUMBER: 26889-5

FORMULA: C4H10O2

KEYWORD: ORGANIC

PORTS NUMBER: 66-013-0938

PORTS MISC INFO:

PORTS RATING: HFR=230

MANUFACTURER:
ALDRICH CHEMICAL CO., INC.
P.O. BOX 355
MILWAUKEE
WI

53201
PHONE: PHONE: 414-273-3850
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	BT 244 246 F	NOTE: 118-119'C.
Melting Point. . . .	NG	
Freezing Point . . .	NG	
Pour Point	NG	
oftening Point. . .	NG	
Specific Gravity . .	EQ .922	
Vapor Pressure . . .	EQ 10.9	NOTE: MM @ 25'C.
Vapor Density. . . .	EQ 3.12	
Percent Volatiles. .	NG	
Evaporation Rate . .	NG	
pH	NG	
Molecular Weight . .	NG	
Viscosity.	NG	

Solubility in Water. NOT GIVEN
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 93 F	NOTE: 33'C.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	EQ 532 F	NOTE: 277'C.

Explosive/Flammable Limits
Lower (LEL). . . . . EQ 1.6
Upper (UEL). . . . . EQ 13.8

Shipping Regulations
UN/NA Number. UN3092
D.O.T. Hazard Class. . . NG
Label . . . . . NOT GIVEN
Proper Shipping Name . . 1-METHOXY-2-PROPANOL

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Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 12/13/95

===== Component Information =====

METHOXY-2-PROPANOL
OSHA PEL (PPM): NG
OSHA PEL (MG/M3):
ACGIH TLV (PPM): 100
ACGIH TLV (MG/M3):
STEL (PPM): 150
STEL (MG/M3):
Product %: EQ 98
C.A.S. No.: 107982

===== SECTION 1. CHEMICAL IDENTIFICATION =====

NAME: 1-METHOXY-2-PROPANOL, 98%

CATALOG #: 26889-5

DATE: 12/13/95

EMERGENCY PHONE: 1-414-273-3850

TELEPHONE: (414) 273-3850

TWX: (910) 262-3052 ALDRICHEM MI

TELEX: 26 843 ALDRICH MI

FAX: (414) 273-4979

MANUFACTURER'S NAME AND ADDRESS:

ALDRICH CHEMICAL CO., INC.
P.O. BOX 355
MILWAUKEE, WISCONSIN 53201 USA

===== SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS =====

SEE COMPONENT INFORMATION.

EC NO: 203-539-1

SYNONYMS: DOWANOL 33B * DOWANOL PM * DOWANOL PM GLYCOL ETHER * DOWTHERM 209 * GLYCOL ETHER PM * METHOXY ETHER OF PROPYLENE GLYCOL * 1-METHOXY-2-PROPANOL (DOT) * POLY-SOLVE MPM * PROPASOL SOLVENT M * PROPYLENE GLYCOL METHYL ETHER * PROPYLENE GLYCOL MONOMETHYL ETHER * ALPHA-PROPYLENE GLYCOL MONOMETHYL ETHER * PROPYLENE GLYCOL MONOMETHYL ETHER (ACGIH) * PROPYLENGLYKOL-MONOMETHYLAETHER (GERMAN) * UCAR SOLVENT LM (OBS.) * UN3092 (DOT) *

===== SECTION 3. HAZARDS IDENTIFICATION =====

LABEL PRECAUTIONARY STATEMENTS:

FLAMMABLE
IRRITANT
IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.
KEEP AWAY FROM SOURCES OF IGNITION - NO SMOKING.

IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.

WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE PROTECTION.

===== SECTION 4. FIRST-AID MEASURES =====

IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES.

IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.

CALL A PHYSICIAN.

WASH CONTAMINATED CLOTHING BEFORE REUSE.

===== SECTION 5. FIRE FIGHTING MEASURES =====

EXTINGUISHING MEDIA: CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM. WATER MAY BE EFFECTIVE FOR COOLING, BUT MAY NOT EFFECT EXTINGUISHMENT.

SPECIAL FIREFIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.

FLAMMABLE.

USE WATER SPRAY TO COOL FIRE-EXPOSED CONTAINERS.

UNUSUAL FIRE AND EXPLOSIONS HAZARDS: VAPOR MAY TRAVEL CONSIDERABLE DISTANCE TO SOURCE OF IGNITION AND FLASH BACK.

CONTAINER MAY OCCUR UNDER FIRE CONDITIONS. FORMS EXPLOSIVE MIXTURES IN AIR.

===== SECTION 6. ACCIDENTAL RELEASE MEASURES =====

EVACUATE AREA.
SHUT OFF ALL SOURCES OF IGNITION.
WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY RUBBER GLOVES.

COVER WITH AN ACTIVATED CARBON ADSORBENT, TAKE UP AND PLACE IN CLOSED CONTAINERS. TRANSPORT OUTDOORS.

VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

===== SECTION 7. HANDLING AND STORAGE =====

REFER TO SECTION 8.

===== SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION =====

WEAR APPROPRIATE NIOSH/MSHA-APPROVED RESPIRATOR, CHEMICAL-RESISTANT GLOVES, SAFETY GOGGLES, OTHER PROTECTIVE CLOTHING.

MECHANICAL EXHAUST REQUIRED.
SAFETY SHOWER AND EYE BATH.
USE NONSPARKING TOOLS.
DO NOT BREATHE VAPOR.
AVOID CONTACT WITH EYES, SKIN AND CLOTHING.
WASH THOROUGHLY AFTER HANDLING.
IRRITANT.
KEEP TIGHTLY CLOSED.
KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAME.
STORE IN A COOL DRY PLACE.

===== SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

FLASH POINT: 93 F 33 C

EXPLOSION LIMITS IN AIR:

UPPER: 13.8%
LOWER: 1.6%

AUTOIGNITION TEMPERATURE: 532 F 277 C

===== SECTION 10. STABILITY AND REACTIVITY =====

INCOMPATIBILITIES:

OXIDIZING AGENTS
ACID CHLORIDES
ACID ANHYDRIDES

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS:

TOXIC FUMES OF: CARBON MONOXIDE, CARBON DIOXIDE

===== SECTION 11. TOXICOLOGICAL INFORMATION =====

ACUTE EFFECTS: MAY BE HARMFUL BY INHALATION, INGESTION, OR SKIN ABSORPTION. VAPOR OR MIST IS IRRITATING TO THE EYES, MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT. CAUSES SKIN IRRITATION.

RTECS #: UB7700000
2-PROPANOL, 1-METHOXY-

IRRITATION DATA:

SKN-RBT 500 MG OPEN MLD	UCDS** 11/15/71
EYE-RBT 230 MG MLD	AMIHBC 9,509,54
EYE-RBT 500 MG/24H MLD	85JCAE -,625,86

TOXICITY DATA:

ORL-RAT LD50: 5660 MG/KG	AIHAAP 23,95,62
IHL-RAT LC50: 10000 PPM/5H	NPIRI* 1,105,74
IPR-RAT LD50: 3720 MG/KG	38MKAJ 2C,3977,82
SCU-RAT LD50: 7800 MG/KG	ARZNAD 22,569,72
IVN-RAT LD50: 4200 MG/KG	ARZNAD 22,569,72
ORL-MUS LD50: 11700 MG/KG	ARZNAD 22,569,72
IVN-MUS LD50: 5300 MG/KG	ARZNAD 22,569,72
ORL-RBT LD50: 5 GM/KG	ARZNAD 22,569,72
SKN-RBT LD50: 13 GM/KG	NPIRI* 1,105,74
SCU-RBT LD50: 5 GM/KG	ARZNAD 22,569,72
IVN-RBT LD50: 1200 MG/KG	ARZNAD 22,569,72

TARGET ORGAN DATA:

BEHAVIORAL (CONVULSIONS OR EFFECT ON SEIZURE THRESHOLD)
BEHAVIORAL (ATAXIA)
LUNGS, THORAX OR RESPIRATION (DYSPNAE)

ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES (RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR COMPLETE INFORMATION.

===== SECTION 12. ECOLOGICAL INFORMATION =====

DATA NOT YET AVAILABLE.

===== SECTION 13. DISPOSAL CONSIDERATIONS =====

BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER BUT EXERT EXTRA CARE IN IGNITING AS THIS MATERIAL IS HIGHLY FLAMMABLE.

OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

===== SECTION 14. TRANSPORT INFORMATION =====

CONTACT ALDRICH CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

===== SECTION 15. REGULATORY INFORMATION =====

EUROPEAN INFORMATION:

EC INDEX NO: 603-064-00-3
FLAMMABLE
IRRITANT
R 10
FLAMMABLE.
S 24
AVOID CONTACT WITH SKIN.

REVIEWS, STANDARDS, AND REGULATIONS:

OEL = MAK
ACGIH TLV-TWA 100 PPM; STEL 150 PPM 85INA8 6,1310,91
MSHA STANDARD-AIR: TWA 100 PPM (360 MG/M3)
DTLWS* 3,27,73
OEL-BELGIUM: TWA 100 PPM (369 MG/M3); STEL 150 PPM (553 MG/M3) JAN93
OEL-DENMARK: TWA 100 PPM (360 MG/M3) JAN93
OEL-FINLAND: TWA 100 PPM (360 MG/M3); STEL 150 PPM; SKIN JAN93
OEL-FRANCE: TWA 100 PPM (360 MG/M3) JAN93
OEL-GERMANY: TWA 100 PPM (375 MG/M3); SKIN JAN93
OEL-THE NETHERLANDS: TWA 100 PPM (360 MG/M3); SKIN JAN93
OEL-SWITZERLAND: TWA 100 PPM (360 MG/M3); STEL 200 PPM (720 MG/M3) JAN93
OEL-UNITED KINGDOM: TWA 100 PPM (360 MG/ME); SKIN JAN93
OEL IN BULGARIA, COLUMBIA, JORDAN, KOREA CHECK ACGIH TLV
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM CHECK ACGIH TLV
NIOSH REL TO THE CHEMICAL-AIR:10H TWA 100 PPM;STEL 150 PPM
NIOSH* DHHS #92-100,92
NOHS 1974: HZD 81815; NIS 44; TNF 5953; NOS 36; TNE 26413
NOES 1983: HZD 81815; NIS 204; TNF 25947; NOS 133; TNE 373990; TFE 110572
EPA TSCA SECTION 8(B) CHEMICAL INVENTORY
ON EPA IRIS DATABASE
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, OCTOBER 1995

===== SECTION 16. OTHER INFORMATION =====

THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT BUT DOES NOT PURPORT TO BE ALL INCLUSIVE AND SHALL BE USED ONLY AS A GUIDE. ALDRICH SHALL NOT BE HELD LIABLE FOR ANY DAMAGE RESULTING FROM HANDLING OR FROM CONTACT WITH THE ABOVE PRODUCT. SEE REVERSE SIDE OF INVOICE OR PACKING SLIP FOR ADDITIONAL TERMS AND CONDITIONS OF SALE.

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PORTS MSDS #: 6779

PRODUCT: 2-PROPANOL

PART NUMBER: A451-4

FORMULA: C3H8O

KEYWORD:

PORTS NUMBER: 66-001-6136

PORTS MISC INFO:

PORTS RATING: HFR=140

MANUFACTURER:
FISHER SCIENTIFIC

PHONE: PHONE:
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 180 F	NOTE: 82'C.
Melting Point. . . .	EQ -130 F	NOTE: -90'C.
Freezing Point . . .	EQ -130 F	NOTE: -90'C.
Pour Point	NG	
oftening Point. . .	NG	
Specific Gravity . .	EQ .78	NOTE: DENSITY.
Vapor Pressure . . .	EQ 33	NOTE: MMHG.
Vapor Density. . . .	EQ 2.1	
Percent Volatiles. .	NG	
Evaporation Rate . .	EQ 1.5	NOTE: N-BUAC=1.
pH	NA	NOTE: NOT AVAILABLE.
Molecular Weight . .	EQ 60.0554	
Viscosity.	EQ 2.1	NOTE: CP @ 77'F.

Solubility in Water. COMPLETELY SOLUBLE IN WATER.
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID, SOLVENT ODOR / DECOMPOSITION TEMPERATURE: NOT AVAILABLE.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 55 F	NOTE: 12.78'C.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	EQ 810 F	NOTE: 432.22'C.
Explosive/Flammable Limits		
Lower (LEL).	EQ 2.5	NOTE: @ 79'F.
Upper (UEL).	EQ 12.1	NOTE: @ 150'C.

Shipping Regulations

UN/NA Number.	UN1219
D.O.T. Hazard Class. . .	3
Label	NOT GIVEN
Proper Shipping Name . .	ISOPROPANOL

==========

Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 1/16/96

===== Component Information =====

PROPANOL
OSHA PEL (PPM):
OSHA PEL (MG/M3): 980
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 983
STEL (PPM):
STEL (MG/M3): 1230
Product %: EQ 100
C.A.S. No.: 67630
Note:
PEL(FINAL) & TLV: 400 PPM / ACGIH STEL: 500 PPM / NIOSH: 980 MG/M3, 400 PPM

===== SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION =====

MSDS NAME: 2-PROPANOL

CATALOG NUMBERS: A415 20, A415 4, A415-20, A415-4, A416 1, A416 20, A416 20 001, A416 200, A416 200 001, A416 200 002, A416 200 003, A416 4, A416 500, A416-1, A416-20, A416-200, A416-4, A416-500, A416S 4, A416S-4, A416SK 4, A416SK-4, A416SS 115, A416SS 50, A416SS-11, A416SS-115, A416SS 20, A416SS-200, A416SS-30, A416SS-50, A417 1, A417 4, A417-1, A417-4, A419 1, A419 4, A419-1, A419-4, A426P 4, A426P-4, A426S 20, A426S 200, A426S 4, A426S 20, A426S-200, A426S-4, A432-1, A451 1, A451 4, A451-1, A451-4, A451SK 1, A451SK 4, A451SK-1, A451SK-4, A464 4, A464-4, A519 4, A520 4, A520-4, HC 500 1GAL, S77795, S77798

SYNONYMS: ISOPROPANOL, DIMETHYL CARBINOL, ISOPROPYL ALCOHOL

2090

CAT NO: A4164

DATE: 01/16/96

FOR INFORMATION, CALL: 201-796-7100

EMERGENCY NUMBER: 201-796-7100

FOR CHEMTREC ASSISTANCE, CALL: 800-424-9300

MANUFACTURER'S NAME AND ADDRESS:

FISHER SCIENTIFIC
1 REAGENT LANE
FAIR LAWN, NJ 07410

===== SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS =====

SEE COMPONENT INFORMATION.

CHEMICAL NAME	EINECS#
2-PROPANOL	UNLISTED

===== SECTION 3 - HAZARDS IDENTIFICATION =====

EMERGENCY OVERVIEW:

APPEARANCE: COLORLESS LIQUID WITH AROMATIC ODOR.

WARNING! FLAMMABLE LIQUID. FP = 55 F. MAY CAUSE SKIN IRRITATION AND DRYNESS DUE TO DEFATTING OF THE SKIN. MAY CAUSE EYE IRRITATION WITH POSSIBLE INJURY.

INHALATION AND INGESTION CAN CAUSE IRRITATION TO THE RESPIRATORY AND DIGESTIVE TRACTS, AND MAY PRODUCE CENTRAL NERVOUS SYSTEM DEPRESSION CHARACTERIZED BY DIZZINESS, DROWSINESS, HEADACHE, NAUSEA AND VOMITING. MAY CAUSE KIDNEY DAMAGE.

TARGET ORGANS: KIDNEYS, CENTRAL NERVOUS SYSTEM.

POTENTIAL HEALTH EFFECTS:

EYE: PRODUCES IRRITATION, CHARACTERIZED BY A BURNING SENSATION, REDNESS, TEARING, INFLAMMATION, AND POSSIBLE CORNEAL INJURY.

SKIN:

PROLONGED AND/OR REPEATED CONTACT MAY CAUSE DEFATTING OF THE SKIN AND DERMATITIS.

MAY CAUSE IRRITATION WITH PAIN AND STINGING, ESPECIALLY IF THE SKIN IS ABRADED.

INGESTION:

MAY CAUSE GASTROINTESTINAL IRRITATION WITH NAUSEA, VOMITING AND DIARRHEA.

MAY CAUSE KIDNEY DAMAGE.

MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION, CHARACTERIZED BY EXCITEMENT, FOLLOWED BY HEADACHE, DIZZINESS, DROWSINESS, AND NAUSEA.

ADVANCED STAGES MAY CAUSE COLLAPSE, UNCONSCIOUSNESS, COMA, AND POSSIBLE DEATH DUE TO RESPIRATORY FAILURE.

INHALATION:

INHALATION OF HIGH CONCENTRATIONS MAY CAUSE CENTRAL NERVOUS SYSTEM EFFECTS CHARACTERIZED BY HEADACHE, DIZZINESS, UNCONSCIOUSNESS AND COMA.

INHALATION OF VAPOR MAY CAUSE RESPIRATORY TRACT IRRITATION.

CHRONIC:

PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE DEFATTING AND DERMATITIS. MAY CAUSE ALLERGIC SKIN REACTION IN SOME INDIVIDUALS.

===== SECTION 4 - FIRST AID MEASURES =====

EYES:

IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, OCCASIONALLY LIFTING THE UPPER AND LOWER LIDS.

GET MEDICAL AID IMMEDIATELY.

SKIN:

FLUSH SKIN WITH PLENTY OF SOAP AND WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES.

GET MEDICAL AID IF IRRITATION DEVELOPS OR PERSISTS.

INGESTION:

IF VICTIM IS CONSCIOUS AND ALERT, GIVE 2-4 CUPFULS OF MILK OR WATER. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. GET MEDICAL AID IMMEDIATELY.

INHALATION: GET MEDICAL AID IMMEDIATELY. REMOVE FROM EXPOSURE TO FRESH AIR IMMEDIATELY. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS

DIFFICULT, GIVE OXYGEN.

ES TO PHYSICIAN:

URINE ACETONE TEST MAY BE HELPFUL IN DIAGNOSIS.
NONE REPORTED.

===== SECTION 5 - FIRE FIGHTING MEASURES =====

GENERAL INFORMATION:

AS IN ANY FIRE, WEAR A SELF-CONTAINED BREATHING APPARATUS IN PRESSURE-DEMAND, MSHA/NIOSH (APPROVED OR EQUIVALENT), AND FULL PROTECTIVE GEAR.
VAPORS CAN TRAVEL TO A SOURCE OF IGNITION AND FLASH BACK.
USE WATER SPRAY TO KEEP FIRE-EXPOSED CONTAINERS COOL.
CONTAINERS MAY EXPLODE IN THE HEAT OF A FIRE.
THIS CHEMICAL POSES AN EXPLOSION HAZARD.

EXTINGUISHING MEDIA:

FOR SMALL FIRES, USE DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR ALCOHOL-RESISTANT FOAM.
USE WATER SPRAY TO COOL FIRE-EXPOSED CONTAINERS.
WATER MAY BE INEFFECTIVE.

AUTOIGNITION TEMPERATURE: 810 F (432.22 C)

FLASH POINT: 55 F (12.78 C)

EXPLOSION LIMITS:

LOWER: 2.5 AT 79 F
UPPER: 12.1 AT 150 F

===== SECTION 6 - ACCIDENTAL RELEASE MEASURES =====

GENERAL INFORMATION: USE PROPER PERSONAL PROTECTIVE EQUIPMENT AS INDICATED IN SECTION 8.

SPILLS/LEAKS: ABSORB SPILL WITH INERT MATERIAL, (E.G., DRY SAND OR EARTH), THEN PLACE INTO A CHEMICAL WASTE CONTAINER. REMOVE ALL SOURCES OF IGNITION.

===== SECTION 7 - HANDLING AND STORAGE =====

HANDLING:

WASH THOROUGHLY AFTER HANDLING.
REMOVE CONTAMINATED CLOTHING AND WASH BEFORE REUSE.
USE WITH ADEQUATE VENTILATION.
USE SPARK-PROOF TOOLS AND EXPLOSION PROOF EQUIPMENT.
AVOID CONTACT WITH EYES, SKIN, AND CLOTHING.
EMPTY CONTAINERS RETAIN PRODUCT RESIDUE, (LIQUID AND/OR VAPOR), AND CAN BE DANGEROUS. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, SPARKS OR OPEN FLAMES.
KEEP CONTAINER TIGHTLY CLOSED.
AVOID INGESTION AND INHALATION.

STORAGE:

KEEP AWAY FROM HEAT, SPARKS, AND FLAME.
KEEP AWAY FROM SOURCES OF IGNITION.
KEEP FROM CONTACT WITH OXIDIZING MATERIALS.
STORE IN A COOL, DRY, WELL-VENTILATED AREA AWAY FROM INCOMPATIBLE SUBSTANCES.

http://jupiter.ports/msds/data/6779

-==== SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION =====

ENGINEERING CONTROLS: USE ADEQUATE GENERAL OR LOCAL EXHAUST VENTILATION TO KEEP AIRBORNE CONCENTRATIONS BELOW THE PERMISSIBLE EXPOSURE LIMITS.

EXPOSURE LIMITS:

CHEMICAL NAME	ACGIH	NIOSH	OSHA - FINAL PELS
2-PROPANOL	400 PPM; 983 MG/M3; 500 PPM STEL; 1230 MG/M3 STEL	400 PPM TWA; 980 MG/M3 TWA; 500 PPM STEL; 1225 MG/M3 STEL	400 PPM TWA; 980 MG/M3 TWA

OSHA VACATED PELS: 2-PROPANOL: 400 PPM TWA; 980 MG/M3 TWA; 500 PPM STEL; 1225 MG/M3 STEL

PERSONAL PROTECTIVE EQUIPMENT:

EYES: WEAR SAFETY GLASSES AND CHEMICAL GOGGLES IF SPLASHING IS POSSIBLE.

SKIN: WEAR APPROPRIATE GLOVES TO PREVENT SKIN EXPOSURE.

CLOTHING: WEAR APPROPRIATE PROTECTIVE CLOTHING TO MINIMIZE CONTACT WITH SKIN.

RESPIRATORS: A NIOSH/MSHA APPROVED AIR PURIFYING RESPIRATOR WITH AN ORGANIC VAPOR CARTRIDGE OR CANISTER MAY BE PERMISSIBLE UNDER CERTAIN CIRCUMSTANCES WHERE AIRBORNE CONCENTRATIONS ARE EXPECTED. A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA.

;=== SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

DECOMPOSITION TEMPERATURE: NOT AVAILABLE.

MOLECULAR FORMULA: C3H8O

===== SECTION 10 - STABILITY AND REACTIVITY =====

CHEMICAL STABILITY: STABLE.

CONDITIONS TO AVOID: STABLE, INCOMPATIBLE MATERIALS, IGNITION SOURCES.

INCOMPATIBILITIES WITH OTHER MATERIALS: STRONG OXIDIZERS, ACETALDEHYDE, CHLORINE, ETHYLENE OXIDE, ACIDS AND ISOCYANATES, HYDROGEN + PALLADIUM, NITROFORM, OLEUM, PHOSGENE, POTASSIUM T-BUTOXIDE, OXYGEN, TRINITROMETHANE, BARIUM PERCHLORATE, TETRAFLUOROBORATE, CHROMIUM TRIOXIDE, SODIUM DICHROMATE + SULFURIC ACID, ALUMINUM, AND ALUMINUM TRIISOPROPOXIDE.

HAZARDOUS DECOMPOSITION PRODUCTS: CARBON MONOXIDE, CARBON DIOXIDE, ACRID SMOKE AND FUMES.

HAZARDOUS POLYMERIZATION: HAS NOT BEEN REPORTED.

===== SECTION 11 - TOXICOLOGICAL INFORMATION =====

RTECS#:

CAS# 67-63-0: NT8050000

LD50/LC50:

CAS# 67-63-0: ORAL, MOUSE: LD50 = 3600 MG/KG; ORAL, RABBIT LD50 = 6410

MG/KG; ORAL, RAT: LD50 = 5045 MG/KG; SKIN, RABBIT: LD50 = 12800 MG/KG.

RCINOGENICITY: 2-PROPANOL -

ACGIH: A2-SUSPECTED HUMAN CARCINOGEN
CALIFORNIA: CARCINOGEN
NIOSH: OCCUPATIONAL CARCINOGEN
NTP: SUSPECT CARCINOGEN
OSHA: POSSIBLE SELECT CARCINOGEN
IARC: GROUP 3 CARCINOGEN

EPIDEMIOLOGY: EARLY EPIDEMIOLOGICAL STUDIES SUGGESTED AN ASSOCIATION BETWEEN THE STRONG ACID MANUFACTURE OF ISOPROPYL ALCOHOL AND PARANASAL SINUS CANCER IN WORKERS. THE RISK OF LARYNGEAL CANCER MAY ALSO BE INCREASED IN THESE WORKERS. HOWEVER, IT HAS NOT BEEN TESTED ADEQUATELY IN ANIMALS TO ASSESS ITS CARCINOGENICITY.

TERATOGENICITY: NO DATA AVAILABLE.

REPRODUCTIVE EFFECTS: NO DATA AVAILABLE.

NEUROTOXICITY: NO DATA AVAILABLE.

MUTAGENICITY: NO DATA AVAILABLE.

OTHER STUDIES: NO DATA AVAILABLE.

===== SECTION 12 - ECOLOGICAL INFORMATION =====

ECOTOXICITY:

ACUTE AQUATIC EFFECTS:

FATHEAD MINNOW: LC50 = 1000 MG/L/96 HR.
GOLDEN ORFE: LC50 = 8970 MG/L/48 HR.
GOLDFISH: LC50 = GT50000 MG/L/24 HR.

ENVIRONMENTAL FATE: THIS CHEMICAL HAS A LOW POTENTIAL TO AFFECT AQUATIC ORGANISMS, SECONDARY WASTE TREATMENT MICROORGANISMS, AND THE GERMINATION AND GROWTH OF SOME PLANTS. IT IS READILY BIODEGRADABLE AND IS NOT EXPECTED TO PERSIST IN AN AQUATIC ENVIRONMENT. IT IS NOT LIKELY TO BIOCONCENTRATE.

PHYSICAL/CHEMICAL: NONE

PHYSICAL/CHEMICAL: NONE

===== SECTION 13 - DISPOSAL CONSIDERATIONS =====

DISPOSE OF IN A MANNER CONSISTENT WITH FEDERAL, STATE, AND LOCAL REGULATIONS.

RCRA D SERIES MAXIMUM CONCENTRATION OF CONTAMINANTS: NOT LISTED.

RCRA D SERIES CHRONIC TOXICITY REFERENCE LEVELS: NOT LISTED.

RCRA F SERIES: NOT LISTED.

RCRA P-SERIES: NOT LISTED.

RCRA U-SERIES: NOT LISTED.

NOT LISTED AS A MATERIAL BANNED FROM LAND DISPOSAL ACCORDING TO RCRA.

===== SECTION 14 - TRANSPORT INFORMATION =====

US DOT:

SHIPPING NAME: ISOPROPANOL
HAZARD CLASS: 3
UN NUMBER: UN1219
PACKING GROUP: II

IMO: NO INFORMATION AVAILABLE.

IATA: NO INFORMATION AVAILABLE.

RID/ADR: NO INFORMATION AVAILABLE.

CANADIAN TDG:

SHIPPING NAME: ISOPROPANOL
HAZARD CLASS: 3
UN NUMBER: UN1219

OTHER INFORMATION: FLASHPOINT 12C

===== SECTION 15 - REGULATORY INFORMATION =====

FEDERAL:

TSCA:

CAS# 67-63-0 IS LISTED ON THE TSCA INVENTORY.

HEALTH & SAFETY REPORTING LIST:

CAS# 67-63-0: EFFECTIVE DATE: DECEMBER 15, 1986

CHEMICAL TEST RULES:

CAS# 67-63-0: TESTING REQUIRED BY: MANUFACTURERS; IMPORTERS; PROCESSOR

SECTION 12B:

CAS# 67-63-0: EXPORT NOTIFICATION REQUIRED - SECTION 4

TSCA SIGNIFICANT NEW USE RULE: NONE OF THE CHEMICALS IN THIS MATERIAL HAVE A SNUR UNDER TSCA.

CERCLA/SARA:

SECTION 302 (RQ): NONE OF THE CHEMICALS IN THIS MATERIAL HAVE AN RQ.
SECTION 302 (TPQ): NONE OF THE CHEMICALS IN THIS PRODUCT HAVE A TPQ.
SECTION 313:

SECTION 313: THIS MATERIAL CONTAINS 2 PROPANOL (CAS# 67-63-0, 100%), WHICH IS SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF SARA TITLE III AND 40 CFR PART 373.

CLEAN AIR ACT:

THIS MATERIAL DOES NOT CONTAIN ANY HAZARDOUS AIR POLLUTANTS.
THIS MATERIAL DOES NOT CONTAIN ANY CLASS 1 OZONE DEPLETORS.
THIS MATERIAL DOES NOT CONTAIN ANY CLASS 2 OZONE DEPLETORS.

CLEAN WATER ACT:

NONE OF THE CHEMICALS IN THIS PRODUCT ARE LISTED AS HAZARDOUS SUBSTANCES UNDER THE CWA.

NONE OF THE CHEMICALS IN THIS PRODUCT ARE LISTED AS PRIORITY POLLUTANTS UNDER THE CWA.

NONE OF THE CHEMICALS IN THIS PRODUCT ARE LISTED AS TOXIC POLLUTANTS UNDER THE CWA.

http://jupiter.ports/msds/data/677

OSHA: NONE OF THE CHEMICALS IN THIS PRODUCT ARE CONSIDERED HIGHLY HAZARDOUS BY OSHA.

STATE:

2-PROPANOL CAN BE FOUND ON THE FOLLOWING STATE RIGHT TO KNOW LISTS: CALIFORNIA, NEW JERSEY, FLORIDA, PENNSYLVANIA, MINNESOTA, MASSACHUSETTS.

CALIFORNIA NO SIGNIFICANT RISK LEVEL: NONE OF THE CHEMICALS IN THIS PRODUCT ARE LISTED.

INTERNATIONAL:

CANADA:

CAS# 67-63-0 IS LISTED ON CANADA'S DSL/NDSL LIST.
CAS# 67-63-0 IS LISTED ON CANADA'S INGREDIENT DISCLOSURE LIST.

EUROPEAN LABELING IN ACCORDANCE WITH EC DIRECTIVES:

HAZARD SYMBOLS: NOT AVAILABLE.
RISK PHRASES:
SAFETY PHRASES:

EXPOSURE LIMITS: OEL-AUSTRALIA; TWA 400 PPM (980 MG/M3); STEL 500 PPM (1225 MG/M3). OEL-BELGIUM: TWA 400 PPM (985 MG/M3); STEL 500 PPM (1230 MG/M3). OEL-DENMARK: TWA 200 PPM (490 MG/M3); SKIN. OEL-FRANCE: STEL 400 PPM (980 MG/M3). OEL-GERMANY: TWA 400 PPM (980 MG/M3). OEL-JAPAN: STEL 400 PPM (980 MG/M3). OEL-THE NETHERLANDS: TWA 400 PPM (980 MG/M3); SKIN. OEL-THE PHILIPPINES: TWA 400 PPM (980 MG/M3). OEL-RUSSIA: STEL 400 PPM (10 MG/M3). OEL-SWEDEN: TWA 150 PPM (350 MG/M3); STEL 250 PPM (600 MG/M3). OEL-SWITZERLAND: TWA 400 PPM (980 MG/M3); STEL 800 PPM. OEL-TURKEY: TWA 200 PPM (500 MG/M3). OEL-UNITED KINGDOM: TWA 400 PPM (980 MG/M3) STEL 500 PPM; SKIN. OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA CHECK ACGIH TLV. OEL IN NEW ZEALAND, SINGAPORE, VIETNAM CHECK ACGI TLV

===== SECTION 16 - ADDITIONAL INFORMATION =====

ADDITIONAL INFORMATION: NO ADDITIONAL INFORMATION AVAILABLE.

MSDS CREATION DATE: FEBRUARY 2, 1995

THE INFORMATION ABOVE IS BELIEVED TO BE ACCURATE AND REPRESENTS THE BEST INFORMATION CURRENTLY AVAILABLE TO US. HOWEVER, WE MAKE NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO SUCH INFORMATION, AND WE ASSUME NO LIABILITY RESULTING FROM ITS USE. USERS SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION FOR THEIR PARTICULAR PURPOSES.

but
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implied, of merchantability, fitness for a particular purpose with re
the information set forth herein or to the product to which the informa
refers. Accordingly, Mallinckrodt will not be responsible for damages
resulting from use of or reliance upon this information.

Mallinckrodt

Material Safety Data

Rec'd 10-4-91

01-01-1000

Emergency Phone Number: 314-539-1600

Mallinckrodt, Inc., Science Products Division, P.O. Box 800, Paris, KY 40362.

ACETIC ACID GLACIAL

PRODUCT IDENTIFICATION:

Synonyms: Acetic acid, methane carboxylic acid

Formula CAS No.: 64-19-7

Molecular Weight: 60.05

Chemical Formula: CH_3COOH

Hazardous Ingredients: Acetic Acid Glacial

PRECAUTIONARY MEASURES

DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. INHALATION MAY CAUSE LUNG DAMAGE. COMBUSTIBLE.

Do not get in eyes, on skin, or on clothing.
Avoid breathing vapor.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.
Keep away from heat and flame.
This substance is classified as a POISON under the Federal Caustic Poison Act.

EMERGENCY/FIRST AID

In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. If swallowed, DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases call a physician.
SEE SECTION 5.

DOT Hazard Class: Corrosive Material

SECTION 1 Physical Data

Appearance: Clear, colorless liquid.

Odor: Strong, vinegar-like.

Solubility: Infinite in water.

Boiling Point: 118°C (244°F).

Melting Point: 16.6°C (62°F).

Density: 1.05

Vapor Density (Air=1): 2.1

Vapor Pressure (mm Hg): 11 @ 20°C (68°F).

Evaporation Rate: 0.97

SECTION 2 Fire and Explosion Information

Fire:
Combustible. Flashpoint: 40°C (104°F) (closed cup).
Autoignition temperature: 427°C (800°F).
Flammable limits, in air, % by volume at 100°C (212°F): lel: 5.4; uel: 16.0.

Explosion:
Above flash point, vapor-air mixtures are explosive within flammable limits noted above.

Fire Extinguishing Media:
Water, dry chemical, foam or carbon dioxide. Water spray may be used to keep fire exposed containers cool.

Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Water may be used to flush spills away from exposures and to dilute spills to non-flammable mixtures. Vapors can flow along surfaces to distant ignition source and flash back. Water diluted acid can react with metals to form hydrogen gas.

SECTION 3 Reactivity Data

Stability:
Stable under ordinary conditions of use and storage. Heat and sunlight can contribute to instability.

Hazardous Decomposition Products:
When heated to decomposition may emit toxic gases and vapors such as carbon monoxide.

Hazardous Polymerization:
Will not occur.

Incompatibilities:
Oxidizers, chromic acid, sodium peroxide, nitric acid, strong caustics, heat, flame.

SECTION 4 Leak/Spill Disposal Information

Ventilate and evacuate area.Clean-up personnel require protective clothing and respiratory protection from vapors. Allow only qualified personnel to handle the spill. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect men attempting to stop leak. Water may be used to flush spills away from exposures and to dilute spills to non-flammable mixtures. Contain and recover liquid when possible. Absorb with vermiculite, dry sand, earth, or similar material. Scoop up with non-sparking tools and place in a closed container, and dispose in a RCRA approved facility. Do not flush to the sewer.

Reportable Quantity (RQ)(CWA/CERCLA) : 5000 lbs.

Ensure compliance with local, state and federal regulations.

CAS# 64-19-7

64197

NFPA Ratings: Health: 2 Flammability: 2 Reactivity: 1

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Emergency Phone Number: 314-539-1600

Mallinckrodt, Inc., Science Products Division, P.O. Box 800, Paris, KY 40362.

SECTION 5 Health Hazard Information

A. EXPOSURE / HEALTH EFFECTS

Inhalation:
Inhalation of concentrated vapors may cause serious damage to the lining of the nose, throat, and lungs. Breathing difficulties may occur. Neither odor nor degree of irritation are adequate to indicate vapor concentration.

Ingestion:
Swallowing can cause severe injury leading to death. Symptoms include sore throat, vomiting, diarrhea. Ingestion of as little as 1.0 ml has resulted in perforation of the esophagus.

Skin Contact:
Contact with concentrated solution may cause serious damage to the skin. Effects may include redness, pain, skin burns. High vapor concentrations may cause skin sensitization.

Eye Contact:
Eye contact with concentrated solutions may cause severe eye damage followed by loss of sight. Exposure to vapor may cause intense watering and irritation to eyes.

Chronic Exposure:
Repeated or prolonged exposures may cause darkening of the skin, erosion of exposed front teeth, and chronic inflammation of the nose, throat, and bronchial tubes.

Aggrevation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems, or impaired respiratory function may be more susceptible to the effects of this substance.

B. FIRST AID

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion:
DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Exposure:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician.

Eye Exposure:
Wash eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

C. TOXICITY DATA (RTECS, 1986)

Oral rat LD50: 3310 mg/kg. Dermal rabbit LD50: 1.06g/Kg. Mutation references cited.

SECTION 6 Occupational Control Measures

Airborne Exposure Limits:
-OSHA Permissible Exposure Limit (PEL):
10 ppm (TWA).
-ACGIH Threshold Limit Value (TLV):
10 ppm (TWA); 15 ppm (STEL).

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

Personal Respirators: (NIOSH Approved)
If the TLV is exceeded a full facepiece chemical cartridge respirator may be worn, in general, up to 100 times the TLV or the maximum use concentration specified by the respirator supplier, whichever is less. Alternatively, a supplied air full facepiece respirator or airlined hood may be worn.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Contact lenses should not be worn when working with this material. Maintain eye wash fountain and quick-drench facilities in work area.

SECTION 7 Storage and Special Information

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances.

.....

ALGLA

Mallinckrodt provides the information contain[illegible] good faith but makes no representation as to its comprehensive[illegible]ccuracy. Individuals receiving this information must exerc[illegible] independent judgment in determining its appropriateness for a particular purpose.

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ergency Phone Number: 314-539-1600

Mallinckrodt, Inc., Science Products Division, P.O. Box 800, Paris, KY 40362.

Addendum to Material Safety Data Sheet

REGULATORY STATUS

Chem.Key: ALGLA)

Hazard Categories for SARA Section 311/312 Reporting

Acute	Chronic	Fire	Pressure	Reactive
X	X	X		X

oduct or Components Product:	SA[illegible]A EHS Sect. 302 RQ [illegible]bs.)	TPQ (lbs.)	SARA Section 313 Chemicals Name List	Chemical Category	CERCLA Sec.103 RQ (lbs.)	RCRA Sec. 261.33
ETIC ACID GLACIAL (64-19-7)	No	No	No	No	5000	No

RA Section 302 EHS RQ: Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355.
RA Section 302 EHS TPQ: Threshold Planning Quantity of Extremely Hazardous Substance. An asterisk (*) following a Threshold Planning Quantity nifies that if the material is a solid and has a particle size equal to or larger than 100 micrometers, the Threshold Planning Quantity = 10,000 LBS.
RA Section 313 Chemicals: Toxic Substances subject to annual release reporting requirements listed at 40 CFR 372.65.
ERCLA Sec. 103: Comprehensive Enviromental Response, Compensation and Liability Act (Superfund). Releases to air, land or water of these hazardous bstances which exceed the Reportable Quantity (RQ) must be reported to the National Response Center, (800-424-8802); Listed at 40 CFR 302.4
CRA: Resource Conservation and Reclamation Act. Commercial chemical product wastes designated as acute hazards and toxic under 40 CFR 261.33

http://jupiter.ports/msds/data/5711

PORTS MSDS #: 5711

PRODUCT: ACETONE

PART NUMBER:

FORMULA: CH3COCH3

KEYWORD: SOLVENT

PORTS NUMBER: 66-001-0500; 660010500; 66-001-6006

PORTS MISC INFO:
LAB MSDS# 167
LAB MSDS# 43

PORTS RATING: HFR=241

MANUFACTURER:
E M INDUSTRIES, INC., E M SCIENCE DIV.
P.O. BOX 70, 480 DEMOCRAT RD.
GIBBSTOWN
NJ

08027
PHONE: PHONE: 609-354-9200
EMERGENCY PHONE: 800-424-9300

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 132.8 F	NOTE: 760 MMHG, 56C.
Melting Point. . . .	EQ -137.2 F	NOTE: -94C.
Freezing Point . . .	NG	
Sour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .7905	
Vapor Pressure . . .	EQ 184	NOTE: MM HG AT 20C.
Vapor Density. . . .	EQ 2.0	
Percent Volatiles. .	GT 99.9	
Evaporation Rate . .	EQ 14.48	NOTE: BUAC = 1.
pH	NG	
Molecular Weight . .	EQ 58.08	
Viscosity.	NG	

Solubility in Water. MISCIBLE.
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID; PUNGENT ODOR.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ .0 F	NOTE: CC.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	NG	
Explosive/Flammable Limits		
Lower (LEL).	EQ 2.60	
Upper (UEL).	EQ 12.80	

Shipping Regulations

UN/NA Number.	UN1090
D.O.T. Hazard Class. . .	NG
Label	NOT GIVEN
Proper Shipping Name . .	ACETONE

==========

Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 11/07/94

=== Component Information =====

ACETONE
OSHA PEL (PPM):
OSHA PEL (MG/M3): 1800
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 1780
STEL (PPM):
STEL (MG/M3): 2400
Product %: ~ 100
C.A.S. No.: 67641
Note:
PEL & TLV: 750 PPM / OSHA STEL: 1000 PPM / ACGIH STEL:

BENZENE
OSHA PEL (PPM): NG
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NG
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: LT .002
C.A.S. No.: 71432

===== CHEMICAL PRODUCT AND COMPANY IDENTIFICATION =====

| SEE OTHER INFORMATION SECTION.

RODUCT NAME: ACETONE

SYNONYMS: DIMETHYL KETONE, 2-PROPANONE

CHEMICAL FAMILY: KETONE

CATALOG NUMBER(S):

AX0110; AX0115; AX0115P; AX0116; AX0118; AX0120;
AX0120P; AX0120S; AX0120T; AX0125; AX0126

MOLECULAR WEIGHT: 58.08

FORMULA: CH3COCH3

PREPARATION DATE: 11/07/94

DATE MSDS PRINTED: Mar 06, 1995

INFORMATION PHONE NUMBER: 609-354-9200

HOURS: MON. TO FRI. 8:30 - 5

CHEMTREC EMERGENCY NUMBER: 800-424-9300

HOURS: 24 HRS A DAY

MANUFACTURER'S NAME AND ADDRESS:

EM SCIENCE
A DIVISION OF EM INDUSTRIES
P.O. BOX 70
480 DEMOCRAT RD.
GIBBSTOWN, N.J. 08027

===== COMPOSITION/INFORMATION ON INGREDIENTS =====

E COMPONENT INFORMATION.

ACETONE MAY CONTAIN TRACE AMOUNT OF BENZENE (LESS THAN 0.002%).
BENZENE
(CAS# 71-43-2) HAS BEEN FOUND TO CAUSE CANCER. NOTIFICATION OF
CARCINOGENIC
INGREDIENTS IN QUANTITY LESS THAN 0.1% IS NOT REQUIRED UNDER
FEDERAL HAZARD
COMMUNICATION LAW.

===== HAZARDS IDENTIFICATION =====

EMERGENCY OVERVIEW: EXTREMELY FLAMMABLE LIQUID AND VAPORS.

HARMFUL IF INHALED OR SWALLOWED.
CAUSES EYE IRRITATION.
MAY CAUSE DAMAGE TO CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS.
CHRONIC EXPOSURE DURING PREGNANCY MAY BE HARMFUL.

APPEARANCE: COLORLESS LIQUID; PUNGENT ODOR

POTENTIAL HEALTH EFFECTS (ACUTE AND CHRONIC):

SYMPTOMS OF EXPOSURE: HARMFUL IF INHALED OR SWALLOWED.

HIGH CONCENTRATIONS OR PROLONGED EXPOSURE CAUSES HEADACHE,
DIZZINESS,
NAUSEA, IRRITATION OF EYES AND RESPIRATORY TRACT, NARCOSIS AND
EVENTUALLY
UNCONSCIOUSNESS.

MAY CAUSE DAMAGE TO CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS.

PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE IRRITATION.

EYE CONTACT CAUSES IRRITATION.

ANIMAL STUDIES SHOW ADVERSE EFFECTS ON FERTILITY WHEN FEMALES
WERE
EXPOSED CHRONICALLY DURING PREGNANCY.

MEDICAL COND. AGGRAVATED BY EXPOSURE: SKIN CONDITIONS, PREGNANCY.

ROUTES OF ENTRY: INHALATION, INGESTION OR SKIN CONTACT.

CARCINOGENICITY: THE MATERIAL IS NOT LISTED (IARC, NTP, OSHA) AS
CANCER
CAUSING AGENT.

MAY CONTAIN TRACE AMOUNT OF BENZENE (SEE
COMPOSITION/INFORMATION ON
INGREDIENTS SECTION).

===== FIRST AID MEASURES =====

EMERGENCY FIRST AID: GET MEDICAL ASSISTANCE FOR ALL CASES OF
OVEREXPOSURE.

SKIN: WASH THOROUGHLY WITH SOAP AND WATER.

EYES: IMMEDIATELY FLUSH THOROUGHLY WITH WATER FOR AT LEAST 15
MINUTES.

INHALATION: REMOVE TO FRESH AIR; GIVE ARTIFICIAL RESPIRATION IF
BREATHING

HAS STOPPED.

INGESTION: IF CONSCIOUS, DRINK WATER AND INDUCE VOMITING
IMMEDIATELY AS
DIRECTED BY MEDICAL PERSONNEL. NEVER GIVE ANYTHING BY MOUTH TO AN
UNCONSCIOUS
PERSON.

REMOVE CONTAMINATED CLOTHING AND WASH BEFORE REUSE.

===== FIRE FIGHTING MEASURES =====

FLASH POINT (F): 0F (CC)

FLAMMABLE LIMITS LEL (%): 2.60

FLAMMABLE LIMITS UEL (%): 12.80

EXTINGUISHING MEDIA: DRY CHEMICAL, "ALCOHOL" FOAM, WATER SPRAY,
CO2.
USE WATER SPRAY TO COOL EXPOSED CONTAINERS.

FIRE FIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS.

FIRE & EXPLOSION HAZARDS: DANGEROUS FIRE AND EXPLOSIVE HAZARD.
VAPOR CAN
TRAVEL DISTANCES TO IGNITION SOURCE AND FLASH BACK. HOT ORGANIC
CHEMICAL
VAPORS OR MISTS ARE SUSCEPTIBLE TO SUDDEN SPONTANEOUS COMBUSTION
WHEN MIXED
WITH AIR. IGNITION MAY OCCUR AT TEMPERATURES BELOW PUBLISHED
AUTOIGNITION OR
IGNITION TEMPERATURES. IGNITION TEMPERATURES DECREASE WITH
INCREASING VAPOR
VOLUME AND VAPOR/AIR CONTACT TIME AND ARE INFLUENCED BY PRESSURE
CHANGES.
IGNITION MAY OCCUR AT TYPICAL ELEVATED TEMPERATURE PROCESS
CONDITIONS,
ESPECIALLY IN PROCESS OPERATING UNDER VACUUM IF SUBJECTED TO SUDDEN
INGRESS
OF AIR, OR OUTSIDE PROCESS EQUIPMENT OPERATING UNDER ELEVATED
PRESSURE IF
SUDDEN ESCAPE OF VAPORS OR MISTS TO THE ATMOSPHERE OCCURS.

===== ACCIDENTAL RELEASE MEASURES =====

SPILL RESPONSE:

EVACUATE THE AREA OF ALL UNNECESSARY PERSONNEL.

WEAR SUITABLE PROTECTIVE EQUIPMENT LISTED UNDER EXPOSURE
CONTROLS/PERSONAL
PROTECTION SECTION.

ELIMINATE ANY IGNITION SOURCES UNTIL THE AREA IS DETERMINED TO BE
FREE FROM
EXPLOSION OR FIRE HAZARDS.

CONTAIN THE RELEASE AND ELIMINATE ITS SOURCE, IF THIS CAN BE DONE
WITHOUT
RISK.

TAKE UP AND CONTAINERIZE FOR PROPER DISPOSAL AS DESCRIBED UNDER
DISPOSAL
CONSIDERATIONS SECTION.

COMPLY WITH FEDERAL, STATE AND LOCAL REGULATIONS ON REPORTING

RELEASES.
REFER TO REGULATORY INFORMATION SECTION FOR REPORTABLE QUANTITY AND
OTHER
REGULATORY DATA.

EM SCIENCE RECOMMENDS SPILL-X ABSORBENT AGENTS FOR VARIOUS TYPES OF SPILLS.
ADDITIONAL INFORMATION ON THE SPILL-X PRODUCTS CAN BE PROVIDED THROUGH THE EM
SCIENCE TECHNICAL SERVICE DEPARTMENT (609) 354-9200.

THE FOLLOWING EM SCIENCE SPILL-X ABSORBENT IS RECOMMENDED FOR THIS PRODUCT:

SX0963 SOLVENT SPILL TREATMENT KIT.

===== HANDLING AND STORAGE =====

HANDLING & STORAGE:

KEEP CONTAINER CLOSED.
STORE IN A COOL AREA AWAY FROM IGNITION SOURCES AND OXIDIZERS.
DO NOT BREATHE VAPOR.
DO NOT GET IN EYES.
AVOID PROLONGED OR REPEATED SKIN CONTACT.
ELECTRICALLY GROUND ALL EQUIPMENT WHEN HANDLING THIS PRODUCT.
RETAIN RESIDUE MAY MAKE EMPTY CONTAINERS HAZARDOUS; USE CAUTION!

===== EXPOSURE CONTROLS/PERSONAL PROTECTION =====

ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT:

VENTILATION, RESPIRATORY PROTECTION, PROTECTIVE CLOTHING, EYE PROTECTION
RESPIRATORY PROTECTION: IF WORKPLACE EXPOSURE LIMIT(S) OF PRODUCT OR ANY
COMPONENT IS EXCEEDED (SEE TLV/PEL), A NIOSH/MSHA APPROVED AIR SUPPLIED
RESPIRATOR IS ADVISED IN ABSENCE OF PROPER ENVIRONMENTAL CONTROL. OSHA
REGULATIONS ALSO PERMIT OTHER NIOSH/MSHA RESPIRATORS (NEGATIVE PRESSURE TYPE)
UNDER SPECIFIED CONDITIONS (SEE YOUR SAFETY EQUIPMENT SUPPLIER). ENGINEERING
AND/OR ADMINISTRATIVE CONTROLS SHOULD BE IMPLEMENTED TO REDUCE EXPOSURE.

MATERIAL SHOULD BE HANDLED OR TRANSFERRED IN AN APPROVED FUME HOOD OR WITH
ADEQUATE VENTILATION.

PROTECTIVE GLOVES (BUTYL RUBBER, CPE, POLYURETHANE OR EQUIVALENT) SHOULD
BE WORN TO PREVENT SKIN CONTACT.

SAFETY GLASSES WITH SIDE SHIELDS SHOULD BE WORN AT ALL TIMES.

WORK/HYGIENIC PRACTICES:

WASH THOROUGHLY AFTER HANDLING.
DO NOT TAKE INTERNALLY.
EYE WASH AND SAFETY EQUIPMENT SHOULD BE READILY AVAILABLE.

EXPOSURE GUIDELINES:

OSHA PEL:

	TWA	STEL	CL

COMPONENT	PPM	MG/M3	PPM	MG/M3	PPM	MG/M3	SKIN
ACETONE	750	1800	1000	2400			

ACGIH - TLV:

	TWA		STEL		CL		
COMPONENT	PPM	MG/M3	PPM	MG/M3	PPM	MG/M3	SKIN
ACETONE	750	1780	1000	2380			

===== PHYSICAL AND CHEMICAL PROPERTIES =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

===== STABILITY AND REACTIVITY =====

STABILITY: YES

HAZARDOUS POLYMERIZATION: DOES NOT OCCUR.

HAZARDOUS DECOMPOSITION: COX.

CONDITIONS TO AVOID: HEAT, CONTACT WITH IGNITION SOURCE.

MATERIALS TO AVOID: ACIDS, OXIDIZERS.

OTHER: POTASSIUM T-BUTOXIDE; NITRIC AND SULFURIC ACID MIXTURE, BROMINE, CHLORINE.

===== TOXICOLOGICAL INFORMATION =====

TOXICITY DATA:

ORL-MUS LD50: 3000 MG/KG.
ORL-RAT LD50: 5800 MG/KG.
IHL-HMN TCLO: 500 PPM.

TOXICOLOGICAL FINDINGS: TESTS ON LABORATORY ANIMALS INDICATE MATERIAL MAY PRODUCE ADVERSE MUTAGENIC AND REPRODUCTIVE EFFECTS. CITED IN REGISTRY OF TOXIC EFFECTS ON SUBSTANCES (RTECS).

===== DISPOSAL CONSIDERATIONS =====

EPA WASTE NUMBERS: U002, D001.

TREATMENT:

SPECIFIED TECHNOLOGY: INCINERATION TO A LEVEL BELOW TCA (TOTAL CONSTITUENT ANALYSES) LEVELS. CONTACT YOUR LOCAL PERMITTED WASTE DISPOSAL COMPANY (TSD) FOR PERMISSIBLE TREATMENT SITE. ALWAYS CONTACT A PERMITTED WASTE DISPOSER (TSD) TO ASSURE COMPLIANCE WITH ALL CURRENT LOCAL, STATE AND FEDERAL REGULATIONS.

===== TRANSPORT INFORMATION =====

DOT PROPER SHIPPING NAME: ACETONE

T ID NUMBER: UN 1090

===== REGULATORY INFORMATION =====

TSCA STATEMENT: THE CAS NUMBER OF THIS PRODUCT IS LISTED ON THE TSCA
INVENTORY.

COMPONENT	SARA EHS (302)	SARA EHS TPQ (LBS)	CERCLA RQ (LBS)
ACETONE			5000

COMPONENT	OSHA FLOOR LIST	SARA 313	DE MINIMIS FOR SARA 313 (%)
ACETONE	Y	Y	1.0

===== OTHER INFORMATION =====

COMMENTS: NONE

FPA HAZARD RATINGS:

HEALTH: 1
FLAMMABILITY: 3
REACTIVITY: 0
SPECIAL HAZARDS:

REVISION HISTORY:

08/26/81; 07/01/83; 06/01/84; 06/01/85; 09/12/86; 06/05/87; 08/28/87;
10/27/87; 03/21/89; 10/06/89; 05/01/90; 05/11/90; 03/01/91; 12/01/92

|: REVISED SECTION
N/A: NOT AVAILABLE
N/E: NONE ESTABLISHED

THE STATEMENTS CONTAINED HEREIN ARE OFFERED FOR INFORMATIONAL PURPOSES ONLY
AND ARE BASED UPON TECHNICAL DATA THAT EM SCIENCE BELIEVES TO BE ACCURATE.
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MSDS # AX0110

44-16-6690
44-16-6700

66-01-0465
44-01-0080

MATERIAL SAFETY DATA SHEET

CORPORATE RESEARCH & DEVELOPMENT
120 ERIE BOULEVARD
SCHENECTADY, N.Y. 12305

MATERIALS INFORMATION SERVICES

NO. 403

ACETYLENE
Revision A
DATE July 1984

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: ACETYLENE
DESCRIPTION: Gas obtained from reaction of calcium carbide with water in an acetylene generator or from approved pressurized cylinders packed with porous solid and acetone.
OTHER DESIGNATIONS: Ethyne, C_2H_2, GE Material D27A16, CAS #000 074 862
MANUFACTURER: Available from many suppliers, including:
Union Carbide Corp, Linde Div.
308 Harper Drive
Moorestown, NJ 08057 Tel: (609) 778-6200
Air Products & Chem., Inc
Box 538 - Allentown, PA 18105 Tel: (215) 481 4911

SECTION II. INGREDIENTS AND HAZARDS

Acetylene gas Typical Impurities*	Generated Gas	Cylinder Gas	%	HAZARD DATA
			>98	Simple asphyxiant** NIOSH has proposed a 10-hr TWA of 2500 ppm because of toxic trace impurities.
Carbon dioxide	<1.0%	<1.0%		
Nitrogen	<1.0	<1.0		
Oxygen	<0.2	<0.2		
Phosphine	0.018	0.00025		
Hydrogen sulfide	0.004	0.0007		
Arsine	>0.003	-		
Ammonia	0.015	-		

*Acetone (an impurity in cylinder gas) and water excluded. Impurity content should be determined from the supplier of the calcium carbide or the cylinder.
**ACGIH (1983) TLV for a simple asphyxiant gas is 18 Vol % min. O_2 content in air at 1 atm.

SECTION III. PHYSICAL DATA

Boiling pt at 10 psig, deg C ------	-75	Critical temperature, deg C ———	36
Specific gravity, 1 atm (Air=1) ——	0.91	Molecular weight ———————	26.04
Water solubility, Vol/Vol at 1 atm:			
0 C ———————	1.7		
15 C ———————	1.1		

Appearance & Odor: Colorless, odorless gas when pure. Most commercial grades have garlic-like odor from impurities.

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits in Air	Lower	Upper
Gaseous at room temp.	>290C; 305C @ 30%*	Volume % in air	2.5 (Explosive) 3	81 (Explosive) 65

Extinguish fire by shutting off source of acetylene. Fires from small leaks in containers can be extinguished by plugging leak with wet waste or putty or smothering with a heavy cloth. When fire involves the inner cylinder, it must be handled by an experienced firefighter. Use water spray to cool fire-exposed cylinders. Cylinder safety fuse melts at 100C and releases gas.
Those involved in fighting acetylene fires need self-contained breathing apparatus.
See Compressed Gas Assoc, SB4, "Handling Acetylene Cylinders in Fire Situations"
*Composition, pressure, moisture content and initial temp. varies the AIT.

SECTION V. REACTIVITY DATA

In its free state under pressure acetylene can decompose violently when heated or shocked to form carbon and hydrogen (no oxygen required). Pressures in excess of 15 psig should never be used for free acetylene without special engineering design. Below 15 psig or in acetone solution in its cylinder acetylene is stable. Only approved valves and manifolds should be used.
It burns in air with an intensely hot (>5400F) sooty flame.
It reacts with copper, silver and mercury to form explosive acetylides. Incomplete combustion of acetylene can form carbon monoxide in high levels.
Acetylene can react explosively with oxygen, chlorine or fluorine on exposure to sunlight.
Do not use in liquified or solidified form!

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GENERAL ELECTRIC

If = 1 ft³
3/5/84

NB-Safety
Item 4 NB 1-15-85
R-3, 2/15/85

NO. 403

SECTION VI. HEALTH HAZARD INFORMATION

TLV (See Sect II)

Acetylene, when pure, is a simple asphyxiant and an anesthetic, nonirritating to skin or mucous membranes. No symptoms occur from the presence of 2.5% acetylene in air (the LEL); at 10-20% a reversible narcosis can be produced; at 35%, (5 minute exposure), collapse can occur from oxygen deficiency. Contaminants in acetylene, particularly in that generated on site from calcium carbide, can have toxic effects, phosphine for example.

In a welding process involving acetylene, metal oxide fume and carbon monoxide may present additional health hazards when acetylene is present in the air.

FIRST AID: Caution! Rescuers may be entering oxygen-deficient and explosion hazard area.

Inhalation: Remove to fresh air. Restore and/or support breathing as needed. If victim unconscious, give prompt O_2 therapy. Keep warm and at rest. Contact a physician. If acetylene from a calcium carbide generator is involved, the acute effects of phosphine and other impurities in the acetylene should be considered.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Notify safety personnel! Provide maximum explosion-proof ventilation. Eliminate ignition sources. Evacuate non-essential personnel. Emergency personnel need protection against simple asphyxiation. Shut off flow if possible. Small gas leaks can be detected by painting suspected area with a soapy water solution and check for bubble formation. Stop leak with wet waste heavy cloth, putty, mud, etc.

DISPOSAL: Remove leaking cylinders outdoors to a safe discharge area. (Posted) Allow gas to discharge at a moderate rate. When empty close valve; return to supplier marked defective. Follow Federal, State and Local regulations.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide general ventilation and/or local exhaust ventilation (explosion-proof) to keep acetylene concentration below 2500 ppm in the workplace air. This level will control explosion hazards as well as exposure to impurities in the acetylene gas.

Avoid use of acetylene in confined or enclosed areas to prevent oxygen deficient atmospheres (18 Vol % O_2 minimum). Provide NIOSH approved air-supplied or self-contained breathing apparatus for emergency or nonroutine situation to protect against anesthetic or asphyxiating levels (Caution! Concentration of gas in this situation also presents an explosion hazard. Risk may be too great to justify entry.)

Those handling cylinders should wear leather gloves, safety shoes and safety goggles.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Obtain and follow the detailed safety regulatons of OSHA [Code of Federal Regulations 29, Chapter VXII, Part 1910.252 (a)] and the recommendations of suppliers for handling, manifolding, and storage of pressurized gas cylinders and the operation of acetylene generators. Periodically check valves for leaks.

Store reserve cylinders away from cylinders of oxygen (and from chlorine and other oxidizing agents) in an upright position. Store in a cool, well-ventilated place away from open flames and other ignition sources. Do not smoke in areas of storage or use.

Protect cylinders, manifolds and piping from physical damage. Piping used with acetylene must be compatible and be electrically bonded and grounded to prevent static sparks.

DOT Classification: FLAMMABLE GAS I.D. No. UN1001 Label: FLAMMABLE GAS

DATA SOURCE(S) CODE: 1-12,14,17,23-25,37,43,49,51

Judgments as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore although reasonable care has been taken in the preparation of such information, General Electric Company extends no warranties, makes no representations and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use

APPROVALS: MIS/CRD J. M. Nielsen

INDUST. HYGIENE/SAFETY [illegible] 6-27-84

MEDICAL REVIEW: 6 July 1984

PORTS MSDS #: 238

PRODUCT: STANDARD, AMMONIA AS N, 1000PPM N

PART NUMBER: LC-17940-1

FORMULA:

KEYWORD: STANDARD

PORTS NUMBER: 66040995-500

PORTS MISC INFO:
NOT GIVEN

PORTS RATING: HFR=000

MANUFACTURER:
LABCHEM INC.
200 WILLIAM PITT WAY
PITTSBURGH
PA

15238
PHONE: PHONE: 412-826-5230
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . . EQ 212 F
Melting Point. . . . EQ 32 F
Freezing Point . . . NG
Pour Point . . . . . NG
Softening Point. . . NG

Specific Gravity . . EQ 1.0
Vapor Pressure . . . EQ 14 NOTE: MM HG @ 20'C (H20).
Vapor Density. . . . EQ .7 NOTE: H2O.
Percent Volatiles. . NG
Evaporation Rate . . LT 1 NOTE: ETHER=1.
pH . . . . . NA NOTE: NOT APPLI/NOT AVAIL.
Molecular Weight . . NG
Viscosity. . . . . NG
Solubility in Water. SOLUBLE.
Odor/Appearance/Other Characteristics:
CLEAR COLORLESS LIQUID, ODORLESS.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . . N* NOTE: NON-FLAMMABLE.
Flash Point, Open Cup . . . NG
Fire Point. . . . . NG
Auto Ignition. . . . . NA NOTE: NOT APPLI/NOT AVAIL.
Explosive/Flammable Limits
Lower (LEL). . . . . NA NOTE: NOT APPLI/NOT AVAIL.
Upper (UEL). . . . . NA NOTE: NOT APPLI/NOT AVAIL.

Shipping Regulations
UN/NA Number. . . . . NG
D.O.T. Hazard Class. . . NG
Label . . . . . NOT GIVEN
Proper Shipping Name . . NOT GIVEN

==========

Preparer/Contact Information: AL BERANEK 412-826-5230

Date Prepared/Revised 11/26/90

===== Component Information =====

AMMONIUM CHLORIDE
OSHA PEL (PPM): NA
OSHA PEL (MG/M3):
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 10
STEL (PPM):
STEL (MG/M3): 20
Product %: EQ .38
C.A.S. No.: 12125029
Note:
PEL: NOT APPLICABLE OR DATA NOT AVAILABLE / TLV & STEL:

WATER
OSHA PEL (PPM): NG
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NG
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 99.6
C.A.S. No.: 7732185

===== IDENTIFICATION =====

PRODUCT NAME: NITROGEN (AMMONIA) STANDARD, 1ml=1ml N = 1.22 mg NH3

Cat # 1794

ATERIAL SAFETY DATA SHEET # 113

REVISED: 11/26/90

CONTACT: Al Beranek

PHONE: (412)826-5230

MANUFACTURER'S NAME AND ADDRESS:

LABCHEM INC.
200 WILLIAM PITT WAY
PITTSBURGH, PA 15238

===== HAZARDOUS INGREDIENTS/IDENTITY INFORMATION =====

SEE COMPONENT INFORMATION.

NAME: NITROGEN (AMMONIA) STANDARD, 1ml=1mg N = 1.22mg NH3

SYN: Nitrogen reference solution

COMPONENTS:	CAS:	FORMULA/F.WT.
(1) ammonium chloride, 0.38%	12125-02-9	NH4Cl / 53.49
(2) water, 99.6%	7732-18-5	H20 / 18.00

CERCLA RATING(0-3): Health - Fire - Reactivity - Persistance - n/a

NFPA RATING (0-4): Health - Fire - Reactivity - n/a

===== PHYSICAL/CHEMICAL CHARACTERISTICS =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

=== FIRE AND EXPLOSION HAZARD DATA =====

FLASH PT.: Non-flammable

EXPLOSION LEVEL:

LOWER (LEL): N/a
UPPER (UEL): N/a

AUTOIGNITION: N/a

EXTINGUISHING MEDIA: Dry chemical, carbon dioxide, water spray or foam.

FIREFIGHTING: No acute hazard. Negligible fire hazard when exposed to heat or flame. Move container if possible, avoid breathing dusts or vapors.

===== REACTIVITY DATA =====

STABILITY: Stable under normal temperatures and pressures up to boiling point(212F).

CONDITIONS TO AVOID: Incompatibilities - water reactive substances (oleum, sodium). Ammonium chloride in sufficient concentrations react violently or explosively with bromine trifluoride, iodine heptafluoride, potassium perchlorate, ammonium nitrate.

HAZARDOUS DECOMPOSITION/BYPRODUCTS: This solution presents negligible hazard from thermal decomposition. Ammonium chloride sublimes unchanged at 644F (340C).

HAZARDOUS POLYMERIZATION: Not known to occur.

===== HEALTH HAZARD DATA =====

TOXICITY: No toxic effects anticipated at this concentration of ammonium chloride. Ammonium chloride salt is a mild respiratory and skin irritant, a severe eye irritant.

LDLO: 78 mg/Kg IV-rabbit; 500mg/Kg SubC-mouse.
LD50: 485mg/Kg IP-mouse; 30mg/Kg IM-rat; 1000mg/Kg Oral - rabbit; 1650 mg/Kg Oral-rat.

CARCINOGENICITY: None reported.

EXPOSURE LIMITS: (For ammonium chloride, as fume)

OSHA-PEL: N/a
ACGIH-TWA: 10mg/m3
-STEL: 20mg/m3
TLV CEILING: N/a
IDLH: N/a
OTHER: N/a

ACUTE HEALTH HAZARDS: No health hazards reported for this solution. Ammonium

chloride salts may irritate the nose, throat, mouth and respiratory tract and
cause wheezing, chest pain, and delayed pulmonary edema. Skin and eye contact
may produce redness and irritation. Ingestion of ammonium salts may produce
nausea, vomiting, gastric irritation - over 6 grams may cause systemic
ammonia toxicity (heavy breathing, blue skin, dullness/-restlessness,
convulsions, coma). Persons with liver or kidney impairment are at increased
risk.

CHRONIC HEALTH HAZARDS: Dermatitis, conjunctivitis may occur. Ammonium
chloride at this concentration should not present a significant health
hazard.

FIRST AID:

INHALATION: Move victim to fresh air, give artificial respiration if
necessary. Maintain airway, medical personnel may give oxygen and treat for
pulmonary edema. Keep victim warm, at rest. Get medical aid immediately.

SKIN: Remove contaminated clothing, wash area with soap and water. Flush
with large amounts of water (15-20min) until chemical is gone. Get medical
aid.

EYES: Flush with large amounts of water (15-20min) lifting upper/lower lids
occasionally until chemical is gone. Get medical aid at once.

INGESTION: Give conscious victim 2-4 glasses of water, induce vomiting
(touch finger to back of throat). Get medical aid at once.

===== PRECAUTIONS FOR SAFE HANDLING AND USE =====

SPILLS OR LEAKS: Absorb with sand, diatomaceous earth, activated charcoal, or
other suitable absorbent. Scoop into container and label for disposal. Spill
may be chemically neutralized to pH 7.

DISPOSAL: Dispose in accordance with Federal, State, and local laws.

STORAGE AND HANDLING: Store capped in virgin linear polyethylene or
equivalent plastic container at room temperature protected from heat and
water reactive materials (oleum, sodium).

===== CONTROL MEASURES =====

RESPIRATORY PROTECTION: Not required for laboratory use of this solution.
Respirators not required for laboratory.

PROTECTIVE CLOTHING AND EQUIPMENT: Gloves are recommended where repeated and

prolonged contact occurs. Wear splash-proof goggles. Do not wear
contact
lenses when working with chemicals.

===== SPECIAL NOTES =====

Information in this MSDS is from available published sources and is
believed
to be accurate. No warranty, express or implied, is made and
LabChem Inc.
assumes no liability resulting from the use of this MSDS. The user
must
determine suitability of this information for his application.

NOTE:

N/A: Means "not applicable" or data "not available".

MSDS for AMMONIUM CITRATE, DIBASIC Page 1

---

1 - PRODUCT IDENTIFICATION

PRODUCT NAME: AMMONIUM CITRATE, DIBASIC
FORMULA: (NH4)2HC6H5O7
FORMULA WT: 226.19
CAS NO.: 3012-65-5
COMMON SYNONYMS: DIAMMONIUM HYDROGEN CITRATE; DIAMMONIUM CITRATE; CITRIC ACID DIAMMONIUM SALT
PRODUCT CODES: 5310,0682
EFFECTIVE: 05/08/86
REVISION #01

PRECAUTIONARY LABELLING

BAKER SAF-T-DATA(TM) SYSTEM

HEALTH	-	1	SLIGHT
FLAMMABILITY	-	1	SLIGHT
REACTIVITY	-	0	NONE
CONTACT	-	1	SLIGHT

HAZARD RATINGS ARE 0 TO 4 (0 = NO HAZARD; 4 = EXTREME HAZARD).

LABORATORY PROTECTIVE EQUIPMENT

SAFETY GLASSES; LAB COAT

PRECAUTIONARY LABEL STATEMENTS

CAUTION
MAY CAUSE IRRITATION
DURING USE AVOID CONTACT WITH EYES, SKIN, CLOTHING. WASH THOROUGHLY AFTER HANDLING. WHEN NOT IN USE KEEP IN TIGHTLY CLOSED CONTAINER.

SAF-T-DATA(TM) STORAGE COLOR CODE: ORANGE (GENERAL STORAGE)

---

2 - HAZARDOUS COMPONENTS

COMPONENT	%	CAS NO.

CAS# 3012-65-5
Ammonium Citrate

NOT APPLICABLE

---

3 - PHYSICAL DATA

BOILING POINT: N/A

VAPOR PRESSURE(MM HG): N/A

MELTING POINT: N/A

VAPOR DENSITY(AIR=1): 1.8

SPECIFIC GRAVITY: 1.48
(H2O=1)

EVAPORATION RATE: N/A
(BUTYL ACETATE=1)

SOLUBILITY(H2O): APPRECIABLE (MORE THAN 10 %) % VOLATILES BY VOLUME: 0

APPEARANCE & ODOR: WHITE GRANULES OR CRYSTALS.

---

4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (CLOSED CUP: N/A

FLAMMABLE LIMITS: UPPER - N/A % LOWER - N/A %

FIRE EXTINGUISHING MEDIA
USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.

SPECIAL FIRE-FIGHTING PROCEDURES
FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE.
MOVE EXPOSED CONTAINERS FROM FIRE AREA, IF IT CAN BE DONE WITHOUT RISK.
USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL.

UNUSUAL FIRE & EXPLOSION HAZARDS
CLOSED CONTAINERS EXPOSED TO HEAT MAY EXPLODE.

TOXIC GASES PRODUCED
AMMONIA, CARBON MONOXIDE, CARBON DIOXIDE

---

5 - HEALTH HAZARD DATA

CARCINOGENICITY: NTP: NO IARC: NO Z LIST: NO OSHA REG: NO

EFFECTS OF OVEREXPOSURE
CONTACT MAY CAUSE IRRITATION OF SKIN, EYES, AND MUCOUS MEMBRANES.

TARGET ORGANS
NONE IDENTIFIED

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
NONE IDENTIFIED

ROUTES OF ENTRY
NONE INDICATED

EMERGENCY AND FIRST AID PROCEDURES

INGESTION:	IF SWALLOWED AND THE PERSON IS CONSCIOUS, IMMEDIATELY GIVE LARGE AMOUNTS OF WATER. GET MEDICAL ATTENTION.
INHALATION:	IF A PERSON BREATHES IN LARGE AMOUNTS, MOVE THE EXPOSED PERSON TO FRESH AIR. GET MEDICAL ATTENTION.
EYE CONTACT:	IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION.
SKIN CONTACT:	IMMEDIATELY WASH WITH PLENTY OF SOAP AND WATER FOR AT LEAST 15 MINUTES.

---

6 - REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: NONE DOCUMENTED

DECOMPOSITION PRODUCTS: AMMONIA, CARBON MONOXIDE, CARBON DIOXIDE

---

7 - SPILL AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE
WEAR SUITABLE PROTECTIVE CLOTHING. CAREFULLY SWEEP UP AND REMOVE.

DISPOSAL PROCEDURE
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS.

---

8 - PROTECTIVE EQUIPMENT

VENTILATION:	USE ADEQUATE GENERAL OR LOCAL EXHAUST VENTILATION TO KEEP FUME OR DUST LEVELS AS LOW AS POSSIBLE.
RESPIRATORY PROTECTION:	NONE REQUIRED WHERE ADEQUATE VENTILATION CONDITIONS EXIST. IF AIRBORNE CONCENTRATION IS HIGH, USE AN APPROPRIATE RESPIRATOR OR DUST MASK.
EYE/SKIN PROTECTION:	SAFETY GLASSES WITH SIDESHIELDS, PROPER GLOVES ARE RECOMMENDED.

---

9 - STORAGE AND HANDLING PRECAUTIONS

SAF-T-DATA(TM) STORAGE COLOR CODE: ORANGE (GENERAL STORAGE)

SPECIAL PRECAUTIONS
KEEP CONTAINER TIGHTLY CLOSED. SUITABLE FOR ANY GENERAL CHEMICAL STORAGE AREA.

---

10 - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC (D.O.T.)

PROPER SHIPPING NAME	AMMONIUM CITRATE, DIBASIC
HAZARD CLASS	ORM-E
LABELS	NONE
REPORTABLE QUANTITY	5000 LBS.

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME CHEMICALS, N.O.S. (NON-REGULATED)

PORTS MSDS #: 346

PRODUCT: STANDARD, ARSENIC 1000PPM IN 10% NITRIC

PART NUMBER:

FORMULA: As

KEYWORD: STANDARD

PORTS NUMBER: 00190040-100

PORTS MISC INFO:
NOT GIVEN

PORTS RATING: HFR=300

MANUFACTURER:
VHG LABS INC.
180 ZACHARY RD #5
MANCHESTER
NH

03109
PHONE: PHONE: 603-622-7660
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	~ 212 F	NOTE: ~100'C.
Melting Point. . . .	~ 32 F	NOTE: ~0'C.
Freezing Point . . .	NG	
Sour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	~ 1	
Vapor Pressure . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Vapor Density. . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Percent Volatiles. .	~ 99	NOTE: @ 21'C.
Evaporation Rate . .	NA	NOTE: NOT APPLI/NOT AVAIL.
pH	NA	NOTE: NOT APPLI/NOT AVAIL.
Molecular Weight . .	EQ 74.92	NOTE: FORMULA WT.
Viscosity.	NG	

Solubility in Water. COMPLETE (100%).
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID, ODORLESS / ODOR THRESHOLD: NOT APPLICABLE/NOT AVAILABLE.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	NA	NOTE: NOT APPLI/NOT AVAIL.
Explosive/Flammable Limits		
Lower (LEL).	NA	NOTE: NOT APPLI/NOT AVAIL.
Upper (UEL).	NA	NOTE: NOT APPLI/NOT AVAIL.

Shipping Regulations

UN/NA Number.	NG
D.O.T. Hazard Class. . .	NG
Label	NOT GIVEN
Proper Shipping Name . .	CHEMICALS, N.O.S. (NON-REGULATED)

==========

Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 1/18/93

===== Component Information =====

ARSENIC
OSHA PEL (PPM):
OSHA PEL (MG/M3): 0.01
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 0.2
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 1.0
C.A.S. No.: 7440382

NITRIC ACID
OSHA PEL (PPM):
OSHA PEL (MG/M3): 5.2
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 5.2
STEL (PPM):
STEL (MG/M3):
Product %: EQ 10
C.A.S. No.: 7697372
Note:
PEL & TLV: 2 PPM / STEL: 4 PPM.

WATER
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: BA
C.A.S. No.: 7732185
Note:
NE = NOT ESTABLISHED / BA = BALANCE.

===== SECTION I - PRODUCT IDENTIFICATION =====

PRODUCT NAME: Arsenic Plasma Emission Standard - 10,000 micrograms/ml

COMMON SYNONYMS: N/A

CHEMICAL FAMILY: Plasma Emission Standards

FORMULA: As

FORMULA WT.: 74.92

CAS NO.: N/A

NIOSH/RTECS NO.: QU5775000

PRODUCT USE: Laboratory Reagent

REVISION DATE: 01/18/93

TEL: (603) 622-7660

FAX: 622-5180

MANUFACTURER'S NAME AND ADDRESS:

VHG LABS, INC.
CHEMICAL PRODUCTS AND SERVICES

180 ZACHARY ROAD #5
MANCHESTER, NH 03109

===== SECTION II - COMPONENTS =====

SEE COMPONENT INFORMATION.

===== SECTION III - PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

ODOR THRESHOLD (PPM): N/A

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

===== SECTION IV - FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT (CLOSED CUP): N/A

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS:

UPPER: N/A
LOWER: N/A

FIRE EXTINGUISHING MEDIA: Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE-FIGHTING PROCEDURES: Firefighters should wear proper protective quipment and self-contained breathing apparatus with full facepiece operated n positive pressure mode.

UNUSUAL FIRE & EXPLOSION HAZARDS: Reacts with most metals to produce hydrogen gas, which can form an explosive mixture with air.

TOXIC GASES PRODUCED: Oxides of nitrogen.

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT: None identified.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE: None identified.

===== SECTION V - HEALTH HAZARD DATA =====

THRESHOLD LIMIT VALUE (TLV/TWA): 5.2 mg/m3 (2 ppm)

TLV is for Nitric acid.

SHORT-TERM EXPOSURE LIMIT (STEL): 10 mg/m3 (4 ppm)

STEL is for Nitric acid.

PERMISSIBLE EXPOSURE LIMIT (PEL): 5.2 mg/m3 (2 ppm)

PEL is for Nitric acid

TOXICITY OF COMPONENTS:

ORAL RAT LD50 FOR ARSENIC: 15.1 mg/kg

INHALATION-1HR RAT LC50 FOR NITRIC ACID: 2500 ppm

INTRAPERITONEAL MOUSE LD50 FOR WATER: 190 g/kg

INTRAVENOUS MOUSE LD50 FOR WATER: 25 g/kg

CARCINOGENICITY: NTP: Yes IARC: Yes Z LIST: Yes OSHA REG: Yes

RCINOGENICITY: This product contains Arsenic, which is listed as a NTP human carcinogen and an IARC human carcinogen (Group 1).

REPRODUCTIVE EFFECTS: None identified

EFFECTS OF OVEREXPOSURE:

INHALATION: Headache, nausea, vomiting, dizziness, irritation of respiratory system, severe irritation or burns of respiratory system, pulmonary edema, lung inflammation

SKIN CONTACT: Severe irritation

EYE CONTACT: Severe irritation

SKIN ABSORPTION: None identified

INGESTION: Burns to mouth, throat, and stomach, may be fatal nausea, vomiting, kidney dysfunction, paralysis

CHRONIC EFFECTS: None identified

TARGET ORGANS: Liver, kidneys, respiratory system, lungs, eyes, skin, teeth, lymphatic system

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: None identified

PRIMARY ROUTES OF ENTRY: Inhalation, ingestion, skin contact, eye contact

EMERGENCY AND FIRST AID PROCEDURES:

INGESTION: CALL A PHYSICIAN. If swallowed, and the victim is conscious, give large amounts of milk, milk of magnesia or whites of eggs beaten with H2O and induce vomiting.

INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

SKIN CONTACT: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

EYE CONTACT: In case of eye contact, immediately flush with plenty of water for at least 15 minutes.

SARA/TITLE III HAZARD CATEGORIES AND LISTS:

ACUTE: Yes CHRONIC: Yes FLAMMABILITY: No PRESSURE: No REACTIVITY: No

EXTREMELY HAZARDOUS SUBSTANCE: Yes Contains Nitric Acid (RQ = 1,000 LBS, TPQ = 1,000 LBS)

CERCLA HAZARDOUS SUBSTANCE: Yes Contains Arsenic (RQ = 1 LB) and Nitric Acid (RQ = 1000 LBS)

SARA 313 TOXIC CHEMICALS: Yes Contains Arsenic and Nitric Acid

TSCA INVENTORY: Yes

STATE LISTS:

FOR PRODUCTS SOLD IN THE STATE OF CALIFORNIA, THE STATE REQUIRES THAT WE PROVIDE TO USERS AND THEIR EMPLOYEES THE FOLLOWING MESSAGE: WARNING: THIS PRODUCT CONTAINS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

===== SECTION VI - REACTIVITY DATA =====

'ABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Heat

INCOMPATIBLES: Strong bases, strong reducing agents, alkalies, most common metals

DECOMPOSITION PRODUCTS: Oxides of nitrogen

===== SECTION VII - SPILL & DISPOSAL PROCEDURES =====

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE: Wear self-contained breathing apparatus and full protective clothing. Stop leak if you can do so without risk. Ventilate area. Neutralize spill with soda ash or lime. With clean shovel, carefully place material into clean, dry container and cover; remove from area. Flush spill area with water.

DISPOSAL PROCEDURE: Dispose in accordance with all applicable federal, state, and local environmental regulations.

EPA HAZARDOUS WASTE NUMBER: D002 (Corrosive Waste)

===== SECTION VIII - PROTECTION INFORMATION =====

EYE/FACE PROTECTION: Goggles & Shield

PROTECTIVE CLOTHING: Lab Coat & Apron

?ROTECTIVE GLOVES: Rubber

VENTILATION REQUIREMENTS: Vent Hood

===== SECTION IX - STORAGE DATA AND ADDITIONAL INFORMATION =====

STORAGE REQUIREMENTS: Keep container tightly closed. Suitable for any general chemical storage area. Isolate from incompatible materials.

===== SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION =====

DOMESTIC (D.O.T.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)

INTERNATIONAL (I.M.O.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)
MARINE POLLUTANTS: No

N/A = Not Applicable or Not Available
N/E = Not Established

The information in this Material Safety Data Sheet meets the requirements of the United States OCCUPATIONAL SAFETY AND HEALTH ACT and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) and the Canadian WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. This document is intended only as a guide to the appropriate precautionary handling of the material by a person trained in, or supervised by a person trained in, chemical handling. The user is responsible for determining the application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes.

Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, VHG cannot warn of all of the potential dangers of use or interaction with other chemicals or materials. VHG warrants that the chemical meets the specifications set forth on the label.

VHG DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.

The user should recognize that this product can cause severe injury and even death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION.

Approved by Quality Assurance Department.

PORTS MSDS #: 342

PRODUCT: STANDARD, BARIUM 1000PPM IN 10% NITRIC

PART NUMBER:

FORMULA: Ba

KEYWORD: STANDARD

PORTS NUMBER: 00190036-100

PORTS MISC INFO:
NOT GIVEN

PORTS RATING: HFR=300

MANUFACTURER:
VHG LABS INC.
180 ZACHARY RD #5
MANCHESTER
NH

03109
PHONE: PHONE: 603-622-7660
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	~ 212 F	NOTE: ~100'C.
Melting Point. . . .	~ 32 F	NOTE: ~0'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	~ 1	
Vapor Pressure . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Vapor Density. . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Percent Volatiles. .	~ 98	NOTE: @ 21'C.
Evaporation Rate . .	NA	NOTE: NOT APPLI/NOT AVAIL.
pH	NA	NOTE: NOT APPLI/NOT AVAIL.
Molecular Weight . .	EQ 137.33	NOTE: FORMULA WT.
Viscosity.	NG	

Solubility in Water. COMPLETE (100%).
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID, ODORLESS / ODOR THRESHOLD: NOT APPLICABLE/NOT AVAILABLE.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	NA	NOTE: NOT APPLI/NOT AVAIL.
Explosive/Flammable Limits		
Lower (LEL).	NA	NOTE: NOT APPLI/NOT AVAIL.
Upper (UEL).	NA	NOTE: NOT APPLI/NOT AVAIL.

Shipping Regulations

UN/NA Number.	NG
D.O.T. Hazard Class. . .	NG
Label	NOT GIVEN
Proper Shipping Name . .	CHEMICALS, N.O.S. (NON-REGULATED)

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Preparer/Contact Information: QUALITY ASSURANCE DEPARTMENT

Date Prepared/Revised 1/18/93

===== Component Information =====

BARIUM NITRATE
OSHA PEL (PPM):
OSHA PEL (MG/M3): 0.5
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 0.5
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 1.9
C.A.S. No.: 10022318

NITRIC ACID
OSHA PEL (PPM):
OSHA PEL (MG/M3): 5
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 5
STEL (PPM):
STEL (MG/M3): 10
Product %: EQ 10
C.A.S. No.: 7697372
Note:
PEL & TLV: 2 PPM / STEL: 4 PPM.

WATER
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: BA
C.A.S. No.: 7732185
Note:
NE = NOT ESTABLISHED / BA = BALANCE.

===== SECTION I - PRODUCT IDENTIFICATION =====

PRODUCT NAME: Barium Plasma Emission Standards - 10,000 micrograms/ml

COMMON SYNONYMS: N/A

CHEMICAL FAMILY: Plasma Emission Standards

FORMULA: Ba

FORMULA WT.: 137.33

CAS NO.: N/A

NIOSH/RTECS NO.: QU5775000

PRODUCT USE: Laboratory Reagent

REVISION DATE: 01/18/93

TEL: (603) 622-7660

FAX: 622-5180

MANUFACTURER'S NAME AND ADDRESS:

VHG LABS, INC.
CHEMICAL PRODUCTS AND SERVICES

http://jupiter.ports/msds/data/342

180 ZACHARY ROAD #5
MANCHESTER, NH 03109

===== SECTION II - COMPONENTS =====

SEE COMPONENT INFORMATION.

===== SECTION III - PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

===== SECTION IV - FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT (CLOSED CUP): N/A

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS:

UPPER: N/A
LOWER: N/A

FIRE EXTINGUISHING MEDIA: Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE-FIGHTING PROCEDURES: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode.

UNUSUAL FIRE & EXPLOSION HAZARDS: Reacts with most metals to produce hydrogen gas, which can form an explosive mixture with air.

TOXIC GASES PRODUCED: Oxides of nitrogen.

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT: None identified.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE: None identified.

===== SECTION V - HEALTH HAZARD DATA =====

THRESHOLD LIMIT VALUE (TLV/TWA): 5 mg/m3 (2 ppm)

TLV is for Nitric acid.

SHORT-TERM EXPOSURE LIMIT (STEL): 10 mg/m3 (4 ppm)

STEL is for Nitric acid.

PERMISSIBLE EXPOSURE LIMIT (PEL): 5 mg/m3 (2 ppm)

PEL is for Nitric acid.

TOXICITY OF COMPONENTS:

ORAL RAT LD50 FOR BARIUM NITRATE: 355 mg/kg

INTRAVENOUS MOUSE LD50 FOR BARIUM NITRATE: 8.5 mg/kg

INHALATION-1HR RAT LC50 FOR NITRIC ACID: 2500 ppm

INTRAPERITONEAL MOUSE LD50 FOR WATER: 190 g/kg

INTRAVENOUS MOUSE LD50 FOR WATER: 25 g/kg

CARCINOGENICITY: NTP: No IARC: No Z LIST: No OSHA REG: No

ARCINOGENICITY: None identified

REPRODUCTIVE EFFECTS: None identified

EFFECTS OF OVEREXPOSURE:

INHALATION: Headache, nausea, vomiting, dizziness, irritation of respiratory system

SKIN CONTACT: Severe irritation

EYE CONTACT: Severe irritation

SKIN ABSORPTION: None identified

INGESTION: Burns to mouth, throat, and stomach, kidney dysfunction

CHRONIC EFFECTS: None identified

TARGET ORGANS: Respiratory system, eyes, skin, teeth

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Damaged skin, eye disorders, cardiopulmonary disease

PRIMARY ROUTES OF ENTRY: Inhalation, ingestion, skin contact, eye contact

EMERGENCY AND FIRST AID PROCEDURES:

INGESTION: CALL A PHYSICIAN. If swallowed, do NOT induce vomiting. If conscious, give water, milk, or milk of magnesia.

INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

SKIN CONTACT: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

EYE CONTACT: In case of eye contact, immediately flush with plenty of water for at least 15 minutes.

SARA/TITLE III HAZARD CATEGORIES AND LISTS:

ACUTE: Yes CHRONIC: Yes FLAMMABILITY: No PRESSURE: No REACTIVITY: No

EXTREMELY HAZARDOUS SUBSTANCE: Yes Contains Nitric Acid (RQ = 1,000 LBS, TPQ = 1,000 LBS)

CERCLA HAZARDOUS SUBSTANCE: Yes Contains Nitric Acid (RQ = 1,000 LBS)

SARA 313 TOXIC CHEMICALS: Yes Contains Nitric Acid

TSCA INVENTORY: Yes

===== SECTION VI - REACTIVITY DATA =====

STABILITY: Stable.

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Heat

INCOMPATIBLES: Strong bases, strong reducing agents, alkalies, most common metals

DECOMPOSITION PRODUCTS: Oxides of nitrogen

=== SECTION VII - SPILL & DISPOSAL PROCEDURES =====

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE: Wear self-contained breathing apparatus and full protective clothing. Stop leak if you can do so without risk. Ventilate area. Neutralize spill with soda ash or lime. With clean shovel, carefully place material into clean, dry container and cover; remove from area. Flush spill area with water.

DISPOSAL PROCEDURE: Dispose in accordance with all applicable federal, state, and local environmental regulations.

EPA HAZARDOUS WASTE NUMBER: D002 (Corrosive Waste)

===== SECTION VIII - PROTECTION INFORMATION =====

EYE/FACE PROTECTION: Goggles & Shield

PROTECTIVE CLOTHING: Lab Coat & Apron

PROTECTIVE GLOVES: Rubber

VENTILATION REQUIREMENTS: Vent Hood

===== SECTION IX - STORAGE DATA AND ADDITIONAL INFORMATION =====

STORAGE REQUIREMENTS: Keep container tightly closed. Store in secure poison area. Isolate from incompatible materials.

==== SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION =====

DOMESTIC (D.O.T.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)

INTERNATIONAL (I.M.O.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)
MARINE POLLUTANTS: No

N/A = Not Applicable or Not Available
N/E = Not Established

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Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, VHG cannot warn of all of the potential dangers of use or interaction with other chemicals or materials. VHG warrants that the chemical meets the specifications set forth on the label. VHG DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.

The user should recognize that this product can cause severe injury and even death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION.

Approved by Quality Assurance Department.

PORTS MSDS #: 5505

PRODUCT: BENZENE

PART NUMBER:

FORMULA: C6H6

KEYWORD: SOLVENT

PORTS NUMBER: NNN

PORTS MISC INFO:
01-02-1000

PORTS RATING: HFR=430

MANUFACTURER:
AMERICAN BURDICK & JACKSON
1953 SOUTH HARVEY STREET
MUSKEGON
MI

49442
PHONE: PHONE: 616-726-3171
EMERGENCY PHONE: 616-726-3171

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 176 F	NOTE: 80'C, 760 MM HG.
Melting Point. . . .	NG	
Freezing Point . . .	EQ 41.9 F	NOTE: 5.5'C.
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .879	NOTE: @ 20'C.
Vapor Pressure . . .	EQ 74.6	NOTE: MM HG @ 20'C.
Vapor Density. . . .	EQ 2.8	
Percent Volatiles. .	~ 100	
Evaporation Rate . .	~ 3	NOTE: BUAC=1.
pH	NG	
Molecular Weight . .	EQ 78.11	
Viscosity.	NG	

Solubility in Water. @ 25C 0.18%.
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS LIQUID WITH A CHARACTERISTIC AROMATIC

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 12.2 F	NOTE: -11'C, TCC.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	EQ 1043.6 F	NOTE: 562'C.

Explosive/Flammable Limits
Lower (LEL). . . . . EQ 1.3
Upper (UEL). . . . . EQ 7.1

Shipping Regulations
UN/NA Number. UN1114
D.O.T. Hazard Class. . . FLAMMABLE LIQUID
Label . . . . . NOT GIVEN
Proper Shipping Name . . BENZENE

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Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 3/01/88

===== Component Information =====

BENZENE
OSHA PEL (PPM): 1
OSHA PEL (MG/M3):
ACGIH TLV (PPM): 10
ACGIH TLV (MG/M3):
STEL (PPM): 25
STEL (MG/M3):
Product %: ~ 100
C.A.S. No.: 71432
Note:
OSHA AND ACGIH STEL / NIOSH: 10 PPM, TLV CEILING: NOT

===== IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

CHEMICAL NAME: Benzene

CHEMICAL FAMILY: Aromatic Hydrocarbon

SYNONYMS: Benzol

CAS NO.: 71-43-2

EMERGENCY TELEPHONE NO.: 312/973-3600 (American Scientific Products)

CHEMTREC TELEPHONE NO.: 800/424-9300

INFORMATION TELEPHONE NO.: 616/726-3171 (American Burdick & Jackson)

MANUFACTURER'S NAME AND ADDRESS:

AMERICAN BURDICK & JACKSON
SUBSIDIARY OF AMERICAN HOSPITAL SUPPLY CORPORATION
1953 SOUTH HARVEY STREET
MUSKEGON, MI 49442

===== PHYSICAL AND CHEMICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Not expected to occur.

APPEARANCE AND ODOR: Clear, colorless liquid with a characteristic aromatic odor.

CONDITIONS TO AVOID: Heat, sparks, open flame, open containers, and poor ventilation.

MATERIALS TO AVOID: Strong oxidizing agents and strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS: Incomplete combustion can generate carbon monoxide and other toxic vapors.

===== FIRE AND EXPLOSION HAZARD DATA =====

E PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Volatile and flammable.

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical or foam.

SPECIAL FIRE FIGHTING PROCEDURES: Water will not be effective in extinguishing a fire and may spread it, but a water spray can be used to cool
exposed containers. Wear full protective clothing and self-contained
breathing apparatus. Heat will build pressure and rupture closed storage
containers.

===== HAZARDOUS COMPONENTS =====

SEE COMPONENT INFORMATION.

BENZENE

CARCINOGEN

===== HEALTH HAZARDS =====

OCCUPATIONAL EXPOSURE LIMITS:

OSHA:

PEL-TWA - 1 ppm
PEL-STEL - 25 ppm

ACGIH:

TLV-TWA - 10 ppm
TLV-STEL - 25 ppm

NIOSH:

TLV-TWA - 10 ppm
TLV-C - Not Listed

CONCENTRATION IMMEDIATELY DANGEROUS TO HEALTH:

OSHA/NIOSH 2,000 ppm

ODOR THRESHOLD:

NSC 2 ppm
NIOSH Not Listed
OHS 1.5-5 ppm

CARCINOGENIC, MUTAGENIC, TERATOGENIC DATA:

Human carcinogen (NTP, IARC, OSHA)
Suspect human carcinogen (ACGIH)
Mutagenic and teratogenic data (RTEC)
Animal carcinogen (IARC)

PRIMARY ROUTES OF ENTRY: Benzene may exert its effects through inhalation,
skin absorption, and ingestion.

INDUSTRIAL EXPOSURE: ROUTE OF EXPOSURE/SIGNS AND SYMPTOMS:

INHALATION: Exposure can cause dizziness, intoxication, excitement,
idache, vomiting, delirium, drowsiness, and unconsciousness.

EYE CONTACT: Liquid and high vapor concentration can cause irritation,
neuritis, atrophy, visual impairment, edema, and cataracts.

SKIN CONTACT: Prolonged or repeated skin contact can cause irritation and
dermatitis through defatting of skin.

INGESTION: Can cause gastrointestinal tract discomfort.

EFFECTS OF OVEREXPOSURE: Benzene is a primary skin irritant, central nervous
system depressant, bone marrow depressant, and leukemogen. Acute benzene
exposure from inhalation or ingestion initially produces excitation and
euphoria, followed by headache, drowsiness, dizziness, vomiting, delirium and
unconsciousness. Respiratory irritation and pulmonary edema are possible.
Severe exposure causes blurred vision, tremors, shallow and rapid
respiration, ventricular fibrillation, paralysis, and convulsions. Liver and
kidney damage may occur. Chronic exposure to benzene poses the most
significant toxic effects. Symptoms are headache, anorexia, nervousness,
weariness, anemia, pallor, bleeding under the skin and eyes, and reduced
clotting ability. Bone marrow damage and leukemia may develop.
iver and
idney damage may occur.

MEDICAL CONDITION AGGRAVATED BY EXPOSURE: Preclude from exposure those
individuals with diseases of the heart, lung, kidney, liver, nervous system,
or the blood, and those susceptible to dermatitis.

EMERGENCY FIRST AID:

INHALATION: Immediately remove to fresh air. If not breathing, administer
mouth-to-mouth rescue breathing. If there is no pulse administer
cardiopulmonary resuscitation (CPR). Contact physician immediately.

EYE CONTACT: Rinse with copious amounts of water for at least 15 minutes.
Get emergency medical assistance.

SKIN CONTACT: Flush thoroughly for at least 15 minutes. Wash affected skin
with soap and water. Remove contaminated clothing and shoes. Wash clothing
before re-use, and discard contaminated shoes. Get emergency medical
assistance.

INGESTION: Call local Poison Control Center for assistance. Contact
physician immediately. Aspiration Hazard - Do not induce vomiting.

===== SAFETY MEASURES AND EQUIPMENT =====

VENTILATION: Adequate ventilation is required to protect personnel

from
exposure to chemical vapors exceeding the PEL and to minimize fire
zards.
e choice of ventilation equipment, either local or general, will
depend on
the conditions of use, quantity of material, and other operating
parameters.

RESPIRATORY: Use approved respirator equipment. Follow NIOSH and
equipment
manufacturer's recommendations to determine appropriate equipment
(air-purifying, air-supplied, or self-contained breathing
apparatus).

EYES: Safety glasses are considered minimum protection. Goggles or
face
shield may be necessary depending on quantity of material and
conditions of
use.

SKIN: Protective gloves and clothing are recommended. The choice of
material
must be based on chemical resistance and other user requirements.
Generally,
polyvinyl alcohol, viton(R) or nitrile latex offers acceptable
chemical
resistance. Individuals who are acutely and specifically sensitive
to benzene
may require additional protective equipment.

STORAGE: Benzene should be protected from temperature extremes and
direct
sunlight. Proper storage of benzene must be determined based on
ther
aterials stored and their hazards and potential chemical
incompatibility. In
general, benzene should be stored in an acceptably protected and
secure
flammable liquid storage room.

OTHER: Emergency eye wash fountains and safety showers should be
available in
the vicinity of any potential exposure. Ground and bond metal
containers to
minimize static sparks.

===== SPILL AND DISPOSAL DATA =====

SPILL CONTROL: Protect from ignition. Wear protective clothing and
use
approved respirator equipment. Absorb spilled material in an
absorbent
recommended for solvent spills and remove to a safe location for
disposal by
approved methods. If released to the environment, comply with all
regulatory
notification requirements.

WASTE DISPOSAL: Dispose of benzene as an EPA hazardous waste.
Hazardous waste
numbers: U019 (Ignitable, Toxic); D001 (Ignitable).

===== SPECIAL NOTES =====

KEY:

CA: Approximately

NA: Not applicable
C: Ceiling
PEL: Permissible Exposure Level
STEL: Short Term Exposure Level
TLV: Threshold Limit Value
TWA: Time Weighted Average
BuAc: Butyl Acetate
NSC: National Safety Council ("Fundamentals of Industrial Hygiene", 1983)
OHS: Occupational Health Services ("Hazardline")

AMERICAN BURDICK & JACKSON'S DISCLAIMER: "The information and recommendations presented herein are based on sources believed to be reliable as of the date hereof. American Burdick & Jackson makes no representation as to the completeness or accuracy thereof. It is the user's responsibility to determine the product's suitability for its intended use, the product's safe use, and the product's proper disposal. No representations or warranties not expressly set forth herein are made hereunder, whether express or implied by operation of law or otherwise, including, but not limited to any implied warranties of MERCHANTABILITY OR FITNESS. American Burdick & Jackson neither assumes nor authorizes any other person to assume for it, any other or ADDITIONAL LIABILITY OR RESPONSIBILITY resulting from the use of, or reliance upon, this information."

CAS# 64742-48-9
Blanket Cleaning
Solvent

MULTIGRAPHICS -- BLANKET CLEANING SOLVENT-83-9-770005
MATERIAL SAFETY DATA SHEET
SN: 685000D020055
Manufacturer's CAGE: 0FTL5
Part No. Indicator: A
Part Number/Trade Name: BLANKET CLEANING SOLVENT-83-9-770005

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General Information

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Item Name: CLEANING SOLVENT, LITHOGRAPHIC BLANKET/ROLLER
Company's Name: AM MULTIGRAPHICS
Company's Street: 1800 WEST CENTRAL ROAD
Company's City: MT. PROSPECT
Company's State: IL
Company's Country: US
Company's Zip Code: 60056
Company's Emerg Ph #: 708-5121/ EVEN 708-398-1900
Company's Info Ph #: 708-5121/ EVEN 708-398-1900
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 01JUN89
Safety Data Review Date: 18SEP95
Supply Item Manager: CX
MSDS Serial Number: BTSBL
Hazard Characteristic Code: F5

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Ingredients/Identity Information

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Proprietary: NO
Ingredient: PERCHLOROETHYLENE (TETRACHLOROETHYLENE) (SARA III)
Ingredient Sequence Number: 01
Percent: 25
NIOSH (RTECS) Number: KX3850000
CAS Number: 127-18-4
OSHA PEL: 100 PPM
ACGIH TLV: 25PPM/100,A3 STEL;94
Other Recommended Limit: NONE SPECIFIED

Proprietary: NO
Ingredient: ALIPHATIC HYDROCARBON
Ingredient Sequence Number: 02
Percent: 65-75
NIOSH (RTECS) Number: 1006236AH
CAS Number: 64742-48-9
OSHA PEL: 100 PPM
ACGIH TLV: 100 TWA, 200PPM STEL
Other Recommended Limit: SAME AS STOD SOLVENT

Proprietary: NO
Ingredient: VM&P NAPHTHA (LIGROINE)
Ingredient Sequence Number: 03
Percent: 5-10
NIOSH (RTECS) Number: OI6180000
CAS Number: 8032-32-4
OSHA PEL: 300 PPM
ACGIH TLV: 300 PPM; 9394
Other Recommended Limit: NONE SPECIFIED

Proprietary: NO
Ingredient: NAPHTHA, LIGHT AROMATIC
Ingredient Sequence Number: 04
Percent: 5-8
NIOSH (RTECS) Number: 1003693SN
CAS Number: 64742-95-6
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: 100 PPM TWA

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Physical/Chemical Characteristics

pearance And Odor: BLUE LIQUID, ODOR OF PERCHLOROETHYLENE
iling Point: 250F,121C
Vapor Density (Air=1): 5.83
Specific Gravity: 0.97
Evaporation Rate And Ref: 1.4 (BU AC=1)
Solubility In Water: INSOLUBLE
Percent Volatiles By Volume: 100

Fire and Explosion Hazard Data

Flash Point: 108F,42C
Flash Point Method: TCC
Lower Explosive Limit: 1.1
Upper Explosive Limit: 5.9
Extinguishing Media: CO2, FOAM, DRY CHEMICAL. DO NOT USE WATER, IT WILL SPREAD FIRE.
Special Fire Fighting Proc: FIRE FIGHTERS SHOULD WEAR PROTECTIVE CLOTHING AND SELF-CONTAINED BREATHING APPARATUS.
Unusual Fire And Expl Hazrds: CHLORINATED HYDROCARBONS INVOLVED IN FIRES CAN DECOMPOSE TO TOXIC HRDROGEN CHLORIDE AND POSSIBLE TRACES OF PHOSGENE.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): OPEN FLAMES, HOT SURFACES.
Materials To Avoid: STRONG OXIDIZING AGENTS, ACID OR BASES.
Hazardous Decomp Products: BURNING MAY PRODUCE CO, CO2, HYDROGEN CHLORIDE AND TRACES OF PHOSGENE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NONE

Health Hazard Data

Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE-EYE:IRRITATION & LACRYMATKON CAN OCCUR FROM PERCHLOROETHYLENE. SKIN:PROLONGED CONTACT MAY CAUSE DERMATITIS. INHALATION: HAS NARCOTIC EFFECT. INGESTION: GI IRRITATION, IF ASPIRATED MAY BE RAPIDLY ABSORBED THROUGH LUNGS, RESULTING IN INJURY TO OTHER BODY SYSTEMS. TARGET ORGANS:SKIN, EYES, LUNGS, CNS, LIVER, KIDNEY.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: ANTICIPATED CARCINOGEN BY NTP.
Signs/Symptoms Of Overexp: INHALATION: LOSS OF COORDINATION, TREMORS OR NAUSEA, VOMITING.
Med Cond Aggravated By Exp: BLOOD PRESSURE, HEART, LIVER, KIDNEY OR PULMONARY PROBLEMS. NERVOUS CONDITIONS, EXCESSIVE OBESITY OR ALCOHOL CONSUMPTION PROBLEMS.
Emergency/First Aid Proc: EYE:IRRIGATE IMMEDIATLEY W/WATER 10-15 MIN. MOVE TO FRESH AIR, IF NOT BREATHING, GIVE MOUTH TO MOUTH RESUSCITATION; IF BREATHING DIFFICULTY, GIVE OXYGEN, CALL PHYSICIAN. INGESTION: DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION IMMEDIATLEY.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: REMOVE PERSONNEL. ABSORB SPILLS WITH ABSORBENT MATERIAL OR RECOVER BY PUMPING.
Waste Disposal Method: DISPOSE OF WASTE SOLVENT AND ANY ABSORBENT IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS. DO NOT POUR INTO SEWER OR SEPTIC TANKS.
Precautions-Handling/Storing: STORE IN A COOL, DRY PLACE IN A SAFE AREA FOR CLASS II COMBUSTIBLE LIQUIDS. KEEP FROM REACH OF CHILDREN.
Other Precautions: FOR COMMERCIAL/INDUSTRIAL USE ONLY. DEPOSIT WIPING CLOTHES IN A SAFETY CONTAINER TO AVOID COMBUSTION. DO NOT REUSE CONTAINER.

Control Measures

spiratory Protection: IF REQUIRED, AN APPROVED SELF-CONTAINED BREATHING PARATUS.
ventilation: LOCAL EXHAUST: ONLY IF 50% OF TLV IS EXCEEDED.
Protective Gloves: NITRILE NBR
Eye Protection: SAFETY GLASSES.
Other Protective Equipment: RUBBER APRON TO KEEP SOLVENT OFF CLOTHING.
Work Hygienic Practices: DO NOT EAT, DRINK OR SMOKE WHILE WORKING WITH THIS PRODUCT.
Suppl. Safety & Health Data: USE IN WELL VENTILATED AREA, AVOID CONTACT.

Transportation Data

Trans Data Review Date: 94206
DOT PSN Code: GJL
DOT Proper Shipping Name: FLAMMABLE LIQUIDS, N.O.S.
DOT Class: 3
DOT ID Number: UN1993
DOT Pack Group: III
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: HIA
IMO Proper Shipping Name: FLAMMABLE LIQUID, N.O.S.
IMO Regulations Page Number: 3345
IMO UN Number: 1993
IMO UN Class: 3.3
IATA PSN Code: MCA
IATA UN ID Number: 1993
IATA Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. *
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFI PSN Code: MCA
AFI Prop. Shipping Name: FLAMMABLE LIQUIDS, N.O.S.
FI Class: 3
FI ID Number: UN1993
AFI Pack Group: III
AFI Label: FLAMMABLE LIQUID
AFI Basic Pac Ref: 7-7
MMAC Code: NK
Additional Trans Data: PSN PER MFR

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 25JUL94
Label Status: F
Common Name: BLANKET CLEANING SOLVENT-83-9-770005
Signal Word: WARNING!
Acute Health Hazard-Moderate: X
Contact Hazard-Moderate: X
Fire Hazard-Moderate: X
Reactivity Hazard-None: X
Special Hazard Precautions: FLAMMABLE LIQUID, CONTAINS NAPHTHA. KEEP AWAY FROM HEAT, SPARKS, AND FLAME. KEEP CONTAINER CLOSED. USE WITH ADEQUATE VENTILATION. IN CASE OF FIRE, USE WATER FOG, FOAM, DRY CHEMICAL, OR CO2. CAUSES IRRITATION OF EYES, SKIN AND RESPIRATORY TRACT. AVOID PROLONGED INHALATION OF VAPORS. TARGET ORGANS-EYES, SKIN, CNS, LIVER AND KIDNEY. FIRST AID- INHALATION:REMOVE TO FRESH AIR, PROVIDE OXYGEN/CPR IF NEEDED. GET MEDICAL HELP. EYES:FLUSH WITH WATER FOR 15 MINUTES. IF IRRITATION PERSISTS CONSULT A PHYSICION. SKIN: WASH WITH SOAP AND WATER. INGESTION:DO NOT INDUCE VOMITING. GET MEDICAL HELP.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: AM MULTIGRAPHICS
Label Street: 1800 WEST CENTRAL ROAD

Label City: MT. PROSPECT
Label State: IL
Label Zip Code: 60056
Label Country: US
Label Emergency Number: 708-5121/ EVEN 708-398-1900
Year Procured: 1994

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URL for this msds http://siri.org. If you wish to change, add to, or delete information in this archive please sent updates to dan@siri.org.

MSDS for **BORIC ACID** / Page 1

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1 - PRODUCT IDENTIFICATION

PRODUCT NAME: BORIC ACID
FORMULA: H3BO3
FORMULA WT: 61.83
CAS NO.: 10043-35-3
NIOSH/RTECS NO.: ED4550000
COMMON SYNONYMS: BORACIC ACID; ORTHOBORIC ACID; BOROFAX
PRODUCT CODES: 0084,5168,0090,0091,9820
EFFECTIVE: 10/03/86
REVISION #02

PRECAUTIONARY LABELLING

BAKER SAF-T-DATA(TM) SYSTEM

HEALTH	-	2	MODERATE
FLAMMABILITY	-	0	NONE
REACTIVITY	-	0	NONE
CONTACT	-	2	MODERATE

HAZARD RATINGS ARE 0 TO 4 (0 = NO HAZARD; 4 = EXTREME HAZARD).

LABORATORY PROTECTIVE EQUIPMENT

SAFETY GLASSES; LAB COAT; VENT HOOD; PROPER GLOVES

PRECAUTIONARY LABEL STATEMENTS

WARNING
CAUSES IRRITATION
HARMFUL IF SWALLOWED OR ABSORBED THROUGH SKIN
AVOID CONTACT WITH EYES, SKIN, CLOTHING.
AVOID BREATHING DUST. KEEP IN TIGHTLY CLOSED CONTAINER. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING.

SAF-T-DATA(TM) STORAGE COLOR CODE: ORANGE (GENERAL STORAGE)

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2 - HAZARDOUS COMPONENTS

CAS# 10043-35-3
Boric Acid

COMPONENT	%	CAS NO.
BORIC ACID	90-100	10043-35-3

3 - PHYSICAL DATA

BOILING POINT: N/A

MELTING POINT: 171 C (340 F)

SPECIFIC GRAVITY: 1.44

VAPOR PRESSURE(MM HG): 15

VAPOR DENSITY(AIR=1): N/A

EVAPORATION RATE: N/A

(H2O=1)

(BUTYL ACETATE=1)

SOLUBILITY(H2O): MODERATE (1 TO 10 %)

% VOLATILES BY VOLUME: 0

APPEARANCE & ODOR: COLORLESS, ODORLESS SOLID.

4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (CLOSED CUP: N/A

FLAMMABLE LIMITS: UPPER - N/A % LOWER - N/A %

FIRE EXTINGUISHING MEDIA
USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.

SPECIAL FIRE-FIGHTING PROCEDURES
FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE.

TOXIC GASES PRODUCED
OXIDES

5 - HEALTH HAZARD DATA

TOXICITY: LD50 (ORAL-RAT)(MG/KG) - 2660
LD50 (SCU-RAT)(MG/KG) - 1400
LD50 (IV-RAT) (MG/KG) - 1330

CARCINOGENICITY: NTP: NO IARC: NO Z LIST: NO OSHA REG: NO

EFFECTS OF OVEREXPOSURE
INGESTION IS HARMFUL AND MAY BE FATAL.
DUST INHALATION MAY CAUSE TIGHTNESS AND PAIN IN CHEST, COUGHING, AND DIFFICULTY IN BREATHING.
CONTACT WITH SKIN OR EYES MAY CAUSE IRRITATION.
PROLONGED EXPOSURE MAY CAUSE DERMATITIS.
INGESTION MAY CAUSE NAUSEA, VOMITING, HEADACHES, DIZZINESS, GASTROINTESTINAL IRRITATION.
CHRONIC EFFECTS OF OVEREXPOSURE MAY INCLUDE KIDNEY AND/OR LIVER DAMAGE.

TARGET ORGANS
NONE IDENTIFIED

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
DAMAGED SKIN

ROUTES OF ENTRY
INGESTION, INHALATION, SKIN CONTACT, EYE CONTACT

EMERGENCY AND FIRST AID PROCEDURES
CALL A PHYSICIAN.

IF SWALLOWED, IF CONSCIOUS, GIVE LARGE AMOUNTS OF WATER. INDUCE VOMITING.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.

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6 - REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: MOISTURE, HEAT

INCOMPATIBLES: POTASSIUM METAL, WATER, STRONG BASES

DECOMPOSITION PRODUCTS: OXIDES

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7 - SPILL AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE
WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. WITH CLEAN SHOVEL, CAREFULLY PLACE MATERIAL INTO CLEAN, DRY CONTAINER AND COVER; REMOVE FROM AREA. FLUSH SPILL AREA WITH WATER.

DISPOSAL PROCEDURE
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS.

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8 - PROTECTIVE EQUIPMENT

VENTILATION: USE ADEQUATE GENERAL OR LOCAL EXHAUST VENTILATION TO KEEP FUME OR DUST LEVELS AS LOW AS POSSIBLE.

RESPIRATORY PROTECTION: NONE REQUIRED WHERE ADEQUATE VENTILATION CONDITIONS EXIST. IF AIRBORNE CONCENTRATION IS HIGH, USE AN APPROPRIATE RESPIRATOR OR DUST MASK.

EYE/SKIN PROTECTION: SAFETY GLASSES WITH SIDESHIELDS, UNIFORM, RUBBER GLOVES ARE RECOMMENDED.

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9 - STORAGE AND HANDLING PRECAUTIONS

SAF-T-DATA(TM) STORAGE COLOR CODE: ORANGE (GENERAL STORAGE)

SPECIAL PRECAUTIONS
KEEP CONTAINER TIGHTLY CLOSED. SUITABLE FOR ANY GENERAL CHEMICAL STORAGE AREA.

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10 - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC (D.O.T.)

PROPER SHIPPING NAME CHEMICALS, N.O.S. (NON-REGULATED)

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME CHEMICALS, N.O.S. (NON-REGULATED)

PORTS MSDS #: 384

PRODUCT: STANDARD, CADMIUM 10PPM IN 10% NITRIC

PART NUMBER: SRM 3108

FORMULA: Cd: [Cd(NO3)2]: HNO3

KEYWORD: STANDARD

PORTS NUMBER: 00190049-100

PORTS MISC INFO:
NOT GIVEN

PORTS RATING: HFR=300

MANUFACTURER:
NATIONAL INSTITUTE OF STANDARDS (NIST)

GAITHERSBURG
MD

20899
PHONE: PHONE: 301-975-2019
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 172 F	NOTE: 78'C, DECOMPOSES.
Melting Point. . . .	~ -30 F	NOTE: -42'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ 1.4	NOTE: DENSITY: 1.504.
Vapor Pressure . . .	EQ 8.0	NOTE: MM @ 20'C.
Vapor Density. . . .	NG	
Percent Volatiles. .	~ 100	NOTE: 122'C.
Evaporation Rate . .	NG	
pH	NG	
Molecular Weight . .	EQ 63.02	
Viscosity.	NG	

Solubility in Water. COMPLETE.
Odor/Appearance/Other Characteristics:
DATA FOR NITRIC ACID / A WHITE TO SLIGHTLY YELLOW LIQUID THAT.....SEE TEXT.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	N*	NOTE: NON FLAMMABLE.
Flash Point, Open Cup . . .	N*	NOTE: NON FLAMMABLE.
Fire Point.	NG	
Auto Ignition.	NA	
Explosive/Flammable Limits		
Lower (LEL).	NA	
Upper (UEL).	NA	

Shipping Regulations

UN/NA Number.	NA1760
D.O.T. Hazard Class. . .	CORROSIVE
Label	NOT GIVEN
Proper Shipping Name . .	NITRIC ACID

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Preparer/Contact Information: CARMELITA S. DAVIS (301)975-6439

Date Prepared/Revised 5/01/90

===== Component Information =====

NITRIC ACID
OSHA PEL (PPM): NG
OSHA PEL (MG/M3):
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 5
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 10
C.A.S. No.: 7697372
Note:
TLV: 2 PPM.

CADMIUM
OSHA PEL (PPM):
OSHA PEL (MG/M3): 0.1
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 0.05
STEL (PPM): NG
STEL (MG/M3):
Product %: NG
C.A.S. No.: 7440439
Note:
TLV: DUST.

CADMIUM NITRATE
OSHA PEL (PPM):
OSHA PEL (MG/M3): 0.2
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 0.05
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 2.10
C.A.S. No.: 10325947
Note:
COMPOUND FORMED IN SOLUTION.

===== SECTION I. MATERIAL IDENTIFICATION =====

MATERIAL NAME: Cadmium Spectrometric Standard Solution

DESCRIPTION/OTHER DESIGNATIONS: Cadmium in Nitric Acid (aqua fortis, engraver's acid, azotic acid) Solution; *Cadmium Nitrate (cadmium nitrate tetrahydrate) in Spectrometric Standard Solution

CHEMICAL FORMULAS: Cd: [Cd(NO3)2]: HNO3

CAS REG. NOS:

7697-37-2 Aqueous Nitric Acid
7440-43-9 Cadmium
10325-94-7 Cadmium Nitrate

DOT CLASSIFICATION: Corrosive (Nitric Acid)

ID #: NA1760

Cadmium Compounds

ID #: UN2570

SRM NUMBER: 3108

MSDS NUMBER: 3108

dmium Spectrometric Standard Solution

NOTE: This SRM contains approximately 1% cadmium in a 10% nitric acid solution.

*The addition of cadmium to nitric acid solution forms cadmium nitrate which will precipitate upon evaporation or drying of the solution.

ISSUED: May, 1988

REVISED: May, 1990

TELEPHONE: (301) 975-2019

MANUFACTURER/SUPPLIER: Available from a number of suppliers.

MANUFACTURER'S/SUPPLIER'S NAME AND ADDRESS:

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
OFFICE OF STANDARD REFERENCE MATERIALS PROGRAM
GAITHERSBURG, MARYLAND 20899

===== SECTION II. HAZARDOUS INGREDIENTS =====

SEE COMPONENT INFORMATION.

HAZARDOUS COMPONENTS	LIMITS AND TOXICITY DATA
Nitric Acid	HUMAN, ORAL LDLO: (4)30 mg/kg
ADMIUM	HUMAN, INHALATION LCLO: 39 mg/m3 for 20 mins. RAT, ORAL LD50: 225 mg/kg RAT, INHALATION LC50: 25 mg/m3 for 30 mins.
Cadmium Nitrate*	RABBIT, SKIN (SEV): 500 mg for 24 hrs. RABBIT, EYE (MOD.): 20 mg for 24 hrs.

*Compound formed in solution.

NOTE: These standards reflect hazardous concentrations of 55-70% for nitric acid and ~ 100% for cadmium and cadmium nitrate.

===== SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

NITRIC ACID:

APPEARANCE AND ODOR: A white to slightly yellow liquid that darkens to a brownish color upon aging and/or exposure to light; characteristic NO2 odor.

SOLUBILITY IN OTHER COMPOUNDS: Decomposes in alcohol.

CADMIUM NITRATE:

APPEARANCE AND ODOR: White, amorphous pieces of hygroscopic needles.

MOLECULAR WEIGHT: 236.42

MELTING POINT: 350 'C

SOLUBILITY IN WATER: Soluble.

SOLUBILITY IN OTHER COMPOUNDS: Soluble in ammonia and alcohol..

DMIUM:

APPEARANCE AND ODOR: Hexagonal crystals, silver-white malleable metal.

MOLECULAR WEIGHT: 112.41

DENSITY: 8.642

BOILING POINT: 767 + or - 2 'C

MELTING POINT: 320.9 'C (becomes brittle at 80 'C)

REFRACTIVE INDEX: 1.13

MOHS HARDNESS: 2.0

VAPOR PRESSURE (AT 394 'C): 1 mm

SOLUBILITY IN WATER: Insoluble

SOLUBILITY IN OTHER COMPOUNDS: Soluble in acids, especially nitric, and in ammonium nitrate.

NOTE: Physical and chemical data on this nitric acid solution does not exist. The data provided above is for the hazardous ingredients >= 1%.

===== SECTION IV. FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT: Nonflammable, however, nitric acid is a strong oxidizing agent which can react with combustible materials to cause fires.

(METHOD USED): N/A

AUTOIGNITION TEMPERATURE: N/A

(NOTE: Autoignition temperature for Cd dust layer is 250 'C)

FLAMMABILITY LIMITS IN AIR (VOLUME %): N/A

EXTINGUISHING MEDIA: Nitric Acid does not burn. Use extinguishing agents that will put out the surrounding fire. Use a water spray to dilute nitric acid during fires and to absorb liberated oxides of nitrogen.

SPECIAL FIRE PROCEDURES: Self-contained breathing apparatus should be used by firefighters in an enclosed area with full protective clothing when nitric acid is involved in the fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Although nitric acid does not burn, it is a powerful oxidizing agent that can react with combustible materials to cause fires. The acid can also react with metals to liberate extremely flammable hydrogen gas.

The acid reacts violently with acetic acid, acetic anhydride, (acetone + acetic acid), (acetone + H2SO4), acetylene, acrolein, acrylonitrile, allyl alcohol, allyl chloride, 2-amino ethanol, NH3, NH4 OH, aniline, anion exchange resins, (dichromate + anion exchange resins), Sb, AsH3, Bi, B, boron decahydride, BP, BrF5, n-butyraldehyde, Ca hypophosphite, C, Cs2C2, 4-chloro-2-nitroaniline, ClF3, chlorosulfonic acid, cresol, cumene, Cu3N2, CuN3, cyanides, cyclic ketones, cyclohexanol, cyclohexanone, diborane, 2,6-di-tert-butyl phenol, diisopropyl ether, epichlorohydrin, ethanol, m-ethylaniline, ethylene imine, 5-ethyl-2methyl pyridine, 5-ethyl-2-picoline, C2H5PH2, FeO, F2, furfuryl alcohol, Ge, glyoxal, hydrazine, HN3, HI, H2O2, H2Se, H2S, H2Te, (indane + H2SO4), isoprene, (ketones + H2O2), (lactic acid + HF), Li, Li6Si2, Mg, Mg3P2, Mg-Ti alloy, Mn, mesitylene, mesityl oxide, 2-methyl-5-ethyl puridine, 4-methyl-cyclohexanone, NdP, nitrobenzene, oleum, organic matter, PH3, PH4I, P, P4I3, PCl3, phthalic acid, phthalic anhydride,

KH2PO2, beta-propiolactone, propylene oxide, pyridine, Rb2C2, Se, selenium iodophosphide, (Ag + ethanol), Na, NaN3, NaOH, SbH3, sulfamic acid, (H2SO4 + lycerides), terpenes, B4H10, thiocyanates, thiophene, Ti, Ti alloy, Ti-Mg alloy, (H2SO4, + C6H5CH3), toluidine, triazine, uns-dimethyl hydrazine, U, U-alloy, U-Nd alloy, U-Nd-Zr alloy, vinylacetate, vinylidene chloride, Zn, Zr-U alloys.

Cadmium and cadmium containing compounds can react violently with fused ammonium nitrate. Contact with hydrochloric and sulfuric acids generates flammable hydrogen gas (reaction is slow).

===== SECTION V. REACTIVITY DATA =====

STABILITY: Stable

CONDITIONS TO AVOID: Avoid any contact with incompatible chemicals. Avoid excessive heat.

INCOMPATIBILITY (MATERIALS TO AVOID): Contact with organic materials such as wood, paper, sawdust, or alcohol, etc., may cause fires. Combustible materials can attain increased flammability after being exposed to nitric acid even if they do not immediately catch fire.

Oxides of nitrogen are evolved from cadmium upon oxidation by nitric acid. Cd is incompatible with strong oxidizing agents, elemental sulfur, selenium, tellurium and hydrazoic acid.

See UNUSUAL FIRE AND EXPLOSION HAZARDS.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Nitrous oxides, including NO, NO2, N2O3 and N2O as well as nitric acid mist or vapor can be produced upon decomposition or reaction of HNO3.

Cadmium can also produce toxic oxides of nitrogen upon oxidation by nitric acid. Heating cadmium metal produces toxic fumes of cadmium oxide.

HAZARDOUS POLYMERIZATION: Will Not Occur

===== SECTION VI. HEALTH HAZARD DATA =====

ROUTE OF ENTRY:

[AANHALATION: X
SKIN: X
INGESTION: X

HEALTH HAZARDS (ACUTE AND CHRONIC): This material is corrosive to all body tissues. Nitric acid is extremely destructive to tissue of the mucus membranes, upper respiratory tract, eyes and skin.

Cadmium is toxic by inhalation and ingestion. Acute toxicity is almost always caused by inhalation of fumes or dust. Chronic poisoning has been reported after prolonged exposure to cadmium oxide fumes and dust, cadmium sulfides and cadmium stearates. The primary effects of chronic inhalation in humans are pulmonary emphysema and kidney damage. Skeletal abnormalities (osteoporosis and pseudofractures) and anemia have been reported following prolonged exposure to cadmium oxide. Prolonged exposure can cause anosmia and a yellow stain that gradually appears on the teeth. NIOSH has recommended that cadmium compounds be regarded as potential occupational carcinogens. This recommendation is based in part on recent epidemiological evidence of excessive lung cancer among workers exposed to cadmium oxide.

SIGNS AND SYMPTOMS OF EXPOSURE: Irritation, difficulty breathing, burning sensation, and yellow skin discoloration can result from contact with nitric acid.

Nausea and vomiting can result from uranium contact. Ingestion of cadmium

compounds can cause severe gastrointestinal distress such as diarrhea and abdominal pain. Inhalation of the fumes can cause irritation of the nose and throat, cough, dyspnea, chest pains, fever and chills. Symptoms of acute intoxication do not develop until several hours after the exposure.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: N/A

NOTE: Heavy smoking has been reported to considerably increase the tissue levels of Cd.

LISTED AS A CARCINOGEN/POTENTIAL CARCINOGEN:

	YES	NO
IN THE NATIONAL TOXICOLOGY PROGRAM (NTP) REPORT ON CARCINOGENS:	X	
IN THE INTERNATIONAL AGENCY FOR RESEARCH (IARC) MONOGRAPHS:	X	
BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA):	X	

NOTE: Cadmium and cadmium nitrate are considered potential carcinogens.

EMERGENCY AND FIRST AID PROCEDURES:

SKIN: Wash immediately with soap and water. Remove contaminated clothing. Watch for chemical burns and treat them accordingly. Contact a physician if necessary.

NOTE TO PHYSICIAN: Wash affected skin areas with a 5% solution of sodium bicarbonate ($NaHCO_3$).

EYE CONTACT: Immediately flush eyes, including under the eyelids, with plenty of water for at least 15 minutes. Contact a physician if necessary.

INHALATION: Remove the victim to fresh air and restore and/or support breathing. Contact a physician if necessary.

INGESTION: Call a poison control center. Never give anything by mouth to someone who is convulsing. Do not induce vomiting. If the victim is responsive, administer one or two glasses of water to drink as quickly as possible after exposure.

TARGET ORGAN(S) OF ATTACK: HNO_3 Lungs, Skin

CD AND COMPOUNDS: Lungs, Respiratory System, Blood, GI Tract, Kidneys

NOTE: Preplacement and annual medical examinations with emphasis on respiratory tract, skin irritations, dental erosion, and lung function tests, should be provided for workers frequently exposed to nitric acid. Medical surveillance procedures for urinary cadmium deposits and protein determinations, and pulmonary-function testing should also be performed.

===== SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE =====

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Notify safety personnel, provide adequate ventilation and eliminate all sources of ignition immediately in case contact with metals should produce highly flammable hydrogen gas. Cleanup personnel need protection against contact with and inhalation of nitric acid. Use water sprays to direct nitric acid away from incompatible chemicals. Surfaces contaminated with spills should be covered with soda ash or sodium bicarbonate to neutralize the acid. Place the neutralized material into containers suitable for eventual disposal, reclamation or destruction.

WASTE DISPOSAL: Follow all Federal, state and local laws governing disposal. Consider reclamation, recycling, or destruction rather than disposal into a landfill.

HANDLING & STORING: The nitrogen oxides produced from the acid are all toxic; nitric acid itself is corrosive. Neoprene gloves and body shields should be used where splashing may occur. Chemical safety showers and eyewash stations

must be readily available. Workers must receive training before handling this material in the workplace; even experienced workers should undergo refresher training periodically.

NOTE: DO NOT WEAR CONTACT LENSES IN THE WORK AREA! Contact lenses pose a special problem. Soft lenses can absorb irritants and all lenses concentrate them. Particles can adhere to lenses and cause corneal damage.

Store in a cool, dry, well-ventilated area away from incompatible materials, such as strong bases, metal powders, carbides, sulfides, and any other readily oxidizable material (see sect. IV and sect. V). Protect containers from physical damage and keep from direct sunlight.

===== SECTION VIII. SOURCE DATA/OTHER COMMENTS =====

SOURCES:

Genium Publishing Corporation, MSDS No. 7, August, 1988.
Genium Publishing Corporation, MSDS No. N154, October, 1985.
DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, 5TH ED., 1979.
HANDBOOK OF TOXIC AND HAZARDOUS CHEMICALS AND CARCINOGENS, 2ND ED., 1985.
HAWLEY'S CONDENSED CHEMICAL DICTIONARY, 11TH ED., 1987.
THE SIGMA-ALDRICH LIBRARY OF CHEMICAL SAFETY DATA, 2ND ED., VOL. I AND II, 1988.

Carmelita S. Davis (301) 975-6439

National Institute of Standards and Technology
Office of Standard Reference Materials
Gaithersburg, Maryland 20899

NOTE: Physical and chemical data contained this MSDS are provided for use in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references, however, NIST does not certify the data on the MSDS. The certified values for this material are given only on the NIST Certificate of Analysis.

66-03-0535*
6627-4004

MATERIAL SAFETY DATA SHEET

CORPORATE RESEARCH & DEVELOPMENT
120 ERIE BOULEVARD
SCHENECTADY, N.Y. 12305

MATERIALS INFORMATION SERVICES

NO. 350

CARBON DISULFIDE
Revision B
DATE September 1982

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: CARBON DISULFIDE
OTHER DESIGNATIONS: CS_2, Carbon Bisulfide, Carbon sulfide, Dithiocarbonic anhydride
CAS #000 075 150

MANUFACTURER: Available from several suppliers, including:
Stauffer Chemical Co.
Industrial Chemical Div.
Westport, Conn 06880 Tel: (203) 222-3000

SECTION II. INGREDIENTS AND HAZARDS

	%	HAZARD DATA
Carbon disulfide ----------	>99.9	8-hr TWA 10_3ppm* or 30 mg/m^3 (skin)
*ACGIH(1982) TLV. Current OSHA PEL is 20 ppm for an 8-hr exposure, 30 ppm ceiling value, and 100 ppm peak value/30 min. NIOSH (1977) has recommended a TLV of 1 ppm with a ceiling of 10 ppm (15 minute sample). (Skin) notation indicates absorption through skin will significantly contribute to total exposure. This material must be used with caution!		Human, Oral LDLo 14 mg/kg

SECTION III. PHYSICAL DATA

Boiling point at 1 atm, deg F -----	115	Specific gravity at 20/4C -------	1.26
Vapor pressure at -5C, mm Hg -------	100	Evaporation rate (BuAc=1) -------	22.6
at 20C, mm Hg -----	300	Molecular weight ----------	76.14
at 28C, mm Hg -------	400	Melting point, deg F ----------	-169
Vapor density, OC, (Air=1) ---------	2.67	Viscosity, 73F, cp ----------	0.36
Solubility in water @ 25C, g/100g --	0.22		

Appearance & Odor: Clear, colorless to yellow, mobile liquid; unpleasant odor (sulfurous) with an odor threshold of about 7 ppm. NOTE: May be very low in odor when very pure.

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits in Air	Lower	Upper
-30°C (closed up)	100°C	% by vol.	1.0	50.0

Extinguishing media: Water fog or spray, high expansion or film forming foam; CO_2 for small fires. Contact of vapors with heat and rust (catalyst), a hot light bulb, or impact (hammer blow) may produce a fire.
Firefighters should maintain cooling streams of water on fire area after fire is out to cool area and prevent CS_2 reignition. CS_2 fires are more difficult to control and extinguish then hexane fires. CS_2 vapor collects in sumps and low lying areas; it can flow along surfaces to a source of ignition and flashback.
Firefighters need Self-contained breathing apparatus.

SECTION V. REACTIVITY DATA

Carbon disulfide is stable in closed containers at room temperature (yellows in sunlight). It does not polymerize. It is not considered a highly reactive substance; however, chemically active metals such as zinc, sodium, potassium plus CS_2 react with incandescence, and CS_2 with azides or organic amines can be explosive. The flammability danger of carbon disulfide is high as an autoignition of 100°C is easily achieved. It is an OSHA Class IB Flammable Liquid.
It is incompatible with strong oxidizing agents.
Combustion can release sulfur dioxide and carbon monoxide.

Flam 4 NB 1-15-86
H = 3 JSM 3/5/82
Safety
R-1, Dept 1/15/86

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GENERAL ELECTRIC

NO. 350

SECTION VI. HEALTH HAZARD INFORMATION

TLV 10 ppm (skin) See Sect II

This material acts quickly on the central nervous system. Overexposure causes vomiting, headache, dizziness, depression, indigestion, irritability, narcosis. Loss of consciousness, convulsions, respiratory paralysis and death occur in severe cases. Eye contact with liquid causes immediate and severe irritation. CS_2 defats the skin. It can cause dermatitis, redness and blistering of the skin. It is absorbed through the skin where it can damage peripheral nerves and produce systemic effects.

Chronic exposure can seriously damage the CNS & cause vision problems, liver and kidney damage, anemia, fatigue and debility. 1-2 oz has been estimated as oral LD_{50} for adult.

FIRST AID: Respiration is of prime importance! Contact a physician for overexposures.

Eye Contact: Flush with water for 15 min., including under eyelids.

Skin Contact: Wash contaminated areas with soap and water. Remove soiled clothing.

Inhalation: Remove to fresh air. Restore and/or support breathing as needed.

Ingestion: Gastric lavage is needed. NIOSH (1978) recommended inducing vomiting. ASTM E752 states "do not induce vomiting". Get medical help promptly.

Get medical help for observation, support and treatment after first aid.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Notify safety personnel. Evacuate area except for clean-up personnel with protection against liquid contact and vapor inhalation. Institute prior plan. Remove ignition sources. Provide optimum, explosion-proof ventilation. Contain spill.

A. Evaporate small spill under good ventilation with fire apparatus ready.

B. Flush spill with water to special retention basin where CS_2 is collected below a water layer for disposal. (Do not flush to sewer!)

C. Absorb in sand or ash and cover with water for pick up (non-sparking tools).

DISPOSAL: Destroy scrap by controlled combustion in approved facility (with scrubber), or recover by distillation. Follow Federal, State and Local regulations.

EPA(RCRA) HW No. P022; EPA(CWA) RQ 5000 lb.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide efficient exhaust and floor level ventilation (explosion-proof) to keep work place vapor levels below TLV requirements. Provide approved positive pressure, self-contained breathing apparatus with full facepeice for emergency or non-routine use below 500 ppm.

Use PVA gloves, aprons or other impervious protective clothing to prevent skin contact. (Avoid immersing gloved hands in CS_2 for extended periods.) Use chemical safety goggles if splashing is possible.

An eyewash station and safety shower should be available in the area of use. Provide suitable training to those working with CS_2. Keep pertinent medical records.

Provide preplacement and periodic medical exams for those regularly exposed to CS_2, with emphasis on the nervous, cardiovascular & reproductive systems, eyes, liver, kidneys, and skin. (CS_2 can be a reproductive hazard at high exposures.)

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Store in cool, well-ventilated, fire-proof area protected with automatic sprinklers and away from ignition sources, oxidizing agents, and combustibles. In large tanks fill voids above CS_2 with water or nitrogen as the tank is emptied. Avoid exposure to direct sunlight. Prevent physical damage to containers.

Electrical services must meet code requirements. Store as OSHA Class IB Flammable Liquid. No smoking near CS_2. Ground and bond containers for transfer to prevent static sparks. Use non-sparking tools. Avoid breathing vapors! Avoid skin and eye contact. Be especially cautious in repetitive usage of this material!

DOT Classification: FLAMMABLE LIQUID - I.D. UN No. 1131

DATA SOURCE(S) CODE: 1-12, 16, 18, 23, 25, 27, 34, 37, 47-49, ASTM E752

Judgments as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, General Electric Company extends no warranties, makes no representations and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

APPROVALS: MIS/CRD J. M. Nielsen

INDUST. HYGIENE/SAFETY 9-22-82

MEDICAL REVIEW: 3 October 1982

PORTS MSDS #: 5250

PRODUCT: CARBON TETRACHLORIDE

PART NUMBER:

FORMULA: CCl4

KEYWORD: SOLVENT

PORTS NUMBER: 03-403-0426

PORTS MISC INFO:
01-03-0426

PORTS RATING: HFR=400

MANUFACTURER:
MALLINCKRODT, INC.
P.O. BOX 800
PARIS
KY

40362
PHONE: PHONE:
EMERGENCY PHONE: 314-539-1600

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 170 F	NOTE: 76.8'C.
Melting Point. . . .	EQ -9 F	NOTE: -23'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ 1.59	
Vapor Pressure . . .	EQ 91	NOTE: MMHG, 20'C.
Vapor Density. . . .	EQ 5.3	
Percent Volatiles. .	NG	
Evaporation Rate . .	N*	NOTE: NO INFORMATION FOUND
pH	NG	
Molecular Weight . .	EQ 153.82	
Viscosity.	NG	

Solubility in Water. 0.08 GM/100 GM WATER @ 20 C (68 F).
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID, ETHER-LIKE ODOR.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NG
Flash Point, Open Cup . . .	NG
Fire Point.	NG
Auto Ignition.	NG
Explosive/Flammable Limits	
Lower (LEL).	NG
Upper (UEL).	NG

Shipping Regulations

UN/NA Number.	NG
D.O.T. Hazard Class. . .	ORM-A
Label	NOT GIVEN
Proper Shipping Name . .	NOT GIVEN

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Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 7/17/91

===== Component Information =====

CARBON TETRACHLORIDE
OSHA PEL (PPM): 2
OSHA PEL (MG/M3):
ACGIH TLV (PPM): 5
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: NG
C.A.S. No.: 56235
Note:
TLV: SKIN.

===== PRODUCT IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

PRODUCT NAME: CARBON TETRACHLORIDE

SYNONYMS: Tetrachloromethane, carbon tet, carbon chloride

HAZARDOUS INGREDIENTS: Carbon tetrachloride

SUPERSEDES: 04-06-89

EMERGENCY PHONE NUMBER: 314-539-1600

MANUFACTURER'S NAME AND ADDRESS:

MALLINCKRODT, INC.
SCIENCE PRODUCTS DIVISION
P.O. BOX 800
PARIS, KY 40362

===== PRECAUTIONARY MEASURES =====

POSSIBLE CANCER HAZARD BASED ON TESTS WITH LABORATORY ANIMALS. EXPOSURE MAY CREATE A CANCER RISK. DANGER! MAY BE FATAL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CAUSES IRRITATION. AFFECTS LIVER, KIDNEY AND CENTRAL NERVOUS SYSTEM.

Do not breathe mist.
Do not get in eyes, on skin, or on clothing.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

===== EMERGENCY/FIRST AID =====

If swallowed, get immediate medical attention. If physician is not immediately available, induce vomiting by giving two glasses of water and sticking finger down throat. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. In all cases call a physician immediately.

SEE HEALTH HAZARD INFORMATION SECTION.

DOT HAZARD CLASS: ORM-A

===== PHYSICAL DATA =====

"E PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

===== FIRE AND EXPLOSION INFORMATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

FIRE: Not considered to be a fire hazard.

EXPLOSION: Not considered to be an explosion hazard.

FIRE EXTINGUISHING MEDIA: Use any means suitable for extinguishing surrounding fire.

SPECIAL INFORMATION: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

NFPA RATINGS:

HEALTH: 3
FLAMMABILITY: 0
REACTIVITY: 0

===== REACTIVITY DATA =====

STABILITY: Stable under ordinary conditions of use and storage.

HAZARDOUS DECOMPOSITION PRODUCTS: Toxic gases and vapors such as hydrogen chloride, chlorine, phosgene, and carbon monoxide may be released when heated to decomposition.

HAZARDOUS POLYMERIZATION: This substance does not polymerize.

INCOMPATIBILITIES: Chemically active metals such as sodium, potassium, and magnesium. Will attack some forms of plastics, rubber, and coatings.

===== LEAK/SPILL DISPOSAL INFORMATION =====

Ventilate and evacuate area. Clean-up personnel require protective clothing and respiratory protection from vapors. Allow only qualified personnel to handle the spill.

SPILLS: Contain and recover spills when possible. Cover larger spills with earth, sand, or inert solid. Transfer to a suitable container.

DISPOSAL: Waste may be disposed in a RCRA approved facility.

REPORTABLE QUANTITY (RQ) (CWA/CERCLA): 10 lbs.

Ensure compliance with local, state and federal regulations.

===== HEALTH HAZARD INFORMATION =====

EXPOSURE/HEALTH EFFECTS:

INHALATION: Inhalation has a narcotic effect. Symptoms include headache, dizziness, nausea and dullness. Following exposures of high concentrations, victim may become unconscious, and if exposure is not terminated, death can result from respiratory failure.

INGESTION: Abdominal pain, vomiting, diarrhea, visual disturbances, dizziness and unconsciousness can occur. Severe gastrointestinal upset progressing to serious kidney and liver damage can occur. Death can occur

immediately or be delayed for as much as one week.

SKIN CONTACT: Can be absorbed through skin, with symptoms paralleling ingestion exposure. A dermatitis may be produced following long or repeated contact. Skin oils are removed upon contact, and the skin becomes red, cracked, and dry.

EYE CONTACT: Severe irritant as vapor or liquid. Symptoms of burning and intense irritation occur.

CHRONIC EXPOSURE: Affects nervous system. Delayed effects from exposure include damage to the heart, liver and kidneys. Repeated or prolonged exposures may cause skin irritation. Symptoms of darkened urine and liver cirrhosis have been reported.

AGGRAVATION OF PRE-EXISTING CONDITIONS: Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of this substance.

FIRST AID:

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

INGESTION: If swallowed, induce vomiting immediately by giving two glasses of water and sticking finger down throat. Never give anything by mouth to an unconscious person. Call physician immediately.

SKIN EXPOSURE: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician immediately.

EYE EXPOSURE: Wash eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

TOXICITY DATA (RTECS, 1991):

ORAL RAT LD50: 2350 mg/kg

SKIN RAT LD50: 5070 mg/kg.

INHALATION RAT LC50: 8000 ppm/4H.

IRRITATION DATA: Skin rabbit 4 mg mild; Eye rabbit 500 mg/24H severe.

Mutation data cited.

Reproductive references cited.

Tumorigenic references cited.

CARCINOGENIC REVIEW:

SUFFICIENT EVIDENCE IN EXPERIMENT ANIMALS: IARC Category 2B; NTP Listed Carcinogen; OSHA Regulated Carcinogen.

===== OCCUPATIONAL CONTROL MEASURES =====

AIRBORNE EXPOSURE LIMITS:

OSHA PERMISSIBLE EXPOSURE LIMIT (PEL): 2 ppm (TWA)

ACGIH THRESHOLD LIMIT VALUE (TLV): 5 ppm (TWA) skin. (Listed as an ACGIH suspect carcinogen.)

VENTILATION SYSTEM: A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure limits. Local exhaust

ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details.

PERSONAL RESPIRATORS (NIOSH APPROVED): If the TLV is exceeded, a full facepiece chemical cartridge respirator may be worn, in general, up to 100 times the TLV or the maximum use concentration specified by the respirator supplier, whichever is less. Alternatively, a supplied air full-facepiece respirator or air-lined hood may be worn.

SKIN PROTECTION: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls to prevent skin contact.

EYE PROTECTION: Use chemical safety goggles and/or a full face shield where splashing is possible. Contact lenses should not be worn when working with this material. Maintain eye wash fountain and quick-drench facilities in work area.

===== STORAGE AND SPECIAL INFORMATION =====

Keep in tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Wear special protective equipment (OCCUPATIONAL CONTROL MEASURES Section) for maintenance break-in or where exposures may exceed established exposure levels. Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Wash hands before eating and do not eat, drink, or smoke in workplace.

===== ADDENDUM =====

THIS ADDENDUM MUST NOT BE DETACHED FROM THE MSDS. IDENTIFIES SARA 313 SUBSTANCES(S). ANY COPYING OR REDISTRIBUTION OF THE MSDS MUST INCLUDE A COPY OF THIS ADDENDUM.

REGULATORY STATUS:

(CHEM.KEY: CARBO)

HAZARD CATEGORIES FOR SARA SECTION 311/312 REPORTING:

ACUTE	CHRONIC	FIRE	PRESSURE	REACTIVE
X	X			

PRODUCT OR COMPONENTS OF PRODUCT:

CARBON TETRACHLORIDE (56-23-5)

SARA EHS SECT. 302:

RQ (LBS.): No
TPQ (LBS.): No

SARA SECTION 313 CHEMICALS:

NAME LIST: Yes
CHEMICAL CATEGORY: No

CERCLA SEC. 103 RQ (LBS.): 10

RCRA SEC. 261.33: U211

SARA SECTION 302 EHS RQ: Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355.

SARA SECTION 302 EHS TPQ: Threshold Planning Quantity of Extremely Hazardous

Substance. An asterisk (*) following a Threshold Planning Quantity signifies that if the material is a solid and has a particle size equal to or larger an 100 micrometers, the Threshold Planning Quantity = 10,000 LBS.

SARA SECTION 313 CHEMICALS: Toxic Substances subject to annual release reporting requirements listed at 40 CFR 372.65.

CERCLA SEC. 103: Comprehensive Environmental Response, Compensation and Liability Act (Superfund). Releases to air, land or water of these hazardous substances which exceed the Reportable Quantity (RQ) must be reported to the National Response Center, (800-424-8802); Listed at 40 CFR 302.4.

RCRA: Resource Conservation and Recovery Act. Commercial chemical product wastes designated as acute hazards and toxic under 40 CFR 261.33.

===== SPECIAL NOTES =====

Mallinckrodt provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. Individuals receiving this information must exercise their independent judgment in determining its appropriateness for a particular purpose.

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PORTS MSDS #: 5301

PRODUCT: CHLORINE TRIFLUORIDE

PART NUMBER:

FORMULA: ClF3

KEYWORD: TRIFLUORIDE

PORTS NUMBER: 03-450-2140; 66-003-0805

PORTS MISC INFO:
95-03-3050

PORTS RATING: HFR=404

MANUFACTURER:
AIR PRODUCTS & CHEMICALS, INC.
7201 HAMILTON BLVD.
ALLENTOWN
PA

18195
PHONE: PHONE: 800-752-1597
EMERGENCY PHONE: 800-523-9374

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 53.2 F	NOTE: 11.8'C.
Melting Point. . . .	NG	
Freezing Point . . .	EQ -105.4 F	NOTE: -76.3'C.
Sour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .509	NOTE: SPEC VOL: 4.25 FT3/#
Vapor Pressure . . .	EQ 1112	NOTE: MMHG, 21.5 PSIA.
Vapor Density. . . .	EQ 3.14	NOTE: SPEC GRAVITY @ 70'F.
Percent Volatiles. .	NG	
Evaporation Rate . .	NG	
pH	NG	
Molecular Weight . .	EQ 92.45	
Viscosity.	NG	

Solubility in Water. REACTS VIOLENTLY.
Odor/Appearance/Other Characteristics:
COLORLESS GAS, PALE YELLOW LIQ.,WHITE SOLID, SHARP PUNGENT & IRRITATING ODOR.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NA	
Flash Point, Open Cup . . .	NA	
Fire Point.	NG	
Auto Ignition.	NA	
Explosive/Flammable Limits		
Lower (LEL).	N*	NOTE: NONFLAMMABLE.
Upper (UEL).	N*	NOTE: NONFLAMMABLE.

Shipping Regulations

UN/NA Number.	UN1045
D.O.T. Hazard Class. . .	2.3
Label	POISON GAS, OXIDIZER
Proper Shipping Name . .	CHLORINE TRIFLUORIDE, COMPRESSED

==========

Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 7/01/94

===== Component Information =====

CHLORINE TRIFLUORIDE
OSHA PEL (PPM): 0.1
OSHA PEL (MG/M3):
ACGIH TLV (PPM): 0.1
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: NG
C.A.S. No.: 7790912
Note:
PEL & TLV: CEILING.

===== PRODUCT IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

PRODUCT NAME: CHLORINE TRIFLUORIDE

CHEMICAL NAME: Chlorine Trifluoride

SYNONYMS: Chlorine Trifluoride

CHEMICAL FAMILY: Halogen fluoride

MSDS NUMBER: 1025

REVISION: 6

PRODUCT INFORMATION: 1-800-752-1597

MANUFACTURER'S NAME AND ADDRESS:

AIR PRODUCTS AND CHEMICALS, INC.
7201 HAMILTON BOULEVARD
ALLENTOWN, PA 18195-1501

===== HAZARDOUS COMPONENTS =====

SEE COMPONENT INFORMATION.

===== HAZARD IDENTIFICATION =====

EMERGENCY OVERVIEW: Chlorine trifluoride is a toxic nonflammable liquefied compressed gas packaged in cylinders under its vapor pressure of 21.5 psia @ 70'F. It is an extremely strong oxidizer and is highly reactive. It has a sharp, pungent odor. The vapor is heavier than air and may collect in low areas or along the floor. It will react with water to form hydrofluoric acid. Liquid spills are extremely dangerous and should not be approached. Wear Self Contained Breathing Apparatus (SCBA) and protective outer garments when entering release area. Exposed personnel require specific medical treatment procedures. If involved in a fire, products of combustion are toxic.

EMERGENCY TELEPHONE NUMBERS:

IN CONTINENTAL U.S., CANADA, OR PUERTO RICO: 800-523-9374
OTHER LOCATIONS: 610-481-7711

POTENTIAL HEALTH EFFECTS:

INHALATION: Corrosive and extremely irritating to the upper and lower respiratory system. Deep lung inflammation (chemical pneumonitis), and

abnormal fluid build up in the lungs (pulmonary edema) are possible and can be fatal.

EYE CONTACT: Irritating and corrosive. Exposure to elevated concentrations can cause burns that may result in blindness.

SKIN CONTACT: Direct skin contact will cause irritation and burns. It will react with moisture to form hydrofluoric acid which may cause additional tissue destruction.

CARCINOGENIC POTENTIAL: Chlorine trifluoride is not listed in IARC, NTP, or OSHA Subpart Z as a carcinogen or potential carcinogen.

EXPOSURE INFORMATION:

ROUTE OF ENTRY: Inhalation (primary), skin and eye contact.

TARGET ORGANS: Airway, lungs, skin and eyes.

EFFECT: Burns to all affected areas.

SYMPTOMS: Coughing, wheezing, respiratory distress, irritation and abnormal fluid formation in the throat, mouth, and nose. Burning and tearing of the eyes. Redness and painful burns to the skin that may be delayed.

CONDITIONS AGGRAVATED: Asthma, emphysema or other respiratory diseases.

===== FIRST AID =====

INHALATION: Move exposed person to an uncontaminated area. If victim is not breathing give artificial respiration. If breathing is difficult give supplemental oxygen. If airway obstruction occurs the placement of an artificial airway by an emergency medical technician may be necessary. Following severe overexposure, trained personnel should administer 2.5% calcium gluconate by nebulizer with patient in sitting position. Excessive acute exposure may cause delayed pulmonary edema (fluid build up) to occur. Patient should be kept under medical observation for at least 24 hours.

EYE CONTACT: Flush eyes with water for a minimum of 5 minutes. Hold eyelids open with fingers to assure complete flushing. Seek medical attention immediately. Trained personnel should administer 1% calcium gluconate solution by continuous drip.

SKIN CONTACT: Flush with large quantities of water. Remove affected clothing. Soak the affected area in solutions of iced 0.24% Hyamine 1662 (benzethonium chloride) or 0.13% Zephiran (benzalkonium chloride). If soaking is impractical, cover burn area with compresses that have been immersed in this solution. Compresses should be changed every five minutes to insure fresh solution is in contact with the skin. Immersion or compresses must be used continuously for at least two hours. These compounds bind the active fluorides in an insoluble form, thus limiting the extent of the burn and relieving pain. Applying 2.5% calcium gluconate gel or slurry in water or glycerin is an alternate treatment for small or minor burns.

NOTE: The above treatment should also be followed for hydrofluoric acid burns resulting from contact with chlorine trifluoride handling systems. Hydrogen fluoride can cause severe burns that may not be immediately painful or visible. Hydrogen fluoride can deplete calcium levels in the body if not promptly treated, causing hypocalcemia which may be fatal. This may result from exposure by inhalation, ingestion, or skin burns larger than 25 square inches.

NOTE TO PHYSICIAN: If pain persists after above topical treatments are applied, it may be necessary to inject 10% aqueous calcium gluconate beneath, around and into burn area. This will more likely be necessary in the treatment of extensive burns or small burns where treatment has been delayed.

The patient should be observed for clinical symptoms of hypocalcemia

following ingestion or inhalation or following extensive burns. Serum calcium determinations must be performed immediately and periodically to monitor for vpocalcemia. EKGs should be performed to monitor for electrocardiographic ridence of hypocalcemia.

In additional information is needed, call the Air Products' emergency numbers (HAZARD IDENTIFICATION Section).

===== FIRE AND EXPLOSION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

EXTINGUISHING MEDIA: None. Most common extinguishing media will react with chlorine trifluoride and will not extinguish the fire.

HAZARDOUS COMBUSTION PRODUCTS: Hydrogen fluoride, and other toxic fluoride compounds.

FIRE FIGHTING PROCEDURES: Chlorine trifluoride will greatly enhance the flammability of other materials. If possible stop the flow of gas to the fire. Cool cylinders with water spray until well after fire is out. If possible, without risk, move cylinders away from fire area.

UNUSUAL HAZARDS: Upon exposure to intense heat or flame cylinder may vent rapidly and/or rupture violently. Chlorine trifluoride cylinders do not have a pressure relief device.

===== ACCIDENTAL RELEASE MEASURES =====

Evacuate all personnel from affected area. Increase ventilation to release area. Use appropriate protective equipment (SCBA) and chemical protective outergarment. If leak is from cylinder or cylinder valve, call the Air Products' emergency telephone number. If leak is in user's system close cylinder valve, safely vent residual product, and inert system before attempting repairs.

DOT 1993 EMERGENCY RESPONSE GUIDEBOOK SUGGESTED EVACUATION DISTANCES:

INITIAL: 500 feet in all directions (small spill or leak)
1000 feet in all directions (large spill or leak)

DOWNWIND PROTECTION: 0.2 miles - day, 1.9 miles - night (small spill or leak)
1.7 miles - day, 3.8 miles - night (night spill or leak)

DANGER: RELEASES OF LIQUID CHLORINE TRIFLUORIDE POSE AN EXTREMELY DANGEROUS SITUATION. IT WILL REACT VIOLENTLY WITH MOST MATERIALS IT CONTACTS INCLUDING CONCRETE, SAND, ASPHALT, AND WATER. EVACUATE AREA AND DO NOT APPROACH SPILLED PRODUCT. DO NOT ATTEMPT TO NEUTRALIZE. CONTACT AIR PRODUCTS' EMERGENCY RESPONSE CENTER AT 800-523-9374 FOR ASSISTANCE.

===== STORAGE AND HANDLING =====

STORAGE: Storage area temperatures should not exceed 125'F (52'C) and should be free of flammable and combustible materials. Storage should be away from heavily traveled areas and emergency exits. Avoid areas where salt or other corrosive materials are present. Secure cylinders in an upright position and store in a well-ventilated area protected from the weather. Valve protection caps and valve outlet seals should remain on cylinders not connected for use. Separate full from empty cylinders. Avoid excessive inventory and storage time. Use a first-in first-out system. Keep accurate inventory records. Visually inspect stored cylinders on a routine basis, at least weekly, for any indication of leakage or other problems.

HANDLING: Use only in well ventilated areas. Do not drag, roll, or slide

cylinder. Use a suitable handtruck designed for cylinder movement. Never attempt to lift a cylinder by its cap. Secure cylinders at all times while in use. Never apply flame or localized heat directly to any part of the cylinder. Do not allow any part of the cylinder to exceed 125'F (52'C). An adjustable strap-wrench should be used to remove over-tight or rusted cylinder caps.

When preparing to connect cylinder for use, always loosen valve outlet seal slowly. Once cylinder has been connected to process, open cylinder valve slowly and carefully. If user experiences any difficulty operating cylinder valve, discontinue use and contact supplier. Use a check valve to prevent reverse flow into cylinder. Use only the approved CGA-670 connection with lead gasket.

Carbon steel, stainless steel, or copper are suitable materials of construction for use with chlorine trifluoride. Brass should be avoided due to the possibility of dezincification. MONEL(R) and nickel are preferred for high temperature (>400'F) applications. Lead is the preferred gasket material. Most metals will form a passive fluoride film that protects the metal from further corrosion.

Any equipment that uses chlorine trifluoride must first be thoroughly cleaned, rinsed with solvent, and dried. The equipment should then be treated (passivated) with increasing concentrations and/or pressures of fluorine as a final cleaning process. This treatment, or passivation process, will allow the fluorine to react with and eliminate any impurities without ignition of equipment and will impart a protective fluoride surface layer. (Contact Air Products for procedure).

Systems that use this product may, over time, become contaminated with powder residue. This material is composed of metal fluorides and should be handled with caution as it may contain small amounts of hydrofluoric acid. Wear a respirator with dust filter and gloves. Systems that contain moisture may form hydrofluoric acid. Keep system under dry inert gas when not in use. This acid is very corrosive to skin and many materials of construction.

SPECIAL REQUIREMENTS: Always store and handle compressed gases in accordance with Compressed Gas Association, Inc. (ph. 703-412-0900) pamphlet CGA P-1, SAFE HANDLING OF COMPRESSED GASES IN CONTAINERS. Local regulations may require specific equipment for storage or use.

WARNING: It is extremely important that the precautions and procedures listed below are understood and implemented. Failure to do this can result in a violent, catastrophic failure of the operating system.

Systems for handling chlorine trifluoride must be of compatible of materials that have been rigorously cleaned for oxidizer service, dried, and passivated with fluoride to form a protective fluoride laver.

Connection of system to cylinder is accomplished using a CGA 670 connection. This requires the use of a thoroughly clean lead gasket. The use of lead is mandatory. The gasket must be cleaned, for oxidizer service, and dried immediately before use.

The boiling point for chlorine trifluoride is 53.2'F. Process lines that contain product in the vapor phase must be kept above that temperature at all times to prevent the vapor from condensing. Chlorine trifluoride cylinders must not be heated by direct means and must never be exposed to localized or overall temperatures above 125'F (52'C).

Chlorine trifluoride must not be allowed to liquefy in process systems intended for vapor phase use. To assure this will not occur, all system components and lines must always be kept warmer than the source cylinder.

Due to the low vapor pressure of chlorine trifluoride at normal temperatures the use of a pressure reducing regulator is not necessary. A control valve, made of Monel or other suitable alloy, must be used in its place.

Allow valves in the system must have a metal to metal sealing surface. The seat should be a dissimilar metal then the stem.

Chlorine trifluoride is a liquefied compressed gas. When extracting product vapor phase from the cylinder the liquid will cool. This will lower the vapor pressure and will effect the process flowrate and pressure.

Cylinders chilled to less than 53'F by storage conditions or rapid vapor use will be at less than atmospheric pressure. Precautions must be taken to avoid introduction of air or other materials into the cylinder to prevent hazardous reactions from occurring.

CAUTION: Inexperienced or first time users of this product should contact the Air Products' Technical Information Center for additional information on storage, handling and use of this product. Call (800) 752-1597.

===== PERSONAL PROTECTION/EXPOSURE CONTROL =====

ENGINEERING CONTROLS: Provide ventilation and/or local exhaust to prevent accumulation of concentrations above 0.1 ppm.

PERSONAL PROTECTION:

GENERAL: Leather gloves, safety shoes, and safety glasses for handling cylinders. Chemical goggles with full-face shield, chemical resistant gloves and splash suit when connecting, disconnecting, or opening cylinders. Respirator with a dust filter is recommended when exposure to metal fluorides is possible. No NIOSH-approved air purifying respirator is available for this product.

EMERGENCY: Full-protection chemical resistant suit and SCBA or positive pressure air line with full-face mask and escape pack should be used in areas where the concentration exceeds 0.1 ppm.

NOTE: Chemical suits may react and burn if in contact with liquid product.

Protective clothing and equipment that may have been in contact with product must be decontaminated or discarded using an approved method. It should not be worn or carried outside the operating area.

===== PHYSICAL AND CHEMICAL PROPERTIES =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

VAPOR PRESSURE @ 70'F (21.1'C): 21.5 psia (148 kPa)

===== REACTIVITY/STABILITY =====

CHEMICAL STABILITY: Stable

CONDITIONS TO AVOID: None

INCOMPATIBILITY: Reacts with all organic materials except certain perfluorinated hydrocarbons, and most inorganic substances except certain metals that have been treated with fluorine to form a passive fluoride layer.

HAZARDOUS DECOMPOSITION PRODUCTS: Chlorine monofluoride, oxygen difluoride, chlorine oxyfluorides, fluorine and hydrogen fluoride in the presence of moisture. Some of these compounds may be shock-sensitive and more toxic than chlorine trifluoride.

HAZARDOUS POLYMERIZATION: Will not occur.

===== TOXICOLOGICAL INFORMATION =====

CHLORINE TRIFLUORIDE IS TOXIC AND VERY IRRITATING AND CORROSIVE TO ALL LIVING tissue.

THE LETHAL CONCENTRATION FOR THIS PRODUCT: LC50 = 299 ppm (1 hr. rat).

Direct toxicity of this material may be accompanied by systemic depletion of calcium ion, an essential electrolyte. Chronic exposure may cause abdominal calcification in bone structure (fluorosis) due to low level systemic absorption.

The potential for hydrogen fluoride formation exists with exposure, therefore its toxicity must also be considered.

===== ECOLOGICAL INFORMATION =====

Do not release large amounts of this product to the atomosphere. The product does not contain any Class I or Class II ozone depleting chemicals. This product is not listed as a marine pollutant by DOT (49 CFR).

===== DISPOSAL =====

UNUSED PRODUCT/EMPTY CYLINDER: Return cylinder and unused product to supplier. Do not attempt to dispose of unused product. Ensure cylinder valve is properly closed, valve outlet cap has been reinstalled leak-tight, and valve protection cap is secured before shipping cylinder. If cylinder was received secured in a shipping cradle, it must be returned in that cradle.

DISPOSAL: Small quantities of this product may be disposed of by slowly flowing gas into a solid or preferably a liquid caustic scrubber. The flow rate must be controlled to prevent overheating the disposal unit.

Soda lime, a sodium hydroxide-calcium oxide mixture, is the preferred solid scrubber medium. A five to fifteen prevent (by weight in water) solution of potassium hydroxide is preferred as a liquid scrubbing medium. To avoid the formation of hazardous hydrolysis products, do not use water. Chlorine trifluoride can react with water and form hydrogen fluoride, chloro-oxy fluorides, and oxygen difluoride.

===== TRANSPORTATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

REPORTABLE QUANTITY (RQ): 10 lbs. (4.54 kgs)

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure upright position in a well ventilated truck. Never transport in passenger compartment of a vehicle.

Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with the owner's written consent is a violation of federal law.

===== REGULATORY INFORMATION =====

U.S. FEDERAL REGULATIONS:

ENVIRONMENTAL PROTECTION AGENCY (EPA):

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980 requires notification to the National Response Center of a release of quantities of hazardous substances equal to or greater than the reportable quantities (RQ's) in 40 CFR 302.

CERCLA REPORTABLE QUANTITY: None

SARA TITLE III: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT OF 1986

SECTION 302: Requires emergency planning based on threshold planning quantities (TPQ's) and release reporting based on reportable quantities (RQ's) of EPA's extremely hazardous substances (40 CFR 355).

Chlorine trifluoride is not listed as an Extremely Hazardous Substance.

SECTIONS 311/312: Require submission of material safety data sheets (MSDSs) and chemical inventory reporting with identification of EPA defined hazard classes.

THE HAZARD CLASSES FOR THIS PRODUCT ARE:

HEALTH:	Immediate	PHYSICAL:	High pressure
	Delayed		Reactive
			Fire

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372. This information must be included in all MSDS's that are copied and distributed for this material.

Chlorine trifluoride is not listed as a Section 313 chemical.

TOXIC SUBSTANCE CONTROL ACT (TSCA): Chlorine trifluoride is listed on the TSCA inventory.

40 CFR 68: Risk Management for Chemical Accident Release Prevention. Requires the development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Chlorine trifluoride is listed as a regulated substance.

THRESHOLD QUANTITY: 500 lbs. (227 kg)

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA):

29 CFR 1910.119: Process Safety Management of Highly Hazardous Chemicals. Require facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Chlorine trifluoride is listed as a highly hazardous chemical.

THRESHOLD QUANTITY (TQ): 1000 lbs. (454 kg)

STATE REGULATIONS:

CALIFORNIA:

PROPOSITION 65: This product does NOT contain any listed substances which the State of California requires warning under this statute.

SCAQMD RULE: VOC = N/A

RMPP RULE: California Risk Management and Prevention Program does not list chlorine trifluoride as an Acutely Hazardous Material (AHM)

===== SUPPLEMENTAL INFORMATION =====

HAZARD RATINGS:

	HEALTH	FLAMMABILITY	REACTIVITY	SPECIAL
NFPA:	4	0	4	W
HMIS:	4	0	4	

REVISION INFORMATION: New Format with additional sections added.

A = Not applicable

66-03-0870

7

MATERIAL SAFETY DATA SHEET

CORPORATE RESEARCH & DEVELOPMENT

SCHENECTADY, N. Y.

MATERIALS INFORMATION SERVICES

No. 366

CHLOROBENZENE

Date October 1977

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: CHLOROBENZENE

OTHER DESIGNATIONS: Chlorobenzol, Monochlorobenzene, Phenyl Chloride, C_6H_5Cl, CAS# 000 108 907

MANUFACTURER: Available from several suppliers

SECTION II. INGREDIENTS AND HAZARDS

	%	HAZARD DATA
Chlorobenzene	ca 100	TLV 75 ppm Rat, oral LD_{50} 2910 mg/kg

SECTION III. PHYSICAL DATA

Boiling point at 1 atm, deg C - 132
Vapor pressure at 25 C, mm Hg - ca 12
Vapor density (Air=1) --------- 3.9
Water solubility ---------- Insoluble

Specific gravity (H_2O=1)- 1.11
Melting point, deg C -- -55 to -45
Volatiles, % ---------- ca 100
Molecular weight ------ 112.56

Appearance & Odor: A clear, colorless, volatile liquid with a faint, almond-like odor.

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air	LOWER	UPPER
29C (84F) (TCC)	638 C (1180F)		1.3%	7.1% 9.6% at

Extinguishing media: CO_2, dry chemical, or foam. 150C

A water spray can be used to control small fires or cool containers of this material in a fire situation. A layer of water will float on top of chlorobenzene and may be useful for extinguishing fire in an open tank.

The dense vapors of this material may flow along surfaces or floors for a considerable distance to an ignition source, and then flash back.

Firefighters should use eye protection and self-contained breathing apparatus in fighting fires in which this material is involved.

SECTION V. REACTIVITY DATA

This material is stable to air, light and moisture at room conditions. It does not undergo hazardous polymerization.

This highly flammable material is dangerous if heated. It oxidizes to form HCl and CO when burned. It is an OSHA Class IB flammable liquid.

Keep separated from oxidizing agents.

Chlorobenzene can react violently with dimethylsulfoxide. Silver perchlorate will form a solvated salt with chlorobenzene which is shock sensitive (explosion).

GENERAL ELECTRIC

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SECTION VI. HEALTH HAZARD INFORMATION

TLV 75 ppm (350 mg/m³)

Chlorobenzene is a fairly strong narcotic with some irritant properties. Overexposure is irritating to the eyes and nasal passages. Excessive inhalation gives headache, dizziness, drowsinness, loss of consciousness, and twitching of extremities.

It is moderately toxic by inhalation or ingestion and can be absorbed slowly through the skin. Prolonged exposure or repeated exposures above the TLV may cause kidney and liver damage; but, in general, chronic exposure information is not established.

FIRST AID:

Eye contact: Immediately flush eyes with abundant running water for 15 minutes. Get medical help if irritation persists.

Skin contact: Wash exposed areas promptly with soap and water. Be sure to remove promptly any contaminated clothing.

Ingestion: Get immediate medical help for gastric lavage.

Inhalation: Remove to fresh air. Restore breathing. Get prompt medical attention for all serious exposures.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Eliminate ignition sources; notify safety personnel. Provide ventilation (explosion proof). Clean up workers need protection against inhalation of vapors and contact with liquid. Collect spill with absorbent solid, such as paper or sawdust, or as a liquid and place in sealed metal container for disposal. Use spark-proof tools.

Disposal - Dispose of scrap by burning in an approved incinerator with a scrubber or dispose of through a licensed waste disposal company.

Pre-accident plans must be made to handle emergencies. Suppliers can be helpful in establishing emergency procedures.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide adequate general ventilation and local exhaust ventilation (explosion-proof equipment!) to meet TLV requirements. Self-contained breathing apparatus should be available for emergency and non-routine use.

Use rubber gloves, aprons, protective clothing, etc. to avoid skin contact with liquid.

Use safety goggles where splashing is possible.

Provide an eye wash station and safety shower in area of use and handling.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Store in tightly closed containers, which are well protected from possible physical damage, in an outdoor or detached area (preferred) or fireproof storage facility. Keep away from heat, sources of ignition, and direct sunlight.

Ground and electrically interconnect containers and equipment for transfers to avoid static sparks. Use explosion-proof tools and electrical equipment and fixtures.

Dispense small amounts from safety cans.

Avoid breathing vapors! Avoid contact with the liquid.

Judgments as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, General Electric Company extends no warranties, makes no representations and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

APPROVALS: MIS, CRD J. M. Nielsen

Industrial Hygiene and Safety

MEDICAL REVIEW:

PORTS MSDS #: 5121

PRODUCT: CHLOROFORM

PART NUMBER:

FORMULA: CHCl3

KEYWORD: SOLVENT

PORTS NUMBER: 03-403-3035

PORTS MISC INFO:
01-03-3035

PORTS RATING: HFR=411

MANUFACTURER:
J.T. BAKER, INC.
222 RED SCHOOL LANE
PHILLIPSBURG
NJ

08865
PHONE: PHONE:
EMERGENCY PHONE: 908-859-2151

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 141 F	NOTE: @ 760 MMHG, 61'C.
Melting Point. . . .	EQ -83 F	NOTE: @ 760 MMHG, -64'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ 1.48	
Vapor Pressure . . .	EQ 159	NOTE: MMHG, 20'C.
Vapor Density. . . .	EQ 4.1	
Percent Volatiles. .	EQ 100	NOTE: 21'C.
Evaporation Rate . .	EQ .09	NOTE: BUTYL ACETATE=1.
pH	NA	NOTE: NOT APPLI/NOT AVAIL.
Molecular Weight . .	EQ 119.38	NOTE: FORMULA WT.
Viscosity.	NG	

Solubility in Water. SLIGHT (0.1-1%).
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS LIQUID, PLEASANT ODOR / ODOR THRESHOLD: NOT APPLI/NOT AVAIL.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Flash Point, Open Cup. . . .	NG	
Fire Point.	NG	
Auto Ignition.	NA	NOTE: NOT APPLI/NOT AVAIL.
Explosive/Flammable Limits		
Lower (LEL).	NA	NOTE: NOT APPLI/NOT AVAIL.
Upper (UEL).	NA	NOTE: NOT APPLI/NOT AVAIL.

Shipping Regulations

UN/NA Number.	UN1888
D.O.T. Hazard Class. . .	6.1
Label	6, HARMFUL, STOW AWAY FROM FOODSTUFFS
Proper Shipping Name . .	CHLOROFORM

==========

Preparer/Contact Information: QUALITY ASSURANCE DEPARTMENT

Date Prepared/Revised 1/04/94

===== Component Information =====

CHLOROFORM
OSHA PEL (PPM):
OSHA PEL (MG/M3): 9.78
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 49
STEL (PPM): NE
STEL (MG/M3):
Product %: BT 98 100
C.A.S. No.: 67663
Note:
NE= NOT ESTABLISHED / PEL: 2 PPM / TLV: 10 PPM.

===== PRODUCT IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

PRODUCT NAME: Chloroform

COMMON SYNONYMS: Trichloromethane; Methyl Trichloride; Methane Trichloride

CHEMICAL FAMILY: Chlorinated Hydrocarbons

CAS NO.: 67-66-3

NIOSH/RTECS NO.: FS9100000

PRODUCT USE: Laboratory Reagent

RODUCT CODES: 9174, E910, 9186, 9175, 9182, 9183, 9257, 9180, 9181

ISSUED: 06/25/94

24-HOUR EMERGENCY TELEPHONE: 908-859-2151

NATIONAL RESPONSE CENTER: 800-424-8802

CHEMTREC: 800-424-9300

NATIONAL RESPONSE IN CANADA: CANUTEC 613-996-6666

OUTSIDE U.S. AND CANADA: Chemtrec 202-483-7616

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers are to be used ONLY IN THE EVENT OF CHEMICAL EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT INVOLVING CHEMICALS. All non-emergency questions should be directed to Customer Service (1-800-JTBAKER) for assistance.

MANUFACTURER'S NAME AND ADDRESS:

J.T. BAKER INC.
222 RED SCHOOL LANE
PHILLIPSBURG, NJ 08865

C2915 -08

PRECAUTIONARY LABELING:

BAKER SAF-T-DATA* SYSTEM:

HEALTH: 3 SEVERE
FLAMMABILITY: 0 NONE
REACTIVITY: 1 SLIGHT
CONTACT: 2 MODERATE

LABORATORY PROTECTIVE EQUIPMENT: GOGGLES & SHIELD, LAB COAT & APRON, VENT HOOD, PROPER GLOVES

U.S. PRECAUTIONARY LABELING: POISON! DANGER! MAY BE FATAL IF SWALLOWED OR INHALED. EXCEPTIONAL HEALTH HAZARD: READ MATERIAL SAFETY DATA SHEET. CAUSES IRRITATION. HARMFUL IF ABSORBED THROUGH SKIN.

NOTE: REPORTED AS CAUSING CANCER IN LABORATORY ANIMALS. EXERCISE DUE CARE.

Avoid contact with eyes, skin, clothing. Do not breathe vapor. Keep in tightly closed containers. Use with adequate ventilation. Wash thoroughly after handling. In case of spill, soak up with sand or earth.

INTERNATIONAL LABELING: Harmful by inhalation. Possible risks of irreversible effects. Keep out of reach of children. Avoid contact with skin and eyes.

SAF-T-DATA* STORAGE COLOR CODE: Blue (health)

===== COMPONENTS =====

SEE COMPONENT INFORMATION.

===== PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

ODOR THRESHOLD (PPM): N/A

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

===== FIRE AND EXPLOSION HAZARD DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

NFPA 704M RATING: 2-0-0

FIRE EXTINGUISHING MEDIA: Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE-FIGHTING PROCEDURES: Firefighters should wear proper protective equipment apparatus with full facepiece operated in positive pressure mode. Move containers from fire area if it can be done without risk. Use water to keep fire-exposed containers cool.

UNUSUAL FIRE & EXPLOSION HAZARDS: None identified.

TOXIC GASES PRODUCED: Hydrogen chloride, chlorine, phosgene

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT: None identified.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE: None identified.

===== HEALTH HAZARD DATA =====

THRESHOLD LIMIT VALUE (TLV/TWA): 49 mg/m3 (10 ppm)

SHORT-TERM EXPOSURE LIMIT (STEL): Not Established

PERMISSIBLE EXPOSURE LIMIT (PEL): 9.78 Not Established

TOXICITY OF COMPONENTS:

ORAL RAT LD50 FOR CHLOROFORM: 908 mg/kg

SUBCUTANEOUS MOUSE LD50 FOR CHLOROFORM: 704 mg/kg

INTRAPERITONEAL MOUSE LD50 FOR CHLOROFORM: 1 g/kg

INHALATION MOUSE LC50 FOR CHLOROFORM: 28 g/m3

CARCINOGENICITY: NTP: Yes; IARC: Yes; Z LIST: Yes; OSHA REG: Yes

CARCINOGENICITY: This substance is listed as an ACGIH anticipated human carcinogen, a NTP anticipated human carcinogen, and an IARC possibily carcinogenic to humans (Group 2B).

REPRODUCTIVE EFFECTS: Reproductive toxicity test have been conducted to evaluate the potential adverse effects chloroform may have on reproduction and offspring of laboratory animals. Chloroform has been found to be embryotoxic and fetal toxic and has delayed fetal development in experimental animals. Studies in mice and rats have shown a marginal teratogenic (birth defects) effect. Studies in rabbits have not shown teratogenic effects.

EFFECTS OF OVEREXPOSURE:

INHALATION: Headache, nausea, vomiting, dizziness, drowsiness, irritation of upper respiratory tract, dryness of mouth and throat, unconsciousness, and may be fatal.

SKIN CONTACT: Irritation, prolonged contact may cause dermatitis.

EYE CONTACT: Irritation, may cause temporary corneal damage.

SKIN ABSORPTION: Rapid absorption.

INGESTION: Nausea, vomiting, gastrointestinal irritation, burns to mouth hd throat, and may be fatal.

CHRONIC EFFECTS: Kidney damage, liver damage.

TARGET ORGANS: Liver, kidneys, heart, eyes, skin

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Kidney disorders, liver disorders, heart disorders, skin disorders.

PRIMARY ROUTES OF ENTRY: Inhalation, ingestion, skin contact, eye contact

EMERGENCY AND FIRST AID PROCEDURES:

INGESTION: CALL A PHYSICIAN. If swallowed, if conscious, immediately induce vomiting.

INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Prompt action is essential.

SKIN CONTACT: In case of contact, flush skin with water.

EYE CONTACT: In case of eye contact, immediately flush with plenty of water for at least 15 minutes.

SARA/TITLE HAZARD CATEGORIES AND LISTS:

ACUTE: Yes; CHRONIC: Yes; FLAMMABILITY: No; PRESSURE: No; REACTIVITY: No

EXTREMELY HAZARDOUS SUBSTANCE: Yes; Contains Chloroform (RQ = 5,000 LBS, TPQ = 10,000 LBS)

CERCLA HAZARDOUS SUBSTANCE: Yes; Contains Chloroform (RQ = 5,000 LBS)

SARA 313 TOXIC CHEMICALS: Yes; Contains Chloroform

GENERIC CLASS: Generic Class Removed from CFR: 7/1/91

TSCA INVENTORY: Yes

STATE LISTS: For products sold in the state of California, the state requires that we provide to users and their employees the following message: WARNING: THIS PRODUCT IS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

===== REACTIVITY DATA =====

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Heat, flame, other sources of ignition, light, air, moisture.

INCOMPATIBLES: Strong bases, alkali metals, aluminum, magnesium, strong oxidizing agents.

DECOMPOSITION PRODUCTS: Chlorine, hydrogen chloride, phosgene

===== SPILL & DISPOSAL PROCEDURES =====

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE: Wear self-contained breathing apparatus and full protective clothing. Stop leak if you can do so without risk. Use water spray to reduce vapors. Take up with sand or other non-combustible absorbent material and place into container for later disposal. Flush spill area with water.

J. T. Baker SOLUSORB(R) solvent absorbent is recommended for spills of this product.

DISPOSAL PROCEDURE: Dispose in accordance with all applicable federal, state, and local environmental regulations.

EPA HAZARDOUS WASTE NUMBER: U044 (Toxic Waste)

===== INDUSTRIAL PROTECTIVE EQUIPMENT =====

VENTILATION: Use general or local exhaust ventilation to meet TLV requirements.

RESPIRATORY PROTECTION: Respiratory protection required if airborne concentration exceeds TLV. At concentrations above 10 ppm, a self-contained breathing apparatus is advised.

EYE/SKIN PROTECTION: Safety goggles and face shield, uniform, protective suit, polyvinyl alcohol gloves are recommended.

===== STORAGE AND HANDLING PRECAUTIONS =====

SAF-T DATA* STORAGE COLOR CODE: Blue (health)

STORAGE REQUIREMENTS: Keep container tightly closed. Store in secure poison area. Isolate from incompatible materials.

===== TRANSPORTATION DATA AND ADDITIONAL INFORMATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

DOMESTIC (D.O.T.):

REPORTABLE QUANTITY: 10 LBS.
PACKAGING GROUP: III
LABELS: 6 HARMFUL store away from foodstuffs
REGULATORY REFERENCES: 49CFR 172.101

INTERNATIONAL (I.M.O.):

PROPER SHIPPING NAME: CHLOROFORM
HAZARD CLASS: 6.1
I.M.O. PAGE: 6103
UN: UN1888
MARINE POLLUTANTS: Yes
PACKAGING GROUP: II
LABELS: POISON
REGULATORY REFERENCES: 49CFR PART 176; IMDG Code

AIR (I.C.A.O.):

PROPER SHIPPING NAME: CHLOROFORM
HAZARD CLASS: 6.1
UN: UN1888
PACKAGING GROUP: II
LABELS: POISON
REGULATORY REFERENCES: 49CFR PART 175; ICAO

We believe the transportation data and references contained herein to be factual and the opinion of qualified experts. The data is meant as a guide to the overall classification of the product and is not package size specific, nor should it be taken as a warranty or representation for which the company assumes legal responsibility. The information is offered solely for your consideration, investigation, and verification. Any use of the information must be determined by the user to be in accordance with applicable Federal, State, and Local laws and regulations. See shipper requirements 49CFR 171.2, certification 172.204, and employee training 49CFR 173.1(b).

U.S. CUSTOMS HARMONIZATION NUMBER: 29031300009

===== SPECIAL NOTES =====

NOTE: When handling liquid products, secondary protective containers must be used for carrying.

N/A = Not Applicable or Not Available;
N/E = Not Established.

The information in this Material Safety Data Sheet meets the requirements of the United States OCCUPATIONAL SAFETY AND HEALTH ACT and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) and the Canadian WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. This document is intended only as a guide to the appropriate precautionary handling of the material by a person trained in, or supervised by a person trained in, chemical handling. The user is responsible for determining the precautions and dangers of this chemical for his or her particular application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes.

Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, Baker cannot warn of all of the potential dangers of use or interaction with other chemicals or materials. Baker warrants that the chemical meets the specifications set forth on the label.

BAKER DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.

The user should recognize that this product can cause severe injury and even

http://jupiter.ports/msds/data/5121

death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION. As new documented general safety information becomes available, Baker will periodically revise this Material Safety Data Sheet.

NOTE: CHEMTREC, CANUTEC, and NATIONAL RESPONSE CENTER emergency telephone numbers are to be used ONLY in the event of CHEMICAL EMERGENCIES involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to Customer Service (1-800-JTBAKER) for assistance.

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* TRADEMARKS OF J.T. BAKER INC.

Approved by Quality Assurance Department.

STATE LISTS: For products sold in the state of California, the state requires that we provide to users and their employees the following message: WARNING: THIS PRODUCT CONTAINS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

===== SECTION VI - REACTIVITY DATA =====

STABILITY: Stable

CONDITIONS TO AVOID: Heat

INCOMPATIBLES: Strong bases, strong reducing agents, alkalies, most common metals

DECOMPOSITION PRODUCTS: Oxides of nitrogen

HAZARDOUS POLYMERIZATION: Will not occur

===== SECTION VII - SPILL & DISPOSAL PROCEDURES =====

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE: Wear self-contained breathing apparatus and full protective clothing. Stop leak if you can do so without risk. Ventilate area. Neutralize spill with soda ash or lime. With clean shovel, carefully place material into clean, dry container and cover; remove froam area. Flush spill area with water.

DISPOSAL PROCEDURE: Dispose in accordance with all applicable federal, state, and local environmental regulations.

EPA HAZARDOUS WASTE NUMBER: D002 (Corrosive Waste)

===== SECTION VIII - PROTECTION INFORMATION =====

EYE/FACE PROTECTION: Goggles & Shield

PROTECTIVE CLOTHING: Lab Coat & Apron

PROTECTIVE GLOVES: Rubber

VENTILATION REQUIREMENTS: Vent Hood

===== SECTION IX - STORAGE DATA AND ADDITIONAL INFORMATION =====

STORAGE REQUIREMENTS: Keep container tightly closed. Suitable for any general chemical storage area. Isolate from incompatible materials.

===== SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION =====

DOMESTIC (D.O.T.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)

INTERNATIONAL (I.M.O.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)

MARINE POLLUTANTS: No

N/A = Not Applicable or Not Available
N/E = Not Established

The information in this Material Safety Data Sheet meets the requirements of the United States OCCUPATIONAL SAFETY AND HEALTH ACT and regulations

promulgated thereunder (29 CFR 1910.1200 et. seq.) and the Canadian WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. This document is intended only as a guide to the appropriate precautionary handling of the material by a person trained in, or supervised by a person trained in, chemical handling. The user is responsible for determining the application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes.

Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, VHG cannot warn of all of the potential dangers of user or interaction with other chemicals or materials. VHG warrants that the chemical meets the specifications set forth on the label. VHG DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.

The user should recognize that this product can cause severe injury and even death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION.

Approved by Quality Assurance Department.

COPPER-CYANIDE

6-03-5610 01-03-55451

720-6 66-03-5400

MATERIAL SAFETY DATA SHEET

CORPORATE RESEARCH & DEVELOPMENT
120 ERIE BOULEVARD
SCHENECTADY, N.Y. 12305

MATERIALS INFORMATION SERVICES

NO. 12

CUPROUS CYANIDE
Revision B

DATE May 1984

most current

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: CUPROUS CYANIDE
OTHER DESIGNATIONS: Copper Cyanide, Cupricin, Copper (I) Cyanide, CAS #000 544 923, CuCN, GE Material D4M6
MANUFACTURER: Available from several suppliers, including:

E.I. Du Pont de Nemours & Co.
Wilmington, DE 19898
Tel: (302) 774-2421

Ashland Chem. Co.
P.O. Box 2219
Columbus, OH 43218
Tel: (606) 324-1133

SECTION II. INGREDIENTS AND HAZARDS

	%	HAZARD DATA
Cuprous Cyanide [CuCN]	ca 100	8-hr TWA 5 mg/m^3* (as CN) (Skin) and 8-hr TWA 1mg/m^3* Copper salt dust or mist (as Cu)

*Current OSHA PEL and ACGIH (1983) TLV. for Cu and CN^{-1} ion. (Control of Cu at 1 mg/m^3 will control CN^{-1} ion at < 0.5 mg/m^3 for this complex salt.)

SECTION III. PHYSICAL DATA

Boiling point, 1 atm, deg C --- Decomposes
Solublity in water ---------- Insoluble*
Specific gravity (H_2O=1) ------- 2.92
Melting point, deg C (in N_2) --- 473
Molecular weight --- 89.56

Appearance & Odor: White to light tan fine powder. Odorless.

*Soluble in alkali cyanide solutions (NaCN, KCN) and in ammonium hydroxide by complex ion formation.

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp	Flammability Limits in Air	Lower	Upper
Non-flammable				

This material does not burn; however, in a fire situation it can thermally decompose and it can liberate flammable and toxic hydrogen cyanide gas when mixed with acid.
Avoid flushing solid with water directly into sewers or waterways or allowing mixing with acid.
Firefighters should wear self-contained breathing apparatus and full protective clothing.

SECTION V. REACTIVITY DATA

This is a stable material in closed containers at room temperature under normal storage and handling conditions. It does not polymerize.
It is incompatible with strong acids and oxidizing agents such as nitrates. Diluted boiling H_2SO_4 has hardly any affect on copper cyanide unless chlorides are present. Hot conc. H_2SO_4, cold conc. HCl and nitric acid will decompose it. Hot dilute HCl reacts to form cuprous chloride and evolves toxic hydrogen cyanide gas. Avoid mixing with acid because of possible hydrogen cyanide generation!
Thermal-oxidative decomposition can produce toxic fumes.

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GENERAL ELECTRIC

NO. 12

SECTION VI. HEALTH HAZARD INFORMATION

TLV 1 mg/m³ (as Cu) (See Sect II)

Cuprous cyanide can be fatal if excessively inhaled or ingested; however, its action is less rapid than that of alkali metal cyanides (MSDS #13 and 58) because the CN^- ion does not readily dissociate from the copper ion complex. (See Sect. V) Cyanide ion inhibits oxygen use by body cells by causing metabolic asphyxiation. Early symptoms include headache, weakness, confusion, nausea, and apparent respiratory stress.

Skin contact can be irritating. Cyanide can penetrate intact skin. Eye contact causes burns.

FIRST AID: (Begin treatment immediately! Notify physician.)

Eye Contact: Flush with plenty of water for at least 15 min., including under eyelids.

Skin Contact: Remove contaminated clothing. Flush affected area with water then wash using detergent.

Inhalation: Remove to fresh air. Restore and/or support breathing as needed. Keep warm and at rest. Administer amyl nitrite perles by inhalation according to directions.*

Ingestion: Give conscious victim a pint of 1% sodium thiosulfate soln. (or soapy water) and induce vomiting. Repeat. Use amyl nitrite perles by inhalation.*

Obtain medical help promptly for treatment, observation & support after first aid.

*LILLY Cyanide Antidote Kit.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Notify safety personnel. Provide ventilation. Clean-up personnel need protection against contact and inhalation.

Scoop up spilled solids into suitable containers for reclaim for disposal. Carefully sweep up (or vacuum up) small spills or residues, avoiding dusting conditions. Prevent contact with acids. Decontaminate trace cyanide in spill area with strong hypochlorite solution and flush to holding area for copper removal.

DISPOSAL: Follow Federal, State, and Local regulations for all effluents and disposals. Dispose of waste through a licensed handler and disposal facility. Burial in an approved, secure landfill has been suggested.

AQUATIC TOXICITY TLm 96:10-1ppm

EPA (RCRA) HW No. P029 [40 CFR 261.33]

SECTION VIII. SPECIAL PROTECTION INFORMATION

Provide general and local exhaust ventilation to meet TLV requirements. Hood exhaust systems should have a face velocity of 100 lfm minimum. Approved dust filter respirators and self-contained breathing apparatus should be available for nonroutine and emergency use.

Use dry cotton gloves for handling solid, and rubber gloves, apron and other protective clothing appropriate for conditions when handling solutions to prevent skin contact.

Use chemical safety goggles with a faceshield where splashing is possible.

Contaminated clothing should be removed promptly and laundered before reuse.

Eyewash stations and washing facilities should be available to areas of use and handling.

Personnel involved with cyanides should have close supervision, and training in hazards, safe handling, first aid procedures, and the proper use of antidote kits.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Store in closed containers in a cool, dry, well-ventilated area separate from acids, weak alkalis and oxidizing agents. Protect containers from physical damage. Solutions of CuCN with KCN and NaCN are corrosive to the skin and eyes and may cause ulcerations which are slow to heal.

Periodically inspect cyanide first aid kits in storage and use areas.

Do not breathe dust or soln mist. Prevent contact with skin or eyes. Do not ingest.

Wash hands thoroughly after handling. Do not smoke or eat in areas of storage or use.

DOT Classification: POISON B I.D. No. UN1587 Label: POISON

DATA SOURCE(S) CODE: 1-12,14,38,47 (MSDS #13&58)

Judgments as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, General Electric Company extends no warranties, makes no representations and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

APPROVALS: MIS. CRD	J. M. Nielsen
INDUST. HYGIENE SAFETY	5-24-84
MEDICAL REVIEW:	15 June 1984

GENERAL ELECTRIC

MATERIAL SAFETY DATA SHEET

CORPORATE RESEARCH & DEVELOPMENT

SCHENECTADY, N. Y. 12305

Phone: (518) 385-4085 DIAL COM: 8*235-4085

MATERIALS INFORMATION SERVICES

NO. MSDS #409

CRESOL

Date December 1978

SECTION I. MATERIAL IDENTIFICATION

MATERIAL NAME: CRESOL

DESCRIPTION: A mixture of isomeric cresols. Materials containing phenol and xylenols are also called "cresol" if less than 50% of the mixture distills above 204 C.

OTHER DESIGNATIONS: Methylphenol, Hydroxytoluene, Hydroxymethylbenzene, $HOC_6H_4CH_3$, GE Material D503 D and E, CAS# 001 319 773

MANUFACTURER: Material is available from several suppliers, including Koppers Company, Inc Organic Materials Division

SECTION II. INGREDIENTS AND HAZARDS	%	HAZARD DATA
Cresol (o-, m-, and p-isomers) 66-03-5505 66-03-5504 66-03-5506 *	ca 100*	8-hr TWA 5 ppm (skin)** or 22 mg/m^3
*Some commercial "cresols" contain phenol and xylenols also. **OSHA and ACGIH (1978) TLV. NIOSH has proposed for regulatory purposes that mixtures of cresols and xylenols be considered "cresols". Also, NIOSH has proposed a 10-hr TWA of 2.3 ppm or 10 mg/m^3 for both cresols and cresylic acids (the later includes higher boiling alkylated phenols).		Rat oral LD50 1454 mg/kg

SECTION III. PHYSICAL DATA*

Boiling point at 1 atm, deg C	191-203	Specific gravity (H_2O=1)	1.03-1.05
Vapor pressure at 38 C, mm Hg	<1	Melting point, deg C	ca 11-35
Water solubility, ca 25 C	Slightly soluble	Molecular weight	108.15

Appearance & Odor: A colorless, yellowish or pinkish liquid with a phenol-like odor.

*Properties for mixed cresol isomers

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point and Method	Autoignition Temp.	Flammability Limits In Air Volume % at ca 300 F	LOWER	UPPER
ca 178-202 F	ca 1038 F		> 1.0	--

Extinguishing Media: Water spray, dry chemical, foam, or carbon dioxide. A water spray can also be used to cool fire-exposed containers

This combustible liquid is a moderate fire hazard and a slight explosion hazard when exposed to heat or flame.

Toxic vapors and gases are emitted from this material in a fire situation; firefighters must wear self-contained breathing apparatus and full protective clothing.

SECTION V. REACTIVITY DATA

Cresol is stable under conditions of normal handling and use. It does not undergo hazardous polymerization.

This combustible material is incompatible with strong oxidizing agents; it can react exothermically with strong bases, with oleum, nitric acid, and chlorosufonic acid.

Thermal-oxidative degradation will produce toxic vapors and gases, including carbon monoxide.

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SECTION VI. HEALTH HAZARD INFORMATION

TLV 5 ppm (See Sect. II)

[illegible] is corrosive to all body tissues it may contact. It is absorbed through the skin [illegible] produce systemic effects (sometimes delayed). Damaged tissue will show white coloration then redness and brown or black with increased effect. Within 30 minutes, skin absorption can produce headache, dizziness, rapid respiration, and weak pulse with unconsciousness or even death resulting from extended contact. Severe injury or death can result from excessive inhalation exposure or from ingestion. Severe abdominal pain and nausea result from ingestion. FIRST AID: CONSULT PHYSICIAN PROMPTLY

Eye contact: Quickly flush the eyes with plenty of running water, including under the eye lids, for 15 minutes; then get prompt medical attention.

Skin contact: Remove cresol from skin quickly by washing exposed areas well with plenty of water plus soap until cresol odor is gone. (If contact is gross remove contaminated clothing and shoes under the safety shower). Further washing of skin with isopropyl alcohol or 20% glycerine in water, followed by water rinse, may be desirable. Obtain doctor's care promptly for all except the most minor contact.

Inhalation: Remove to fresh air. Have qualified person restore breathing and/or give oxygen if needed. Get physician's care promptly.

Ingestion: Give 3+ glasses of milk or a weak sodium bicarbonate solution to drink followed by egg whites. Induce vomiting. Repeat with water until vomitus is clear. Get physician's care.

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

Notify safety personnel of large spills. Provide exhaust ventilation. Eliminate ignition sources. Exclude from area all except properly equipped clean-up personnel (see Sect. VIII). A water spray can be used to flush cresol away from sensitive areas. (Flush to retention area, not to drain!) Contain and collect material in approved container for disposal. Small spills can be picked up with absorbent solid or paper for disposal.

DISPOSAL: Burn scrap material (or its solution in a flammable solvent) using an approved incinerator, or label properly for disposal through a licensed waste disposal company. Follow Federal, State and local regulations.

SECTION VIII. SPECIAL PROTECTION INFORMATION

When practical, use cresol in completely enclosed systems to prevent exposure.

Provide explosion-proof general ventilation and local exhaust ventilation to meet TLV requirements. When cresol is misted or heated, local exhaust ventilation is necessary. Use downdraft ventilation. Above the TLV use full facepiece respirator with organic canister or cartridge (up to 500 mg/m3). or air-supplied respirator (up to 1100 mg/m3) or a self-contained respirator for non-routine and emergency situations.

Use rubber gloves and additional protective equipment, such as rubber apron, rubber boots, acid-proof suit, etc., as circumstances of use require to prevent body contact. Use chemical safety goggles and in addition a face shield where splashing is possible.

Provide deluge-type safety shower and eyewash station immediately available in areas of use, handling, or storage of cresol. A hose delivering a stream of clean water is also desirable for washing and dilution.

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Store in a cool, clean, well-ventilated place away from oxidizing agents and sources of ignition. Protect containers from physical damage. Avoid use of aluminum, copper, and brass alloys in contact with cresol in storage and process equipment.

Cresol is similar in its toxicity and reactivity to phenol.

Workers who handle cresol should be well trained in its hazards and well supervised. Preplacement and periodic medical exams should be given and counsel given those with conditions which could be aggravated by cresol exposure.

(see also ASTM D3538)

DATA SOURCE(S) CODE: 2-6, 8,12,16,19

Judgments as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, General Electric Company extends no warranties makes no representations and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

APPROVALS: MIS, CRD	J. M. [illegible]
Industrial Hygiene and Safety	[illegible]
Corporate Medical Staff	George F. Martelon M.D.

PORTS MSDS #: 6330

PRODUCT: CRESOL RED

PART NUMBER:

FORMULA: C21 H18 O5 S

KEYWORD: INDICATOR

PORTS NUMBER: 66-009-0995

PORTS MISC INFO:

PORTS RATING: HFR=420

MANUFACTURER:
ACROS ORGANICS
711 FORBES AVENUE
PITTSBURGH
PA

15219
PHONE: PHONE: 800-227-6701
EMERGENCY PHONE: 800-424-9300

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	NG	
Melting Point. . . .	EQ 536 F	NOTE: 280'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	NA	NOTE: NOT AVAILABLE.
Vapor Pressure . . .	NE	NOTE: NEGLIGIBLE.
Vapor Density. . . .	NG	
Percent Volatiles. .	NG	
Evaporation Rate . .	NE	NOTE: NEGLIGIBLE.
pH	NG	
Molecular Weight . .	NG	
Viscosity.	NG	

Solubility in Water. APPRECIABLE.
Odor/Appearance/Other Characteristics:
REDDISH BROWN CRYSTALLINE SOLID / VOLATILE FRACTION BY WEIGHT: NEGLIGIBLE.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NA	NOTE: NOT APPLICABLE.
Flash Point, Open Cup . . .	NA	NOTE: NOT APPLICABLE.
Fire Point.	NG	
Auto Ignition.	NG	
Explosive/Flammable Limits		
Lower (LEL).	NG	
Upper (UEL).	NG	

Shipping Regulations

UN/NA Number.	NG
D.O.T. Hazard Class. . .	NOT GIVEN
Label	NOT GIVEN
Proper Shipping Name . .	NOT GIVEN

==========

Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 12/01/94

===== Component Information =====

ESOL RED
OSHA PEL (PPM): NG
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NG
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: ~ 100
C.A.S. No.: 1733126
Note:
EXPOSURE LIMITS: NOT ESTABLISHED.

===== SECTION I. IDENTIFICATION =====

PRODUCT NAME: CRESOL RED

SYNONYM(S): 4,4'-(3H-2, 1-BENZOXATHIOL-3-YLIDENE)BIS(2-METHYLPHENOL) 5,5-DIOXIDE

FORMULA: C21 H18 05 S

CAT NO(S): 108 2841; 108 2858; 108 2866

CHEM. NO(S): 00744

ACCESSION NUMBER: 900744

R-0099.100B
87-8664
)900744*

DATE OF REVISION: 02/19/88

MODIFIED BY FISHER SCIENTIFIC: 12/94

FOR EMERGENCY TRANSPORTATION INFORMATION CALL CHEMTREC: 800-424-9300

MANUFACTURER'S NAME AND ADDRESS:

ACROS ORGANICS
711 FORBES AVENUE
PITTSBURGH, PA 15219-4785
1-800-ACROS-01 (1-800-227-6701)

===== SECTION II. PRODUCT AND COMPONENT HAZARD DATA =====

SEE COMPONENT INFORMATION.

===== SECTION III. PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

===== SECTION IV. FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT: Not Applicable

EXTINGUISHING MEDIA: Water spray; Dry chemical; Carbon dioxide

SPECIAL FIRE FIGHTING PROCEDURES: Wear self-contained breathing apparatus and protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Fire or excessive heat may produce hazardous decomposition products. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

===== SECTION V. REACTIVITY DATA =====

STABILITY: Stable

INCOMPATIBILITY: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Combustion will produce carbon dioxide and probably carbon monoxide. Oxides of sulfur may also be present.

HAZARDOUS POLYMERIZATION: Will not occur.

===== SECTION VI. TOXICITY AND HEALTH HAZARD DATA =====

EXPOSURE LIMITS: Not established.

EXPOSURE EFFECTS:

INHALATION: Low hazard for usual industrial handling.
SKIN: Low hazard for usual industrial handling.
EYE: No specific hazard known. Contact may cause transient irritation.
INGESTION: Expected to be a low ingestion hazard.

FIRST AID:

INHALATION: Remove to fresh air following overexposure.
SKIN: Wash after each contact.
EYE: Flush eyes with plenty of water.
INGESTION: Drink 1-2 glasses of water. Seek medical attention.

===== SECTION VII. VENTILATION AND PERSONAL PROTECTION =====

VENTILATION AND RESPIRATORY PROTECTION: Good ventilation should be sufficient. Supplementary ventilation or respiratory protection may be needed in special circumstances.

SKIN AND EYE PROTECTION: Safety glasses recommended in industrial operations involving chemicals. If prolonged or repeated skin contact is necessary, gloves or other protection may be required.

===== SECTION VIII. SPECIAL STORAGE AND HANDLING PRECAUTIONS =====

Keep from contact with oxidizing materials.

===== SECTION IX. SPILL, LEAK, AND DISPOSAL PROCEDURES =====

Sweep up material and package for safe feed to an incinerator. Dispose by incineration or contract with licensed chemical waste disposal agency. Discharge, treatment, or disposal may be subject to federal, state or local laws.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

http://haz1.siri.org:80 's/h/q443/q247.htm

MERICHEM --'CRESYLIC ACID'- CRESYLIC ACID,TECHNICAL
MATERIAL SAFETY DATA SHEET
NSN: 6810002649019
Manufacturer's CAGE: MERIC
Part No. Indicator: A
Part Number/Trade Name: CRESYLIC ACID

==========

General Information

==========

Item Name: CRESYLIC ACID,TECHNICAL
Company's Name: MERICHEM COMPANY
Company's Street: 1914 HADEN ROAD
Company's City: HOUSTON
Company's State: TX
Company's Country: US
Company's Zip Code: 77015
Company's Emerg Ph #: 713-455-1311/800-424-9300(CHEMTREC)
Company's Info Ph #: 713-455-1311
Distributor/Vendor # 1: INLAND PACKAGING
Distributor/Vendor # 1 Cage: 66172
Record No. For Safety Entry: 001
Tot. Safety Entries This Stk#: 005
Status: SE
Date MSDS Prepared: 01JUL89
Safety Data Review Date: 08NOV89
Supply Item Manager: CX
MSDS Serial Number: BHBYK
Specification Number: MIL-C-1324B
Hazard Characteristic Code: C1
Unit Of Issue: GL
Unit Of Issue Container Qty: 1 GALLON
Type Of Container: CAN
Net Unit Weight: 8.6 POUNDS

==========

Ingredients/Identity Information

==========

Proprietary: NO
Ingredient: PHENOL
Ingredient Sequence Number: 01
Percent: 7.1
NIOSH (RTECS) Number: SJ3325000
CAS Number: 108-95-2
OSHA PEL: S, 5 PPM
ACGIH TLV: S, 5 PPM; 8990
Other Recommended Limit: NOT ESTABLISHED

CAS# 108-95-2
MSDS Serial BHBYK
Cresylic Acid

DRAFT

Proprietary: NO
Ingredient: CRESOL, ALL ISOMERS (CRESYLIC ACID) (SARA III)
Ingredient Sequence Number: 02
Percent: 38.2
NIOSH (RTECS) Number: GO5950000
CAS Number: 1319-77-3
OSHA PEL: S, 5 PPM
ACGIH TLV: S, 5 PPM; 9192
Other Recommended Limit: NOT ESTABLISHED

Proprietary: NO
Ingredient: XYLENOL (SARA III)
Ingredient Sequence Number: 03
Percent: 33.1
NIOSH (RTECS) Number: ZE5425000
CAS Number: 1300-71-6
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NOT ESTABLISHED

Proprietary: NO
Ingredient: O-ETHYLPHENOL (2-ETHYLPHENOL) (% SHOWN IS FOR THE SUM OF ORTHO 1.3%,META 7.8% AND PARA 4.4%)
Ingredient Sequence Number: 04
Percent: 13.5
NIOSH (RTECS) Number: SL4025000
CAS Number: 90-00-6
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NOT ESTABLISHED

Proprietary: NO
Ingredient: ALKYLATED PHENOLS
Ingredient Sequence Number: 05
Percent: 8.1
NIOSH (RTECS) Number: 1002020AP
OSHA PEL: UNKNOWN
ACGIH TLV: UNKNOWN
Other Recommended Limit: UNKNOWN
==========

Physical/Chemical Characteristics

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Appearance And Odor: AMBER LIQUID.ANTISEPTIC SWEET ODOR.
Boiling Point: 374F,190C
Melting Point: <0F,<-17.8C
Vapor Pressure (MM Hg/70 F): 1

Vapor Density (Air=1): 3.86
Specific Gravity: 1.03
Solubility In Water: 5%
pH: 5.5

Fire and Explosion Hazard Data

Flash Point: >175F,>79C
Flash Point Method: TCC
Lower Explosive Limit: 1.5
Extinguishing Media: USE CARBON DIOXIDE, FOAM, DRY CHEMICAL, OR WATER FOG.
Special Fire Fighting Proc: FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT WHEN FIGHTING CHEMICAL FIRE. USE WATER SPRAY TO COOL NEARBY CONTAINERS EXPOSED TO FIRE.
Unusual Fire And Expl Hazrds: MAY GENERATE TOXIC GASES ON COMBUSTION.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): HIGH TEMPERATURES, SPARKS, OPEN FLAMES
Materials To Avoid: STRONG OXIDIZING AGENTS
Hazardous Decomp Products: CARBON MONOXIDE, CARBON DIOXIDE,INCOMPLETELY BURNED CARBON PRODUCTS.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT APPLICABLE

Health Hazard Data

LD50-LC50 Mixture: LD50 (ORAL RAT) IS UNKNOWN
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: THIS MATERIAL IS CORROSIVE,IRRITANT,TOXIC AND SENSITIZER. TARGET ORGANS ARE:LUNGS,LIVER,EYES,KIDNEYS,SKIN,MUCOUS MEMBRANES AND NERVOUS SYSTEM.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE OF THE COMPOUNDS IN THIS PRODUCT IS LISTED BY IARC, NTP, OR OSHA AS A CARCINOGEN.
CHEMICAL BURNS.WHITE WRINKLED DISCOLORATION YIELDING SERIOUS BURNS OR SYSTEMIC POISONING.IRRITATION OF EYES,NOSE AND THROAT.MAY BE FATAL.
INGESTION:SYSTEMIC POISONING.BURNING PAIN FROM MOUTH TO STOMACH.FATAL.
Med Cond Aggravated By Exp: PERSONS WITH A HISTORY OF AILMENTS OR WITH A PRE-EXISTING DISEASE INVOLVING THE EYES, SKIN, OR RESPIRATORY TRACT MAY BE AT INCREASED RISK FROM EXPOSURE.

Emergency/First Aid Proc: INHALATION:REMOVE TO FRESH AIR. RESUSCITATE IF NOT BREATHING. GET MEDICAL ATTENTION. EYES:IMMEDIATELY FLUSH WITH PLENTY OF REMOVE CONTAMINATED CLOTHING. WASH WITH SOAP AND WATER. IF IRRITATION PERSISTS, GET MEDICAL ADVICE. INGESTION:DO NOT INDUCE VOMITING. GIVE LARGE AMOUNTS OF MILK OR WATER.NOTHING BY MOUTH IF UNCONSCIOUS.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE PERSONNEL.WEAR SCBA AND PROTECTIVE CLOTHING AND EQUIPMENT.ABSORB IN INERT MATERIAL AND PLACE IN A CLOSED METAL CONTAINER.
Neutralizing Agent: NOT APPLICABLE.
Waste Disposal Method: NOTIFY YOUR LOCAL ENVIRONMENTAL OFFICER.DISPOSAL SHOULD BE MADE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS.
Precautions-Handling/Storing: STORE IN A COOL, DRY, WELL VENTILATED AREA. KEEP CONTAINERS TIGHTLY CLOSED WHEN NOT IN USE. PROTECT CONTAINERS FROM PHYSICAL DAMAGE.
Other Precautions: DO NOT TAKE INTERNALLY. DO NOT BREATHE MIST. AVOID PROLONGED OR REPEATED BREATHING OF VAPOR. AVOID CONTACT WITH EYES. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING. FOR INDUSTRIAL USE ONLY.

Control Measures

Respiratory Protection: IF VENTILATION DOES NOT MAINTAIN INHALATION EXPOSURES BELOW PEL(TLV), USE NIOSH/MSHA APPROVED ORGANIC VAPOR CARTRIDGE AND DUST/MIST PRE-FILTER RESPIRATORS AS PER CURRENT 29 CFR 1910.134, INSTRUCTIONS/WARNINGS AND NIOSH-RESPIRATOR SELECTION.
Ventilation: MECHANICAL (GENERAL) ROOM VENTILATION IS NORMALLY ADEQUATE. LOCAL EXHAUST MAY BE REQUIRED IF WORK AREA NOT VENTED.
Protective Gloves: NEOPRENE, NITRILE, PVC OR NATURAL RUBBER
Eye Protection: SAFETY GOGGLES WITH OPTIONAL FACE SHIELD
Other Protective Equipment: EYE WASH STATION AND SAFETY SHOWER. CHEMICAL BOOTS,SLICKER SUIT.
Work Hygienic Practices: OBSERVE GOOD PERSONAL HYGIENE PRACTICES AND RECOMMENDED PROCEDURES. DO NOT WEAR CONTAMINATED CLOTHING OR FOOTWEAR.
Suppl. Safety & Health Data: AVOID PROLONGED OR REPEATED EXPOSURE. DO NOT GET ON SKIN OR IN EYES. DO NOT BREATHE VAPORS OR MISTS.

Transportation Data

Trans Data Review Date: 89312
DOT PSN Code: DYZ
DOT Proper Shipping Name: CRESOLS
DOT Class: 6.1

DOT ID Number: UN2076
DOT Pack Group: II
DOT Label: POISON, CORROSIVE
IMO PSN Code: EUD
IMO Proper Shipping Name: CRESYLIC ACID
IMO Regulations Page Number: 6114
IMO UN Number: 2022
IMO UN Class: 6.1
IMO Subsidiary Risk Label: CORROSIVE
IATA PSN Code: HPR
IATA UN ID Number: 2022
IATA Proper Shipping Name: CRESYLIC ACID
IATA UN Class: 6.1
IATA Subsidiary Risk Class: 8
IATA Label: TOXIC & CORROSIVE
AFI PSN Code: HPM
AFI Prop. Shipping Name: CRESOLS
AFI Class: 6.1
AFI ID Number: UN2076
AFI Pack Group: II
AFI Label: POISON
AFI Basic Pac Ref: 10-9

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Disposal Data

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Label Data

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Label Required: YES
Technical Review Date: 08NOV89
Label Status: G
Common Name: CRESYLIC ACID,TECHNICAL
Signal Word: DANGER!
Special Hazard Precautions: RAPIDLY ABSORBED THROUGH SKIN! CAUSES SEVERE BURNS. DO NOT GET IN EYES, ON SKIN, ON CLOTHING. AVOID BREATHING VAPOR. DO NOT TAKE INTERNALLY. TARGET ORGANS ARE LUNG,LIVER,EYES,KIDNEYS,SKIN,MUCOUS MEMBRANES AND NERVOUS SYSTEM.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: MERICHEM COMPANY
Label Street: 1914 HADEN ROAD
Label City: HOUSTON
Label State: TX
Label Zip Code: 77015
Label Country: US

http://haz1.siri.org ls/h/q443/q247.html

Label Emergency Number: 713-455-1311/800-424-9300(CHEMTREC)
Year Procured: 1985
==========
URL for this msds http://siri.org. If you wish to change, add to, or delete information in this archive please sent updates to dan@siri.org.

PORTS MSDS #: 6608

PRODUCT: CS INK CS-174-5

PART NUMBER:

FORMULA:

KEYWORD: INK

PORTS NUMBER: 66-009-0997

PORTS MISC INFO:
CS-174-5

PORTS RATING: HFR=210

MANUFACTURER:
AM MULTIGRAPHICS
1800 WEST CENTRAL ROAD
MT. PROSPECT
IL

60056
PHONE: PHONE:
EMERGENCY PHONE: 708-870-5121

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	GT 200 F	
Melting Point. . . .	NA	NOTE: NOT APPLICABLE.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	GT 1.0	
Vapor Pressure . . .	NA	NOTE: NOT APPLICABLE.
Vapor Density. . . .	NA	NOTE: NOT APPLICABLE.
Percent Volatiles. .	NG	
Evaporation Rate . .	LT 1	NOTE: BUAC=1, SLOWER.
pH	NA	NOTE: NOT APPLICABLE.
Molecular Weight . .	NG	
Viscosity.	NG	

Solubility in Water. < 0.1%.
Odor/Appearance/Other Characteristics:
BLACK PASTE, OILY ODOR.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 260 F	NOTE: PMCC.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	NG	
Explosive/Flammable Limits		
Lower (LEL).	NE	NOTE: NOT ESTABLISHED.
Upper (UEL).	NE	NOTE: NOT ESTABLISHED.

Shipping Regulations

UN/NA Number.	NE
D.O.T. Hazard Class. . .	NOT ESTABLISHED
Label	NONE REQUIRED
Proper Shipping Name . .	NOT REGULATED

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Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 3/01/95

http://jupiter.ports/msds/data 6608

===== Component Information =====

.ODIFIED ROSIN ESTERS & HYDROCARBON RESINS
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NE
STEL (MG/M3):
Product %: BT 20 25
C.A.S. No.: NOT GIVEN
Note:
FOR ALL COMPONENTS: NE = NOT ESTABLISHED; ACGIH STEL.

CARBON BLACK
OSHA PEL (PPM):
OSHA PEL (MG/M3): 3.5
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NE
STEL (MG/M3):
Product %: BT 20 25
C.A.S. No.: 1333864
Note:
FOR ALL COMPONENTS: NIOSH (TWA & STEL): NE.

PETROLEUM DISTILLATE
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
:GIH TLV (MG/M3):
STEL (PPM): NE
STEL (MG/M3):
Product %: BT 20 25
C.A.S. No.: NOT GIVEN
Note:
SEVERELY HYDROTREATED / CAS #: NE.

TECHNICAL WHITE OIL
OSHA PEL (PPM):
OSHA PEL (MG/M3): 5
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NE
STEL (MG/M3):
Product %: BT 10 15
C.A.S. No.: 8042475
Note:
PEL: AS OIL MIST.

VEGETABLE OILS
OSHA PEL (PPM):
OSHA PEL (MG/M3): 5
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NE
STEL (MG/M3):
Product %: BT 3 5
C.A.S. No.: NOT GIVEN
lote:
PEL: AS OIL MIST / CAS #: NE.

VEGETALBE OIL ALKYDS
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NE
STEL (MG/M3):
Product %: BT 3 5
C.A.S. No.: NOT GIVEN
Note:
NON-HAZARDOUS / CAS # NE.

BODIED LINSEED OIL
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NE
STEL (MG/M3):
Product %: BT 3 5
C.A.S. No.: 67746081
Note:
NON-HAZARDOUS.

ANTI-OXIDANT COMPOUND
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NE
STEL (MG/M3):
Product %: BT 3 5
C.A.S. No.: NOT GIVEN
Note:
NON-HAZARDOUS / CAS #: NE.

===== I. PRODUCT IDENTIFICATION =====

TRADE NAME: CS Inks

NAME/SYNONYM: Lithographic Ink

PART NUMBERS:

CS-174-9
CS-174-C
CS-174-5

MSDS CODE NO.: 031

DATE (REVISED): March 1, 1995

EMERGENCY PHONE - DAY: (708) 870-5121
EMERGENCY PHONE - NIGHT: (708) 398-1900

MANUFACTURER/DISTRIBUTOR'S NAME AND ADDRESS:

AM MULTIGRAPHICS
1800 WEST CENTRAL ROAD
MT. PROSPECT, ILLINOIS 60056

===== II. INGREDIENTS - CONFIDENTIAL INFORMATION FOR ..... =====

II. INGREDIENTS - CONFIDENTIAL INFORMATION FOR SAFETY/HEALTH USE ONLY

SEE COMPONENT INFORMATION.

HEMICAL NAME	NTP, IARC, OSHA CARCINOGEN
*Modified rosin esters & hydrocarbon resins	No
Carbon black***	No
Petroleum distillate (severely hydrotreated)	No
Technical white oil	No
Vegetable oils	No
*Vegetable oil alkyds	No
*Bodied linseed oil	No
*Anti-oxidant compound	No

*Non-hazardous as defined by 29CFR1910.1200.
**As oil mist.
***When wetted with vehicle, as in this product, it is no longer considered to be a health hazard.

===== III. PHYSICAL PROPERTIES =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

===== IV. FIRE AND EXPLOSION HAZARD =====

FLASH POINT: 260'F PMCC

FLAMMABLE LIMITS:

LEL: N/E
UEL: N/E

EXTINGUISHING MEDIA: Foam, CO2, dry chemical.

SPECIAL FIRE FIGHTING PROCEDURE: Water can be used to keep material cool. Self-contained breathing apparatus may be required.

UNUSUAL FIRE/EXPLOSION HAZARDS: Dense smoke generated while burning.

===== V. REACTIVITY DATA =====

STABILITY: Stable

CONDITIONS TO AVOID: Excess heat.

INCOMPATIBILITY, MATERIALS TO AVOID: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: Dense smoke and possible carbon dioxide and carbon monoxide.

HAZARDOUS POLYMERIZATION: Will not occur.

===== VI. SPILL OR LEAK PROCEDURE/WASTE DISPOSAL =====

Wipe up spills with rags. Dispose of rags in containers for oily waste.

DISPOSAL: Landfill or incineration in accordance with local, state and federal regulations for non-hazardous waste.

===== VII. HEALTH HAZARD DATA =====

ROUTES OF ENTRY, SIGNS AND SYMPTOMS OF OVEREXPOSURE, ACUTE AND CHRONIC

EFFECTS:

EYE: Contact may cause burning and irritation.

SKIN: Prolonged or repeated exposure may cause irritation or dermatitis.

INHALATION: Excessive inhalation of vapors may cause headaches, dizziness, drowsiness and nausea.

INGESTION: May cause irritation or gastric disturbance.

TARGET ORGANS: Skin

CARCINOGENICITY: Ingredients not found in NTP, OSHA or IARC.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY NORMAL EXPOSURE: Some skin disorders, such as dermatitis.

EMERGENCY AND FIRST AID:

EYE: Rinse with water, at least 15 minutes. If irritation persists, consult a physician.

SKIN: Wash with mild soap and water.

INHALATION: Remove to fresh air. Apply respiration or oxygen if needed. Consult a physician.

INGESTION: DO NOT induce vomiting. Get medical aid.

===== VIII. SPECIAL PROTECTION INFORMATION =====

RESPIRATION PROTECTION: Not normally required.

VENTILATION: General ventilation as per local or state regulations.

PROTECTIVE GLOVES: Not required

EYE PROTECTION: Optional

OTHER PROTECTION: Apron, footwear, impervious clothing as needed to avoid excessive skin contact.

===== IX. SPECIAL PRECAUTIONS =====

HANDLING AND STORAGE: Keep containers closed when not in use. Keep away from heat, sparks and open flame.

OTHER: Wash hands and face with soap and water before eating. Do not reuse container. Keep from reach of children. For Commercial/Industrial use only.

===== X. ENVIRONMENTAL DATA =====

HAZARDOUS SUBSTANCE (40 CFR 372: SARA Sec. 313): None

REPORTABLE QUANTITY (40 CFR 355: SARA Sec. 302): None

HAZARDOUS SUBSTANCE (40 CFR 302: CERCLA Table 302.4): None

RCRA WASTE NUMBER: None

VOLATILE ORGANIC COMPOUNDS: 0.42 lbs/gal or 51 g/l (EPA method 24)

SARA HAZARD CLASS:

ACUTE: No

CHRONIC: No
FIRE: No
PRESSURE: No
REACTIVITY: No

H.M.I.S. RATING:

HEALTH: 1
FLAMMABILITY: 1
REACTIVITY: 0

===== XI. DOT SHIPPING INFORMATION =====

SURFACE: Not Regulated

AIR: Not Regulated

PROPER SHIPPING NAME: N/A

UN: N/E

CLASS: N/E

LABELS: None required

NOTE: The chemicals in this product are listed on the TSCA inventory.

===== XII. DISCLAIMER =====

The information contained in this Material Safety Data Sheet is furnished without warranty of any kind. AM Multigraphics believes that the information contained herein is current as of the revision data of this MSDS. Since the conditions of use of this product are beyond the control of AM Multigraphics, it is the obligation of the user to determine the conditions for safe use.

N/A = Not Applicable
N/E = Not Established

PORTS MSDS #: 309

PRODUCT: STANDARD, INORGANIC PRIORITY POLLUTANT-SOIL(CYANIDE)

PART NUMBER:

FORMULA:

KEYWORD: STANDARD

PORTS NUMBER: 00190038-40

PORTS MISC INFO:
NOT GIVEN

PORTS RATING: HFR=100

MANUFACTURER:
ENVIRONMENTAL RESOURCES ASSOCIATION
5540 MARSHALL ST.
ARVADA
CO

80002
PHONE: PHONE: 303-431-8454
EMERGENCY PHONE: 303-431-8454

===== Physical/Chemical Characteristics =====

Boiling Point. . . . NA
Melting Point. . . . NA
Freezing Point . . . NG
Pour Point . . . . . NG
Softening Point. . . NG

Specific Gravity . . EQ 1.20
Vapor Pressure . . . NA
Vapor Density. . . . GT 1 NOTE: HEAVIER.
Percent Volatiles. . NG
Evaporation Rate . . NA
pH . . . . . NA
Molecular Weight . . NG
Viscosity. . . . . NG
Solubility in Water. COMPLETE.
Odor/Appearance/Other Characteristics:
LIGHT BROWN SOIL, ODORLESS.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . . N* NOTE: NOT IGNITABLE.
Flash Point, Open Cup . . . N* NOTE: NOT IGNITABLE.
Fire Point. . . . . NG
Auto Ignition. . . . . NG
Explosive/Flammable Limits
Lower (LEL). . . . . NA
Upper (UEL). . . . . NA

Shipping Regulations
UN/NA Number. . . . . NG
D.O.T. Hazard Class. . . NG
Label . . . . . NOT GIVEN
Proper Shipping Name . . NOT GIVEN

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Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 7/29/94

===== Component Information =====

BLANK SOILS
OSHA PEL (PPM): NA
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NA
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 100
C.A.S. No.: NOT GIVEN

BLANK SANDS
OSHA PEL (PPM): NA
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NA
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 100
C.A.S. No.: NOT GIVEN

===== IDENTIFICATION =====

IDENTITY: Blank Soil and Sand (laboratory standard)

EMERGENCY TEL: 303) 431-8454

INFO. TEL. NUM: 303) 431-8454

DATE: JULY 29, 1994

MANUFACTURER'S NAME AND ADDRESS:

ENVIRONMENTAL RESOURCE ASSOCIATES
5540 MARSHAL STREET
ARVADA, COLORADO 80002

===== HAZARDOUS INGREDIENTS/IDENTITY =====

SEE COMPONENT INFORMATION.

Blank Soil and Sand products consist of either precleaned soil or silica sand. They do not contain any hazardous components at a concentration that might be expected to cause any toxic effects under ordinary conditions of use and handling.

===== PHYSICAL/CHEMICAL CHARACTERISTICS =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

===== FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT (METHOD): Not ignitable

FLAMMABLE LIMITS:

LEL: N/A
UEL: N/A

EXTINGUISHING MEDIA: None

SPECIAL FIRE PROCEDURES: None

UNUSUAL FIRE/EXPLOSION HAZARDS: None

:=== REACTIVITY DATA =====

STABILITY: Stable

CONDITIONS TO AVOID: None

HAZARDOUS POLYMERIZATION: No

CONDITIONS TO AVOID: None

===== HEALTH HAZARD DATA =====

ROUTE(S) OF ENTRY:

INHN: Yes
SKIN: Yes
INGESTION: Yes

HEALTH HAZARDS:

CARCINOGENICITY:

NTP: NO
IARC MONOGRAPHS: No
OSHA REGULATED: No

SIGNS AND SYMPTOMS: Irritation of nasal passages, sneezing, tearing of eyes

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Dermititis, Bronchitis, asthma

EMERGENCY AND FIRST AID PROCEDURES: Remove from exposure. Wash skin and eyes with clear water.

===== PRECAUTIONS FOR SAFE HANDLING AND USE =====

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Collect the spilled material being careful to avoid creating excessive dust.

WASTE DISPOSAL METHOD: Dispose of as non-hazardous waste

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Protect from rough handling might cause breakage

OTHER PRECAUTIONS: Avoid breathing dust

===== CONTROL MEASURES =====

RESPIRATORY PROTECTION (SPECIFY TYPE): Use adequate ventilation

VENTILATION:

LOCAL EXHAUST: Adequate Vent
Mechanical hood
SPECIAL:
OTHER:

PROTECTIVE GLOVES: Neoprene or Vinyl

EYE PROTECTION: Safety glasses

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Laboratory coat and closed shoes

WORK/HYGIENIC PRACTICES: Wash hands with soap and warm water

PORTS MSDS #: 5713

PRODUCT: CYCLOHEXANONE

PART NUMBER:

FORMULA: C6H10O

KEYWORD: SOLVENT

PORTS NUMBER: 03-403-2080; 66-003-5660

PORTS MISC INFO:
01-03-2080

PORTS RATING: HFR=321

MANUFACTURER:
HACH CO.
P.O. BOX 907
AMES
IA

50010
PHONE: PHONE: 800-227-4224
EMERGENCY PHONE: 303-623-5716

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 312.08 F	NOTE: 155.6'C.
Melting Point. . . .	EQ -52.6 F	NOTE: -47'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .948	
Vapor Pressure . . .	EQ 136	NOTE: MM @ 100'C.
Vapor Density. . . .	EQ 3.4	
Percent Volatiles. .	NG	
Evaporation Rate . .	ND	
pH	ND	NOTE: NOT DETERMINED.
Molecular Weight . .	NG	
Viscosity.	NG	

Solubility in Water. SLIGHTLY SOLUBLE. ACID: ND; OTHER: MOST ORGANIC SOLVENT
Odor/Appearance/Other Characteristics:
PEPPERMINT ODOR / WHITE TO YELLOW, OILY LIQUID.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 111 F	NOTE: 44'C.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	EQ 788 F	NOTE: 420'C.

Explosive/Flammable Limits
Lower (LEL). . . . . EQ 1.1
Upper (UEL). . . . . EQ 9.4

Shipping Regulations

UN/NA Number.	NA1915
D.O.T. Hazard Class. . .	3
Label	NOT GIVEN
Proper Shipping Name . .	CYCLOHEXANONE

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Preparer/Contact Information: REGULATORY AFFAIRS DEPT.

Date Prepared/Revised 1/01/95

===== Component Information =====

CYCLOHEXANONE
OSHA PEL (PPM): 25
OSHA PEL (MG/M3):
ACGIH TLV (PPM): 25
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 100
C.A.S. No.: 108941
Note:
PEL & TLV: SKIN.

===== PRODUCT IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

PRODUCT NAME: Cyclohexanone

CAS NO: 108-94-1

CHEMICAL NAME: Cyclohexanone

CHEMICAL FAMILY: Ketones

CAT. NO.: 14033

EMERGENCY TELEPHONE & ROCKY MOUNTAIN POISON CTR.: (303) 623-5716

MANUFACTURER NAME AND ADDRESS:

HACH CO.
P.O. BOX 907
AMES, IA 50010

FOR ASSISTANCE, CONTACT: (800) 227-4224

REGULATORY AFFAIRS DEPT.
PO BOX 907 AMES, IA 50010
(800) 227-4224

MANUFACTURER'S NAME AND ADDRESS:

HACH COMPANY
PO BOX 907
AMES, IA 50010

===== INGREDIENTS =====

SEE COMPONENT INFORMATION.

CYCLOHEXANONE

SARA: NOT LISTED
RCRA: U057
HAZARD: Combustible; Causes eye irritation; Moderately toxic

===== PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

SOLUBILITY IN:

ACID: Not determined
OTHER: Most organic solvents.

ETAL CORROSIVITY:

ALUMINUM: ND
STEEL: ND

STABILITY: Stable

STORAGE PRECAUTIONS: Store in a cool, dry, dark place.

===== FIRE, EXPLOSION HAZARD AND REACTIVITY DATA =====

FLASH POINT: 44'C; 111'F

METHOD: CLOSED CUP

FLAMMABILITY LIMITS:

LOWER: 1.1%
UPPER: 9.4%

SUSCEPTIBILITY TO SPONTANEOUS HEATING: None

SHOCK SENSITIVITY: None

AUTOIGNITION PT.: 420'C; 788'F

EXTINGUISHING MEDIA: Dry chemical, alcohol foam or carbon dioxide.

FIRE/EXPLOSION HAZARDS: Combustible; may react violently with oxidizers.

HAZARDOUS DECOMP. PRODUCTS: May emit toxic fumes of carbon monoxide and carbon dioxide.

OXIDIZER: No

NFPA CODES:

HEALTH: 1
FLAMMABILITY: 2
REACTIVITY: 0

CONDITIONS TO AVOID: Extreme temperatures; contact with oxidizers such as nitric acid, hydrogen peroxide, reducers, acids and alkalies.

===== HEALTH HAZARD DATA =====

THIS PRODUCT MAY BE: Irritating to eyes, skin and respiratory tract.

ACUTE TOXICITY:

Oral rat LD50 = 1535 mg/kg = Moderately toxic;
Inhalation rat LC50 = 8000 ppm/4 hours;
Skin rabbit LD50 = 948 mg/kg

ROUTES OF EXPOSURE: Ingestion, inhalation, skin absorption.
TARGET ORGANS: Kidneys, liver

CHRONIC TOXICITY: Not determined

ROUTES OF EXPOSURE: Not determined
TARGET ORGANS: Kidneys, liver

CANCER INFORMATION: Experimental mutagen

ROUTES OF EXPOSURE: Not determined
TARGET ORGANS: Not determined

EREXPOSURE: Causes severe eye and mild skin irritation. May cause nausea, vomiting, diarrhea, headaches, weakness, dizziness, drowsiness, loss of coordination, central nervous system depression, consciousness, coma, death.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing liver and kidney conditions.

===== PRECAUTIONARY MEASURES =====

Avoid contact with eyes, skin and clothing.

Do not breathe vapor.

Wash thoroughly after handling.

Keep away from heat, sparks and open flame.

Keep away from oxidizers.

PROTECTIVE EQUIPMENT: Fume hood, lab grade goggles, disposable latex gloves, lab coat.

===== FIRST AID =====

EYE AND SKIN CONTACT: Immediately flush eyes and skin with water for 15 minutes. Remove contaminated clothing. Call physician.

INGESTION: Do NOT induce vomiting. Give 1 - 2 glasses of water. Call a physician immediately. Never give anything by mouth to an unconscious person.

INHALATION: Remove to fresh air. Give artificial respiration if necessary. Call physician.

===== SPILL AND DISPOSAL PROCEDURES =====

IN CASE OF SPILL OR RELEASE: Remove all sources of ignition. Absorb spill with non-reactive absorbent. Do not breathe fumes. Incinerate material in an EPA-approved facility

DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.

===== TRANSPORTATION DATA =====

D.O.T. PROPER SHIPPING NAME: Cyclohexanone

HAZARD CLASS: 3
ID: UN1915
GROUP: III

I.C.A.O. PROPER SHIPPING NAME: Cyclohexanone

HAZARD CLASS: 3
ID: UN1915
GROUP: III

I.M.O. PROPER SHIPPING NAME: Cyclohexanone

HAZARD CLASS: 3.3
ID: UN1915
GROUP: III

http://jupiter.ports/msds/data/5713

===== REFERENCES =====

1) TLV's Threshold Limit Values and Biological Exposure Indices for 1988-89. American Conference of Governmental Industrial Hygienists, 1988.

2) Air Contaminants, Federal Register, Vol. 54, No. 12, Thursday, January 19, 1989, pp. 2332-2983.

3) Sax, N. Irving. Dangerous Properties of Industrial Materials, 6th Ed. New York: Van Nostrand Reinhold Co. 1984.

4) The Merck Index, 11th Ed. Rahway, New Jersey: Merck and Co., Inc., 1989

5) Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Association, 1991.

6) Technical judgment

7) NIOSH Registry of Toxic Effects of Chemical Substances, 1985-86. Cincinnati: U.S. Department of Health and Human Services, April 1987.

8) Patty, Frank A. Industrial Hygiene and Toxicology, 3rd Revised Edition. Volume 2. New York; a Wiley-Interscience Publication, 1981.

===== SPECIAL NOTES =====

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

HACH COMPANY, WORLD HEADQUARTERS, PO BOX 389, LOVELAND, CO 80539

HACH EUROPE, BP 229, B5000 NAMUR 1, BELGIUM

(C) HACH CO. 1995

http://haz1.siri.org:80/msds/h/q362/q130945

MULTIGRAPHICS DIV; AM INTERNATIONAL -- DEGLAZING SOLV. #S 83-0-105532, 83-9-105533 -
MATERIAL SAFETY DATA SHEET
CAS# 71-55-6
MSDS Ser BJMBQ
Deglazing Solv
NSN: 6850002011269
Manufacturer's CAGE: 09177
Part No. Indicator: B
Part Number/Trade Name: DEGLAZING SOLV. #S 83-0-105532, 83-9-105533

General Information

Item Name: LITHOGRAPHING FOUNTAIN SOLUTION
Company's Name: MULTIGRAPHICS DIVISION; AM INTERNATIONAL, INC.
Company's Street: 1800 WEST CENTRAL ROAD
Company's City: MT.PROSPECT
Company's State: IL
Company's Country: US
Company's Zip Code: 60056-2293
Company's Emerg Ph #: 312-870-5121 (DAY) 398-1900 (NIGHT)
Company's Info Ph #: 312-870-5121
Record No. For Safety Entry: 002
Tot Safety Entries This Stk#: 004
Status: SE
Date MSDS Prepared: 01APR89
Safety Data Review Date: 14JAN91
Supply Item Manager: CX
MSDS Preparer's Name: NORMAN J. ENGLBRECHT
MSDS Serial Number: BJMBQ
Hazard Characteristic Code: N1

Ingredients/Identity Information

Proprietary: NO
Ingredient: METHYL CHLOROFORM (1,1,1-TRICHLOROEHANE) (SARA III)
Ingredient Sequence Number: 01
Percent: 96%
NIOSH (RTECS) Number: KJ2975000
CAS Number: 71-55-6
OSHA PEL: 350 PPM/450 STEL
ACGIH TLV: 350 PPM/450STEL;9192
Other Recommended Limit: NONE SPECIFIED

Physical/Chemical Characteristics

Appearance And Odor: CLEAR COLORLESS LIQUID WITH ETHERAL ODOR.
Boiling Point: 154F,68C
Vapor Pressure (MM Hg/70 F): 120
Vapor Density (Air=1): 4.54
Specific Gravity: 1.31
Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: 0.35 (BUTYL ACETATE= 1)
Solubility In Water: NEGLIGIBLE
Corrosion Rate (IPY): UNKNOWN

Fire and Explosion Hazard Data

Flash Point: NONE
Flash Point Method: TCC
Lower Explosive Limit: 7
Upper Explosive Limit: 15
Extinguishing Media: USE WATER FOG, CARBON DIOXIDE OR DRY CHEMICAL.
Special Fire Fighting Proc: FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT FOR POSSIBLE EXPOSURE TO HYDROGEN CHLORIDE AND POSSIBLE TRACES OF PHOSGENE.
Unusual Fire And Expl Hazrds: VAPORS CONCENTRATED IN A CONFINED OR POORLY VENTILATED AREA CAN BE IGNITED UPON CONTACT WITH A HIGH ENERGY SPARK, FLAME, OR HIGH HEAT SOURCE.

Reactivity Data

Stability: YES

Cond To Avoid (Stability): HIGH TEMPERATURES, SPARKS, AND OPEN FLAMES
Materials To Avoid: CAUSTICS, OXIDIZERS AND ALUMINUM.
Hazardous Decomp Products: HYDROGEN CHLORIDE AND POSSIBLE TRACE OF PHOSGENE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT APPLICABLE

Health Hazard Data

LD50-LC50 Mixture: UNKNOWN
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: EYE IRRITANT, MILDLY IRRITATING TO SKIN, WILL DEFAT SKIN. SLIGHTLY TOXIC, ANASTHETHIC EFFECTS MAY OCCUR IN RANGES OF 1000 PPM IF INHALED. NOT SIGNIFICANTLY TOXIC IF INGESTED.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE OF THE COMPOUNDS IN THIS PRODUCT IS LISTED BY IARC, NTP, OR OSHA AS A CARCINOGEN.
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.
Med Cond Aggravated By Exp: INCREASED SENSITIVITY TO ADRENALIN MAY BE CAUSED BY OVEREXPOSURE.
Emergency/First Aid Proc: INHALATION:REMOVE TO FRESH AIR. RESUSCITATE IF NOT BREATHING. GET MEDICAL ATTENTION. EYES:IMMEDIATELY FLUSH WITH PLENTY OF REMOVE CONTAMINATED CLOTHING. WASH WITH SOAP AND WATER. IF IRRITATION PERSISTS, GET MEDICAL ADVICE. INGESTION:DO NOT INDUCE VOMITING. GIVE MILK OR USP MINERAL OIL. GET IMMEDIATE MEDICAL ATTENTION.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: SMALL SPILL: WIPE/SOAK UP WITH TOWELS OR RAGS. LARGE SPILL: WEAR SUITABLE MASK - EVAPORATES RAPIDLY. DO NOT POUR DOWN DRAIN.
Neutralizing Agent: NOT APPLICABLE.
Waste Disposal Method: DISPOSAL SHOULD BE MADE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS.
Precautions-Handling/Storing: STORE IN A COOL, DRY, WELL VENTILATED AREA. KEEP CONTAINERS TIGHTLY CLOSED WHEN NOT IN USE. PROTECT CONTAINERS FROM PHYSICAL DAMAGE.
Other Precautions: READ AND FOLLOW DIRECTIONS ON LABEL. DO NOT REUSE CONTAINER. DO NOT USE WITH ALUMINUM.

Control Measures

Respiratory Protection: IF VENTILATION DOES NOT MAINTAIN INHALATION EXPOSURES BELOW PEL(TLV), USE NIOSH/MSHA APPROVED ORGANIC VAPOR CARTRIDGE AND DUST/MIST PRE-FILTER RESPIRATORS AS PER CURRENT 29 CFR 1910.134, INSTRUCTIONS/WARNINGS AND NIOSH-RESPIRATOR SELECTION.
Ventilation: LOCAL EXHAUST ONLY TO REMAIN BELOW 50% OF TLV.
Protective Gloves: NEOPRENE
Eye Protection: SAFETY GLASSES WITH OPTIONAL FACE SHIELD
Other Protective Equipment: EYE WASH STATION AND SAFETY SHOWER. INDUSTRIAL-TYPE WORK CLOTHING AND APRON AS REQUIRED.
Work Hygienic Practices: OBSERVE GOOD PERSONAL HYGIENE PRACTICES AND RECOMMENDED PROCEDURES. DO NOT WEAR CONTAMINATED CLOTHING OR FOOTWEAR.
Suppl. Safety & Health Data: AVOID PROLONGED OR REPEATED EXPOSURE. DO NOT GET ON SKIN OR IN EYES. DO NOT BREATHE VAPORS OR MISTS.

Transportation Data

Disposal Data

Label Data

Label Required: YES

Technical Review Date: 14JAN91
Label Status: F
ommon Name: DEGLAZING SOLV. #S 83-0-105532, 83-9-105533
hronic Hazard: YES
Signal Word: WARNING!
Acute Health Hazard-Moderate: X
Contact Hazard-Moderate: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: VAPORS MAY CAUSE DIZZINESS OR SUFFOCATION. EXPOSURE IN AN ENCLOSED AREA MAY BE VERY HARMFUL. CONTACT MAY IRRITATE OR BURN SKIN AND EYES. FIRE MAY PRODUCE IRRITATING OR POISONOUS GASES. RUNOFF FROM FIRE CONTROL OR DILUTION WATER MAY CAUSE POLLUTION. EYE IRRITANT, MILDLY IRRITATING TO SKIN, WILL DEFAT SKIN. SLIGHTLY TOXIC, ANASTHETHIC EFFECTS MAY OCCUR IN RANGES OF 1000 PPM IF INHALED. NOT SIGNIFICANTLY TOXIC IF INGESTED.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: MULTIGRAPHICS DIVISION; AM INTERNATIONAL, INC.
Label Street: 1800 WEST CENTRAL ROAD
Label City: MT.PROSPECT
Label State: IL
Label Zip Code: 60056-2293
Label Country: US
Label Emergency Number: 312-870-5121 (DAY) 398-1900 (NIGHT)
==========
URL for this msds http://siri.org. If you wish to change, add to, or delete information in this archive please sent updates to dan@siri.org.

PORTS MSDS #: 5809

PRODUCT: ELECTROSTATIC SOLUTION

PART NUMBER: 83-1-104054

FORMULA:

KEYWORD: HFR=220

PORTS NUMBER: 66-020-2270; 66-001-0135

PORTS MISC INFO:
NOT GIVEN

PORTS RATING: HFR=210

MANUFACTURER:
AM MULTIGRAPHICS
1800 WEST CENTRAL ROAD
MT. PROSPECT
IL

60056
PHONE: PHONE:
EMERGENCY PHONE: 708-870-5121

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 212 F	
Melting Point. . . .	NA	NOTE: NOT APPLICABLE.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ 1.08	
Vapor Pressure . . .	EQ 15	NOTE: MMHG @ 25'C.
Vapor Density. . . .	NE	NOTE: NOT ESTABLISHED.
Percent Volatiles. .	NG	
Evaporation Rate . .	LT 1	NOTE: WATER=1, SLOWER.
pH	EQ 4.5	
Molecular Weight . .	NG	
Viscosity.	NG	

Solubility in Water. COMPLETE.
Odor/Appearance/Other Characteristics:
YELLOW GREEN LIQUID, SLIGHT ALMOND ODOR.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NO	NOTE: NONE.
Flash Point, Open Cup . . .	NO	NOTE: NONE.
Fire Point.	NG	
Auto Ignition.	NG	
Explosive/Flammable Limits		
Lower (LEL).	NA	NOTE: NOT APPLICABLE.
Upper (UEL).	NA	NOTE: NOT APPLICABLE.

Shipping Regulations

UN/NA Number.	NE
D.O.T. Hazard Class. . .	NOT ESTABLISHED
Label	NONE REQUIRED
Proper Shipping Name . .	NOT APPLICABLE

==========

Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 3/01/95

===== Component Information =====

POTASSIUM HEXACYANOFERRATE
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NE
STEL (MG/M3):
Product %: BT 2 5
C.A.S. No.: 13943583
Note:
FOR ALL COMPONENTS: NE: NOT ESTABLISHED.

MONOAMMONIUM PHOSPHATE
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NE
STEL (MG/M3):
Product %: BT 8 10
C.A.S. No.: 7722761

GLYCERINE
OSHA PEL (PPM):
OSHA PEL (MG/M3): 10
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 10
STEL (PPM): NE
STEL (MG/M3):
Product %: BT 12 14
C.A.S. No.: 56815
Note:
PEL & TLV: AS MIST ONLY.

GUM ARABIC
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NE
STEL (MG/M3):
Product %: BT 1 2
C.A.S. No.: 9000015

WATER
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NE
STEL (MG/M3):
Product %: BT 74 79
C.A.S. No.: 7732185

===== I. PRODUCT IDENTIFICATION =====

TRADE NAME: Electrostatic Solution

NAME/SYNONYM: Conversion Solution

PART NUMBERS:

83-1-104054 1 gal.
83-0-104055 5 gal.
200-1050-50A 50 gal.

DATE: March 1, 1995 (Revised)

MSDS CODE NO.: 095

EMERGENCY PHONE:

DAY: (708) 870-5121
NIGHT: (708)-398-1900

MANUFACTURED/DISTRIBUTED BY:

AM MULTIGRAPHICS
1800 WEST CENTRAL ROAD
MT. PROSPECT, ILLINOIS 60056

===== II. INGREDIENTS =====

II. INGREDIENTS - CONFIDENTIAL INFORMATION FOR SAFETY/HEALTH USE ONLY

SEE COMPONENT INFORMATION.

(ALL EXPOSURE LIMITS ARE PPM UNLESS OTHERWISE NOTED)

CHEMICAL NAME	OSHA PEL TWA	ACGIH, NIOSH TLV, EXPOSURE STEL	NTP, IARC OSHA LIMITS CARCINOGEN
* Potassium hexacyanoferrate			No
* Momoammonium phosphate			No
* glycerine			No
* gum arabic			No
* water			No

* Non-hazardous as defined by 29 CFR 1910.1200.

** As mist only.

===== III. PHYSICAL PROPERTIES =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

===== IV. FIRE AND EXPLOSION HAZARD =====

FLASH POINT (METHOD): None

FLAMMABLE LIMITS:

LEL: N/A
UEL: N/A

EXTINGUISHING MEDIA: Compatible with all extinguishing media.

SPECIAL FIRE FIGHTING PROCEDURE: None

UNUSUAL FIRE/EXPLOSION HAZARDS: Catastrophic accidents, involving large quantities of product and accompanied by fire or contact with large quantities of strong acid, response personnel will be required to wear NIOSH/MSHA approved self-contained breathing apparatus due to, and dependent upon, the quantities of cyanide.

===== V. REACTIVITY DATA =====

STABILITY: Stable under normal conditions of use

CONDITIONS TO AVOID: Stroang light & heat

INCOMPATIBILITY, MATERIALS TO AVOID: Chlorine bleach, strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS: Product will slowly decompose with formation of hydrocyanic acid, complex cyanoferrates and cyanides.

HAZARDOUS POLYMERIZATION: Will not occur.

===== VI. SPILL OR LEAK PROCEDURE/WASTE DISPOSAL =====

Flush with water to drain.

DISPOSAL: Small quantities such as employed in normal use may be flushed with water to drain. Do not mix with acid wastes. Larger quantities should not be dumped into waterways, check Federal, State and Local regulations regarding disposal of hexacyanoferrate salts (Generally 2 ppm maximum in streams and lakes).

===== VII. HEALTH HAZARD DATA =====

ROUTES OF ENTRY, SIGNS AND SYMPTOMS OF OVEREXPOSURE, ACUTE AND CHRONIC EFFECTS:

EYE: May cause eye irritation.

SKIN: Prolonged contact may cause skin irritation.

INHALATION: Not a normal route of entry.

INGESTION: Large doses may cause gastro-intestinal irritation.

TARGET ORGANS: None known

CARCINOGENICITY: Not found in NTP, IARC or OSHA.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY NORMAL EXPOSURE: None. Hexacyanoferrate salts are considered slightly toxic to humans, regardless of whether exposure is acute dermal, acute ingestion or chronic systemic. Any effect on the human body is temporary and reversible and the effect disappears following termination of exposure.

EMERGENCY AND FIRST AID:

EYE: Flush with water for 15 minutes. Get medical aid.

SKIN: Wash with soap and water

INHALATION: Not a normal route of entry.

INGESTION: Induce vomiting, get medical aid.

===== VIII. SPECIAL PROTECTION INFORMATION =====

RESPIRATION PROTECTION: N/A

VENTILATION: Normal air conditioning

PROTECTIAVE GLOVES: Not required

EYE PROTECTION: Optional

OTHER PROTECTION: N/A

===== IX. SPECIAL PRECAUTIONS =====

NDLING AND STORAGE: Store in a cool, dark place, away from strong acids and ire hazards. Wash thoroughly after handling.

OTHER: Read label precautions. Do not reuse container. For Commercial use only. Keep from reach of children.

===== X. ENVIRONMENTAL DATA =====

HAZARDOUS SUBSTANCE (40 CFR 372: SARA SEC. 313): None

REPORTABLE QUANTITY (40 CFR 355: SARA SEC. 302) None

HAZARDOUS SUBSTANCE (40 CFR 302: CERCLA TABLE 302.4): None.

RCRA WASTE NUMBER: None

VOLATILE ORGANIC COMPOUNDS: None

SARA HAZARD CLASS:

ACUTE: No
CHRONIC: No
FIRE: No
PRESSURE: No
REACTIVITY: No

NFPA HAZARD RATING:

HEALTH: 1
FLAMMABILITY: 0
REACTIVITY: 0
SPECIFIC HAZARD: N/A

===== XI. DOT SHIPPING INFORMATION =====

SURFACE: Non-hazardous

AIR: Non-hazardous

PROPER SHIPPING NAME: N/A

UN: N/E
CLASS: N/E
LABELS: None required

NOTE: The chemicals in this product are listed on the TSCA inventory.

===== XII. DISCLAIMER =====

The information contained in this Material Safety Data Sheet is furnished without warranty of any kind. AM Multigraphics believes that the information contained herein is current as of the revision date of this MSDS. Since the conditions of use of this product are beyond the control of AM Multigraphics, it is the obligation of the user to determine the conditions for safe use.

N/A = Not Applicable
N/E = Not Established

http://haz1.siri.or -/l/q209/q193.html

POLYSCIENCE -- ENDRIN, 510C-4
MATERIAL SAFETY DATA SHEET
NSN: 681000N047396
Manufacturer's CAGE: 58378
Part No. Indicator: A
Part Number/Trade Name: ENDRIN, 510C-4

==========

General Information

==========

Company's Name: POLYSCIENCE
Company's Street: 7800 MERRIMAC AVE
Company's City: NILES
Company's State: IL
Company's Country: US
Company's Zip Code: 60648
Company's Emerg Ph #: 321-965-0611
Company's Info Ph #: 321-965-0611
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 01MAR92
Safety Data Review Date: 14NOV95
MSDS Serial Number: BSTJG
Hazard Characteristic Code: T2

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Ingredients/Identity Information

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Proprietary: NO
Ingredient: 1,4:5,8-DIMETHANONAPHTHALENE, 1,2,3,4,10,10-HEXACHLORO-6, 7-EPOXY-1, 4,4A,5,6,7,8,8A- OCTAHYDRO-, ENDO, ENDO-; (ING 2)
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: IO1575000
CAS Number: 72-20-8
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

Proprietary: NO
Ingredient: ING 1: (ENDRIN) (MFR CAS # 105208-85-3)
Ingredient Sequence Number: 02
NIOSH (RTECS) Number: 9999999ZZ
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

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Physical/Chemical Characteristics

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Appearance And Odor: NONE SPECIFIED BY MANUFACTURER.

CAS# 72-20-8
MSDS Serial BSTJG
Endrin

http://haz1.siri.org:80/ 's/h/q209/q193.htm

Fire and Explosion Hazard Data

Extinguishing Media: USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: STRONG OXIDIZING AGENTS, ACIDS.
Hazardous Decomp Products: TOXIC FUME OF: CARBON MONOXIDE, CARBON DIOXIDE. HYDROGEN CHLORIDE GAS.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

Health Hazard Data

LD50-LC50 Mixture: LD50:(ORAL,RAT)3 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: ACUTE: MAY BE FATAL IF INHALED, SWALLOWED/ WEAKNESS, NAUSEA, TWITCHING AND TINGLING OF LIMBS, DEAFNESS AND METAL CONFUSION, CONVULSIONS, SOMETIMES ACCOMPANIED BY VIOLENT MUSCULAR CONTRACTIONS AND PERIODS OF UNCON MAY ALSO OCCUR. (EFTS OF OVEREXP)
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: HLTH HAZ: CHRONIC: CONTAINS A RADIOACTIVE NERVES, LIVER.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: SKIN: OBTAIN MED ATTN IMMED. INGEST: WASH OUT FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. ASSURE ADEQUATE FLUSHING BY SEPARATING EYELIDS W/FINGERS. CALL A PHYSICIAN.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVAC AREA. WEAR NIOSH/MSHA APPRVD SCBA, RUBB BOOTS & HEAVY RUBB GLOVES. COVER W/AN ACTIVATED CARBON ABSORB, TAKE UP & PLACE IN CLSD CONTRS. TRANSPORT OUTDOORS. VENT AREA & WASH SPILL SITE AFTER MATL PICKUP IS COMPLETE. HNDLE AS A RADIOACTIVE SPILL.

http://haz1.siri.org /h/q209/q193.html

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISPOSE OF SPILLED MATERIAL AS RADIOACTIVE WASTE. CONSULT LOCAL, STATE AND FEDERAL REGULATIONS ON DISPOSAL OF RADIOACTIVE WASTE. OBSERVE ALL FEDERAL, STATE, AND LOCAL LAWS.
Precautions-Handling/Storing: DO NOT BREATHE VAPOR. RADOIACTIVE MATERIAL. CAN CAUSE DEPRESSION.
Other Precautions: VERY TOXIC BY INHALATION, IN CONTACT W/SKIN AND IF SWALLOWED. IRRITATING TO EYES, RESP SYS AND SKIN. KEEP AWAY FROM SOURCES OF IGNITION. NO SMOKING.

Control Measures

Respiratory Protection: NIOSH/MSHA APPROVED SCBA SHOULD BE WORN.
Ventilation: USE ONLY IN A CHEMICAL FUME HOOD.
Protective Gloves: HEAVY RUBBER GLOVES.
Eye Protection: ANSI APPRVD CHEM WORK GOGGLES (SUPP)
Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER.
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.
Suppl. Safety & Health Data: EYE PROT: WITH FULL LENGTH FACESHIELD (FP N).

Transportation Data

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 19JAN94
Label Date: 19JAN94
Label Status: G
Common Name: ENDRIN, 510C-4
Chronic Hazard: YES
Signal Word: DANGER!
Acute Health Hazard-Severe: X
Contact Hazard-Severe: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: RADIOACTIVE MATERIAL. KEEP FROM IGNITION SOURCES. ACUTE: MAY BE FATAL IF INHALED, SWALLOWED OR ABSORBED THRU SKIN. EXPOSURE CAN CAUSE: WEAKNESS, NAUSEA, TWITCHING AND TINGLING OF LIMBS, DEAFNESS AND MENTAL CONFUSION, CONVULSIONS, SOMETIMES ACCOMPANIED BY VIOLENT MUSCULAR CONTRACTIONS AND PERIODS OF UNCONSCIOUSNESS MAY ALSO OCCUR. CHRONIC: CONTAINS A RADIOACTIVE ISOTOPE WHICH MAY PRODUCE CANCER AND GENETIC MUTATION. TARGET ORGANS: NERVES, LIVER.

http://haz1.siri.org:80/s/h/q209/q193.html

Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: POLYSCIENCE
Label Street: 7800 MERRIMAC AVE
Label City: NILES
Label State: IL
Label Zip Code: 60648
Label Country: US
Label Emergency Number: 321-965-0611

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URL for this msds http://siri.org. If you wish to change, add to, or delete information in this archive please sent updates to dan@siri.org.

LOGOS SCIENTIFIC -- ETHANOL - ETHANOL, REAGENT
MATERIAL SAFETY DATA SHEET
NSN: 6810013155340
Manufacturer's CAGE: 4J986
Part No. Indicator: A
Part Number/Trade Name: ETHANOL

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General Information

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Item Name: ETHANOL, REAGENT
Company's Name: LOGOS SCIENTIFIC INC
Company's Street: 700 SUNSET RD
Company's City: HENDERSON
Company's State: NV
Company's Country: US
Company's Zip Code: 89015-2602
Company's Emerg Ph #: 702-565-1383
Company's Info Ph #: 702-565-1383
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 003
Status: SE
Date MSDS Prepared: 06NOV90
Safety Data Review Date: 20JUL92
Supply Item Manager: CX
MSDS Serial Number: BNKTC
Specification Number: NOT APPLICABLE
Hazard Characteristic Code: F3
Unit Of Issue: BT
Unit Of Issue Container Qty: 32 FL OZ
Type Of Container: BOTTLE
Net Unit Weight: 1.6 LBS
NRC/State License Number: NOT APPLICABLE

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Ingredients/Identity Information

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Proprietary: NO
Ingredient: ETHYL ALCOHOL (ETHANOL)
Ingredient Sequence Number: 01
Percent: 70-98
NIOSH (RTECS) Number: KQ6300000
CAS Number: 64-17-5
OSHA PEL: 1000 PPM
ACGIH TLV: 1000 PPM; 9192
Other Recommended Limit: NONE SPECIFIED

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Physical/Chemical Characteristics

CAS# 64-17-5
MSDS BNKTC
Ethanol

http://haz1.siri.org:80 ls/h/q149/q257.html

Appearance And Odor: CLEAR LIQUID WITH ALCOHOL ODOR.
Boiling Point: 175F,79C
Vapor Pressure (MM Hg/70 F): 40 MM HG
Vapor Density (Air=1): 1.59
Specific Gravity: 0.79
Evaporation Rate And Ref: >1 (ETHER=1)
Solubility In Water: 100%
pH: N/A

Fire and Explosion Hazard Data

Flash Point: 55.6F,13.1C
Flash Point Method: TCC
Lower Explosive Limit: 3.3
Upper Explosive Limit: 19
Extinguishing Media: WATER SPRAY ONLY, DRY CHEMICAL, CARBON DIOXIDE, ALCOHOL FOAM.
Special Fire Fighting Proc: DO NOT USE DIRECT WATER STREAM. WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING.
Unusual Fire And Expl Hazrds: BURNS WITH AN INVISIBLE FLAME IN DAYLIGHT. EXTINGUISH ALL NEARBY SOURCES OF IGNITION BECAUSE VAPORS MAY BE MOVED BY AIR CURRENTS.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): HIGH TEMPERATURES, SPARKS AND OPEN FLAMES.
Materials To Avoid: STRONG OXIDIZERS, CHROMIC ANHYDRIDE, LEAD PERCHLORATE, PERCHLORIC ACID.
Hazardous Decomp Products: NONE SPECIFIED BY MANUFACTURER.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT APPLICABLE

Health Hazard Data

LD50-LC50 Mixture: UNKNOWN
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: SKIN AND EYE IRRITATION. MAY BE FATAL OR CAUSE BLINDNESS.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT APPLICABLE

http://haz1.siri.org ls/h/q149/q257.htm

Signs/Symptoms Of Overexp: HEADACHE, NAUSEA.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES- IRRIGATE IMMEDIATELY WITH WATER FOR 15 MINUTES. CALL PHYSICIAN. SKIN- FLUSH WITH WATER IMMEDIATELY. INHALATION- MOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NEEDED. CALL PHYSICIAN. INGESTION- INDUCE VOMITING. CALL PHYSICIAN.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: ABSORB ON PAPER AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS. FLUSH AREA WITH WATER. LARGE SPILLS SHOULD BE DIKED WITH SOIL OR NON-COMBUSTIBLE ABSORBENT MATERIAL.
Neutralizing Agent: NONE
Waste Disposal Method: ALL LIQUID OR CONTAMINATED ABSORBENT SHOULD BE DISPOSED OF IN DOT-APPROVED WASTE CONTAINERS. COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS FOR DISPOSAL OF THIS MATERIAL.
Precautions-Handling/Storing: KEEP AWAY FORM HEAT, SPARKS, FLAMES. STORE IN COOL, DRY, WELL-VENTILATED AREA AWAY FROM INCOMPATIBLE MATERIALS. VENT CONTAINERS FREQUENTLY.
Other Precautions: DO NOT GET IN EYES, ON SKIN OR CLOTHING. WASH THOROUGHLY AFTER USE.

Control Measures

Respiratory Protection: NONE NORMALLY REQUIRED.
Ventilation: MECHANICAL EXHAUST.
Protective Gloves: CHEMICAL RESISTANT.
Eye Protection: CHEMICAL GOGGLES OR FULL FACE SHIELD.
Other Protective Equipment: LAB COAT.
Work Hygienic Practices: WASH HANDS THOROUGHLY AFTER HANDLING THIS MATERIAL.
Suppl. Safety & Health Data: NONE

Transportation Data

Trans Data Review Date: 92202
DOT PSN Code: FTN
DOT Proper Shipping Name: ETHANOL OR ETHYL ALCOHOL OR ETHANOL SOLUTIONS OR ETHYL ALCOHOL SOLUTIONS
DOT Class: 3
DOT ID Number: UN1170
DOT Pack Group: II
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: GPL
IMO Proper Shipping Name: ETHYL ALCOHOL
IMO Regulations Page Number: 3219 *

http://haz1.siri.org:80 ls/h/q149/q257.htm

IMO UN Number: 1170
IMO UN Class: 3.2
IMO Subsidiary Risk Label: -
IATA PSN Code: KXQ
IATA UN ID Number: 1170
IATA Proper Shipping Name: ETHANOL
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFI PSN Code: KXQ
AFI Prop. Shipping Name: ETHANOL OR ETHANOL SOLUTIONS
AFI Class: 3
AFI ID Number: UN1170
AFI Pack Group: II
AFI Label: FLAMMABLE LIQUID
AFI Basic Pac Ref: 7-7

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Disposal Data

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Label Data

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Label Required: YES
Technical Review Date: 20JUL92
Label Date: 20JUL92
Label Status: F
Common Name: ETHANOL
Chronic Hazard: NO
Signal Word: DANGER!
Acute Health Hazard-Moderate: X
Contact Hazard-Slight: X
Fire Hazard-Severe: X
Reactivity Hazard-None: X
Special Hazard Precautions: SKIN AND EYE IRRITATION. MAY BE FATAL OR CAUSE BLINDNESS. KEEP AWAY FORM HEAT, SPARKS, FLAMES. STORE IN COOL, DRY, WELL-VENTILATED AREA AWAY FROM INCOMPATIBLE MATERIALS. VENT CONTAINERS FREQUENTLY. FIRST AID: EYES- IRRIGATE IMMEDIATELY WITH WATER FOR 15 MINUTES. CALL PHYSICIAN. SKIN- FLUSH WITH WATER IMMEDIATELY. INHALATION-MOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NEEDED. CALL PHYSICIAN. INGESTION- INDUCE VOMITING. CALL PHYSICIAN.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: LOGOS SCIENTIFIC INC
Label Street: 700 SUNSET RD
Label City: HENDERSON
Label State: NV

http://haz1.siri.org:8 ls/h/q149/q257.htm

Label Zip Code: 89015-2602
Label Country: US
Label Emergency Number: 702-565-1383

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PORTS MSDS #: 5996

PRODUCT: ETHYL ETHER

PART NUMBER:

FORMULA: C4-H10-O

KEYWORD: ORGANIC

PORTS NUMBER: 66-005-4025; 66-001-6129; 66-005-4023

PORTS MISC INFO:
LAB MSDS# 162

PORTS RATING: HFR=244

MANUFACTURER:
FISHER SCIENTIFIC CO.
1 REAGENT LANE, P.O. BOX 375
FAIR LAWN
NJ

07410
PHONE: PHONE: 201-796-7100
EMERGENCY PHONE: 201-796-7100

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 95 F	NOTE: 35'C.
Melting Point. . . .	EQ -190 F	NOTE: -123'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .7	
Vapor Pressure . . .	EQ 442	NOTE: MMHG @ 20'C.
Vapor Density. . . .	EQ 2.6	
Percent Volatiles. .	NG	
Evaporation Rate . .	EQ 37.5	NOTE: BUAC=1.
pH	NG	
Molecular Weight . .	EQ 74.12	
Viscosity.	NG	

Solubility in Water. 6.9%.
Odor/Appearance/Other Characteristics:
COLORLESS,VOLATILE,MOBILE LIQUID W/ AN ETHEREAL ODOR & A BURNING SWEET TASTE.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ -49 F	NOTE: -45'C.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	EQ 356 F	NOTE: 180'C.

Explosive/Flammable Limits
Lower (LEL). . . . . EQ 1.9
Upper (UEL). . . . . EQ 48

Shipping Regulations
UN/NA Number. UN1155
D.O.T. Hazard Class. . . 3-FLAMMABLE LIQUID
Label . . . . . FLAMMABLE LIQUID
Proper Shipping Name . . DIETHYL ETHER

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Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 7/06/95

===== Component Information =====

ETHYL ETHER
OSHA PEL (PPM):
OSHA PEL (MG/M3): 1210
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 1210
STEL (PPM):
STEL (MG/M3): 1520
Product %: EQ 100
C.A.S. No.: 60297
Note:
PEL & TLV: 400 PPM / OSHA & ACGIH STEL: 500 PPM.

===== SUBSTANCE IDENTIFICATION =====

SUBSTANCE: ETHYL ETHER

CAS NUMBER: 60-29-7

TRADE NAMES/SYNONYMS: DIETHYL ETHER; ETHOXYETHANE; ETHER; ETHYL OXIDE; DIETHYL OXIDE; SURFURIC ETHER; RCRA U117; UN 1155; STCC 4908157; C4H10O; ACC08980

CHEMICAL FAMILY: ETHER, ALIPHATIC

MOLECULAR FORMULA: C4-H10-O

MOLECULAR WEIGHT: 74.12

AT NO: E1984

CERCLA RATINGS (SCALE 0-3): HEALTH=2 FIRE=3 REACTIVITY=1 PERSISTENCE=1

NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=4 REACTIVITY=1

DATE: 09/13/95

EMERGENCY NUMBER: (201) 796-7100

CHEMTREC ASSISTANCE: (800) 424-9300

TELEPHONE: (201) 796-7100

MANUFACTURER'S NAME AND ADDRESS:

FISHER SCIENTIFIC
CHEMICAL DIVISION
1 REAGENT LANE
FAIR LAWN NJ 07410

===== COMPONENTS AND CONTAMINANTS =====

SEE COMPONENT INFORMATION.

COMPONENT: ETHYL ETHER

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:

ETHYL ETHER:

400 PPM (1210 MG/M3) DFG MAK TWA;
800 PPM (2420 MG/M3) DFG MAK 30 MINUTE PEAK, AVERAGE VALUE, 4 TIMES/SHIFT

MEASUREMENT METHOD: CHARCOAL TUBE; ETHYL ACETATE; GAS CHROMATOGRAPHY WITH FLAME IONIZATION DETECTION; (NIOSH III # 1610).

100 POUNDS CERCLA SECTION 103 REPORTABLE QUANTITY

OSHA REVOKED THE FINAL RULE LIMITS OF JANUARY 19, 1989 IN RESPONSE TO THE 11TH CIRCUIT COURT OF APPEALS DECISION (AFL-CIO v. OSHA) EFFECTIVE JUNE 30, 1993. SEE 29 CFR 1910.1000 (58 FR 35338)

===== PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

ODOR THRESHOLD: 0.33 PPM

SOLVENT SOLUBILITY: ALCOHOL, ACETONE, BENZENE, CHLOROFORM, SOLVENT NAPHTHA

===== FIRE AND EXPLOSION DATA =====

FIRE AND EXPLOSION HAZARD: DANGEROUS FIRE AND EXPLOSION HAZARD WHEN EXPOSED TO HEAT OR FLAME. MAY ACCUMULATE STATIC ELECTRIC CHARGES THAT RESULT IN IGNITION OF ITS VAPORS. VAPOR-AIR MIXTURES ARE EXPLOSIVE. MAY FORM EXPLOSIVE PEROXIDES IF EXPOSED TO AIR OR LIGHT FOR LONG PERIODS OF TIME. VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL A CONSIDERABLE DISTANCE TO SOURCE OF IGNITION AND FLASHBACK.

FLASH POINT: -49 F (-45 C) (CC)

UPPER EXPLOSIVE LIMIT: 48%

LOWER EXPLOSIVE LIMIT: 1.9%

AUTOIGNITION TEMP.: 356 F (180 C)

FLAMMABILITY CLASS(OSHA): IA

FIREFIGHTING MEDIA: DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR ALCOHOL-RESISTANT FOAM (1993 EMERGENCY RESPONSE GUIDEBOOK, RSPA P 5800.6).

FOR LARGER FIRES, USE WATER SPRAY, FOG OR ALCOHOL-RESISTANT FOAM (1993 EMERGENCY RESPONSE GUIDEBOOK, RSPA P 5800.6).

ALCOHOL FOAM: (NFPA 325M, FIRE HAZARD PROPERTIES OF FLAMMABLE LIQUIDS, GASES, AND VOLATILE SOLIDS, 1991).

FIREFIGHTING: MOVE CONTAINER FROM FIRE AREA IF YOU CAN DO IT WITHOUT RISK. APPLY COOLING WATER TO SIDES OF CONTAINERS THAT ARE EXPOSED TO FLAMES UNTIL WELL AFTER FIRE IS OUT. STAY AWAY FROM ENDS OF TANKS. FOR MASSIVE FIRE IN CARGO AREA, USE UNMANNED HOSE HOLDER OR MONITOR NOZZLES; IF THIS IS IMPOSSIBLE, WITHDRAW FROM AREA AND LET FIRE BURN. WITHDRAW IMMEDIATELY IN CASE OF RISING SOUND FROM VENTING SAFETY DEVICE OR ANY DISCOLORATION OF TANK DUE TO FIRE. ISOLATE FOR 1/2 MILE IN ALL DIRECTIONS IF TANK, RAIL CAR OR TANK TRUCK IS INVOLVED IN FIRE (1993 EMERGENCY RESPONSE GUIDEBOOK, RSPA P 5800.6, GUIDE PAGE 26).

EXTINGUISH ONLY IF FLOW CAN BE STOPPED; USE WATER IN FLOODING QUANTITIES AS A FOG, SOLID STREAMS MAY SPREAD FIRE. COOL CONTAINERS WITH FLOODING AMOUNTS OF WATER, APPLY FROM AS FAR A DISTANCE AS POSSIBLE. AVOID BREATHING TOXIC VAPORS KEEP UPWIND. EVACUATE TO A RADIUS OF 1500 FEET FOR UNCONTROLLABLE FIRES. CONSIDER EVACUATION OF DOWNWIND AREA IF MATERIAL IS LEAKING.

WATER MAY BE INEFFECTIVE (NFPA 325M, FIRE HAZARD PROPERTIES OF FLAMMABLE LIQUIDS, GASES, AND VOLATILE SOLIDS, 1991)

===== TRANSPORTATION DATA =====

S. DEPARTMENT OF TRANSPORTATION SHIPPING NAME-ID NUMBER, 49 CFR 172.101:
ETHYL ETHER-UN 1155

U.S. DEPARTMENT OF TRANSPORTATION HAZARD CLASS OR DIVISION, 49 CFR 172.101:
3 - FLAMMABLE LIQUID

U.S. DEPARTMENT OF TRANSPORTATION PACKING GROUP, 49 CFR 172.101: PG I

U.S. DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS, 49 CFR 172.101 AND SUBPART E: FLAMMABLE LIQUID

U.S. DEPARTMENT OF TRANSPORTATION PACKAGING AUTHORIZATIONS:

EXCEPTIONS: 49 CFR 173.150
NON-BULK PACKAGING: 49 CFR 173.201
BULK PACKAGING: 49 CFR 173.243

U.S. DEPARTMENT OF TRANSPORTATION QUANTITY LIMITATIONS 49 CFR 172.101:

PASSENGER AIRCRAFT OR RAILCAR: 1 L
CARGO AIRCRAFT ONLY: 30 L

===== TOXICITY =====

ETHYL ETHER:

IRRITATION DATA: 360 MG OPEN SKIN-RABBIT MILD; 50 MG/24 HOURS SKIN-GUINEA PIG SEVERE; 100 PPM EYE-HUMAN; 100 MG EYE-RABBIT MODERATE

TOXICITY DATA: 200 PPM INHALATION-HUMAN TCLO; 73,000 PPM/2 HOURS INHALATION-RAT LC50; 106,000 PPM INHALATION-RABBIT LCL0; 6500 PPM/99 MINUTES NHALATION-MOUSE LC50; 76,000 PPM INHALATION-DOG LCL0; 260 MG/KG ORAL-MAN DLO; 1215 MG/KG ORAL-RAT LD50; 8 MG/KG SUBCUTANEOUS-MOUSE LDLO; 996 MG/KG NTRAVENOUS-MOUSE LD50; 2420 MG/KG INTRAPERITONEAL-MOUSE LD50; 2000 MG/KG INTRAPERITONEAL-GUINEA PIG LDLO; MUTAGENIC DATA (RTECS).

CARCINOGEN STATUS: HUMAN INADEQUATE EVIDENCE (IARC GROUP-3).

LOCAL EFFECTS: IRRITANT - INHALATION, SKIN, EYE.

ACUTE TOXICITY LEVEL: MODERATELY TOXIC BY INGESTION; RELATIVELY NON-TOXIC BY INHALATION.

TARGET EFFECTS: CENTRAL NERVOUS SYSTEM DEPRESSANT.

AT INCREASED RISK FROM EXPOSURE: PERSONS WITH A HISTORY OF CHRONIC SKIN OR RESPIRATORY DISEASE.

ADDITIONAL DATA: ALCOHOLIC BEVERAGES ENHANCE THE TOXIC EFFECT.

===== HEALTH EFFECTS AND FIRST AID =====

INHALATION:

ETHYL ETHER: IRRITANT/NARCOTIC. 1900 PPM IMMEDIATELY DANGEROUS TO LIFE OR HEALTH.

ACUTE EXPOSURE: INHALATION OF VAPORS MAY CAUSE IRRITATION TO THE RESPIRATORY TRACT. HUMAN ODOR DETECTION MAY BEGIN AT 0.7 PPM. NASAL IRRITATION MAY OCCUR AT 200 PPM. HIGHER CONCENTRATIONS MAY BEGIN TO PRODUCE CENTRAL NERVOUS SYSTEM DEPRESSION WITH DROWSINESS, DIZZINESS, NAUSEA, EADACHE, STUPOR, AND UNCONSCIOUSNESS. HOWEVER, CONCENTRATIONS OF 7000 PPM AVE BEEN TOLERATED BY SOME WORKERS WITHOUT UNTOWARD EFFECTS. INITIAL SYMPTOMS MAY INCLUDE VOMITING, PALLOR, EXCITEMENT TO DROWSINESS, LOWERING OF THE PULSE AND BODY TEMPERATURE, IRREGULAR RESPIRATION, MUSCULAR RELAXATION, AND EXCESSIVE SALIVATION. TEMPORARY AFTER EFFECTS OF EXPOSURE MAY INCLUDE

VOMITING, SALIVATION, IRRITATION OF RESPIRATORY PASSAGES, HEADACHES, AND DEPRESSION OR EXCITATION. ALBUMIN MAY APPEAR IN THE URINE AND POLYCYTHEMIA IN THE BLOOD. 19,000 PPM IS CONSIDERED THE LOWEST ANESTHESIA-PRODUCING DOSE. THEREFORE, THERE IS A LARGE MARGIN OF SAFETY BETWEEN THE CONCENTRATIONS CAUSING NASAL IRRITATION AND THOSE CAUSING ANESTHESIA, PERMANENT DAMAGE OR DEATH. DEATH HAS BEEN REPORTED FROM RESPIRATORY PARALYSIS.

CHRONIC EXPOSURE: REPEATED OR PROLONGED EXPOSURE MAY CAUSE ANOREXIA, EXHAUSTION, HEADACHE, DROWSINESS, DIZZINESS, EXCITATION, AND PSYCHIC DISTURBANCES. DAMAGE TO THE LIVER AND KIDNEY MAY OCCUR. TOLERANCE MAY BE ACQUIRED THROUGH REPEATED EXPOSURES.

FIRST AID: REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. PERFORM ARTIFICIAL RESPIRATION IF NECESSARY. KEEP PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT:

ETHYL ETHER: IRRITANT.

ACUTE EXPOSURE: CONTACT WITH THE SKIN MAY CAUSE IRRITATION BY DEFATTING AND DRYING OF THE SKIN. ABSORPTION THROUGH HUMAN SKIN IS NOT GREAT ENOUGH TO CAUSE A DELETERIOUS EFFECT.

CHRONIC EXPOSURE: REPEATED OR PROLONGED EXPOSURE MAY CAUSE DERMATITIS WITH CRACKING AND DRYING OF THE SKIN DUE TO THE EXTRACTION OF OILS.

FIRST AID: REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (AT LEAST 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT:

ETHYL ETHER: IRRITANT.

ACUTE EXPOSURE: VAPORS MAY CAUSE IRRITATION. THE UNDILUTED LIQUID MAY CAUSE PAINFUL INFLAMMATION OF A TRANSITORY NATURE. AN EXAMINATION OF A HUMAN EYE AFTER A GENEROUS SPLASH SHOWED DULLING OF THE CORNEA.

CHRONIC EXPOSURE: REPEATED OR PROLONGED EXPOSURE MAY CAUSE CONJUNCTIVITIS.

FIRST AID: WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (AT LEAST 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:

ETHYL ETHER: NARCOTIC.

ACUTE EXPOSURE: INGESTION MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION WITH NAUSEA, VOMITING, DROWSINESS, AND DIZZINESS. THE FATAL AMOUNT IS ESTIMATED AT 1 OR 2 OUNCES. SYMPTOMS MAY BE SIMILAR TO ETHANOL INTOXICATION EXCEPT THAT ONSET IS MORE RAPID AND DURATION IS SHORTER. BECAUSE OF ITS VOLATILITY, THE STOMACH MAY BECOME PROMPTLY DISTENDED WHICH MAY HINDER BREATHING.

CHRONIC EXPOSURE: REPEATED DRINKING OF ETHER HAS BEEN REPORTED RESULTING IN THE DEVELOPMENT OF THE "ETHER HABIT" AND GENERAL DEBILITY.

FIRST AID: ESTABLISH AIRWAY AND MAINTAIN RESPIRATION. REMOVE VOLATILE ANESTHETICS BY FORCED VENTILATION. (DREISBACH, HANDBOOK OF POISONING, 11TH ED.) GET MEDICAL ATTENTION IMMEDIATELY.

ANTIDOTE: NO SPECIFIC ANTIDOTE. TREAT SYMPTOMATICALLY AND SUPPORTIVELY.

===== REACTIVITY =====

REACTIVITY:

ETHYL ETHER: IN THE PRESENCE OF OXYGEN, OR ON LONG STANDING, OR WHEN)NTAINED IN BOTTLES AND EXPOSED TO SUNLIGHT, UNSTABLE PEROXIDES SOMETIMES ORM WHICH MAY EXPLODE SPONTANEOUSLY OR WHEN HEATED.

INCOMPATIBILITIES:

ETHYL ETHER:

ACETYL PEROXIDE: POSSIBLE VIOLENT EXPLOSION.
BORON TRIAZIDE: POSSIBLE EXPLOSION.
BROMINE: VIOLENT REACTION.
BROMINE AZIDE: FORMATION OF EXPLOSIVE SOLUTION.
BROMINE PENTAFLUORIDE: FIRE AND EXPLOSION HAZARD.
BROMINE TRIFLUORIDE: EXPLOSION.
CHLORINE: POSSIBLE IGNITION OR EXPLOSION.
CHLORINE TRIFLUORIDE: VIOLENT, POSSIBLE EXPLOSIVE REACTION.
CHROMIC ANHYDRIDE: VIOLENT REACTION.
CHROMYL CHLORIDE: IGNITION.
HALOGENS: FIRE AND EXPLOSION HAZARD.
HYDROGEN PEROXIDE: VIOLENT DETONATION.
INTERHALOGENS: FIRE AND EXPLOSION HAZARD.
IODINE HEPTAFLUORIDE: IGNITION.
IODINE (VII) OXIDE: MAY DECOMPOSE EXPLOSIVELY.
LITHIUM ALUMINUM HYDRIDE: EXPLOSION HAZARD.
NITRIC ACID: EXPLOSION HAZARD.
NITROSYL PERCHLORATE: EVOLVES GAS THEN EXPLODES.
NITRYL HYPOFLUORITE (FLUORINE NITRATE): EXPLOSION HAZARD.
NITRYL PERCHLORATE: EXPLOSION HAZARD.
OXIDIZERS (STRONG): FIRE AND EXPLOSION HAZARD.
OXYGEN (LIQUID): EXPLOSION HAZARD.
OZONE: EXPLOSION HAZARD.
PEAT SOILS: EXPLOSION HAZARD.
PERCHLORIC ACID: EXPLOSION HAZARD.
PERMANGANIC ACID: EXPLOSION HAZARD.
PEROXODISULFURIC ACID: EXPLOSION HAZARD.
POTASSIUM PEROXIDE: SPONTANEOUSLY FLAMMABLE.
SILVER PERCHLORATE: VIOLENT EXPLOSION.
SODIUM PEROXIDE: IGNITION.
SULFONYL CHLORIDE: VIGOROUS DECOMPOSITION.
THIOTRITHIAZYL PERCHLORATE: EXPLOSION HAZARD.
TRIETHYLALUMINUM DIETHYL ETHERATE: SPONTANEOUSLY FLAMMABLE.
TRIMETHYLALUMINUM DIETHYL ETHERATE: SPONTANEOUSLY FLAMMABLE.
URANYL NITRATE: POSSIBLE EXPLOSION; SOLUTIONS MAY EXPLODE ON EXPOSURE TO SUNLIGHT.
WOOD PULP EXTRACTS: EXPLOSION HAZARD.

DECOMPOSITION: THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE TOXIC OXIDES OF CARBON.

POLYMERIZATION: HAZARDOUS POLYMERIZATION HAS NOT BEEN REPORTED TO OCCUR UNDER NORMAL TEMPERATURES AND PRESSURES.

===== STORAGE AND DISPOSAL =====

OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE.

STORAGE: PROTECT AGAINST PHYSICAL DAMAGE. DETACHED OUTSIDE STORAGE IS PREFERRED. INSIDE STORAGE SHOULD BE IN A STANDARD FLAMMABLE LIQUIDS STORAGE ROOM OR CABINET. ISOLATE FROM OTHER COMBUSTIBLE MATERIALS. AVOID DIRECT SUNLIGHT. PROTECT AGAINST STATIC ELECTRICITY AND LIGHTNING. FOR LARGE QUANTITY STORAGE ROOMS, PROTECT WITH AUTOMATIC SPRINKLER SYSTEMS AND TOTAL FLOODING CARBON DIOXIDE SYSTEMS. THE REACTIVITY HAZARD MAY BE INCREASED TO 3 ON LONG STANDING DUE TO PEROXIDE FORMATION. SEPARATE FROM OXIDIZING MATERIALS (NFPA 49, HAZARDOUS CHEMICALS DATA, 1975).

STORE AWAY FROM INCOMPATIBLE SUBSTANCES.

"SPOSAL: DISPOSAL MUST BE IN ACCORDANCE WITH STANDARDS APPLICABLE TO NERATORS OF HAZARDOUS WASTE, 40CFR 262. EPA HAZARDOUS WASTE NUMBER U117.

CONDITIONS TO AVOID: AVOID CONTACT WITH HEAT, SPARKS, FLAMES, OR OTHER SOURCES OF IGNITION. VAPORS MAY BE EXPLOSIVE AND POISONOUS; DO NOT ALLOW UNNECESSARY PERSONNEL IN AREA. DO NOT OVERHEAT CONTAINERS; CONTAINERS MAY VIOLENTLY RUPTURE AND TRAVEL A CONSIDERABLE DISTANCE IN HEAT OF FIRE.

ETHERS WHICH CONTAIN PEROXIDES MAY EXPLODE WHEN THE CAPS OR STOPPERS OF THEIR CONTAINERS ARE REMOVED.

===== SPILL AND LEAK PROCEDURES =====

OCCUPATIONAL SPILL: SHUT OFF IGNITION SOURCES; NO FLARES, SMOKING OR FLAMES IN HAZARD AREA. STOP LEAK IF YOU CAN DO IT WITHOUT RISK. WATER SPRAY MAY REDUCE VAPOR; BUT IT MAY NOT PREVENT IGNITION IN CLOSED SPACES. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER NONCOMBUSTIBLE ABSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR LATER DISPOSAL. FOR LARGER SPILLS, DIKE FAR AHEAD OF SPILL FOR LATER DISPOSAL. KEEP UNNECESSARY PEOPLE AWAY; ISOLATE HAZARD AREA AND DENY ENTRY. STAY UPWIND; KEEP OUT OF LOW AREAS.

REPORTABLE QUANTITY (RQ): 100 POUNDS

THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) SECTION 304 REQUIRES THAT A RELEASE EQUAL TO OR GREATER THAN THE REPORTABLE QUANTITY FOR THIS SUBSTANCE BE IMMEDIATELY REPORTED TO THE LOCAL EMERGENCY PLANNING COMMITTEE AND THE STATE EMERGENCY RESPONSE COMMISSION (40 CFR 355.40). IF THE RELEASE OF THIS SUBSTANCE IS REPORTABLE UNDER CERCLA SECTION 103, THE NATIONAL RESPONSE CENTER MUST BE NOTIFIED IMMEDIATELY AT (800) 424-8802 OR (202) 426-2675 IN THE METROPOLITAN WASHINGTON, D.C. AREA (40 CFR 302.6).

===== PROTECTIVE EQUIPMENT =====

VENTILATION: PROVIDE GENERAL DILUTION VENTILATION TO MEET PUBLISHED EXPOSURE LIMITS. VENTILATION EQUIPMENT MUST BE EXPLOSION-PROOF.

RESPIRATOR: THE FOLLOWING RESPIRATORS AND MAXIMUM USE CONCENTRATIONS ARE RECOMMENDATIONS BY THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, NIOSH POCKET GUIDE TO CHEMICAL HAZARDS; NIOSH CRITERIA DOCUMENTS OR BY THE U.S. DEPARTMENT OF LABOR, 29 CFR 1910 SUBPART Z.

THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAMINATION LEVELS FOUND IN THE WORK PLACE, MUST NOT EXCEED THE WORKING LIMITS OF THE RESPIRATOR AND BE JOINTLY APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH AND THE MINE SAFETY AND HEALTH ADMINISTRATION (NIOSH-MSHA).

ETHYL ETHER:

1900 PPM: ANY CHEMICAL CARTRIDGE RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE(S).

ANY AIR-PURIFYING, FULL FACEPIECE RESPIRATOR (GAS MASK) WITH A CHIN-STYLE, FRONT- OR BACK-MOUNTED ORGANIC VAPOR CANISTER.

ANY POWERED, AIR-PURIFYING RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE(S).

ANY SUPPLIED-AIR RESPIRATOR.

ANY SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE.

ESCAPE: ANY AIR-PURIFYING, FULL FACEPIECE RESPIRATOR (GAS MASK) WITH A HIN-STYLE, FRONT-OR BACK-MOUNTED ORGANIC VAPOR CANISTER. ANY APPROPRIATE ESCAPE-TYPE, SELF-CONTAINED BREATHING APPARATUS.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH

CONDITIONS:

ANY SELF-CONTAINED BREATHING APPARATUS THAT HAS A FULL FACEPIECE AND IS 'ERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE.

ANY SUPPLIED-AIR RESPIRATOR THAT HAS A FULL FACEPIECE AND IS OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE IN COMBINATION WITH AN AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE.

CLOTHING: EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE (IMPERVIOUS) CLOTHING AND EQUIPMENT TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE.

GLOVES: EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT CONTACT WITH THIS SUBSTANCE.

EYE PROTECTION: EMPLOYEE MUST WEAR SPLASH-PROOF OR DUST-RESISTANT SAFETY GOGGLES TO PREVENT EYE CONTACT WITH THIS SUBSTANCE.

EMERGENCY EYE WASH: WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES MAY BE EXPOSED TO THIS SUBSTANCE, THE EMPLOYER SHOULD PROVIDE AND EYE WASH FOUNTAIN WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

===== SPECIAL NOTES =====

AUTHORIZED - FISHER SCIENTIFIC, INC.

CREATION DATE: 09/28/84

REVISION DATE: 07/06/95

ADDITIONAL INFORMATION:

THIS INFORMATION IS BELIEVED TO BE ACCURATE AND REPRESENTS THE BEST INFORMATION CURRENTLY AVAILABLE TO US. HOWEVER, WE MAKE NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO SUCH INFORMATION, AND WE ASSUME NO LIABILITY RESULTING FROM ITS USE. USERS SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION FOR THEIR PARTICULAR PURPOSES.

PORTS MSDS #: 5488

PRODUCT: FREON 113 REFRIGERANT

PART NUMBER:

FORMULA: CCl2FCClF2

KEYWORD: FREON

PORTS NUMBER: 03-983-3200

PORTS MISC INFO:
95-19-6720

PORTS RATING: HFR=101

MANUFACTURER:
E.I. DUPONT DE NEMOURS & CO., INC.
1007 MARKET STREET
WILMINGTON
DE

19898
PHONE: PHONE: 800-962-9919
EMERGENCY PHONE: 800-441-3637

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 118 F	NOTE: 48'C.
Melting Point. . . .	NG	
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ 1.57	NOTE: G/CC @ 25'C, LIQUID.
Vapor Pressure . . .	EQ 333.98	NOTE: MMHG, 6.46 PSIA.
Vapor Density. . . .	EQ 2.9	NOTE: @ 25'C(77'F).
Percent Volatiles. .	EQ 100	NOTE: WT%.
Evaporation Rate . .	GT 1	NOTE: CC14 = 1.
pH	EQ 7	NOTE: NEUTRAL.
Molecular Weight . .	EQ 187.38	
Viscosity.	NG	

Solubility in Water. 0.02 WT% @ 25'C(77'F).
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS LIQUID, SLIGHT ETHEREAL ODOR.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	N*	NOTE: WILL NOT BURN.
Flash Point, Open Cup . . .	N*	NOTE: WILL NOT BURN.
Fire Point.	NG	
Auto Ignition.	EQ 572 F	NOTE: 300'C.
Explosive/Flammable Limits		
Lower (LEL).	NG	
Upper (UEL).	NG	

Shipping Regulations

UN/NA Number.	NG
D.O.T. Hazard Class. . .	NG
Label	NOT GIVEN
Proper Shipping Name . .	NOT GIVEN

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Preparer/Contact Information: ENVIRONMENTAL ENGINEER, DUPONT ELECTRONICS, 800-441-94

Date Prepared/Revised 9/08/93

http://jupiter.ports/msds/data/5488

===== Component Information =====

-,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE
OSHA PEL (PPM):
OSHA PEL (MG/M3): 7600
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 7670
STEL (PPM):
STEL (MG/M3): 9590
Product %: EQ 100
C.A.S. No.: 76131
Note:
ACGIH STEL: 1250 PPM / PEL & TLV: 1000 PPM / AEL: NONE ESTABLISHED.

===== CHEMICAL PRODUCT/COMPANY IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

PRODUCT NAME: FREON 113 REFRIGERANT

MATERIAL IDENTIFICATION: "FREON" is a registered trademark of DuPont.

CORPORATE MSDS NUMBER: DU000126

2024FR

REVISED: 8-SEP-1993

PRINTED: 14-DEC-1993

ADENAMES AND SYNONYMS:

TRICHLOROTRIFLUOROETHANE
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE
"FREON" TF SOLVENT
"FREON" TF CLEANING AGENT
"FREON" PRECISION CLEANING AGENT
"FREON" TF
"FREON" PCA
"FREON" FT 113
CC0031
CC0292

PHONE NUMBERS:

PRODUCT INFORMATION: 1-800-441-9442
TRANSPORT EMERGENCY: CHEMTREC: 1-800-424-9300
MEDICAL EMERGENCY: 1-800-441-3637

COMPANY IDENTIFICATION:

MANUFACTURER/DISTRIBUTOR'S NAME AND ADDRESS:

DUPONT
1007 MARKET STREET
WILMINGTON, DE 19898

===== COMPOSITION/INFORMATION ON INGREDIENTS =====

SEE COMPONENT INFORMATION.

COMPONENTS/MATERIAL

* 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE ("FREON" 113)

* Regulated as a Toxic Chemical under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

===== HAZARDS IDENTIFICATION =====

POTENTIAL HEALTH EFFECTS:

PRINCIPAL HEALTH HAZARDS (INCLUDING SIGNIFICANT ROUTES, EFFECTS, SYMPTOMS OF OVEREXPOSURE, AND MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE): In acute toxicity testing in animals, "FREON" 113 was of very low toxicity by inhalation. However, life-threatening exposures may occur if handled carelessly. Vapors are heavier than air posing a hazard of asphyxiation if they are trapped in enclosed or low places. At flame temperatures, this fluorocarbon may decompose to hydrogen fluoride which may be lethal at low concentrations. "FREON" 113 poses a hazard of fatal heart irregularities if inhaled at high concentrations. Skin or eye contact may cause irritation. Prolonged skin contact may cause drying of the skin. Inhalation or ingestion may cause dizziness, headache, confusion, incoordination and loss of consciousness.

ANIMAL DATA:

INHALATION 4 HOUR LC50: 52,500 ppm in rats
SKIN ABSORPTION ALD: >11,000 mg/kg in rabbits
ORAL LD50: 43,000 mg/kg in rats

The liquid is a mild skin irritant and a slight eye irritant. The compound has produced a weak allergic skin reaction (sensitization) in guinea pigs.

SKIN: Repeated exposure to high doses of the liquid maintained in close contact with the skin caused severe local irritation in rabbits. This reaction is typically seen when defatting agents are tested under similar conditions.

INHALATION: The effects in animals from high single exposures include anaesthetic effects such as tremors, dizziness, incoordination, and loss of consciousness, and irregular heartbeat (cardiac arrhythmias) due to the heart being made more sensitive to adrenalin (cardiac sensitization). Repeated exposure at high concentrations also produced central nervous system effects during exposure but not evidence of other systemic toxicity.

INGESTION: High, single oral administration of the liquid, at or near lethal doses, produced lethargy within several minutes. Survivors have shown no apparent toxic effects.

There is no evidence of carcinogenicity or teratogenicity in animal testing. In a reproductive toxicity study in rats, no adverse effects on reproductive toxicity study in rats, no adverse effects on reproductive performance were seen at concentrations of 500 ppm, and only minimal effects (slight decrease in corpora lutea) were observed at 12,500 ppm.

This compound does not produce genetic damage in bacterial or mammalian cell cultures. It does not produce heritable genetic damage in male animals (dominant lethal test).

HUMAN HEALTH EFFECTS OF OVEREXPOSURE BY:

SKIN CONTACT MAY INITIALLY INCLUDE: Mild skin irritation, mainly due to rapid evaporation, with possible discomfort or rash. Prolonged skin contact may cause temporary tingling, numbness, coldness, or drying of skin. There are no reports of human skin sensitization. Significant skin permeation, and systemic toxicity, after contact appears unlikely.

EYE CONTACT MAY INITIALLY INCLUDE: Mild eye irritation with discomfort, tearing, or blurring of vision.

The major ingestion hazard is aspiration (liquid entering the lungs during ingestion or vomiting) which may result in "chemical pneumonia". Symptoms include coughing, gasping, choking, shortness of breath, bluish discoloration of the skin, rapid breathing and heart rate, and fever. Pulmonary edema or bleeding, drowsiness, confusion, coma and seizures may occur in more serious cases. Symptoms may develop immediately or as late as 24 hours after the exposure, depending on how much chemical entered the lungs.

INHALATION OR INGESTION MAY INCLUDE: Temporary nervous system depression with anaesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness. Higher exposures may cause temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation. Fatality may occur from gross overexposure. One report cites two cases where workers who were repeatedly overexposed to the compound experienced liver damage; however, it was not proven that the compound actually caused the damage. Another study evaluated 50 workers exposed for an average of over 2 years to 46 - 4700 ppm. No adverse effects were found except for 1 case of dry skin.

CARCINOGENICITY INFORMATION: None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA, or ACGIH as a carcinogen.

===== FIRST AID MEASURES =====

FIRST AID:

INHALATION: If high concentrations are inhaled, immediately remove persons to fresh air; keep them calm. If not breathing, give artifical respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT: In case of skin contact, flush skin with plenty of water for 5 minutes. Get medical attention if irritation is present.

EYE CONTACT: In case of eye contact, immediately flush eyes with plenty of water for 15 minutes. Call a physician.

INGESTION: If swallowed, no specific intervention is indicated as the compound is not likely to be hazardous by ingestion. Do not induce vomiting. However, consult a physician if necessary.

NOTE TO PHYSICIANS: Activated charcoal slurry may be administered. To prepare activated charcoal slurry suspend 50 g activated charcoal in 400 mL water in plastic bottle and shake well. Administer 5 mL/kg, or 350 mL for an average adult.

Because of a possible increased risk of eliciting cardiac dysrhythmias, catecholamine drugs, such as epinephrine, should be used with special caution in situations of emergency life support.

Because of the danger of aspiration, emesis or gastric lavage should not be employed unless the risk is justified by the presence of additional toxic substances. Activated charcoal may induce vomiting, but may be given after emesis or lavage to absorb toxic additives. Steroid therapy in mild to moderate cases does not improve outcome. Bacterial pneumonia often occurs after exposure, but prophylactic antibiotics are not indicated and should be reserved for documented bacterial pneumonia.

===== FIRE FIGHTING MEASURES =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

FLAMMABLE PROPERTIES:

FLASH POINT: Will not burn

FIRE AND EXPLOSION HAZARDS: Drums may rupture under fire conditions. Decomposition may occur.

EXTINGUISHING MEDIA: As appropriate for combustibles in area.

FIRE FIGHTING INSTRUCTIONS: Use water spray or fog to cool container. Self-contained breathing apparatus (SCBA) is required if drums rupture and contents are spilled under fire conditions.

===== ACCIDENTAL RELEASE MEASURES =====

SAFEGUARDS (PERSONNEL):

NOTE: Review FIRE FIGHTING MEASURES Section and HANDLING (PERSONNEL) in HANDLING AND STORAGE Section before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

ACCIDENTAL RELEASE MEASURES: Ventilate area. Do not flush into sewers. Dike spill. Collect on absorbent material and transfer to steel drums for recovery or disposal. Use self-contained breathing apparatus (SCBA) for large spills. Comply with Federal, State, and local regulations on reporting releases.

===== HANDLING AND STORAGE =====

HANDLING (PERSONNEL): Avoid breathing vapors and prolonged skin exposure. Use with sufficient ventilation to keep employee exposure below recommended limits.

STORAGE: Clean, dry area. Do not heat above 125 deg F.

===== EXPOSURE CONTROLS/PERSONAL PROTECTION =====

ENGINEERING CONTROLS: Normal ventilation for standard use procedures is generally adequate. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low or enclosed places.

PERSONAL PROTECTIVE EQUIPMENT: Impervious gloves should be used to avoid prolonged or repeated exposure. Chemical splash goggles should be worn as needed to prevent eye contact. Under normal use conditions, no respiratory protection is required when using this product. Self-contained breathing apparatus (SCBA) is required if a large spill occurs.

EXPOSURE GUIDELINES:

APPLICABLE EXPOSURE LIMITS:

1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE:

PEL (OSHA): 1,000 ppm, 7,600 mg/m3, 8 Hr. TWA
TLV (ACGIH): 1,000 ppm, 7,670 mg/m3, 8 Hr. TWA
STEL 1,250 ppm, 9,590 mg/m3
AEL* DUPONT: None Established

* AEL is Du Pont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

===== PHYSICAL AND CHEMICAL PROPERTIES =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

===== STABILITY AND REACTIVITY =====

CHEMICAL STABILITY: Material is stable. However, avoid open flames and high

temperatures.

INCOMPATIBILITY WITH OTHER MATERIALS: Incompatible with alkali or alkaline earth metals - powdered Al, Zn, Be, etc.

POLYMERIZATION: Polymerization will not occur.

OTHER HAZARDS:

DECOMPOSITION: Decomposition products are hazardous. This compound can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids, and possibly carbonyl halides.

===== ECOLOGICAL INFORMATION =====

ECOTOXICOLOGICAL INFORMATION:

AQUATIC TOXICITY: 96-hour LC50, rainbow trout: 7.4 mg/L

===== DISPOSAL CONSIDERATIONS =====

WASTE DISPOSAL: Comply with Federal, State, and local regulations. Remove to a permitted waste disposal facility.

EPA HAZARDOUS WASTE NOS.: F001 and F002 may apply to waste materials.

===== TRANSPORTATION INFORMATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

SHIPPING INFORMATION:

SHIPPING CONTAINERS: Tank Cars. Tank Trucks. Drums.

NOT REGULATED AS A HAZARDOUS MATERIAL BY DOT OR IMO.

===== REGULATORY INFORMATION =====

U.S. FEDERAL REGULATIONS:

TSCA INVENTORY STATUS: Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312:

ACUTE: Yes
CHRONIC: No
FIRE: No
REACTIVITY: No
PRESSURE: No

LISTS:

EXTREMELY HAZARDOUS SUBSTANCE: No
CERCLA HAZARDOUS SUBSTANCE: No
TOXIC CHEMICALS: Yes

===== OTHER INFORMATION =====

NFPA, NPCA-HMIS:

NPCA-HMIS RATING:

HEALTH: 1
FLAMMABILITY: 0

REACTIVITY: 1

Personal Protection rating to be supplied by user depending on use
onditions.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

RESPONSIBILITY FOR MSDS: Environmental Engineer

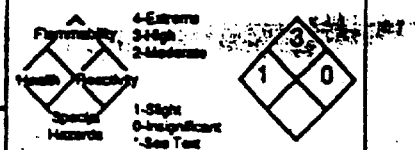
ADDRESS:

DUPONT
ELECTRONICS
WILMINGTON, DE 19880-0030

TELEPHONE: 800-441-9442

# Indicates updated section.

MATERIAL SAFETY DATA SHEET

24-HOUR EMERGENCY ASSISTANCE	GENERAL ASSISTANCE	NFPA FIRE HAZARD SYMBOL
BP America (In Ohio): 800-362-8059 (Outside Ohio): 800-321-8642 CHEMTREC Assist: 800-424-9300	216-586-6499	
MSDS Number > AD1		

MANUFACTURER: The Standard Oil Company and its Subsidiaries
ADDRESS: 200 Public Square, Cleveland, OH 44114-2375

PRODUCT IDENTIFICATION

TRADE NAME: **GASOLINE, REGULAR UNLEADED**

CAS NUMBER: None
SYNONYM(S): MOTOR FUEL; GASOLINE
CHEMICAL FAMILY: Hydrocarbon
MOLECULAR FORMULA: Mixture
MOLECULAR WEIGHT: Mixture
PRODUCT CODE: P 1650 **HIERARCHY:** 040.040

PRODUCT HAZARD SUMMARY

HEALTH
DANGER!
HARMFUL OR FATAL IF SWALLOWED
ASPIRATION HAZARD
VAPORS MAY BE HARMFUL
LONG-TERM EXPOSURE TO VAPORS HAS CAUSED CANCER IN SOME LABORATORY ANIMALS
MAY BE IRRITATING TO THE SKIN, EYES AND RESPIRATORY TRACT

FLAMMABILITY
DANGER!
EXTREMELY FLAMMABLE LIQUID
VAPORS MAY EXPLODE

REACTIVITY
STABLE

PRODUCT HEALTH HAZARD INFORMATION

EFFECTS OF OVEREXPOSURE

INGESTION:
MODERATELY TOXIC. Human LDLo = ~10-30 gms. Aspiration into lungs may cause pneumonitis. May cause gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting and diarrhea. May cause harmful central nervous system effects. Effects may

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This reprinted material in not the complete and official position of the NFPA on the referenced subject, which is represented only by the standard in its entirety.

include excitation, euphoria, headache, dizziness, drowsiness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death.

SKIN:
PRACTICALLY NON-TOXIC. Rabbit dermal LD50 = >5 ml/kg. SLIGHTLY IRRITATING. Repeated or prolonged contact may result in defatting, redness, itching, inflammation, cracking and possible secondary infection. High pressure skin injections are SERIOUS MEDICAL EMERGENCIES. Injury may not appear serious at first; within a few hours, tissue will become swollen, discolored and extremely painful (see Notes to Physician section).

EYE:
May cause slight transient irritation.

INHALATION:
May cause respiratory tract irritation. Exposure may cause central nervous system symptoms similar to those listed under "Ingestion" (see Ingestion section). May also cause anemia and irregular heart rhythm. Repeated or prolonged exposures may cause behavioral changes.

SPECIAL TOXIC EFFECTS:
A product of similar composition has been found to be carcinogenic to laboratory animals when given by inhalation. Also, a variety of mutagenicity assays have been conducted that have yielded conflicting results.

NOTE: This product has not been tested as a whole for all potential health effects. It may have other health hazards related to its components. See "Ingredient/Health Hazards" for additional information.

FIRST AID

INGESTION:
DO NOT INDUCE VOMITING BECAUSE OF DANGER OF ASPIRATING LIQUID INTO LUNGS. Get immediat medical attention. If spontaneous vomiting occurs, monitor for breathing difficulty.

SKIN CONTACT:
Remove contaminated clothing immediately. Wash area of contact thoroughly with soap and water. Get medical attention if irritation persists. High pressure skin injections are SERIOUS MEDICAL EMERGENCIES. Get immediate medical attention.

EYE CONTACT:
Flush immediately with large amounts of water. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists.

INHALATION:
Remove affected person from source of exposure. If not breathing, institute cardiopulmonary resuscitation (CPR). If breathing is difficult, give oxygen. Get medical attention.

NOTES TO PHYSICIAN

In case of ingestion, gastric lavage with activated charcoal can be used promptly to prevent absorption. Consideration should be given to the use of an intratracheal tube, to prevent aspiration. Individuals intoxicated by gasoline should be hospitalized immediately, with acute and continuing attention to neurologic and cardiopulmonary function. Positive pressure ventilation may be necessary. After the initial episode,

individuals should be followed for changes in blood variables and the delayed appearance of pulmonary edema and chemical pneumonitis. Such patients should be followed for several days or weeks for delayed effects, including bone marrow toxicity, hepatic and renal impairment. Individuals with chronic pulmonary disease will be more seriously impaired, and recovery from inhalation exposure may be complicated. In case of skin injection, prompt debridement of the wound is necessary to minimize necrosis and tissue loss.

PERSONAL PROTECTION INFORMATION

SKIN PROTECTION:
Wear impervious gloves and protective clothing to prevent skin contact.

RESPIRATORY PROTECTION:
Use NIOSH or MSHA approved equipment when airborne exposure limits are exceeded. NIOSH/MSHA approved breathing equipment must be available for non-routine and emergency use. Ventilation may be used to control or reduce airborne concentrations.

PHYSICAL PROPERTIES

BOILING POINT: 13.0 C (55 F)
SPECIFIC GRAVITY: 0.72 - 0.74 @ 60 F
MELTING POINT: NA
% VOLATILE: 100.0 @ 437 F
VAPOR PRESSURE: 760.00 MM HG @ 100 F
EVAPORATION RATE (WATER=1): >1
VAPOR DENSITY (AIR=1): 1.2 AS VAPOR
VISCOSITY: ND
% SOLUBILITY IN WATER: NEGLIGIBLE
POUR POINT: ND
pH: ND
APPEARANCE/ODOR: CLEAR LIQUID WITH A STRONG HYDROCARBON ODOR.

FIRE AND EXPLOSION DATA

FLASH POINT: -37.0 C (-35 F) TCC
AUTOIGNITION TEMPERATURE: 444.0 C (833 F)
FLAMMABILITY LIMITS IN AIR (% BY VOL.) LOWER: 1.4 **UPPER:** 7.6

BASIC FIREFIGHTING PROCEDURES:
Use dry chemical, foam or carbon dioxide to extinguish fire. Water may be ineffective but should be used to cool fire-exposed containers, structures and to protect personnel. If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak. Use water to flush spills away from sources of ignition. Do not flush down public sewers.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Dangerous when exposed to heat or flame. Vapors form flammable or explosive mixtures with air at room temperature. Vapor or gas may spread to distant ignition sources and flash back. Vapors may concentrate in confined areas. Runoff to sewer may cause fire or explosion hazard. Containers may explode in heat of fire. Irritating or toxic substances may be emitted upon thermal decomposition. Exposed firefighters should wear MSHA/NIOSH approved self-contained breathing apparatus, with full face mask and full protective equipment.

REACTIVITY DATA

STABILITY/INCOMPATIBILTY:
Stable under normal conditions of use. Avoid contact with strong oxidizers.

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS:
Combustion may produce CO, CO2 and reactive hydrocarbons.

ENVIRONMENTAL INFORMATION

SPILL OR RELEASE TO THE ENVIRONMENT:
If your facility or operation has an "Oil or Hazardous Substance Contingency Plan", activate its procedures.

-- Take immediate steps to stop and contain the spill. Caution should be exercised regarding personnel safety and exposure to the spilled material.

-- For technical advise and assistance related to chemicals, contact CHEMTREC (800/424-9300) and your local fire department.

-- Notify the National Response Center, if required.

Emergency Action:
Keep unnecessary people away. Stay upwind; keep out of low areas. Isolate hazard area and deny entry. (Also see Personal Protection Information section.) Isolate for 1/2 mile in all directions if tank or tankcar is involved in fire.

Spill or Leak Procedure:
No flares, smoking or flames in hazard area. Stop leak if you can do it without risk. Use water spray to reduce vapors. Small Spills: Take up with sand or other noncombustible absorbent material or other sorbent known to be compatible, then flush area with water. Large Spills: Dike far ahead of spill for later disposal.

Notification:
Any spill or release, or substantial threat of release, of this material to navigable water (virtually any surface water) sufficient to cause a visible sheen upon the water must be reported immediately to the National Response Center (800/424-8802), as required by U.S. Federal Law. Failure to report may result in substantial civil and criminal penalties.

WASTE DISPOSAL:
This substance, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however it could be hazardous if it is considered toxic, corrosive, ignitable, or reactive according to Federal definitions (40 CFR 261). Additionally, it could be designated as hazardous according to state regulations. This substance could also become a hazardous waste if it is mixed with or comes in contact with a hazardous waste. If such contact or mixing may have occurred, check 40 CFR 261 to determine whether it is a hazardous waste. If it is a hazardous waste, regulations at 40 CFR 262, 263, and 264 apply.

The transportation, storage, treatment, and disposal of this waste material must be conducted in compliance with all applicable Federal, state, and local regulations.

ADDITIONAL ENVIRONMENTAL REGULATORY INFORMATION:
This substance is listed as a toxic pollutant pursuant to 40 CFR 122.21, Appendix D, Table

II/III. Any unusual introduction of this substance into the facility's process streams, stormwater and/or wastewater could result in the violation of U.S. Federal Law. Facilities must notify the USEPA as soon as they know, or have reason to believe, that any activity has occurred, or will occur, which would result in the discharge of a toxic pollutant which is not regulated in the facility's NPDES permit. Notification levels are described in 40 CFR 122.42(a)(1) and 122.42(a)(2). Refer to spill section for additional regulations. There may be specific regulations at the local, regional or state level that pertain to this material.

SPECIAL PRECAUTIONS/SUPPLEMENTAL INFORMATION

HANDLING/STORAGE:

Store in tightly closed containers in cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion.

Empty containers may contain toxic, flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards.

INGREDIENTS/HEALTH HAZARD INFORMATION

COMPONENT	CAS NO.	%	EXPOSURE LIMITS - REFERENCE
Gasoline	None	90-95	300 ppm TWA; 500 ppm STEL (ACGIH)

Gasoline has been shown to cause an increased rate of kidney tumors in laboratory animals.

Benzene	71-43-2	0-5	1 ppm 8-hour TWA; 5 ppm STEL (OSHA) 1 ppm 60-minute CEIL (NIOSH); 10 ppm (30 mg/M3) TLV (ACGIH 1987-88).

Harmful or fatal if swallowed, inhaled or absorbed through the skin. Dog oral LDLo = 2000 mg/kg. Rat LC50 = 10,000 ppm/7 hours. Aspiration hazard. Moderately irritating to the skin. May cause allergic reactions in some individuals. Severely irritating to the eye. Acute benzene poisoning causes central nervous system depression. Benzene is carcinogenic to laboratory animals when given by intubation or by inhalation. Chronic exposure affects the hematopoietic system causing blood disorders including anemia and pancytopenia. There is an association between occupational exposure to benzene and human leukemia. This associa- is based on limited information and is currently unresolved. Mutagenic and clastogenic in mammalian and non-mammalian test systems. Reproductive toxicant only at doses that are maternally toxic, based on tests with animals. Carcinogenic determinations: IARC--Human positive and animal suspected carcinogen; NTP--Known carcinogen; ACGIH--Suspected carcinogen.

Remaining components not determined hazardous and/or hazardous components present at less than 1.0% (0.1% for carcinogens).	NA	Trace	NA

ND = No Data
NA = Not Applicable

REVISION DATE: 03-may-1988	COMPLETED BY: PATNESKY
REPLACES SHEET DATED: NA	APPROVED BY: R.W. MAST

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

ND = No Data
NA = Not Applicable

http://haz1.siri.org:8 s/h/q209/q197.htm

POLYSCIENCE -- HEPTACHLOR, 510C-9
MATERIAL SAFETY DATA SHEET
NSN: 681000N047400
Manufacturer's CAGE: 58378
Part No. Indicator: A
Part Number/Trade Name: HEPTACHLOR, 510C-9

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General Information

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Company's Name: POLYSCIENCE
Company's Street: 7800 MERRIMAC AVE
Company's City: NILES
Company's State: IL
Company's Country: US
Company's Zip Code: 60648
Company's Emerg Ph #: 321-965-0611
Company's Info Ph #: 321-965-0611
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 01MAR92
Safety Data Review Date: 14NOV95
MSDS Serial Number: BVBVF
Hazard Characteristic Code: T3

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Ingredients/Identity Information

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Proprietary: NO
Ingredient: 4,7-METHANOINDENE, 1,4,5,6,7,8,8-HEPTACHLORO-3A, 4,7,7A-TETRAHYDRO-; (HEPTACHLOR) (SARA III)
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: PC0700000
CAS Number: 76-44-8
OSHA PEL: 0.5 PPM, S
ACGIH TLV: 0.5 PPM, S

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Physical/Chemical Characteristics

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Appearance And Odor: NONE SPECIFIED BY MANUFACTURER.
Melting Point: >203F,>95C
Specific Gravity: 1.57
Solubility In Water: INSOLUBLE

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Fire and Explosion Hazard Data

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Extinguishing Media: USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING

CAS# 76-44-8
MSDS Serial BVBVF
Heptachlor

FIRE CONDITIONS.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: ALKALI METALS.
Hazardous Decomp Products: TOXIC FUMES OF: CARBON MONOXIDE, CARBON DIOXIDE, HYDRO-GEN CHLORIDE GAS.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

Health Hazard Data

LD50-LC50 Mixture: LD50:(ORAL,RAT) 40 MG/KG
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE: MAY BE FATAL IF INHALED, SWALLOWED, OR ABSORBED THROUGH SKIN. EXPOSURE CAN CAUSE: TREMORS, CONVULSIONS,KIDNEY DAMAGE, RESPIRATORY COLLAPSE AND DEATH. CHRONIC: CARCINOGEN. REPEATED EXPOSURE CAN CAUSE: DAMAGE TO LIVER. TARGET ORGANS(S): CENTRAL NERVOUS SYSTEM, LIVER.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: HEPTACHLOR:IARC MONOGRAPHS ON THE EVALUATION OF CARCIN RISK OF CHEMS TO MAN, VOL 53, PG 115, 1991: GRP 2B. ANIMAL LIVER.
Signs/Symptoms Of Overexp: HLTH HAZ: MAY PRODUCE CANCER AND GENETIC MUTATION.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: INGEST: WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS. CALL A PHYSICIAN. SKIN: FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MIN. REMOVE CONTAMINATED CLOTHING AND SHOES. CALL A PHYSICIAN. EYE: FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MIN. ASSURE ADEQUATE FLUSHING BY SEPARATING THE EYELIDS WITH FINGERS. CALL A PHYSICIAN.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: WEAR APPROP NIOSH/MSHA APPRVD SCBA, RUBBER BOOTS AND HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENT AREA & WASH SPILL SITE AFTER MATL PICKUP

IS COMPLETE.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: OBSERVE ALL FEDERAL, STATE AND LOCAL LAWS.
Precautions-Handling/Storing: DANGER: HIGHLY TOXIC. CARCINOGEN. AVOID ALL CONTACT.
Other Precautions: NONE SPECIFIED BY MANUFACTURER.

Control Measures

Respiratory Protection: NIOSH/MSHA APPROVED SCBA.
Ventilation: USE ONLY IN CHEMICAL FUME HOOD.
Protective Gloves: RUBBER GLOVES.
Eye Protection: CHEMICAL SAFETY GOGGLES.
Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER.
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.
Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

Transportation Data

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 16FEB94
Label Date: 15FEB94
Label Status: G
Common Name: HEPTACHLOR, 510C-9
Chronic Hazard: YES
Signal Word: DANGER!
Acute Health Hazard-Severe: X
Contact Hazard-Slight: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: ACUTE: MAY BE FATAL IF INHALED, SWALLOWED/ ABSORBED THROUGH SKIN, CAUSING TREMORS, CONVULSIONS, KIDNEY DAMAGE, RESPIRATORY COLLAPSE & DEATH. CHRONIC: CANCER HAZARD. CONTAINS HEPTACHLOR, WHICH IS LISTED AS A LIVER CARCINOGEN TO ANIMALS (FP N).
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: POLYSCIENCE
Label Street: 7800 MERRIMAC AVE
Label City: NILES

http://haz1.siri.org:80' 's/h/q209/q197.htm

Label State: IL
Label Zip Code: 60648
Label Country: US
Label Emergency Number: 321-965-0611

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URL for this msds http://siri.org. If you wish to change, add to, or delete information in this archive please sent updates to dan@siri.org.

PORTS MSDS #: 161

PRODUCT: HEXANE

PART NUMBER:

FORMULA: C6H14

KEYWORD: SOLVENT

PORTS NUMBER: 66-067-3255; 660673256-4; 66-067-3256

PORTS MISC INFO:
NOT GIVEN

PORTS RATING: HFR=330

MANUFACTURER:
EM SCIENCE
480 DEMOCRAT RD., POB 70
GIBBSTOWN
NJ

08027
PHONE: PHONE: 609-354-9200
EMERGENCY PHONE: 800-424-9300

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 149 F	NOTE: 65'C.
Melting Point. . . .	EQ -139 F	NOTE: -95'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .6603	
Vapor Pressure . . .	EQ 125	NOTE: 20'C.
Vapor Density. . . .	EQ 3.0	
Percent Volatiles. .	EQ 100	
Evaporation Rate . .	EQ 9.0	NOTE: BUAC=1.
pH	NG	
Molecular Weight . .	EQ 86.18	
Viscosity.	NG	

Solubility in Water. SLIGHT.
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS LIQUID.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ -7 F	NOTE: CC.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	NG	

Explosive/Flammable Limits

Lower (LEL).	EQ 1.2
Upper (UEL).	EQ 7.5

Shipping Regulations

UN/NA Number.	UN1208
D.O.T. Hazard Class. . .	NG
Label	NOT GIVEN
Proper Shipping Name . .	HEXANE

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Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 2/24/95

===== Component Information =====

.EXANE
OSHA PEL (PPM):
OSHA PEL (MG/M3): 180
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 176
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 90.00
C.A.S. No.: 110543
Note:
PEL & TLV: 50 PPM.

METHYLPENTANES
OSHA PEL (PPM): NG
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NG
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: BT .0 5
C.A.S. No.: NOT GIVEN
Note:
CAS #: UNKNOWN.

BENZENE
OSHA PEL (PPM): NG
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NG
CGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ .0002
C.A.S. No.: 71432
Note:
TRACE LEVELS MAY BE CONTAINED.

===== NAME AND PRODUCT =====

COMMON NAME (ON LABEL): HEXANE

TRADE NAME SYNONYMS: HEXANE, HEXANES

CHEMICAL FAMILY: ALIPHATIC HYDROCARBON

CHEMICAL FORMULA: C6H14

CHEMICAL NUMBER: MHX0297-1

ITEM NUMBER: 0423152

VNDR CATLG NBR:

ENTRY DATE: 02-24-90

CHANGE DATE: 02-24-95 SPECIAL REQUEST

EMERGENCY PHONE: 800-424-9300 (CHEMTREC)

MANUFACTURER'S NAME AND ADDRESS:

E M SCIENCE

A DIV OF EM INDUSTRIES
P.O. BOX 70
GIBBSTOWN, NJ 08027

SUPPLIER'S NAME AND ADDRESS:

CURTIN MATHESON SCIENTIFIC, INC.
9999 VETERANS MEMORIAL
DOCK A
HOUSTON, TX 77038

===== HAZARDOUS INGREDIENTS =====

SEE COMPONENT INFORMATION.

HAZARDOUS COMPONENT	TLV	PEL
HEXANE	.000 SEE HEALTH HAZARD DATA Section	.000 SEE HEALTH HAZARD DATA Section

PEL: Permissible Exposure Limit established by the Occupational Safety and Health Administration (OSHA).

TLV: Threshold Limit Value established by the American Conference of Governmental Industrial Hygienists, 1986-87.

OTHER INGREDIENT INFORMATION:

ALSO CONTAINS METHYLPENTANES 0-5% CAS# UNKNOWN. MAY CONTAIN TRACE LEVELS (0.0002%) BENZENE CAS# 71-43-2.

==== PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

===== FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT: -7' F (CC)

LOWER EXPLOSIVE LIMIT: 1.2

UPPER EXPLOSIVE LIMIT: 7.5

EXTINGUISHING MEDIA: CARBON DIOXIDE, DRY CHEMICAL, FOAM.

UNUSUAL FIRE AND EXPLOSION HAZARDS: DANGEROUS FIRE AND EXPLOSION HAZARD. VAPOR CAN TRAVEL DISTANCES TO IGNITION SOURCE AND FLASH BACK.

SPECIAL FIRE FIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS.

===== HEALTH HAZARD DATA =====

HEALTH HAZARDS (ACUTE & CHRONIC): SEE SIGNS AND SYMPTOMS OF EXPOSURE.

PRIMARY ROUTES OF EXPOSURE: INHALATION, INGESTION, OR SKIN CONTACT.

SIGNS AND SYMPTOMS OF EXPOSURE: TOXIC BY INGESTION AND INHALATION. VAPOR INHALATION CAUSES IRRITATION OF NASAL AND RESPIRATORY PASSAGES, HEADACHE, DIZZINESS, NAUSEA, CENTRAL NERVOUS SYSTEM DEPRESSION. CHRONIC OVEREXPOSURE CAN CAUSE SEVERE NERVE DAMAGE. MAY CAUSE IRRITATION ON CONTACT WITH SKIN OR EYES. MAY CAUSE DAMAGE TO KIDNEYS.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: KIDNEY, RESPIRATORY, AND CNS CONDITIONS.

CARCINOGENICITY: THIS MATERIAL IS NOT LISTED AS CANCER CAUSING AGENT.

NTP: NO
IARC: NO
OSHA: NO

EMERGENCY AND FIRST AID PROCEDURES: GET MEDICAL ASSISTANCE FOR ALL CASES OF OVEREXPOSURE.

SKIN: WASH THOROUGHLY WITH SOAP AND WATER.

EYES: IMMEDIATELY FLUSH THOROUGHLY WITH WATER FOR AT LEAST 15 MINUTES.

INHALATION: REMOVE TO FRESH AIR; GIVE ARTIFICIAL RESPIRATION IF BREATHING HAS STOPPED.

INGESTION: DO NOT INDUCE VOMITING; GET MEDICAL ATTENTION.

THRESHOLD LIMITS/TOXICITY DATA:

HEXANE:

OSHA-PEL: TWA 50 PPM, 180 MG/M3.
ACGIH-TLV: TWA 50 PPM, 176 MG/M3.

TOXICITY DATA:

IHL-HMN TCLO: 5000 PPM/10M;
ORAL-RAT LD50: 28710 MG/KG.

TOXICOLOGICAL FINDINGS: TESTS ON LABORATORY ANIMALS INDICATE MATERIAL MAY PRODUCE ADVERSE MUTAGENIC AND REPRODUCTIVE EFFECTS. CITED IN REGISTRY OF TOXIC EFFECTS OF SUBSTANCES (RTECS).

===== REACTIVITY DATA =====

STABILITY: STABLE

CONDITIONS TO AVOID: HEAT; CONTACT WITH IGNITION SOURCES.

INCOMPATIBILITY (MATERIALS TO AVOID): OXIDIZERS

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: COX

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: DOES NOT OCCUR.

===== SPILL, LEAK AND DISPOSAL PROCEDURES =====

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: EVACUATE THE AREA OF ALL UNNECESSARY PERSONNEL. WEAR SUITABLE PROTECTIVE EQUIPMENT LISTED UNDER EXPOSURE/PERSONAL PROTECTION. ELIMINATE ANY IGNITION SOURCES UNTIL THE AREA IS DETERMINED TO BE FREE FROM EXPLOSION OR FIRE HAZARDS. CONTAIN THE RELEASE AND ELIMINATE ITS SOURCE, IF THIS CAN BE DONE WITHOUT RISK. TAKE UP AND CONTAINERIZE FOR PROPER DISPOSAL AS DESCRIBED UNDER DISPOSAL. COMPLY WITH FEDERAL, STATE AND LOCAL REGULATIONS ON REPORTING RELEASES. REFER TO REGULATORY INFORMATION FOR REPORTABLE QUANTITY AND OTHER REGULATORY DATA.

THE FOLLOWING EM SCIENCE SPILL-X ABSORBENT IS RECOMMENDED FOR THIS PRODUCT: SX0863 SOLVENT SPILL TREATMENT KIT.

WASTE DISPOSAL METHOD:

EPA WASTE NUMBERS: D001. INCINERATION, FUELS BLENDING OR RECYCLE. CONTACT YOUR LOCAL PERMITTED WASTE DISPOSAL SITE (TSD) FOR PERMISSIBLE TREATMENT

SITES. ALWAYS CONTACT A PERMITTED WASTE DISPOSER (TSD) TO ASSURE COMPLIANCE WITH ALL CURRENT LOCAL, STATE AND FEDERAL REGULATIONS.

===== SPECIAL PROTECTION INFORMATION =====

RESPIRATORY PROTECTION: MATERIAL SHOULD BE HANDLED OR TRANSFERRED IN AN APPROVED FUME HOOD OR WITH ADEQUATE VENTILATION. IF WORKPLACE EXPOSURE LIMIT(S) OF PRODUCT OR ANY COMPONENT IS EXCEEDED (SEE TLV/PEL), A NIOSH/MSHA APPROVED AIR SUPPLIED RESPIRATOR IS ADVISED IN ABSENCE OF PROPER ENVIRONMENTAL CONTROL. OSHA REGULATIONS ALSO PERMIT OTHER NIOSH/MSHA RESPIRATORS (NEGATIVE PRESSURE TYPE) UNDER SPECIFIED CONDITIONS (SEE YOUR SAFETY EQUIPMENT SUPPLIER). ENGINEERING AND OR ADMINISTRATIVE CONTROLS SHOULD BE IMPLEMENTED TO REDUCE EXPOSURE.

LOCAL VENTILATION: SEE RESPIRATORY PROTECTION ABOVE.

MECHANICAL VENTILATION: SEE RESPIRATORY PROTECTION ABOVE.

SPECIAL VENTILATION: SEE RESPIRATORY PROTECTION ABOVE.

OTHER VENTILATION: SEE RESPIRATORY PROTECTION ABOVE.

PROTECTIVE GLOVES: (NITRILE OR EQUIVALENT) SHOULD BE WORN TO PREVENT SKIN CONTACT.

EYE PROTECTION: SAFETY GLASSES WITH SIDE SHIELDS SHOULD BE WORN AT ALL TIMES.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: NO OTHER PROTECTIVE CLOTHING GIVEN.

===== SPECIAL PRECAUTIONS =====

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: KEEP CONTAINER CLOSED. STORE IN A COOL AREA AWAY FROM IGNITION SOURCES AND OXIDIZERS. DO NOT BREATHE VAPOR. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING. ELECTRICALLY GROUND ALL EQUIPMENT WHEN HANDLING THIS PRODUCT. RETAINED RESIDUE MAY MAKE EMPTY CONTAINERS HAZARDOUS; USE CAUTION! WASH THOROUGHLY AFTER HANDLING. DO NOT TAKE INTERNALLY. EYE WASH AND SAFETY EQUIPMENT SHOULD BE READILY AVAILABLE.

===== OTHER INFORMATION =====

MISCELLANEOUS INFO.:

NFPA HAZARD RATINGS:

HEALTH: 1
FLAMMABILITY:
REACTIVITY:

DOT SHIPPING NAME: HEXANE.

DOT NUMBER: UN1208.

N/A= NOT AVAILABLE.

N/E= NONE ESTABLISHED.

N/G= NOT GIVEN.

THE INFORMATION, DATA AND RECOMMENDATIONS CONTAINED HEREIN WERE PROVIDED TO CMS BY THE MANUFACTURER NAMED ON THIS MATERIAL SAFETY DATA SHEET. CMS MAKES NO WARRANTY OF ANY KIND WHATEVER WITH RESPECT THERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON. CMS RESERVES THE RIGHT TO REVISE THIS MATERIAL SAFETY DATA SHEET AS NEW INFORMATION IS PROVIDED TO IT BY ITS MANUFACTURER.

- NICKEL SPECIAL #5630 - 07-28-118C

MATERIAL SAFETY DATA SHEET

720-5

Rec'd 11-21-91

PREPARATION/REVISION DATE:
September 24, 1990

SECTION I

MANUFACTURER'S NAME: SELECTRONS LTD.	EMERGENCY TELEPHONE: (203) 755-9900
ADDRESS: 137 MATTATUCK HEIGHTS RD., P.O. BOX 115, WATERBURY, CT 06725-0115	
CHEMICAL NAME: Electrolyte Nickel Solution	COMMON NAME: SPS 5630 Selectron Nickel (Special)
CHEMICAL FAMILY: Mineral Acids	FORMULA: $NiSO_4 \cdot C_2H_2O_2$

N/A = NOT APPLICABLE N/E = NOT ESTABLISHED

SECTION II HAZARDOUS INGREDIENTS

CHEMICAL AND COMMON NAME	%	APPLICABLE EXPOSURE LIMITS PEL-WISHA/OSHA	TLV-ACGIH	OTHER
Nickel Sulfate CAS #7786-81-4	<42	.1mg/m^3	.1mg/m^3	
Acetic Acid CAS #64-19-7	<5	25mg/m^3	10 ppm	
Hydrochloric Acid CAS#7647-01-0	<9	C 5 ppm	C 5 ppm	
Balance - Non-hazardous ingredients and/or water	<44			

NFPA Rating: Health=3
Fire=0
Reactivity=1

WHIMIS: Class E - Corrosive Material

CARCINOGENIC INGREDIENTS

CHEMICAL AND COMMON NAME	%	REFERENCE SOURCE NTP	IARC	WISHA/OSHA
Nickel Sulfate CAS #7786-81-4	<36		X	

SECTION III HEALTH HAZARD DATA

ACUTE HEALTH EFFECTS: Immediate irritation to eyes, nose and throat. Inhalation of vapor can cause severe damage to lining of nose, throat and lungs. Contact can cause severe damage to eyes and skin.

CHRONIC HEALTH EFFECTS: Continuous heavy exposure to fumes can cause respiratory disease and tissue damage.

ROUTES OF ENTRY: Inhalation, absorption.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Chronic respiratory conditions in persons with impaired pulmonary function. Persons with pre-existing skin disorders may be more susceptible than others.

EMERGENCY AND FIRST AID PROCEDURES:

EYES - Immediately flush with large amounts of water for at least 15 minutes. Consult a physician.

SKIN - Flush area with large amounts of water for at least 15 minutes.

SWALLOWED - Give large quantities of water to dilute the acid. DO NOT INDUCE VOMITING. Get medical attention immediately.

INHALATION - Remove person to fresh air.

SECTION IV CHEMICAL DATA

BOILING POINT F	N/A	SPECIFIC GRAVITY (H20=1)	1.05
VAPOR PRESSURE (mm Hg.)	N/A	PERCENT VOLATILE BY VOLUME (%)	N/A
VAPOR DENSITY (AIR=1)	N/A	EVAPORATION RATE (_____=1)	N/A
SOLUBILITY (Specify Solvents): Miscible in all proportions.		pH	0.6

APPEARANCE AND ODOR: Green colored solution with a strong, pungent vinegar odor.

SPS 5630

SECTION V PHYSICAL HAZARD DATA

FLASH POINT (Method used):	FLAMMABLE LIMITS:	Lel	Uel
N/A	N/A		

EXTINGUISHING MEDIA: No restrictions

SPECIAL FIRE FIGHTING PROCEDURES: N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS: N/A

INCOMPATIBILITY (Materials to avoid): Strong oxidizers (chromic acid, nitric acid, sodium peroxide).

HAZARDOUS DECOMPOSITION PRODUCTS: N/A

			CONDITIONS TO AVOID: N/A
HAZARDOUS POLYMERIZATION	MAY OCCUR		
	WILL NOT OCCUR	X	
STABILITY	UNSTABLE		
	STABLE	X	

SECTION VI SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Ventilate area. Can be neutralized with soda ash or absorbed with an inert material. A respirator should be worn, the size depending upon the quantity spilled.

WASTE DISPOSAL METHOD: Must be disposed of in accordance with State and Federal Regulations.

SECTION VII EXPOSURE CONTROL INFORMATION

RESPIRATORY PROTECTION (Specify type):
Dust and mist and fume respirator, 3M #9920 - NIOSH approved

VENTILATION	LOCAL EXHAUST: adequate exhaust	SPECIAL: N/A
	MECHANICAL (General): N/A	OTHER: N/A

PROTECTIVE GLOVES: Impervious rubber	EYE PROTECTION: Chemical splash safety goggles.

OTHER PROTECTIVE EQUIPMENT: Any other equipment so as not to splash on skin.

OTHER ENGINEERING CONTROLS: N/A

WORK PRACTICES: Eating and smmoking should not be permitted in areas where this material is handleed. Proper training should be given to personnel handling this material.

HYGIENIC PRACTICES: Employees who handle this material should wash their hands and face thoroughly before eating, smoking or using rest room facilities.

SECTION VIIII SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANNDLING AND STORING: Where there is any possibility of exposure to this material, safety showers and eye wash facilities should be in the immediate work area for emergency use. Keep container before opening. Keep away from heat and sunlight.

MAINTENANCE PERSONNEL: N/A

OTHER PRECAUTIONS: If clothing should become splashed or contaminated with this product, it should be drenched with water and not worn again until laundered.

95-01-0055
01-01-015

HYDROFLUORIC ACID, ANHYDROUS

MATERIAL SAFETY DATA SHEET

A. GENERAL INFORMATION

Trade Name(Common Name)	(X)CAS No.( )Allied Product Code
Hydrofluoric Acid, Anhydrous (HF, Anhydrous HF,AHF, Hydrogen Fluoride)	7664-39-3

Chemical Name and/or Synonym
Hydrogen Fluoride

Formula	Molecular Weight
HF	20.01

Address (No.,Street,City,State, and Zip Code)
ALLIED-SIGNAL,INC.
ENGINEERED MATERIALS SECTOR
P.O. Box 1139R
Morristown N.J. 07962

Contact	Phone Number	Last Issue Date	Current Issue Date
Product Safety Dept.	(201) 455-4157	August, 1991	December, 1991

B. FIRST AID MEASURES

Exposure to hydrofluoric acid requires special treatment. See pages 7-8 and References (k-n).	Emergency Phone Number (201) 455-2000

C. HAZARDS INFORMATION — HEALTH

Inhalation

Mild exposure: Can irritate nose, throat and respiratory system. Onset of symptoms may be delayed for several hours. Severe exposure: Can cause nose and throat burns, lung inflammation and pulmonary edema. Also results in other systemic effects including depletion of calcium levels in the body which if not promptly treated can result in death due to hypocalcemia. LC_{50}'s (animal) range from 342 to 1774 ppm/1H -Reference (a).

Ingestion

Can cause severe mouth, throat and stomach burns and be fatal if swallowed. Even with small amounts or dilute solutions profound and possibly fatal hypocalcemia and systemic toxicity is likely to occur unless medical treatment is promptly initiated - Reference (d).

C. HAZARDS (CONT.)

Skin
Both liquid and vapor can cause severe burns which may not be immediately painful or visible. HF will penetrate skin and attack underlying tissues and bone. Large burns (over 25 square inches) may also cause hypocalcemia and other systemic effects which may be fatal. Solutions as dilute as 2% or lower may cause burns - Reference (h).

Eyes
Both liquid and vapor can cause irritation or corneal burns and conjunctivitis. Solutions as dilute as 2% or lower may cause burns - Reference (h).

Permissible Concentration: Air (See Section J)

TWA OSHA PEL = 3 ppm (2.6 mg/m^3) as F

OSHA STEL = 6 ppm (5.2 mg/^{3}) as F

ACGIH TLV = 3 ppm (2.6 mg/m^3) as F (Ceiling)

Biological mg/L (F) in urine 4 (pre-shift) 7 (post-shift) see reference (e)

Unusual Chronic Toxicity
Bone and joint changes in humans (Fluorosis).
HF is not a carcinogenic substance as listed by IARC, NTP, ACGIH or OSHA.

FIRE AND EXPLOSION

Flash Point °C	Autoignition °C	Flammable Limits In Air(% By Vol.)
Not Flammable ( ) Open Cup ( ) Closed Cup	Temperature NA	Lower - NA Upper - NA

Unusual Fire and Explosion Hazards
Reaction with certain metals generates flammable and potentially explosive hydrogen gas. Considerable heat is evolved when contacted with many substances. Heat increases pressure and may explode container. Will react violently with water.

D. PRECAUTIONS/PROCEDURES

Fire Extinguishing Agents Recommended
Use water or suitable agent for fires adjacent to non-leaking tanks or containers of HF.

Fire Extinguishing Agents To Avoid
Do not use solid water streams near ruptured tanks or spills of HF. Acid reacts violently with water and can splatter acid onto personnel.

Special Fire Fighting Precautions
Wear self-contained breathing apparatus approved by NIOSH and full protective clothing (see Section E). Use water spray to keep containers cool.

D. PRECAUTIONS/PROCEDURES (CONT.)

Ventilation
Sufficient to reduce vapor and acid mists below permissible TLV levels. Packaging and unloading areas and open processing equipment may require mechanical exhaust systems.

Normal Handling
Do not breathe vapor or mist. Use only with adequate ventilation. Avoid all contact with skin, eyes, and clothing, even dilute solutions. Do not add water to acid.

Storage
Store in approved containers only. Store in cool, well-ventilated area. Flammable hydrogen gas can be generated in metal storage containers. Diking of storage tanks is recommended. Unlined carbon steel storage tanks in HF service may be subject to indiscriminate hydrogen blistering and should, therefore, be routinely inspected and repaired if needed. Non-destructive tank thickness testing (NDT) should be utilized for periodic checks of tank wall thickness. See also section K

Spill or Leak (ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT - SECTION E)
Good ventilation is necessary. Discharge will ordinarily be a vapor or a liquid that rapidly vaporizes. Full protective equipment described in Section E must be used by those treating spills or repairing leaks. (See Section I for disposal methods). Attempt to keep out of sewer. Any release to the environment of this product may be subject to Federal and/or state reporting requirements. Check with appropriate authorities.

Special: Precautions/Procedures/Label Instructions Signal Word - DANGER! POISON!
Employees should be thoroughly trained in safety procedures.(See references). To prevent ignition of hydrogen gas that may be present from contact with metals, smoking, flames and sparks should not be permitted in storage areas.

E.PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection
Where required, use a respirator approved by NIOSH for HF gas or mists, as applicable. Some exposures may require a NIOSH-approved, self-contained breathing apparatus or air-supplied respirator. See References (e), (g).

Eyes and Face
As a minimum, wear hard hat, chemical safety goggles (plastic lenses), full face plastic shield. Do not wear contact lenses. For increased protection, use air-supplied acid hood.

Hands,Arms,and Body
For routine product use, wear acid-resistant jacket, trousers, boots and gauntlet gloves. For increased protection, use air-supplied acid suit.

Other Clothing and Equipment
Eyewash and quick-drench shower facilities, protected from freezing, should be available where HF is stored or handled.

F. PHYSICAL DATA

Material Is (At Normal Conditions): (X)Liquid ( )Solid ( )Gas ( )		Appearance and Odor Colorless liquid, fumes in air. Sharp pungent odor.
Boiling Point 67.2°F (19.54°C) Melting Point -118°F (-84°C)	Specific Gravity (H_2O = 1) 0.980	Vapor Density (Air = 1) 2.21 @ 70°F; 1.97 @ 75°F; 1.76 @ 80°F
Solubility in Water (% by Weight) Complete	pH NA	Vapor Pressure Hg at 20°C(X) (PSIG)( ) 776
Evaporation Rate (Butyl Acetate = 1) (x) (Ether = 1) ( ) (time to evaporate) ( ) Greater than 1		% Volatiles by Volume (At 20°C) 100

G. REACTIVITY DATA

Stability ( ) Unstable (X) Stable	Conditions to Avoid NA

Incompatibility (Materials to Avoid)

(1) Glass, concrete and other silicon-bearing materials: yield silicon tetrafluoride gas. Pressure buildup from this process has been known to blow up glass containers. Other hazards of this gas: See Reference (i).
(2) Carbonates, sulfides, and cyanides: yield toxic gases: carbon dioxide, hydrogen sulfide, and hydrogen cyanide.
(3) Alkalies, some oxides: cause strong exothermic reactions that can be violent.
(4) Common metals: yield hydrogen gas, a fire and explosive hazard and a reactive hazard.
(5) Corrosive to many materials including leather, rubber and many organics.
(6) Considerable heat is evolved and violent reaction can occur if water is added to HF.

Hazardous Decomposition Products

NA; boils away unchanged (see Section F).

Hazardous Polymerization ( ) May Occur (X) Will Not Occur	Conditions to Avoid NA

H. HAZARDOUS INGREDIENTS (MIXTURES ONLY)

Materials or Components/C.A.S. #	WT. %	Hazard Data(See Sect.J)
NA		

ND = NOT DETERMINED NA = NOT APPLICABLE

I. ENVIRONMENTAL

Degradability/Aquatic Toxicity	Octanol/Water Partition Coefficient
Aquatic toxicity: 60 ppm/*/fish/lethal/fresh water -Reference (j). *Time period not specified.	N.D.

EPA Hazardous Substance? Yes (X) No ( ) If So Reportable: 100 # Quantity (Clean Water Act Sect. 311)	40 CFR 116-117

Waste Disposal Methods (Disposer Must Comply With Federal,State and Local Disposal or Discharge Laws)

As waste disposal methods may vary, contact the supplier for specific recommendations. Treat small amounts by adding to an excess of water and neutralize with a lime slurry, limestone, soda ash or other alkali. Add to water and neutralize cautiously as reaction is immediate and can be violent. Considerable amounts of harmful vapors may be released. Good ventilation is required. Dispose of residue (or slurry) by removal to an approved chemical wastes landfill or by an approved disposal contractor.

RCRA Status of Unused Material If Discarded:	Hazardous Waste Number:(If Applicable)	40 CFR
EPA Hazardous Waste.	U134 (hydrofluoric acid)	261

J. REFERENCES

Permissible Concentration References

29 CFR 1910.1000 "Z1A Table", OSHA, 1989.
Threshold Limit Values and Biological Exposure Indices for 1990-1991, ACGIH.

Regulatory Standards	D.O.T. Information:	49 CFR
This product is not sold for food or drug use. TSCA Inventory status: Included (as of 1978).	Proper Shipping Name: Hydrogen Fluoride, Anhydrous Classification: Corrosive & Poison - Inhalation Hazard UN Number: 1052	172.101

General

(a) NIOSH Registry of Toxic Effects of Chemical Substances. 1985-86.
(b) Gosselin, et. al., Clinical Toxicology of Commercial Products,5th Ed.1984
(c) NFPA Manual 49, "Fire Protection Guide on Hazardous Materials", 10th Ed.,1991.
(d) Manoguerra, A.S., "Fatal Poisoning from Acute Hydrofluoric Acid Ingestion" Am. J. Emerg. Med. 4:362-3, 1986.
(e) NIOSH Criteria Document, Hydrogen Fluoride, Mar. 1976, Health and Human Services Department, Washington.
(f) Allied-Signal, Inc. Wall chart on Hydrofluoric Acid.
(g) NIOSH/OSHA Manual, "Pocket Guide to Chemical Hazards", June 1990.
(h) Derelanko, M.J., et. al., "Acute Dermal Toxicity of Dilute Hydrofluoric Acid", J. Toxicol. 4:73-85, 1985.
(i) Stokinger, H. E., "The Halogens and the Nonmetals Boron and Silica", Chapter 40; Patty's Industrial Hygiene and Toxicology, G. V. Clayton and F. E. Clayton (Eds.), 3rd Ed., 1981, Volume 2B, p. 2939.
(j) Coast Guard CHRIS system, form HFX,"Hydrogen Fluoride", Oct. 1978.
(k) Vance, Michael V, et. al., "Digital Hydrofluoric Acid Burns: Treatment with Intraarterial Calcium Infusion". Ann.Emerg.Med.15:890-896,Aug.1986
(l) MacKinnon, M.A., "Hydrofluoric Acid Burns". Derm. Clin. N.Am. 6:67-74, January, 1988.
(m) Edelman, Philip, "Hydrofluoric Acid Burns". State Art.Rev.:Occup.Med. 1:89-103, Jan.-Mar., 1986.
(n) Allied-Signal Inc. "Recommended Medical Treatment for Hydrofluoric Acid Exposure", 1991.

K. Additional Information

Information (Hazards, precautions, first aid, etc) is abbreviated. More detailed information is contained in the references given in Section J.

MSDS FILE # - 879

THIS MATERIAL SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION AND INVESTIGATION.

ALLIED-SIGNAL, INC. PROVIDES NO WARRANTIES, EITHER EXPRESSED OR IMPLIED, AND ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE DATA CONTAINED HEREIN.

SECTION B. FIRST AID MEASURES AND MEDICAL TREATMENT

A. For Acid Burns to the Body (Not the Eyes)

1. Remove the victim from the contaminated area and immediately place under a safety shower or wash the burned area with a water hose, whichever is available.
2. Remove all contaminated clothing while washing continuously.
3. Keep washing with large amounts of water for a minimum of 15 to 20 minutes: this may be reduced to 5 minutes if appropriate first aid or medical treatment is readily available. (See 5a-5b-5c).
4. Have someone make arrangements for medical attention while continuing to flush the affected area with water.

5(a) After thorough washing for at least 5 minutes the burned area should be immersed in a solution of 0.13% iced aqueous Zephiran® Chloride.* If immersion is not practical, towels should be soaked with the above solution and used as compresses for the burned area. Ideally compresses should be changed every 2 minutes. Soaking should continue until pain is relieved, up to 4 to 6 hours. At our plants we generally keep 10 - 15 liters of solution made up available for use. Solutions are replaced annually if not previously used.

5(b) As an alternate first aid treatment 2.5% calcium gluconate gel** may be promptly and continuously massaged into the burned area, until pain is relieved.

5(c) For larger burns, or for burns with concentrated HF, or if pain is not relieved by soaking in Zephiran® (5a) or by calcium gluconate gel (5b), or as an alternative to treatments in 5(a) or 5(b), the treatment is for the physician to inject sterile 5% aqueous calcium gluconate solution subcutaneously beneath, around, and in the burned area. Initially use no more than 0.5 cc per square centimeter and do not distort appearance of skin. If pain is not completely relieved, additional treatment is indicated. (5% calcium gluconate solution may be prepared by mixing equal parts of 10% calcium gluconate solution with normal saline.)

6. Seek medical attention as soon as possible for all burns regardless of how minor they may appear initially.

B. For Acid in the Eyes

1. Irrigate eyes for at least 15 minutes with copious quantities of water, keeping eyelids apart and away from eyeballs during irrigation.
2. Get competent medical attention immediately, preferably an eye specialist.
3. If a physician is not immediately available, apply one or two drops of 0.5% Pontocaine® Hydrochloride*** solution followed by a second irrigation for 15 minutes. Do not use the solution described for skin treatment. Use no oils or greases unless instructed to do so by a physician.
4. Irrigate with 1% calcium gluconate in normal saline for 1 to 2 hours to prevent or lessen corneal damage.

C. If HF is Swallowed

1. Drink large amounts of water to dilute. Do not induce vomiting.
2. Several glasses of milk or several ounces of milk of magnesia may be given for their soothing effect.
3. Take victim to a doctor.

D. First Aid for Inhalation

1. Move to fresh air. Keep the victim lying down, quiet and warm.
2. Get competent medical attention immediately.
3. If breathing has stopped, start artificial respiration at once.
4. Oxygen should be administered to a victim who is having difficulty breathing and by an authorized person only, until the victim is able to breathe easily by himself.
5. Do not give stimulants unless instructed to do so by a physician.
6. Victim should be examined by a physician and held under observation for at least 24-hours.
7. Note to Physician: Treat as chemical pneumonia. Monitor for hypocalcemia. 2.5% calcium gluconate in normal saline by nebulizer or by IPPB with 100% oxygen may decrease pulmonary damage. Bronchodilators may also be administered.

NOTE TO PHYSICIAN: For burns of large skin areas, (greater than 25 square inches), for ingestion and for significant inhalation exposure, severe systemic effects may occur. Monitor and correct for hypocalcemia, cardiac arrhythmias, hypomagnesemia and hyperkalemia. In some cases renal dialysis may be indicated. For certain burns, especially of the digits, use of intra-arterial calcium gluconate may be indicated. (Reference k).

*Zephiran Chloride is a trade name for Benzalkonium Chloride, Merck Index (10th Ed.) monograph 1055, a quaternary ammonium compound, sold by Winthrop Laboratories, N.Y.C., NY 10016. Pontocaine Hydrochloride is a trade name for Tetracaine Hydrochloride, Merck Index (10th Ed.) monograph 9014, sold by Winthrop Laboratories, N.Y.C., NY 10016.

**Calcium gluconate gel may be prepared by mixing 2.5 gms of calcium gluconate USP in 100 ml of surgical water soluble lubricant (e.g. KY Jelly, Johnson & Johnson Products, Inc., New Brunswick, NJ 08903) or by mixing one 10 cc ampule of 10% calcium gluconate solution per 1.5 oz of KY Jelly.

***Pontocaine Hydrochloride is a trade name for Tetracaine Hydrochloride, Merck Index (10th Ed.) monograph 9014, sold by Winthrop Laboratories, N.Y.C., NY 10016.

Environmental Data Sheet

Supplement to MSDS: Hydrofluoric Acid, Anhydrous

Current Issue Date: 12-1991 MSDS #: 879

****

SARA - TITLE III (40 CFR 300)

1. This product contains the following extremely hazardous substance(s) (Sections 302 and 304):

Component	TPQ (LBS)	RQ (LBS)
Hydrofluoric Acid	100	100

2. This product contains the following CERCLA hazardous substance(s) (Section 302 and 304)

Component	WT %	RQ (LBS)
Hydrofluoric Acid	100	100

NOTE: THE INFORMATION PROVIDED IN SECTION 1 AND 2 IS REQUIRED FOR EMERGENCY RESPONSE REPORTING.

3. This product has the following hazards (Sections 311 and 312):

	YES	NO
Immediate	X	
Delayed	X	
Fire		X
Pressure		X
Reactive	X	

4. This product contains the following toxic chemicals (Section 313):

Component	CAS #	WT %
Hydrofluoric Acid	7664-39-3	100

For additional information on the above chemicals see the material safety data sheet.

PORTS MSDS #: 5012

PRODUCT: ISOPROPYL ALCOHOL

PART NUMBER:

FORMULA:

KEYWORD: SOLVENT

PORTS NUMBER: 03-401-4421; 03-450-0140

PORTS MISC INFO:
01-01-4421
95-01-4545

PORTS RATING: HFR=230

MANUFACTURER:
CORCO CHEMICAL CORP.
TYBURN RD. & CEDAR LANE
FAIRLESS HILLS
PA

19030
PHONE: PHONE:
EMERGENCY PHONE: 215-295-5006

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 180 F	NOTE: 82.5'C.
Melting Point. . . .	EQ -128 F	NOTE: -89'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .7854	NOTE: @ 20'/4'C.
Vapor Pressure . . .	EQ 33	NOTE: MM HG @ 20'C.
Vapor Density. . . .	EQ 2.07	
Percent Volatiles. .	NG	
Evaporation Rate . .	NA	
pH	NG	
Molecular Weight . .	NG	
Viscosity.	NG	

Solubility in Water. MISCIBLE.
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID, ODOR OF RUBBING ALCOHOL.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 53 F	NOTE: 11.6'C.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	NG	

Explosive/Flammable Limits

Lower (LEL).	EQ 2
Upper (UEL).	EQ 12

Shipping Regulations

UN/NA Number.	UN1219
D.O.T. Hazard Class. . .	FLAMMABLE LIQUID
Label	NOT GIVEN
Proper Shipping Name . .	NOT GIVEN

==========

Preparer/Contact Information: SIGNATURE

Date Prepared/Revised 6/05/91

==== Component Information =====

ISOPROPYL ALCOHOL
OSHA PEL (PPM):
OSHA PEL (MG/M3): 980
ACGIH TLV (PPM): N*
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: NG
C.A.S. No.: 67630
Note:
PEL:400PPM; TLV:NOT REPORTED; IDLH:12000PPM; NIOSH

===== IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

IDENTITY (AS USED ON LABEL AND LIST): Isopropyl Alcohol

#1901

EMERGENCY TELEPHONE NUMBER: (215) 5006/5007

TELEPHONE NUMBER FOR INFORMATION:

MANUFACTURER'S NAME AND ADDRESS:

CORCO CHEMICAL CORPORATION
TYBURN RD. & CEDAR LANE
FAIRLESS HILLS, PENNA. 19030

===== HAZARDOUS INGREDIENTS/IDENTITY INFORMATION =====

SEE COMPONENT INFORMATION.

HAZARDOUS COMPONENTS (SPECIFIC CHEMICAL IDENTITY; COMMON NAME(S))

IsoPropyl Alcohol, C3H8O

COMMON NAMES (SYNONYMS)

iso-Propanol
2-Propanol
Sec-Propyl Alcohol
Dimethylcarbinol
Petrohol
IPA

INDEXED AS:

RTECS: NT 8050000
UN 1219
NFPA: 130
DOT: Flammable Liquid

===== PHYSICAL/CHEMICAL CHARACTERISTICS =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

===== FIRE AND EXPLOSION HAZARD DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

EXTINGUISHING MEDIA: CO2, Dry chemical, Alcohol Foam, Water Spray

ECIAL FIRE FIGHTING PROCEDURES: Wear self-contained breathing apparatus and
full protective equipment. Cool flame exposed containers with water until
well after fire is out.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Auto ignition @ 852'F. Flame of alcohol
fire may not be visible! Container may explode in heat of fire.

===== REACTIVITY DATA =====

STABILITY: Stable

CONDITIONS TO AVOID: Heat, Spark, Flame

INCOMPATIBILITY (MATERIALS TO AVOID): Strong Oxidizers

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: COx

HAZARDOUS POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID: Heat, Spark, Flame, Oxidizers

===== HEALTH HAZARD DATA =====

ROUTE(S) OF ENTRY:

INHALATION: Yes
SKIN: Yes
INGESTION: Yes

HEALTH HAZARDS (ACUTE AND CHRONIC): Eye, Nose, Throat irritant, Narcosis at
high concentrations. Product not considered an important toxic hazard and has
good warning proporties.

Ingestion of 100 ml may be fatal.

CARCINOGENICITY:

NTP: Not reported
IARC MONOGRAPHS: Reported; Indefinite
OSHA REGULATED: Not as carcinogen

NOTE: Possible carcinogen-consult literature.

SIGNS AND SYMPTOMS OF EXPOSURE: Blushing, Headache, Mental depression,
Nausea, Vomiting, Narcosis, Coma, Ingestion may be fatal.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Eye, Skin, Sinuses,
Respiratory

EMERGENCY AND FIRST AID PROCEDURES:

EYE, SKIN: Immediate water flush.

INHALATION: Fresh air. Artificial respiration.

INGESTION: If conscious induce vomit. Call Physician!

===== PRECAUTIONS FOR SAFE HANDLING AND USE =====

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:
Eliminate ignition
urces. For major spill, wear self-contained breathing apparatus
d full
protective equipment. Use water spray to reduce vapors. Take up
with
non-combustible absorbent and containerize for later disposal.

WASTE DISPOSAL METHOD: To be performed in compliance with all
local, State,
and Federal regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Avoid breathing
vapor. Do
not get liquid or vapor in Eyes, on Skin, on Clothing. Keep
container closed,
away from heat and flame.

OTHER PRECAUTIONS: Observe all precautions when handling "Empty"
containers
and possible residue therein.

===== CONTROL MEASURES =====

RESPIRATORY PROTECTION (SPECIFY TYPE): Full face organic vapor
chemical
cartridge respirator @ 1000 ppm

VENTILATION:

LOCAL EXHAUST: Recommended (Explosion Proof)
MECHANICAL (GENERAL): Recommended (Explosion Proof)
SPECIAL:
OTHER:

PROTECTIVE GLOVES: Rubber

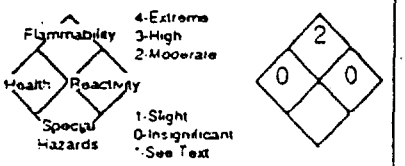
EYE PROTECTION: Full face shield, Splash goggles

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Grounded containers.
Protective
coveralls. Eye wash. Safety Shower.

WORK/HYGIENIC PRACTICES: Work safely. Respect the material. Wash
after
handling.

BP OIL

MATERIAL SAFETY DATA SHEET

24-HOUR EMERGENCY ASSISTANCE	GENERAL ASSISTANCE	NFPA FIRE HAZARD SYMBOL
BP America (In Ohio): 800-362-8059 (Outside Ohio): 800-321-8642 CHEMTREC Assist: 800-424-9300	216-441-8124	
MSDS Number > 1025		

MANUFACTURER/SUPPLIER: BP Oil Company
ADDRESS: 200 Public Square, Cleveland, OH 44114-2375

PRODUCT IDENTIFICATION

TRADE NAME:

1-K KEROSINE

CAS NUMBER: 64741-77-1
)NYM(S): LIGHT HYDROCRACKED DISTILLATE; MIDDLE DISTILLATE
.MICAL FAMILY: PETROLEUM HYDROCARBONS
MOLECULAR FORMULA: MIXTURE
MOLECULAR WEIGHT: NA
PRODUCT CODE: P 1419 HIERARCHY: 040.020

PRODUCT HAZARD SUMMARY

HEALTH
DANGER!
HARMFUL OR FATAL IF SWALLOWED
ASPIRATION HAZARD IF SWALLOWED--CAN ENTER LUNGS AND CAUSE DAMAGE
MAY BE IRRITATING TO THE SKIN, EYES AND RESPIRATORY TRACT
VAPORS MAY BE HARMFUL
SKIN CANCER HAZARD BASED ON TESTS WITH LABORATORY ANIMALS

FLAMMABILITY
CAUTION!
COMBUSTIBLE LIQUID & VAPOR

REACTIVITY
STABLE

PRODUCT HEALTH HAZARD INFORMATION

INGESTION:
'DERATELY TOXIC. Human oral LDLo = ~10 mls. Aspiration into lungs may cause aumonitis. May cause gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting and diarrhea. May cause harmful central nervous system effects. Effects

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may include excitation, euphoria, headache, dizziness, drowsiness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death.

SKIN:

PRACTICALLY NON-TOXIC. Rabbit dermal LD50 = >5 ml/kg. Repeated or prolonged contact may result in defatting, redness, itching, inflammation, cracking and possible secondary infection. May cause allergic reactions in some individuals. Absorption from prolonged or massive skin contact may cause poisoning. High pressure skin injections are SERIOUS MEDICAL EMERGENCIES. Injury may not appear serious at first; within a few hours, tissue will become swollen, discolored and extremely painful (see Notes to Physician section).

EYE:

Exposure to vapors, fumes or mists may cause irritation.

INHALATION:

May cause respiratory tract irritation. Exposure may cause central nervous system symptoms similar to those listed under "Ingestion" (see Ingestion section). Degenerative changes in the liver, kidneys and bone marrow may occur with prolonged, high concentrations. Repeated or prolonged exposures may cause behavioral changes.

SPECIAL TOXIC EFFECTS:

Products of similar composition have produced skin cancer in laboratory animals and have been positive in mutagenic test systems.

NOTE: This product has not been tested as a whole for all potential health effects. It may have other health hazards related to its components. See "Ingredient/Health Hazards" for additional information.

FIRST AID

INGESTION:

DO NOT INDUCE VOMITING BECAUSE OF DANGER OF ASPIRATING LIQUID INTO LUNGS. Get immediate medical attention. If spontaneous vomiting occurs, monitor for breathing difficulty.

SKIN CONTACT:

Remove contaminated clothing immediately. Wash area of contact thoroughly with soap and water. Get medical attention if irritation persists. High pressure skin injections are SERIOUS MEDICAL EMERGENCIES. Get immediate medical attention.

EYE CONTACT:

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists.

INHALATION:

Remove affected person from source of exposure. If not breathing, ensure open airway and institute cardiopulmonary resuscitation (CPR). If breathing is difficult, administer oxygen if available. Get medical attention.

NOTES TO PHYSICIAN

In case of ingestion, gastric lavage with activated charcoal can be used promptly to prevent absorption. Consideration should be given to the use of an intratracheal tube, to prevent aspiration. Individuals intoxicated by 1-K Kerosine should be hospitalized immediately, with acute and continuing attention to neurologic and cardiopulmonary function. Positive pressure ventilation may be necessary. After the initial episode,

ndividuals should be followed for changes in blood variables and the delayed appearance of pulmonary edema and chemical pneumonitis. Such patients should be followed for several days or weeks for delayed effects, including bone marrow toxicity, hepatic and renal [illegible]nt. Individuals with chronic pulmonary disease will be more seriously impaired, a[illegible]very from inhalation exposure may be complicated.

In case of skin injection, prompt debridement of the wound is necessary to minimize necrosis and tissue loss.

PERSONAL PROTECTION INFORMATION

YE PROTECTION:
Avoid eye contact with this material. Wear safety glasses or chemical goggles. Provide an eyewash station in the work area.

KIN PROTECTION:
Avoid skin contact. When working with this substance, wear appropriate chemical protective gloves. Depending upon conditions of use, additional protection may be necessary such as face shield, apron, armcovers, etc.

ESPIRATORY PROTECTION:
If exposure limits are exceeded or if irritation is experienced, NIOSH approved respiratory protection should be worn. Ventilation and other forms of engineering controls are often the preferred means for controlling chemical exposures. Respiratory protection may be needed for non-routine or emergency situations.

PHYSICAL PROPERTIES

[illegible]NG POINT: 148.900 C (300 F)
P[illegible]GRAVITY: 0.825 @ 60 F
IEL [illegible]POINT: NA
[illegible] VOLATILE: 100.000
APOR PRESSURE: 0.400 MM HG @ 60 F
VAPORATION RATE (WATER=1): SLOWER
APOR DENSITY (AIR=1): 4.700 (ESTIMATED)
ISCOSITY: 1.300- 2.200 CST @ 100 F
[illegible] SOLUBILITY IN WATER: NEGLIGIBLE
[illegible]CTANOL/WATER PARTITION COEFFICIENT: ND
OUR POINT: -34.400 C (-30 F)
H: NEUTRAL
PPEARANCE/ODOR: COLORLESS, CLEAR LIQUID WITH A HYDROCARBON ODOR.

FIRE AND EXPLOSION DATA

LASH POINT: 48.900 C (120 F)
UTOIGNITION TEMPERATURE: 210.000 C (410 F) ESTIMATED
LAMMABILITY LIMITS IN AIR (% BY VOL.) LOWER: 0.7000
LAMMABILITY LIMITS IN AIR (% BY VOL.) UPPER: 0.5000

ASIC FIREFIGHTING PROCEDURES:
Use water spray, dry chemical, foam or carbon dioxide to extinguish fire. Use water spray [illegible]ool fire-exposed containers, structures and to protect personnel. If leak or spill [illegible] ignited, ventilate area and use water spray to disperse gas or vapor and to

ID = No Data
IA = Not Applicable

protect personnel attempting to stop leak. Use water to flush spills away from sources of ignition. Do not flush down public sewers or other drainage systems.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Irritating or toxic substances may be emitted upon thermal decomposition. Dangerous when exposed to heat or flame. Runoff to sewer may cause fire or explosion hazard. Containers may explode in heat of fire. Exposed firefighters should wear MSHA/NIOSH approved self-contained breathing apparatus with full face mask and full protective equipment.

REACTIVITY DATA

STABILITY/INCOMPATIBILTY:

Stable. Avoid contact with strong oxidizers.

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS:

Combustion may produce CO, CO2 and reactive hydrocarbons.

ENVIRONMENTAL INFORMATION

SPILL OR RELEASE TO THE ENVIRONMENT:

If your facility or operation has an "Oil or Hazardous Substance Contingency Plan", activate its procedures.

-- Take immediate steps to stop and contain the spill. Caution should be exercised regarding personnel safety and exposure to the spilled material.

-- For technical advice and assistance related to chemicals, contact CHEMTREC (800/424-9300) and your local fire department.

-- Notify the National Response Center, if required.

Emergency Action:

Keep unnecessary people away. Stay upwind; keep out of low areas. Isolate hazard area and deny entry. (Also see Personal Protection Information section.) Isolate for 1/2 mile in all directions if tank or tankcar is involved in fire.

Spill or Leak Procedure:

No flares, smoking or flames in hazard area. Stop leak if you can do it without risk. Use water spray to reduce vapors. Small Spills: Take up with sand or other noncombustible absorbent material or other sorbent known to be compatible, then flush area with water. Large Spills: Dike far ahead of spill for later disposal.

Notification:

Any spill or release, or substantial threat of release, of this material to navigable water (virtually any surface water) sufficient to cause a visible sheen upon the water must be reported immediately to the National Response Center (800/424-8802), as required by U.S. Federal Law. Failure to report may result in substantial civil and criminal penalties.

WASTE DISPOSAL:

This substance, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however it could be hazardous if it is considered toxic, corrosive, ignitable, or reactive according to Federal definitions (40 CFR 261). Additionally, it could be designated as hazardous according to state regulations. This substance could also become a hazardous waste if it is mixed with or comes in contact with a hazardous waste. If such contact or mixing may have occurred, check 40 CFR 261 to

determine whether it is a hazardous waste. If it is a hazardous waste, regulations at 40 CFR 262, 263, and 264 apply.

transportation, storage, treatment, and disposal of this waste material must be ducted in compliance with all applicable Federal, state, and local regulations.

SARA TITLE III INFORMATION:

Listed below are the hazard categories for the Superfund Amendments and Reauthorization Act (SARA) Section 311/312 (40 CFR 370):

Immediate Hazard: X Delayed Hazard: X Fire Hazard: X Pressure Hazard: - Reactivity Hazard: -

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ADDITIONAL ENVIRONMENTAL REGULATORY INFORMATION:

There may be specific regulations at the local, regional or state level that pertain to this material.

SPECIAL PRECAUTIONS/SUPPLEMENTAL INFORMATION

HANDLING/STORAGE:

Store in tightly closed containers in cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Use non-sparking tools. Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion.

EMPTY CONTAINERS:

Empty containers may contain toxic, flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken ainst these hazards.

TRANSPORTATION REQUIREMENTS

D.O.T. PROPER SHIPPING NAME (49 CFR 172.101):	KEROSENE
D.O.T. HAZARD CLASS (49 CFR 172.101):	COMBUSTIBLE LIQUID
UN/NA CODE (49 CFR 172.101):	UN 1223
BILL OF LADING DESCRIPTION (49 CFR 172.202):	KEROSINE, COMBUSTIBLE LIQUID, UN 1223
D.O.T. LABELS REQUIRED (49 CFR 172.101):	NA
D.O.T. PLACARDS REQUIRED (49 CFR 172.504):	

INGREDIENTS/HEALTH HAZARD INFORMATION

COMPONENT	CAS NO.	%	EXPOSURE LIMITS - REF.
Light hydrocracked distillate	64741-77-1	99.90-100	None established

ND = No Data
NA = Not Applicable

REVISION DATE: 20-dec-1989 REPLACES SHEET DATED: 14-jul-1989

COMPLETED BY: BP OIL HSEQ DEPARTMENT

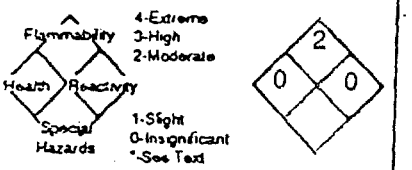
NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

ND = No Data
NA = Not Applicable

KEROSENE

BP OIL

MATERIAL SAFETY DATA SHEET

24-HOUR EMERGENCY ASSISTANCE	GENERAL ASSISTANCE	NFPA FIRE HAZARD SYMBOL
BP America (In Ohio): 800-362-8059 (Outside Ohio): 800-321-8642 CHEMTREC Assist: 800-424-9300	216-441-8124	
MSDS Number > 1294		

MANUFACTURER/SUPPLIER: BP Oil Company
ADDRESS: 200 Public Square, Cleveland, OH 44114-2375

PRODUCT IDENTIFICATION

TRADE NAME:
BP KEROSINE

CAS NUMBER: 8008-20-6
'YM(S): KEROSINE; MIDDLE DISTILLATE; PROCESS STREAM
,AL FAMILY: PETROLEUM HYDROCARBONS
MOLECULAR FORMULA: MIXTURE
MOLECULAR WEIGHT: NA
PRODUCT CODE: P 1410 HIERARCHY: 040.020

PRODUCT HAZARD SUMMARY

HEALTH
DANGER!
HARMFUL OR FATAL IF SWALLOWED
ASPIRATION HAZARD IF SWALLOWED--CAN ENTER LUNGS AND CAUSE DAMAGE
VAPORS MAY BE HARMFUL
MAY BE IRRITATING TO THE SKIN, EYES AND RESPIRATORY TRACT
HEATED MATERIAL MAY CAUSE THERMAL BURNS
SKIN CANCER HAZARD BASED ON TESTS WITH LABORATORY ANIMALS

FLAMMABILITY
CAUTION!
COMBUSTIBLE LIQUID & VAPOR

REACTIVITY
STABLE

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PRODUCT HEALTH HAZARD INFORMATION

INGESTION:

MODERATELY TOXIC. Human oral LDLo = ~10 mls. Aspiration into lungs may cause pneumonitis. May cause gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting and diarrhea. May cause harmful central nervous system effects. Effect may include excitation, euphoria, headache, dizziness, drowsiness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death.

SKIN:

PRACTICALLY NON-TOXIC. Rabbit dermal LD50 = >5 ml/kg. MODERATELY IRRITATING. Repeated or prolonged contact may result in defatting, redness, itching, inflammation, cracking and possible secondary infection. May cause allergic reactions in some individuals. Absorption from prolonged or massive skin contact may cause poisoning. High pressure skin injections are SERIOUS MEDICAL EMERGENCIES. Injury may not appear serious at first; within a few hours, tissue will become swollen, discolored and extremely painful (see Notes to Physician section). Contact with heated material may cause thermal burns.

EYE:

Exposure to vapors, fumes or mists may cause irritation. Contact with heated material may cause thermal burns.

INHALATION:

May cause respiratory tract irritation. Exposure may cause central nervous system symptoms similar to those listed under "Ingestion" (see Ingestion section). Degenerative changes in the liver, kidneys and bone marrow may occur with prolonged, high concentrations. Repeated or prolonged exposures may cause behavioral changes.

SPECIAL TOXIC EFFECTS:

Products of similar composition have produced skin cancer in laboratory animals and ha[illegible] n positive in mutagenic test systems. IARC has determined that there is limited [illegible]dence for the carcinogenicity of strait-run kerosine in experimental animals.

WARNING: The use of any hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of combustion products and inadequate oxygen levels.

NOTE: This product has not been tested as a whole for all potential health effects. It may have other health hazards related to its components. See "Ingredient/Health Hazards" for additional information.

FIRST AID

INGESTION:

DO NOT INDUCE VOMITING BECAUSE OF DANGER OF ASPIRATING LIQUID INTO LUNGS. Get immediate medical attention. If spontaneous vomiting occurs, monitor for breathing difficulty.

SKIN CONTACT:

Remove contaminated clothing immediately. Wash area of contact thoroughly with soap and water. Get medical attention if irritation persists. High pressure skin injections are SERIOUS MEDICAL EMERGENCIES. Get immediate medical attention. Thermal burns require immediate medical attention.

EYE CONTACT:

Flush immediately with large amounts of water. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists.

Thermal burns require immediate medical attention.

INHALATION:
ve affected person from source of exposure. If not breathing, ensure open airway and
itute cardiopulmonary resuscitation (CPR). If breathing is difficult, administer
oxygen if available. Get medical attention.

NOTES TO PHYSICIAN

In case of ingestion, gastric lavage with activated charcoal can be used promptly to prevent absorption. Consideration should be given to the use of an intratracheal tube, to prevent aspiration. Individuals intoxicated by middle distillates should be hospitalized immediately, with acute and continuing attention to neurologic and cardiopulmonary function. Positive pressure ventilation may be necessary. After the initial episode, individuals should be followed for changes in blood variables and the delayed appearance of pulmonary edema and chemical pneumonitis. Such patients should be followed for several days or weeks for delayed effects, including bone marrow toxicity, hepatic and renal impairment. Individuals with chronic pulmonary disease will be more seriously impaired, and recovery from inhalation exposure may be complicated. In case of skin injection, prompt debridement of the wound is necessary to minimize necrosis and tissue loss.

PERSONAL PROTECTION INFORMATION

EYE PROTECTION:
Avoid eye contact with this material. Wear safety glasses or chemical goggles. Provide an eyewash station in the work area. Do not wear contact lenses when working with this substance.

PROTECTION:
id skin contact. When working with this substance, wear appropriate chemical
otective gloves. Depending upon conditions of use, additional protection may be necessary such as face shield, apron, armcovers, etc.

RESPIRATORY PROTECTION:
If exposure limits are exceeded or if irritation is experienced, NIOSH approved respiratory protection should be worn. Ventilation and other forms of engineering controls are often the preferred means for controlling chemical exposures. Respiratory protection may be needed for non-routine or emergency situations.

PHYSICAL PROPERTIES

BOILING POINT:	148.900 C (300 F)
SPECIFIC GRAVITY:	ND
MELTING POINT:	NA
% VOLATILE:	100.000
VAPOR PRESSURE:	0.400 MM HG @ 68 F
EVAPORATION RATE (WATER=1):	SLOWER
VAPOR DENSITY (AIR=1):	4.700
VISCOSITY:	1.400- 2.100 CST @ 100 F
% SOLUBILITY IN WATER:	NEGLIGIBLE
OCTANOL/WATER PARTITION COEFFICIENT:	ND
IR POINT:	-34.400 C (-30 F)
	ND

ND = No Data
NA = Not Applicable

APPEARANCE/ODOR: COLORLESS/STRAW/COLORED CLEAR LIQUID WITH A HYDROCARBON ODOR.

FIRE AND EXPLOSION DATA

FLASH POINT: 48.900 C (120 F) TCC
AUTOIGNITION TEMPERATURE: 210.000 C (410 F)
FLAMMABILITY LIMITS IN AIR (% BY VOL.) LOWER: 0.700
FLAMMABILITY LIMITS IN AIR (% BY VOL.) UPPER: 5.000

BASIC FIREFIGHTING PROCEDURES:
Use water spray, dry chemical, foam or carbon dioxide to extinguish fire. Use water spra to cool fire-exposed containers, structures and to protect personnel. If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop leak. Use water to flush spills away from sources o ignition. Do not flush down public sewers or other drainage systems.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Dangerous when exposed to heat or flame. Containers may explode in heat of fire. Runoff to sewer may cause fire or explosion hazard. Irritating or toxic substances may be emitted upon thermal decomposition. Exposed firefighters should wear MSHA/NIOSH approved self-contained breathing apparatus with full face mask and full protective equipment.

REACTIVITY DATA

STABILITY/INCOMPATIBILTY:
Stable. Avoid contact with strong oxidizers.

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS:
Combustion may produce CO, CO2 and reactive hydrocarbons.

ENVIRONMENTAL INFORMATION

SPILL OR RELEASE TO THE ENVIRONMENT:
If your facility or operation has an "Oil or Hazardous Substance Contingency Plan", activate its procedures.

-- Take immediate steps to stop and contain the spill. Caution should be exercised regarding personnel safety and exposure to the spilled material.

-- For technical advice and assistance related to [illegible] (800/424-9300) and your local fire department.

-- Notify the National Response Center, if required. Also notify appropriate state and local regulatory agencies, the LEPC and the Coast Guard if the release is into a waterway.

Emergency Action:
Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind; keep out of low areas. (Also see Personal Protection Information section.) Isolate for 1/2 mile in all directions if tank, rail car or tank truck is involved in fire.

Spill or Leak Procedure:
Shut off ignition sources; no flares, smoking or flames in hazard area. Stop leak if you can do it without risk. Water spray may reduce vapor; but it may not prevent ignition in closed spaces. Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal. Large Spills: Dike far ahead of

ND = No Data
NA = Not Applicable

liquid spill for later disposal.

Notification:

spill or release, or substantial threat of release, of this material to navigable ar (virtually any surface water) sufficient to cause a visible sheen upon the water must be reported immediately to the National Response Center (800/424-8802), as required by U.S. Federal Law. Failure to report may result in substantial civil and criminal penalties. Also contact the Coast Guard and appropriate state and local regulatory agencies.

WASTE DISPOSAL:

This substance, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however it could be characteristically hazardous if it is considered toxic, corrosive, ignitable, or reactive according to Federal definitions (40 CFR 261). Additionally, it could be designated as hazardous according to state regulations. This substance could also become a hazardous waste if it is mixed with or comes in contact with a hazardous waste. Check 40 CFR 261 to determine whether it is a hazardous waste. If it is a hazardous waste, regulations at 40 CFR 262, 263, 264, 268 and 270 apply. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate.

The transportation, storage, treatment, and disposal of this waste material must be conducted in compliance with all applicable Federal, state, and local regulations.

SARA TITLE III INFORMATION:

Listed below are the hazard categories for the Superfund Amendments and Reauthorization Act (SARA) Section 311/312 (40 CFR 370):

Immediate Hazard: X Delayed Hazard: X Fire Hazard: X Pressure Hazard: - Reactivity Hazard: -

ADDITIONAL ENVIRONMENTAL REGULATORY INFORMATION:

There may be specific regulations at the local, regional or state level that pertain to this material.

SPECIAL PRECAUTIONS/SUPPLEMENTAL INFORMATION

HANDLING/STORAGE:

Store in tightly closed containers in cool, [illegible] well-ventilated area away from heat, sources of ignition and incompatibles. Use non-sparking tools. Ground [illegible] equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion. Do not siphon this product by mouth. Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Remove contaminated clothing and clean before reuse. Shower after work using soap and water.

This product does not meet the sulfur limits for K-1 Kerosine and should not be used in non-flue connected appliances, heaters or wick lamps.

EMPTY CONTAINERS:

Empty containers may contain toxic, flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards.

ND = No Data
NA = Not Applicable

TRANSPORTATION REQUIREMENTS

D.O.T. PROPEER SHIPPING NAME (49 CFR 172.101):	KEROSINE, COMBUSTIBLE LIQUID, UN 1223
D.O.T. HAZARRD CLASS (49 CFR 172.101):	COMBUSTIBLE LIQUID
UN CODE (49 CFR 172.101):	UN 1223
BILL OF LADING DESCRIPTION (49 CFR 172.202):	KEROSINE, COMBUSTIBLE LIQUID, UN 1223
D.O.T. LABELS REQUIRED (49 CFR 172.101):	NA
D.O.T. PLACARDS REQUIRED (49 CFR 172.504):	COMBUSTIBLE

INGREDIENTS/HEALTH HAZARD INFORMATION

COMPONENT	CAS NO.	%	EXPOSURE LIMITS - REF.
Kerosine	8008-20-6	99.90-100	None established
Remaining components not determined hazardous and/or hazardous components present at less than 1.0% (0.1% for carcinogens).	NA	Trace	NA

REVISION DATE: 30-oct-1991 REPLACES SHEET DATED: 21-aug-1990
COMPLETED BY: BP OIL HSEQ DEPARTMENT

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by Vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards inherent in the nature of the product.

N Data
NA = Not Applicable

http://jupiter.ports/msds/data/5259

===== Component Information =====

PHOSPHORIC ACID
OSHA PEL (PPM):
OSHA PEL (MG/M3): 1
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 1
STEL (PPM):
STEL (MG/M3): 3
Product %: EQ 85
C.A.S. No.: 7664382
Note:
ACGIH STEL.

WATER
OSHA PEL (PPM): NG
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NG
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 15
C.A.S. No.: NOT GIVEN

===== PRODUCT IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

PRODUCT NAME: PHOSPHORIC ACID

YNONYMS: Ortho-phosphoric acid; white phosphoric acid

FORMULA CAS NO.: 7664-38-2

HAZARDOUS INGREDIENTS: Phosphoric acid 85%, 15% water

SUPERSEDES: 01-01-85

EMERGENCY PHONE NUMBER: 314-539-1600

MANUFACTURER'S NAME AND ADDRESS:

MALLINCKRODT, INC.
SCIENCE PRODUCTS DIVISION
P.O. BOX 800
PARIS, KY 40362

===== PRECAUTIONARY MEASURES =====

DANGER! CAUSES SEVERE BURNS. HARMFUL IF SWALLOWED OR INHALED.

Avoid contact with eyes, skin and clothing.
Keep container closed.
Use with adequate ventilation.
Avoid breathing mist.
Wash thoroughly after handling.

===== EMERGENCY/FIRST AID =====

In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. If swallowed, DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give

PORTS MSDS #: 347

PRODUCT: STANDARD, LEAD 1000PPM IN 10% NITRIC

PART NUMBER:

FORMULA: Pb

KEYWORD: STANDARD

PORTS NUMBER: 00190041-100; 00190028-100; 00190041

PORTS MISC INFO:
LAB MSDS# 334
LAB MSDS# 347

PORTS RATING: HFR=300

MANUFACTURER:
VHG LABS INC.
180 ZACHARY RD #5
MANCHESTER
NH

03109
PHONE: PHONE: 603-622-7660
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	~ 212 F	NOTE: ~100'C.
Melting Point. . . .	~ 32 F	NOTE: ~0'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	~ 1	
Vapor Pressure . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Vapor Density. . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Percent Volatiles. .	~ 99	NOTE: @ 21'C.
Evaporation Rate . .	NA	NOTE: NOT APPLI/NOT AVAIL.
pH	NA	NOTE: NOT APPLI/NOT AVAIL.
Molecular Weight . .	EQ 207.20	NOTE: FORMULA WT.
Viscosity.	NG	

Solubility in Water. COMPLETE (100%).
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID, ODORLESS / ODOR THRESHOLD: NOT APPLICABLE/NOT AVAILABLE.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	NA	NOTE: NOT APPLI/NOT AVAIL.
Explosive/Flammable Limits		
Lower (LEL).	NA	NOTE: NOT APPLI/NOT AVAIL.
Upper (UEL).	NA	NOTE: NOT APPLI/NOT AVAIL.

Shipping Regulations

UN/NA Number.	NG
D.O.T. Hazard Class. . .	NG
Label	NOT GIVEN
Proper Shipping Name . .	CHEMICALS, N.O.S. (NON-REGULATED)

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Preparer/Contact Information: QUALITY ASSURANCE DEPARTMENT

http://jupiter.ports/msds/data/347

Date Prepared/Revised 1/29/93

==== Component Information =====

LEAD
OSHA PEL (PPM):
OSHA PEL (MG/M3): 0.05
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 0.15
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 1.0
C.A.S. No.: 7439921

NITRIC ACID
OSHA PEL (PPM):
OSHA PEL (MG/M3): 5.2
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 5.2
STEL (PPM):
STEL (MG/M3): 10
Product %: EQ 10
C.A.S. No.: 7697372
Note:
PEL & TLV: 2 PPM / STEL: 4 PPM.

WATER
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: BA
C.A.S. No.: 7732185
Note:
NE = NOT ESTABLISHED / BA = BALANCE.

===== SECTIN I - PRODUCT IDENTIFICATION =====

PRODUCT NAME: Lead Plasma Emission Standard - 10,000 micrograms/ml

COMMON SYNONYMS: N/A

CHEMICAL FAMILY: Plasma Emission Standards

FORMULA: Pb

FORMULA WT.: 207.20

CAS NO.: N/A

NIOSH/RTECS NO.: QU5775000

PRODUCT USE: Laboratory Reagent

REVISION DATE: 01/29/93

TEL: (603) 622-7660

FAX: 622-5180

MANUFACTURER'S NAME AND ADDRESS:

VHG LABS, INC.

http://jupiter.ports/msds/data/347

CHEMICAL PRODUCTS AND SERVICES
180 ZACHARY ROAD #5
MANCHESTER, NH 03109

===== SECTION II - COMPONENTS =====

SEE COMPONENT INFORMATION.

===== SECTION III - PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

ODOR THRESHOLD (PPM): N/A

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

===== SECTION IV - FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT (CLOSED CUP): N/A

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS:

UPPER: N/A
LOWER: N/A

FIRE EXTINGUISHING MEDIA: Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE-FIGHTING PROCEDURES: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode.

UNUSUAL FIRE & EXPLOSION HAZARDS: Reacts with most metals to produce hydrogen gas, which can form an explosive mixture with air.

TOXIC GASES PRODUCED: Oxides of nitrogen.

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT: None identified.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE: None identified.

===== SECTION V - HEALTH HAZARD DATA =====

THRESHOLD LIMIT VALUE (TLV/TWA): 5.2 mg/m3 (2 ppm)

TLV is for Nitric acid.

SHORT-TERM EXPOSURE LIMIT (STEL): 10 mg/m3 (4 ppm)

STEL is for Nitric acid.

PERMISSIBLE EXPOSURE LIMIT (PEL): 5.2 mg/m3 (2 ppm)

PEL is for Nitric acid.

TOXICITY OF COMPONENTS:

INHALATION-1HR RAT LC50 FOR NITRIC ACID: 2500 ppm

INTRAPERITONEAL MOUSE LD50 FOR WATER: 190 g/kg

INTRAVENOUS MOUSE LD50 FOR WATER: 25 g/kg

CARCINOGENICITY: NTP: No IARC: No Z LIST: No OSHA REG: No

CARCINOGENICITY: None identified

REPRODUCTIVE EFFECTS: This product contains a chemical known to the State of California to cause birth defects and other reproductive harm.

EFFECTS OF OVEREXPOSURE:

INHALATION: Severe irritation or burns of respiratory system, headache, nausea, vomiting, dizziness, pulmonary edema, lung inflammation, may be fatal

SKIN CONTACT: Severe irritation

EYE CONTACT: Severe irritation

SKIN ABSORPTION: None identified

INGESTION: Burns to mouth, throat, and stomach, nausea, vomiting, kidney dysfunction

CHRONIC EFFECTS: Damage to lungs, teeth, anemia, kidney damage, blurred vision, lead build-up in the central nervous system

TARGET ORGANS: Eyes, skin, mucous membranes, GI tract, central nervous system, gingival tissue, respiratory system, lungs, kidneys, blood, teeth

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Damaged skin, eye disorders, cardiopulmonary disease, lung disease

PRIMARY ROUTES OF ENTRY: Inhalation, ingestion, skin contact, eye contact

EMERGENCY AND FIRST AID PROCEDURES:

INGESTION: CALL A PHYSICIAN. If swallowed, do NOT induce vomiting If conscious, give water, milk or milk of magnesia.

INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

SKIN CONTACT: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

EYE CONTACT: In case of eye contact, immediately flush with plenty of water for at least 15 minutes.

SARA/TITLE III HAZARD CATEGORIES AND LISTS:

ACUTE: Yes CHRONIC: Yes FLAMMABILITY: No PRESSURE: No REACTIVITY: No

EXTREMELY HAZARDOUS SUBSTANCE: Yes Contains Nitric Acid (RQ = 1,000 LBS, TPQ = 1,000 LBS)

CERCLA HAZARDOUS SUBSTANCE: Yes Contains Lead (RQ = 1 LB) and Nitric Acid (RQ = 1000 LBS)

SARA 313 TOXIC CHEMICALS: Yes Contains Lead and Nitric Acid

TSCA INVENTORY: Yes

STATE LISTS:

FOR PRODUCTS SOLD IN THE STATE OF CALIFORNIA, REQUIRES THAT WE PROVIDE TO USERS AND THEIR EMPLOYEES THE FOLLOWING MESSAGE: WARNING: THIS PRODUCT CONTAINS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE BIRTH DEFECTS AND OTHER REPRODUCTIVE HARM.

===== SECTION VI - REACTIVITY DATA =====

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Heat

INCOMPATIBLES: Strong bases, strong reducing agents, alkalies, most common metals

DECOMPOSITION PRODUCTS: Oxides of nitrogen

===== SECTION VII - SPILL & DISPOSAL PROCEDURES =====

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE: Wear self-contained breathing apparatus and full protective clothing. Stop leak if you can do so without risk. Ventilate area. Neutralize spill with soda ash or lime. With clean shovel, carefully place material into clean, dry container and cover; remove from area. Flush spill area with water.

DISPOSAL PROCEDURES: Dispose in accordance with all applicable federal, state, and local environmental regulations.

EPA HAZARDOUS WASTE NUMBER: D002 (Corrosive Waste)

===== SECTION VIII - PROTECTION INFORMATION =====

EYE/FACE PROTECTION: Goggles & Shield

PROTECTIVE CLOTHING: Lab Coat & Apron

PROTECTIVE GLOVES: Rubber

VENTILATION REQUIREMENTS: Vent Hood

===== SECTION IX - STORAGE DATA AND ADDITIONAL INFORMATION =====

STORAGE REQUIREMENTS: Keep container tightly closed. Store in secure poison area. Isolate from incompatible materials.

===== SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION =====

DOMESTIC (D.O.T.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)

INTERNATIONAL (I.M.O.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)
MARINE POLLUTANTS: No

N/A = Not Applicable or Not Available
N/E = Not Established

The information in this Material Safety Data Sheet meets the requirements of the United States OCCUPATIONAL SAFETY AND HEALTH ACT and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) and the Canadian WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. This document is intended only as a guide to the appropriate precautionary handling of the material by a person trained in, or supervised by a person trained in, chemical handling. The user is responsible for determining the application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes.

Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, VHG cannot warn of all of the potential dangers of use or interaction with other chemicals or materials. VHG warrants that the chemical meets the specifications set forth on the label.

VHG DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.

The user should recognize that this product can cause severe injury and even death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION.

Approved by Quality Assurance Department.

PORTS MSDS #: 341

PRODUCT: STANDARD, MERCURY 1000PPM IN 10% NITRIC

PART NUMBER:

FORMULA: Hg

KEYWORD: STANDARD

PORTS NUMBER: 00190035-100

PORTS MISC INFO:
NOT GIVEN

PORTS RATING: HFR=300

MANUFACTURER:
VHG LABS INC.
180 ZACHARY RD #5
MANCHESTER
NH

03109
PHONE: PHONE: 603-622-7660
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	~ 212 F	NOTE: ~100'C.
Melting Point. . . .	~ 32 F	NOTE: ~0'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	~ 1	
Vapor Pressure . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Vapor Density. . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Percent Volatiles. .	~ 99	NOTE: @ 21'C.
Evaporation Rate . .	NA	NOTE: NOT APPLI/NOT AVAIL.
pH	NA	NOTE: NOT APPLI/NOT AVAIL.
Molecular Weight . .	EQ 200.59	NOTE: FORMULA WT.
Viscosity.	NG	

Solubility in Water. COMPLETE (100%).
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID, ODORLESS / ODOR THRESHOLD: NOT APPLICABLE/NOT AVAILABLE.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	NA	NOTE: NOT APPLI/NOT AVAIL.
Explosive/Flammable Limits		
Lower (LEL).	NA	NOTE: NOT APPLI/NOT AVAIL.
Upper (UEL).	NA	NOTE: NOT APPLI/NOT AVAIL.

Shipping Regulations

UN/NA Number.	NG
D.O.T. Hazard Class. . .	NG
Label	NOT GIVEN
Proper Shipping Name . .	CHEMICALS, N.O.S. (NON-REGULATED)

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Preparer/Contact Information: QUALITY ASSURANCE DEPARTMENT

Date Prepared/Revised 1/29/93

===== Component Information =====

MERCURY
OSHA PEL (PPM):
OSHA PEL (MG/M3): 0.05
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 0.05
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 1.0
C.A.S. No.: 7439976

NITRIC ACID
OSHA PEL (PPM):
OSHA PEL (MG/M3): 5
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 5
STEL (PPM):
STEL (MG/M3): 10
Product %: EQ 10
C.A.S. No.: 7697372
Note:
PEL & TLV: 2 PPM / STEL: 4 PPM.

WATER
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: BA
C.A.S. No.: 7732185
Note:
NE = NOT ESTABLISHED / BA = BALANCE.

===== SECTION I - PRODUCT IDENTIFICATION =====

PRODUCT NAME: Mercury Plasma Emission Standard - 10,000 g/ml

COMMON SYNONYMS: N/A

CHEMICAL FAMILY: Plasma Emission Standards

FORMULA: Hg

FORMULA WT.: 200.59

CAS NO.: N/A

PRODUCT USE: Laboratory Reagent

REVISION DATE: 01/29/93

TEL: (603) 622-7660

FAX: 622-5180

MANUFACTURER'S NAME AND ADDRESS:

VHG LABS, INC.
CHEMICAL PRODUCTS AND SERVICES
180 ZACHARY ROAD #5
MANCHESTER, NH 03109

http://jupiter.ports/msds/data/341

=== SECTION II - COMPONENTS =====

SEE COMPONENT INFORMATION.

===== SECTION III - PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

===== SECTION IV - FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT (CLOSED CUP): N/A

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS:

UPPER: N/A
LOWER: N/A

FIRE EXTINGUISHING MEDIA: Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE-FIGHTING PROCEDURES: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode.

UNUSUAL FIRE & EXPLOSION HAZARDS: Reacts with most metals to produce hydrogen as, which can form an explosive mixture with air.

TOXIC GASES PRODUCED: Oxides of nitrogen.

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT: None identified.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE: None identified.

===== SECTION V - HEALTH HAZARD DATA =====

THRESHOLD LIMIT VALUE (TLV/TWA): 5 mg/m3 (2 ppm)

TLV is for Nitric acid.

SHORT-TERM EXPOSURE LIMIT (STEL): 10 mg/m3 (4 ppm)

STEL is for Nitric acid.

PERMISSIBLE EXPOSURE LIMIT (PEL): 5 mg/m3 (2 ppm)

PEL is for Nitric acid.

TOXICITY OF COMPONENTS:

INHALATION-1HR RAT LC50 FOR NITRIC ACID: 2500 ppm

INTRAPERITONEAL MOUSE LD50 FOR WATER: 190 g/kg

INTRAVENOUS MOUSE LD50 FOR WATER: 25 g/kg

CARCINOGENICITY: NTP: No IARC: No Z LIST: No OSHA REG: No

CARCINOGENICITY: None identified

REPRODUCTIVE EFFECTS: None identified

EFFECTS OF OVEREXPOSURE:

INHALATION: Headache, nausea, vomiting, dizziness, irritation of respiratory system

SKIN CONTACT: Severe irritation

EYE CONTACT: Severe irritation

SKIN ABSORPTION: None identified

INGESTION: Burns to mouth, throat, and stomach, kidney dysfunction

CHRONIC EFFECTS: None identified

TARGET ORGANS: Respiratory system, eyes, skin, teeth

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Damaged skin,eye disorders, cardiopulmonary disease

PRIMARY ROUTES OF ENTRY: Inhalation, ingestion, skin contact, eye contact

EMERGENCY AND FIRST AID PROCEDURES:

INGESTION: CALL A PHYSICIAN. If swallowed, do NOT induce vomiting If conscious, give water, milk, or milk of magnesia.

INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

SKIN CONTACT: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

EYE CONTACT: In case of eye contact, immediately flush with plenty of water for at least 15 minutes.

SARA/TITLE III HAZARD CATEGORIES AND LISTS:

ACUTE: Yes CHRONIC: Yes FLAMMABILITY: No PRESSURE: No REACTIVITY: No

EXTREMELY HAZARDOUS SUBSTANCE: Yes Contains Nitric Acid (RQ = 1,000 LBS, TPQ = 1,000 LBS)

CERCLA HAZARDOUS SUBSTANCE: Yes Contains Nitric Acid (RQ = 1,000 LBS)

SARA 313 TOXIC CHEMICALS: Yes Contains Nitric Acid

TSCA INVENTORY: Yes

===== SECTION VI - REACTIVITY DATA =====

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Heat

INCOMPATIBLES: Strong bases, strong reducing agents, alkalies, most common metals

DECOMPOSITION PRODUCTS: Oxides of nitrogen

===== SECTION VII - SPILL & DISPOSAL PROCEDURES =====

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE: Wear self-contained

breathing apparatus and full protective clothing. Stop leak if you can do so without risk. Ventilate area. Neutralize spill with soda ash or lime. With clean shovel, carefully place material into clean, dry container and cover; remove from area. Flush spill area with water.

DISPOSAL PROCEDURE: Dispose in accordance with all applicable federal, state, and local environmental regulations.

EPA HAZARDOUS WASTE NUMBER: D002 (Corrosive Waste)

===== SECTION VIII - PROTECTION INFORMATION =====

EYE/FACE PROTECTION: Goggles & Shield

PROTECTIVE CLOTHING: Lab Coat & Apron

PROTECTIVE GLOVES: Rubber

VENTILATION REQUIREMENTS: Vent Hood

===== SECTION IX - STORAGE DATA AND ADDITIONAL INFORMATION =====

STORAGE REQUIREMENTS: Keep container tightly closed. Store in secure poison area. Isolate from incompatible materials.

===== SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION =====

DOMESTIC (D.O.T.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)

NTERNATIONAL (I.M.O.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)
MARINE POLLUTANTS: No

N/A = Not Applicable or Not Available
N/E = Not Established

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Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, VHG cannot warn of all of the potential dangers of user or interaction with other chemicals or materials. VHG warrants that the chemical meets the specifications set forth on the label. VHG DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.

The user should recognize that this product can cause severe injury and even death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION.

Approved by Quality Assurance Department.

PORTS MSDS #: 107

PRODUCT: METHANOL

PART NUMBER:

FORMULA: CH3OH

KEYWORD: SOLVENT

PORTS NUMBER: 66-001-6038; 66-013-0910; 66-001-6001

PORTS MISC INFO:
NOT GIVEN

PORTS RATING: HFR=330

MANUFACTURER:
CURTIN MATHESON SCIENTIFIC, INC
POB 1546, 9999 VETERANS MEM.DR
HOUSTON
TX

77251
PHONE: PHONE:
EMERGENCY PHONE: 314-982-5000

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 148 F	NOTE: 64.5'C.
Melting Point. . . .	EQ -144 F	NOTE: -98'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .8	
Vapor Pressure . . .	EQ 97	NOTE: MM HG @ 20'C.
Vapor Density. . . .	EQ 1.1	
Percent Volatiles. .	NG	
Evaporation Rate . .	EQ 5.9	NOTE: BU AC = 1.
pH	NG	
Molecular Weight . .	EQ 32.04	
Viscosity.	NG	

Solubility in Water. MISCIBLE WITH WATER.
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS LIQUID, CHARACTERISTIC ODOR.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 52 F	NOTE: 11'C.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	EQ 725 F	NOTE: 385'C.

Explosive/Flammable Limits

Lower (LEL).	EQ 6.7
Upper (UEL).	EQ 36

Shipping Regulations

UN/NA Number.	NG
D.O.T. Hazard Class. . .	FLAMMABLE LIQUID
Label	NOT GIVEN
Proper Shipping Name . .	NOT GIVEN

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Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 5/11/92

===== Component Information =====

METHYL ALCOHOL
OSHA PEL (PPM): 200
OSHA PEL (MG/M3):
ACGIH TLV (PPM): 200
ACGIH TLV (MG/M3):
STEL (PPM): 250
STEL (MG/M3):
Product %: EQ 100
C.A.S. No.: 67561
Note:
PEL, TLV, OSHA & ACGIH STEL: SKIN.

===== PRODUCT IDENTIFICATION =====

PRODUCT: METHYL ALCOHOL

SYNONYMS: Wood alcohol; methanol; carbinol

FORMULA CAS NO.: 67-56-1

MOLECULAR WEIGHT: 32.04

CHEMICAL FORMULA: CH3OH

HAZARDOUS INGREDIENTS: Methyl alcohol

PRECAUTIONARY MEASURES:

DANGER! MAY BE FATAL IF SWALLOWED.
HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. VAPOR HARMFUL. FLAMMABLE! MAY CAUSE BLINDNESS. CANNOT BE MADE NONPOISONOUS. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATOR TRACT.

Keep away from heat, sparks and flame.
Avoid contact with eyes, skin and clothing.
Avoid breathing vapor.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

EMERGENCY/FIRST AID:

In all cases call a physician immediately. If swallowed, induce vomiting immediately by giving two glasses of water and sticking finger down throat. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes.

SEE HEALTH HAZARD INFORMATION SECTION.

DOT HAZARD CLASS: Flammable Liquid

EMERGENCY PHONE NUMBER: 314-982-5000

MANUFACTURED FOR:

CURTIN MATHESON SCIENTIFIC, INC.
9999 VETERANS MEMORIAL DRIVE
P.O. BOX 1546
HOUSTON, TEXAS 77251

===== PHYSICAL DATA =====

SE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

===== FIRE AND EXPLOSION INFORMATION =====

FIRE: Flammable.

FLASHPOINT: 11'C (52'F) (CC).

AUTOIGNITION TEMPERATURE: 385'C (725'F).

FLAMMABLE LIMITS IN AIR, % BY VOLUME:

LEL: 6.7
UEL: 36

EXPLOSION: Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Moderate explosion hazard and dangerous fire hazard when exposed to heat, sparks or flames.

FIRE EXTINGUISHING MEDIA: Water spray, dry chemical, alcohol foam or carbon dioxide.

SPECIAL INFORMATION: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Use water spray to blanket fire, cool fire exposed containers, and to flush non-ignited spills or vapors away from fire. Vapors can flow along surfaces to distant ignition source and flash back.

NFPA RATINGS:

HEALTH: 1
FLAMMABILITY: 3
REACTIVITY: 0

===== REACTIVITY DATA =====

STABILITY: Stable under ordinary conditions of use and storage.

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon oxides and formaldehyde may form when heated to decomposition.

HAZARDOUS POLYMERIZATION: This substance does not polymerize.

INCOMPATIBILITIES: Strong oxidizing agents such as nitrates, perchlorates or sulfuric acid. Will attack some forms of plastics, rubber, and coatings. May react with metallic aluminium and generate hydrogen gas.

===== LEAK/SPILL DISPOSAL INFORMATION =====

Ventilate area of leak or spill. Remove all sources of ignition. Clean-up personnel require protective clothing and respiratory protection from vapors. Contain and recover liquid when possible. Collect as hazardous waste and atomize in a suitable RCRA approved combustion chamber, or absorb with vermiculite, dry sand, earth or similar material for disposal as hazardous waste in a RCRA approved facility. Do not flush to sewer!

REPORTABLE QUANTITY (RQ)(CWA/CERCLA): 5000 lbs.

Ensure compliance with local, state and federal regulations.

===== HEALTH HAZARD INFORMATION =====

EXPOSURE/HEALTH EFFECTS:

INHALATION: A slight irritant to the mucous membranes. Toxic effects erted upon nervous system, particularly the optic nerve. Once absorbed into ne body, it is very slowly eliminated. Symptoms of overexposure may include headache, drowsiness, nausea, vomiting, blurred vision, blindness, coma, and death. A person may get better but then worse again up to 30 hours later.

INGESTION: Toxic. Symptoms parallel inhalation. Can intoxicate and cause blindness. Usual fatal dose: 100-125 milliliters.

SKIN CONTACT: Methyl alcohol is a defatting agent and may cause skin to become dry and cracked. Skin absorption can occur, symptoms may parallel inhalation exposure.

EYE CONTACT: Irritant. Continued exposure may cause eye lesions.

CHRONIC EXPOSURE: Marked impairment of vision and enlargement of the liver has been reported. Repeated or prolonged exposure may cause skin irritation.

AGGRAVATION OF PRE-EXISTING CONDITIONS: Persons with pre-existing skin disorders or eye problems or impaired liver or kidney function may be more susceptible to the effects of the substance.

FIRST AID:

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

INGESTION: If swallowed, induce vomiting immediately by giving two glasses of water and sticking finger down throat. Never give anything by mouth to an unconscious person. Call physician immediately.

SKIN EXPOSURE: Remove any contaminated clothing. Wash skin with soap or ild detergent and water for at least 15 minutes. Get medical attention if ırritation develops or persists.

EYE EXPOSURE: Wash eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

TOXICITY DATA (RTECS, 1991): ORAL RAT LD50: 5628 mg/kg INHALATION RAT LC50: 64000 ppm/4H SKIN RABBIT: 15800 mg/kg; investigated as tumorigen, mutagen, reproductive effector.

===== OCCUPATIONAL CONTROL MEASURES =====

AIRBORNE EXPOSURE LIMITS:

OSHA PERMISSIBLE EXPOSURE LIMIT (PEL): 200 ppm (TWA), 250 ppm (STEL) skin

ACGIH THRESHOLD LIMIT VALUE (TLV): 200 ppm (TWA), 250 ppm (STEL) skin

VENTILATION SYSTEM: A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

PERSONAL RESPIRATORS: (NIOSH APPROVED) If the TLV is exceeded, wear a supplied air, full-facepiece respirator, airlined hood, or self-contained breathing apparatus.

SKIN PROTECTION: Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure.

EYE PROTECTION: Use chemical safety goggles. Contact lenses should not be worn when working with this material. Maintain eye wash fountain and quick-drench facilities in work area.

===== STORAGE AND SPECIAL INFORMATION =====

Protect against physical damage. Outside or detached storage is preferred. Inside storage should be in a standard flammable liquids storage room or cabinet. Separate from oxidizing materials. Storage and use areas should be No Smoking areas. Spark-proof tools and explosion-proof equipment should be used in the storage and handling areas.

===== ADDENDUM TO MATERIAL SAFETY DATA SHEET =====

THIS ADDENDUM MUST NOT BE DETACHED FROM THE MSDS. IDENTIFIES SARA 313 SUBSTANCE(S). ANY COPYING OR REDISTRIBUTION OF THE MSDS MUST INCLUDE A COPY O THIS ADDENDUM.

REGULATORY STATUS:

(CHEM.KEY: METOL)

HAZARD CATEGORIES FOR SARA SECTION 311/312 REPORTING:

ACUTE: X
CHRONIC: X
FIRE: X
PRESSURE:
REACTIVE:

PRODUCT OR COMPONENTS OF PRODUCT	SARA EHS SECT. 302 RQ(LBS.)	TPQ(LBS.)	SARA SECTION 313 CHEMICALS NAME LIST	CHEMICAL CATEGORY
METHYL ALCOHOL (67-56-1)	No	No	Yes	No

	CERCLA SEC. 103 RQ (lbs.)	RCRA SEC. 261.33
METHYL ALCOHOL (67-56-1)	5000	U154

SARA SECTION 302 EHS RQ: Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355.

SARA SECTION 302 EHS TPQ: Threshold Planning Quantity of Extremely Hazardous Substance. An asterisk (*) following a Threshold Planning Quantity signifies that if the material is a solid and has a particle size equal to or larger than 100 micrometers, the Threshold Planning Quantity = 10,000 LBS.

SARA SECTION 313 CHEMICALS: Toxic Substances subject to annual release reporting requirements listed at 40 CFR 372.65.

CERCLA SEC. 103: Comprehensive Environmental Response, Compensation and Liability Act (Superfund). Releases to air, land or water of these hazardous substances which exceed the Reportable Quantity (RQ) must be reported to the National Response Center, (800-424-8802); Listed at 40 CFR 302.4.

RCRA: Resource Conservation and Recovery Act. Commercial chemical product wastes designated as acute hazards and toxic under 40 CFR 261.33.

===== SPECIAL NOTES =====

CMS provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. Individuals receiving this information must exercise their independent judgment in determining its

http://jupiter.ports/msds/data/107

appropriateness for a particular purpose.

MS makes no representation, or warranties, either express or implied, of rchantability, fitness for particular purpose with respect to the nformation set forth herein or to the product to which the information refers. Accordingly, CMS will not be responsible for damages resulting from use of or reliance upon this information.

CHEMPURE(TM) Brand

EFFECTIVE DATE: 05-11-86

SUPERSEDES: 04-06-89

PORTS MSDS #: 5370

PRODUCT: METHYL ETHYL KETONE

PART NUMBER:

FORMULA: C-H3-C-H2-C-O-C-H3

KEYWORD: SOLVENT

PORTS NUMBER: 03-413-2130

PORTS MISC INFO:
01-13-2130

PORTS RATING: HFR=330

MANUFACTURER:
FISHER SCIENTIFIC CO.
1 REAGENT LANE, P.O. BOX 375
FAIR LAWN
NJ

07410
PHONE: PHONE: 201-796-7100
EMERGENCY PHONE: 201-796-7100

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 176 F	NOTE: 80'C.
Melting Point. . . .	EQ -123 F	NOTE: -86'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .8054	
Vapor Pressure . . .	EQ 100	NOTE: MMHG @ 25'C.
Vapor Density. . . .	EQ 2.5	
Percent Volatiles. .	NG	
Evaporation Rate . .	EQ 2.7	NOTE: ETHER = 1.
pH	NG	
Molecular Weight . .	EQ 72.12	
Viscosity.	EQ .40	NOTE: CP @ 25'C.

Solubility in Water. 27.5% / SOLUBLE IN ALCOHOL,ETHER,BENZENE,ACETONE,OILS.
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID WITH AN ACETONE-LIKE ODOR / ODOR THRESHOLD: 10 PPM.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 16 F	NOTE: -9'C.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	EQ 759 F	NOTE: 404'C.
Explosive/Flammable Limits		
Lower (LEL).	EQ 1.4	NOTE: @ 200'F.
Upper (UEL).	EQ 11.4	NOTE: @ 200'F.

Shipping Regulations

UN/NA Number.	UN1193
D.O.T. Hazard Class. . .	3 FLAMMABLE LIQUID
Label	FLAMMABLE LIQUID
Proper Shipping Name . .	METHYL ETHYL KETONE

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Preparer/Contact Information: AUTHORIZED-FISHER SCIENTIFIC INC.

Date Prepared/Revised 11/16/94

===== Component Information =====

METHYL ETHYL KETONE
OSHA PEL (PPM):
OSHA PEL (MG/M3): 590
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 590
STEL (PPM):
STEL (MG/M3): 885
Product %: EQ 100
C.A.S. No.: 78933
Note:
OSHA & ACGIH STEL: 300 PPM / PEL & TLV: 200 PPM / NIOSH:590 MG/M3, 200 PPM.

===== SUBSTANCE IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

SUBSTANCE: METHYL ETHYL KETONE

CAS-NUMBER: 78-93-3

TRADE NAMES/SYNONYMS: BUTANONE; 2-BUTANONE; ETHYL METHYL KETONE; METHYL ACETONE; 3-BUTANONE; MEK; RCRA U159; STCC 4909243; UN 1193; M209; M208; C4H8O; ACC14460

CHEMICAL FAMILY: Ketone, aliphatic

INDEX: 12922830071

AT NO: M209500

DATE: 1/17/95

CERCLA RATINGS (SCALE 0-3): HEALTH=3; FIRE=3; REACTIVITY=0; PERSISTENCE=0

NFPA RATINGS (SCALE 0-4): HEALTH=1; FIRE=3; REACTIVITY=0

EMERGENCY NUMBER: (201) 796-7100

CHEMTREC ASSISTANCE: (800) 424-9300

MANUFACTURER'S NAME AND ADDRESS:

FISHER SCIENTIFIC
CHEMICAL DIVISION
1 REAGENT LANE
FAIR LAWN, NJ 07410
(201) 796-7100

===== COMPONENTS AND CONTAMINANTS =====

SEE COMPONENT INFORMATION.

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:

METHYL ETHYL KETONE:

300 ppm (885 mg/m3) NIOSH recommended STEL.
200 ppm (590 mg/m3) DFG MAK TWA;
400 ppm (1180 mg/m3) DFG MAK 30 minute peak, average value, 4 times/shift.

MEASUREMENT METHOD: Ambersorb (R) xe-347 tube; carbon disulfide; gas chromatography with flame ionization detection; (NIOSH Vol. III # 2500).

5000 pounds CERCLA Section 103 Reportable Quantity subject to SARA Section 313 Annual Toxic Chemical Release Reporting.

OSHA revoked the final rule limits of January 19, 1989 in response to the 11th Circuit Court of Appeals decision (AFL-CIO v. OSHA) effective June 30, 1993. See 29 CFR 1910. 1000 (58 FR 35338).

===== PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

===== FIRE AND EXPLOSION DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

FIRE AND EXPLOSION HAZARD: Dangerous fire hazard when exposed to heat or flame.

Vapors are heavier than air and may travel a considerable distance to a source of ignition and flash back.

Vapor-air mixtures are explosive above flash point.

FLAMMABILITY CLASS(OSHA): IB

FIREFIGHTING MEDIA: Dry chemical, carbon dioxide, water spray or alcohol-resistant foam (1993 Emergency Response Guidebook, RSPA P 5800.6).

For larger fires, use water spray, fog or alcohol-resistant foam (1993 Emergency Response Guidebook, RSPA P 5800.6).

Alcohol foam (NFPA 325M, Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids, 1991).

FIREFIGHTING: Move container from fire area if you can do it without risk. Apply cooling water to sides of containers that are exposed to flames until well after fire is out. Stay away from ends of tanks. For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire. Isolate for 1/2 mile in all directions if tank, rail car or tank truck is involved in fire (1993 Emergency Response Guidebook, RSPA P 5800.6, Guide Page 26).

Extinguish only if flow can be stopped; use water in flooding amounts as fog, solid streams may not be effective. Cool containers with flooding quantities of water. Apply from as far a distance as possible. Avoid breathing vapors, keep upwind.

Water may be ineffective (NFPA 325M, Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids, 1991).

===== TRANSPORTATION DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

U.S. DEPARTMENT OF TRANSPORTATION SHIPPING NAME-ID NUMBER, 49 CFR 172.101: Methyl Ethyl Ketone - UN 1193

U.S. DEPARTMENT OF TRANSPORTATION HAZARD CLASS OR DIVISION, 49 CFR 172.101: 3 - Flammable liquid

U.S. DEPARTMENT OF TRANSPORTATION PACKING GROUP, 49 CFR 172.101: PG II

S. DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS, 49 CFR 172.101 AND BPART E: Flammable liquid

U.S. DEPARTMENT OF TRANSPORTATION PACKAGING AUTHORIZATIONS:

EXCEPTIONS: 49 CFR 173.150
NON-BULK PACKAGING: 49 CFR 173.202
BULK PACKAGING: 49 CFR 173.242

U.S. DEPARTMENT OF TRANSPORTATION QUANTITY LIMITATIONS 49 CFR 172.101:

PASSENGER AIRCRAFT OR RAILCAR: 5 L
CARGO AIRCRAFT ONLY: 60 L

===== TOXICITY =====

METHYL ETHYL KETONE:

IRRITATION DATA: 500 mg/24 hours skin-rabbit moderate; 402 mg/24 hours skin-rabbit mild; 13,780 ug/24 hours open skin-rabbit mild; 350 ppm eye-human; 80 mg eye-rabbit.

TOXICITY DATA: 100 ppm/5 minutes inhalation-human TCLo; 23,500 mg/m3/8 hours inhalation-rat LC50; 40 gm/m3/2 hours inhalation-mouse LC50; 38 gm/m3 inhalation-mammal LC50; 6480 mg/kg skin-rabbit LD50; 2737 mg/kg oral-rat LD50; 4050 mg/kg oral-mouse LD50; 607 mg/kg intraperitoneal-rat LD50; 616 mg/kg intraperitoneal-mouse LD50; 2000 mg/kg intraperitoneal-guinea pig LDLo; 5000 ppm/6 hour/90 day intermittent inhalation-rat TCLo; mutagenic data (RTECS); reproductive effects data (RTECS).

CARCINOGEN STATUS: None.

LOCAL EFFECTS: Irritant - inhalation, skin and eyes.

ACUTE TOXICITY LEVEL: Moderately toxic by ingestion; slightly toxic by inhalation and dermal absorption.

TARGET EFFECTS: Central nervous system depressant.

AT INCREASED RISK FROM EXPOSURE: Persons with a history of chronic skin or respiratory disease, or peripheral neuropathy.

ADDITIONAL DATA: May enhance the neurotoxic effects of n-hexane or methyl n-butyl ketone, and predispose the liver to injury from hepatotoxins including carbon tetrachloride and chloroform, and potentiate the nephrotoxicity of chloroform. Interactions with alcohol may occur. One study shows an increased risk of leukemia for children whose fathers had occupational exposure to methyl ethyl ketone after the birth of the child.

===== HEALTH EFFECTS AND FIRST AID =====

INHALATION:

METHYL ETHYL KETONE: Irritant/narcotic. 3000 ppm Immediately Dangerous to Life or Health.

ACUTE EXPOSURE: Vapor concentrations of 100-200 ppm caused mild nose and throat irritation; 90-270 ppm/4 hours caused shortened time estimations in men and increased the variation of time estimation tests in women; 300-500 ppm was objectionable and caused throat irritation, headache, vomiting, and nausea; 3,300 ppm was moderately irritating; and momentary exposure to 10,000 ppm produced intolerable irritation of the nose. Other effects may include difficulty in breathing, coughing and shortness of breath, and central nervous system depression with dizziness, drowsiness, weakness, loss of consciousness, and possibly death. One case of retrobulbar neuritis has

been reported in a worker exposed for 1 1/2 hours. Headache, mild vertigo and diminished vision were noted. Two other men had a similar exposure, but reported only mild respiratory symptoms and conjunctival irritation. It was suggested the optic nerve toxicity may have been related to the metabolism to methanol. Guinea pigs exposed to 10,000 ppm developed irritation rapidly, and narcosis developed after 240-280 minutes; at 33,000 ppm these symptoms developed sooner and caused death in 200-260 minutes; at 100,000 ppm narcosis and death occurred within 45-55 minutes. The animals that died exhibited emphysema, slight congestion of the brain and marked congestion of systemic organs, especially the lungs.

CHRONIC EXPOSURE: Offspring of pregnant rats exposed to 1,000 or 3,000 ppm exhibited skeletal, soft tissue, and sternebral variations. The same investigators repeated the study and the 3,000 ppm dose produced slight maternal and fetal toxicity. However, no embryo toxicity or teratogenicity were seen. Occupational exposure to methyl ethyl ketone and acetone has produced unconsciousness and convulsions; methyl ethyl ketone and a jelly-like substance produced weakness and numbness in the legs; and methyl ethyl ketone and tetrahydrofuran produced loss of muscle strength, fatigue, and bilateral paresthesia. Methyl ethyl ketone may have potentiated the neurotoxic effects of n-hexane in glue-sniffers and methyl n-butyl in workers.

FIRST AID: Remove from exposure area to fresh air immediately. Perform artificial respiration if necessary. Keep person warm and at rest. Treat symptomatically and supportably. Get medical attention immediately.

SKIN CONTACT:

METHYL ETHYL KETONE: Irritant.

ACUTE EXPOSURE: Contact with liquid or concentrated vapors may cause dermatitis. Direct contact with the liquid may cause extreme thickening of the fingernails, with permanent destruction of the nail beds. Skin sensitization did not occur when tested in man. Application of a lethal dose to rabbit skin produced erythema, edema, and necrosis. Liver and intestinal congestion were also reported.

CHRONIC EXPOSURE: Repeated or prolonged exposure may cause defatting of the skin producing a dry, scaly, fissured dermatitis. Skin absorption may have contributed to the toxic effects detailed in chronic inhalation of workers exposed to methyl ethyl ketone and other substances.

FIRST AID: remove contaminated clothing and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately.

EYE CONTACT:

METHYL ETHYL KETONE: Irritant.

ACUTE EXPOSURE: Exposure to vapor concentrations of 200 ppm caused irritation; 3,300 ppm produced moderate irritation; and 10,000 ppm was almost intolerable to guinea pigs. One case of severe anterior uveitis has been reported from the liquid, but may have been triggered by trauma. Direct contact of the liquid caused painful irritation and temporary corneal injury in rabbits, graded 5 on scale of 1-10. In guinea pigs, 100,000 ppm caused temporary corneal opacity which cleared within 8 days.

CHRONIC EXPOSURE: Repeated or prolonged exposure to irritants may cause conjunctivitis.

FIRST AID: Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately.

INGESTION:

METHYL ETHYL KETONE: NARCOTIC.

ACUTE EXPOSURE: Ingestion has caused coma, hyperventilation, metabolic acidosis and tachycardia. Other effects may include gastrointestinal irritation with abdominal spasms, nausea, vomiting, headache, and dizziness. Administration of lethal doses to animals produced congested and hemorrhagic lungs and congestion of the liver, alimentary tract, and peritoneal wall. Aspiration of ketones may result in chemical pneumonitis.

CHRONIC EXPOSURE: Repeated administration of methyl ethyl ketone and ethyl n-butyl ketone produced clinical neuropathy in animals.

FIRST AID: If the person is conscious and not convulsing, induce emesis by giving syrup of ipecac followed by water. (If vomiting occurs keep the head below the hips to prevent aspiration). Repeat in 20 minutes if not effective initially. Give activated charcoal. In patients with depressed respiration or if emesis is not produced, perform gastric lavage cautiously (Dreisbach, Handbook of Poisoning, 12th Ed.). Treat symptomatically and supportably. Gastric lavage should be performed by qualified medical personnel. Get medical attention immediately.

ANTIDOTE: No specific antidote. Treat symptomatically and supportably.

===== REACTIVITY =====

REACTIVITY: Stable under normal temperatures and pressures.

INCOMPATIBILITIES:

METHYL ETHYL KETONE:

CHLOROFORM: Vigorous, exothermic reaction in the presence of a base.

CHLOROSULFONIC ACID: Mixing in closed containers may result in increased temperature and pressure.

EXPLOSIVES: May react.

HYDROGEN PEROXIDE, NITRIC ACID: Produces shock and heat sensitive oily peroxide.

ISOPROPANOL: Two explosions occurred during laboratory distillation of isopropanol, one with a sample stored for 4 years. No cause was apparent, but the presence of traces of ketone(s) promoting peroxidation is a possibility.

OLEUM: mixing in closed container may result in increased temperature and pressure.

OXIDIZERS (STRONG): Possible fire and explosion hazard.

PEROXIDES: May react.

PLASTICS: May be attacked.

POTASSIUM TERT-BUTOXIDE: Ignition reaction.

RADIOACTIVE MATERIALS: May react.

RESINS: May be attacked.

RUBBER: May be attacked.

DECOMPOSITION: Thermal decomposition products may include toxic oxides of carbon.

POLYMERIZATION: Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

===== STORAGE AND DISPOSAL =====

Observe all federal, state and local regulations when storing or disposing this substance.

STORAGE: Store in accordance with 29 CFR 1910.106.

BONDING AND GROUNDING: Substances with low electroconductivity, which may be ignited by electrostatic sparks, should be stored in containers which meet the bonding and grounding guidelines specified in NFPA 77-1983, Recommended Practice on Static Electricity.

Store away from incompatible substances.

DISPOSAL: Disposal must be in accordance with standards applicable to generators of hazardous waste, 40 CFR 262. EPA hazardous waste number U159.

METHYL ETHYL KETONE:

REGULATORY LEVEL: 200.0 mg/l (TCLP-40 CFR 261 Appendix II).

Materials which contain the above substance at or above the TCLP regulatory level meet the EPA toxicity characteristic, and must be disposed of in accordance with 40 CFR 262. EPA Hazardous Waste Number D035.

CONDITIONS TO AVOID: Avoid contact with heat, sparks, flames, or other sources of ignition. Vapors may be explosive and poisonous; do not allow unnecessary personnel in area. Do not overheat containers; containers may violently rupture and travel a considerable distance in heat of fire.

===== SPILL AND LEAK PROCEDURES =====

SOIL SPILL: Dig holding area such as lagoon, pond or pit for containment.

Absorb bulk liquid with fly ash, cement powder, sawdust, or commercial sorbents.

AIR SUPPLY: Apply water spray to knock down vapors.

WATER SPILL: Limit spill motion and dispersion with natural barriers or oil spill control booms.

Use suction hoses to remove trapped soil material.

OCCUPATIONAL SPILL: Shut off ignition sources; no flares, smoking or flames in hazard area. Stop leak if you can do it without risk. Water spray may reduce vapor; but it may not prevent ignition in closed spaces.

For small spills, take up with sand or other noncombustible absorbent material and place in containers for later disposal.

For larger spills, dike far ahead of spill for later disposal. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind; keep out of low areas.

REPORTABLE QUANTITY (RQ): 5000 pounds

The Superfund Amendments and Reauthorization Act (SARA) Section 304 requires that a release equal to or greater than the reportable quantity for this substance be immediately reported to the local emergency planning committee and the state emergency response commission (40 CFR 355.40). If the release of this substance is reportable under CERCLA Section 103, the National Response Center must be notified immediately at (800) 424-8802 or (202) 426-2675 in the metropolitan Washington, D.C. area (40 CFR 302.6).

===== PROTECTIVE EQUIPMENT =====

VENTILATION: Provide local exhaust or general dilution ventilation to meet published exposure limits. Ventilation equipment must be explosion-proof if explosion concentrations of dust, vapor or fume are present.

RESPIRATOR: The following respirators and maximum use concentrations are recommendations by the U.S. Department of Health and Human Services, NIOSH Pocket Guide to Chemical Hazards; NIOSH criteria documents or by the U.S. Department of Labor, 29 CFR 1910 Subpart Z.

The specific respirator selected must be based on contamination levels found in the work place, must not exceed the working limits of the respirator and be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

METHYL ETHYL KETONE:

1000 PPM:

Any powered air-purifying respirator with organic vapor cartridge(s).
Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s).

3000 PPM:

Any air-purifying, full facepiece respirator (gas mask) with a chin-style or front- or back-mounted organic vapor canister.
Any supplied-air respirator operated in continuous flow mode.
Any self-contained breathing apparatus with a full facepiece.
Any supplied-air respirator with a full facepiece.

ESCAPE:

Any air-purifying, full facepiece respirator (gas mask) with a chin-style or front- or back-mounted organic vapor canister.
Any appropriate escape-type self-contained breathing apparatus.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

CLOTHING: Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged skin contact with this substance.

GLOVES: Employee must wear appropriate protective gloves to prevent contact with this substance.

EYE PROTECTION: Employee must wear splash-proof or dust-resistant safety goggles to prevent eye contact with this substance.

EMERGENCY EYE WASH: Where there is any possibility that an employee's eyes may be exposed to this substance, the employee should provide an eye wash fountain within the immediate work area for emergency use.

===== SPECIAL NOTES =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

AUTHORIZED - FISHER SCIENTIFIC, INC.

CREATION DATE: 09/28/84

http://jupiter.ports/msds/data/5370

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STARTEX CHEMICAL -- METHYL ISOBUTYL KETONE - METHYL ISOBUTYL KETONE
MATERIAL SAFETY DATA SHEET
NSN: 6810002812761
Manufacturer's CAGE: START
Part No. Indicator: A
Part Number/Trade Name: METHYL ISOBUTYL KETONE

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General Information

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Item Name: METHYL ISOBUTYL KETONE
Company's Name: STARTEX CHEMICAL
Company's P. O. Box: 687
Company's City: CONROE
Company's State: TX
Company's Country: US
Company's Zip Code: 77305
Company's Emerg Ph #: 409-539-6244
Company's Info Ph #: 409-539-6244
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 009
Status: SE
Date MSDS Prepared: 17NOV92
Safety Data Review Date: 17NOV92
Supply Item Manager: CX
MSDS Preparer's Name: DGSC-SSH
Preparer's Company: DEFENSE GENERAL SUPPLY CENTER
Preparer's St Or P. O. Box: 8000 JEFFERSON DAVIS HIGHWAY
Preparer's City: RICHMOND
Preparer's State: VA
Preparer's Zip Code: 23297-5680
MSDS Serial Number: BPJBD
Specification Number: TT-M-268
Hazard Characteristic Code: F4
Unit Of Issue: DR
Unit Of Issue Container Qty: 55 GALLONS
Type Of Container: DRUM
Net Unit Weight: 366.4 LBS

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Ingredients/Identity Information

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Proprietary: NO
Ingredient: METHYL ISOBUTYL KETONE (SARA III)
Ingredient Sequence Number: 01
Percent: 100 %
NIOSH (RTECS) Number: SA9275000
CAS Number: 108-10-1

CAS# 108-10-1
MSDS BPJBD
Methyl Ethyl Ketone

OSHA PEL: 100 PPM/75 STEL
ACGIH TLV: 50 PPM/75 STEL; 9293
Other Recommended Limit: NONE SPECIFIED

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Physical/Chemical Characteristics

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Appearance And Odor: CLEAR COLORLESS LIQUID, ACETONE-LIKE ODOR.
Boiling Point: 244F,118C
Melting Point: -112F,-80C
Vapor Pressure (MM Hg/70 F): 16
Vapor Density (Air=1): 3.45
Specific Gravity: 0.803
Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: 1.62 (BUTYL ACETATE=1)
Solubility In Water: INSOLUBLE
Corrosion Rate (IPY): UNKNOWN

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Fire and Explosion Hazard Data

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Flash Point: 73F,23C
Flash Point Method: CC
Lower Explosive Limit: 1.4 %
Upper Explosive Limit: 7.5 %
Extinguishing Media: USE CARBON DIOXIDE, FOAM, OR DRY CHEMICALS FOR SMALL FIRES. USE ALCOHOL-TYPE OR ALL-PURPOSE-TYPE FOAMS FOR LARGE FIRES.
Special Fire Fighting Proc: FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT WHEN FIGHTING CHEMICAL FIRE. USE WATER SPRAY TO COOL NEARBY CONTAINERS EXPOSED TO FIRE.
Unusual Fire And Expl Hazrds: FIRE OR EXCESSIVE HEAT MAY CAUSE PRODUCTION OF HAZARDOUS DECOMPOSITION PRODUCTS. USE WATER SPRAY TO DISPERSE VAPORS; REIGNITION IS POSSIBLE.

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Reactivity Data

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Stability: YES
Cond To Avoid (Stability): HIGH TEMPERATURES, SPARKS, AND OPEN FLAMES
Materials To Avoid: STRONG OXIDIZING AGENTS (SUCH AS NITRIC ACID & HCLO), A;DEHYDES AND ALKALIES. VIOLENT REACTION WITH POTASSIUM T-BUTOXIDE
Hazardous Decomp Products: CARBON MONOXIDE, CARBON DIOXIDE
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NONE. WILL NOT OCCUR.

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Health Hazard Data

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LD50-LC50 Mixture: LD50 (ORAL RAT) IS 2080 MG/KG
Route Of Entry - Inhalation: YES

http://haz1.siri.org:8(ls/h/q224/q151.htm

Route Of Entry - Skin: YES
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: ACUTE-EYE:SEVERE IRRITATION. SKIN:REPEATED CONTACT MAY CAUSE DEFATING/IRRITATION.INHALATION:IRRITATIONG & ITCHING SENSATION OF RESPIRATORY TRACT,NAUSEA/VOMITING,DIZZINESS/UNCONSCIOUSNESS. INGESTION:NAUSEA,HEADACHE,INFLAMATION OF GI-TRACT,LARGE DOSES MAY PRODUCE NARCOSIS. CHRONIC-SKIN:IRRITATION MAY RESULT IN DERMATITIS
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: PRODUCT CONTAINS NO INGREDIENTS CURRENTLY CLASSIFIED AS CARCINOGENIC BY NTP, IARC OR OSHA.
Signs/Symptoms Of Overexp: EYE:IRRITATION, REDNESS/SWELLING OF CONJUCTIVA AND PAIN. SKIN & RESPIRATORY TRACT IRRITATION, COUGHING, VOMITING, HEADACHE,DIZZINESS, LATHARGY AND UNCONSCIOUSNESS.
Med Cond Aggravated By Exp: PERSONS WITH A HISTORY OF AILMENTS OR WITH A PRE-EXISTING DISEASE INVOLVING THE EYES, SKIN, OR RESPIRATORY TRACT MAY BE AT INCREASED RISK FROM EXPOSURE.
Emergency/First Aid Proc: INHALATION:REMOVE TO FRESH AIR. RESUSCITATE IF NOT BREATHING. GET MEDICAL ATTENTION. EYES:IMMEDIATELY FLUSH WITH PLENTY OF REMOVE CONTAMINATED CLOTHING. WASH WITH SOAP AND WATER. IF IRRITATION PERSISTS, GET MEDICAL ADVICE. INGESTION:GIVE TWO GLASSES OF WATER. DO NOT INDUCE VOMITING. GET IMMEDIATE MEDICAL ATTENTION.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: SMALL SPILL: WIPE/SOAK UP WITH PAPER TOWEL OR INERT ABSORBENT. PUT IN DISPOSAL CONTAINER. REMOVE RESIDUE WITH WATER. LARGE SPILL: EVACUATE AND VENTILATE AREA. IF POSSIBLE, STOP LEAK. DIKE TO RETAIN RUN OFF. VACUUM UP FREE LIQUID. ABSORB/WASH RESIDUE
Neutralizing Agent: NONE
Waste Disposal Method: INCINERATE IN A FURNACE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS.
Precautions-Handling/Storing: STORE IN A COOL, DRY, WELL VENTILATED AREA. KEEP CONTAINERS TIGHTLY CLOSED. PROTECT CONTAINERS FROM PHYSICAL DAMAGE & STATIC ELECTRICITY.
Other Precautions: DO NOT TAKE INTERNALLY. DO NOT BREATHE VAPORS. AVOID CONTACT WITH EYES. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING. DO NOT USE WITH COPPER/COPPER ALLOYS, PLASTICS INCLUDING POLYVINYL CHLORIDE/POLYETHYLENE.

Control Measures

Respiratory Protection: IF VENTILATION DOES NOT MAINTAIN INHALATION EXPOSURES BELOW PEL(TLV), USE NIOSH/MSHA APPROVED ORGANIC VAPOR CARTRIDGE AND DUST/MIST PRE-FILTER RESPIRATORS AS PER CURRENT 29 CFR 1910.134,

http://haz1.siri.org:80 h/q224/q151.html

INSTRUCTIONS/WARNINGS AND NIOSH-RESPIRATOR SELECTION.
Ventilation: MECHANICAL (GENERAL) ROOM VENTILATION IS NORMALLY ADEQUATE.
LOCAL EXHAUST MAY BE REQUIRED IF WORK AREA NOT VENTED.
Protective Gloves: NEOPRENE, NITRILE, PVC OR NATURAL RUBBER
Eye Protection: SAFETY GOGGLES WITH OPTIONAL FACE SHIELD
Other Protective Equipment: EYE WASH STATION AND SAFETY SHOWER.
INDUSTRIAL-TYPE WORK CLOTHING AND APRON AS REQUIRED.
Work Hygienic Practices: OBSERVE GOOD PERSONAL HYGIENE PRACTICES AND
RECOMMENDED PROCEDURES. DO NOT WEAR CONTAMINATED CLOTHING OR FOOTWEAR.
Suppl. Safety & Health Data: AVOID PROLONGED OR REPEATED EXPOSURE. DO NOT
GET ON SKIN OR IN EYES. DO NOT BREATHE VAPORS OR MISTS.

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Transportation Data

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Trans Data Review Date: 92351
DOT PSN Code: ABF
DOT Proper Shipping Name: ACETONE
DOT Class: 3
DOT ID Number: UN1090
DOT Pack Group: II
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: ADF
IMO Proper Shipping Name: ACETONE
IMO Regulations Page Number: 3102
IMO UN Number: 1090
IMO UN Class: 3.1
IMO Subsidiary Risk Label: -
IATA PSN Code: ACM
IATA UN ID Number: 1090
IATA Proper Shipping Name: ACETONE
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFI PSN Code: ACM
AFI Prop. Shipping Name: ACETONE
AFI Class: 3
AFI ID Number: UN1090
AFI Pack Group: II
AFI Label: FLAMMABLE LIQUID
AFI Basic Pac Ref: 7-7

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Disposal Data

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Label Data

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Label Required: YES

http://haz1.siri.org:8(1s/h/q224/q151.htm

Technical Review Date: 17NOV92
Label Status: F
Common Name: METHYL ISOBUTYL KETONE
Chronic Hazard: YES
Signal Word: DANGER!
Acute Health Hazard-Moderate: X
Contact Hazard-Moderate: X
Fire Hazard-Severe: X
Reactivity Hazard-None: X
Special Hazard Precautions: EXTREMELY FLAMMABLE LIQUID AND VAPORS. VAPORS MAY SPREAD LONG DISTANCES AND IGNITE. KEEP AWAY FROM HEAT, SPARKS, AND FLAME. KEEP CONTAINER CLOSED. USE WITH ADEQUATE VENTILATION. IN CASE OF FIRE, USE DRY CHEMICAL, CO2 OR ALCOHOL FOAM. ACUTE-EYE:SEVERE IRRITATION. SKIN:REPEATED CONTACT MAY CAUSE DEFATING/IRRITATION.INHALATION:IRRITATION/ STINGING & ITCHING SENSATION OF RESPIRATORY TRACT,NAUSEA/VOMITING, DIZZINESS/UNCONSCIOUSNESS.INGESTION:NAUSEA,VOMITING,HEADACHE,DIZZINESS AND UNCNSCIOUSNESS. CHRONIC-SKIN:IRRITATION/ALLERGIC REACTION. SPILL: EVACUATE AREA. REMOVE IGNITION SOURCES. ABSORB WITH INERT MATERIAL/WASH RESIDUE WITH WATER.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: STARTEX CHEMICAL
Label P.O. Box: 687
Label City: CONROE
Label State: TX
Label Zip Code: 77305
Label Country: US
Label Emergency Number: 409-539-6244
==========
URL for this msds http://siri.org. If you wish to change, add to, or delete information in this archive please sent updates to dan@siri.org.

PORTS MSDS #: 129

PRODUCT: METHYLENE CHLORIDE

PART NUMBER:

FORMULA: CHCl2

KEYWORD: CARCINOGEN

PORTS NUMBER: 66-001-6112; 66-001-6113; 66-001-6116; 66072203; 66-007-2203; 66-01

PORTS MISC INFO:
NOT GIVEN

PORTS RATING: HFR=311

MANUFACTURER:
FISHER SCIENTIFIC

PHONE: PHONE:
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . . EQ 104 F
Melting Point. . . . EQ -142 F
Freezing Point . . . EQ -142 F
Pour Point . . . . . NG
Softening Point. . . NG

Specific Gravity . . EQ 1.33 NOTE: DENSITY.
Vapor Pressure . . . EQ 350 NOTE: MMHG @ 20'C.
Vapor Density. . . . EQ 2.9
Percent Volatiles. . NG
Evaporation Rate . . NA NOTE: NOT AVAILABLE.
pH . . . . . NA NOTE: NOT AVAILABLE.
Molecular Weight . . EQ 83.913
Viscosity. . . . . NA NOTE: NOT AVAILABLE.
Solubility in Water. MODERATELY SOLUBLE IN WATER.
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID, ETHEREAL ODOR / DECOMPOSITION TEMPERATURE: NOT AVAILABLE.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . . NA NOTE: NOT APPLICABLE.
Flash Point, Open Cup . . . NA NOTE: NOT APPLICABLE.
Fire Point. . . . . NG
Auto Ignition. . . . . EQ 1033 F NOTE: 556.11'C.
Explosive/Flammable Limits
Lower (LEL). . . . . EQ 15.1 NOTE: @ 103'C.
Upper (UEL). . . . . EQ 17.3 NOTE: @ 148'C.

Shipping Regulations
UN/NA Number. UN1593
D.O.T. Hazard Class. . . 6.1
Label . . . . . NOT GIVEN
Proper Shipping Name . . DICHLOROMETHANE

==========

Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 1/11/95

http://jupiter.ports/msds/data/129

===== Component Information =====

METHYLENE, DICHLORO-
OSHA PEL (PPM): 500
OSHA PEL (MG/M3):
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 174
STEL (PPM): 2000
STEL (MG/M3):
Product %: EQ 100
C.A.S. No.: 75092
Note:
PEL (FINAL & VACATED):1000 PPM,CEIL / TLV:50 PPM / OSHA STEL: 5MIN IN 3HRS.

===== SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION =====

PRODUCT: Dichloromethane

14930

MSDS NAME: Dichloromethane

CATALOG NUMBERS: BP1186 4, BP1186-4, BP11864 001, BP1186SS 115, BP1186SS 200, BP1186SS 30, BP1186SS 50, D123-1, D142 4, D142-4, D143 1, D143 4, D143-1, D143-4, D143SK 1, D143SK 4, D143SK-1, D143SK-4, D143SS-11, D143SS-115, D143SS-20, D143SS-200, D143SS-30, D143SS-50, D150 1, D150 4, D150-1, D150-4, D150SK 1, D150SK 4, D150SK-1, D150SK-4, D150SS 200, D150SS 30, D150SS 50, D150SS-11, D150SS-115, D150SS-20, D150SS-200, D150SS-30, D150SS-50, D151 1, D151 4, D151-1, D151-4, D152-4 D154 4, D1544LOT009, D35 1, D35 4, D35-1, D35-4, D 37 1, D37 20, D37 200, D37 200 001, D37 200 002, D37 4, D37 500, D37-1, D37-20 D37-200, D37-4, D37-500, D37SK 4, D37SK-4, D37SS 115, D37SS-115, D37SS-200, D37SS-30, D37SS-50, S71971, S719971-1, S80084, S80084-1, S80084-1MF*, S80084MF*

SYNONYMS: Methylene chloride, methylene dichloride, freon30

CAT NO: D1424

DATE: 01/19/96

FOR INFORMATION, CALL: 201-796-7100
EMERGENCY NUMBER: 201-796-7100
FOR CHEMTREC ASSISTANCE, CALL: 800-424-9300

COMPANY IDENTIFICATION:

FISHER SCIENTIFIC
1 REAGENT LANE
FAIR LAWN, NJ 07410

===== SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS =====

SEE COMPONENT INFORMATION.

CHEMICAL NAME	EINECS#
Methane, dichloro-	200-838-9

===== SECTION 3 - HAZARDS IDENTIFICATION =====

EMERGENCY OVERVIEW:

APPEARANCE: Colorless liquid with a ethereal odor. Caution! Vapors cause

eye and skin irritation. Contact with liquid causes severe eye and skin irritation and possible burns. May be absorbed through the skin. Inhalation nd ingestion may cause respiratory and digestive tract irritation, central ervous system depression characterized by headache, nausea, vomiting, izziness, and drowsiness. May cause cancer based on animal data. Vapors mixed with air in proper proportion will propagate a flame. Reproductive/development effects have been reported in animals.

TARGET ORGANS: Central nervous system, liver, lungs, pancreas.

POTENTIAL HEALTH EFFECTS:

EYES: Contact with eyes may cause severe irritation, and possible eye burns.

SKIN: Exposure may cause irritation and possible burns. May be absorbed through the skin. Causes a burning sensation on contact with the skin.

INGESTION: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advances stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure.

INHALATION: Inhalation of high concentrations may cause central nervous system effects characterized by headache, dizziness, unconsciousness and coma. Causes respiratory tract irritation. Methylene chloride is metabolized to carbon monoxide. Overexposure may cause an increase in carboxyhemoglobin levels in blood. Persons with a compromised cardiovascular system may not be able to tolerate the added cardiovascular stress.

CHRONIC: Prolonged or repeated skin contact may cause dermatitis. Possible cancer hazard based on tests with laboratory animals. Lung, liver and pancreatic tumors have been associated with chronic exposure to methylene hloride. Animals studies with rats and mice have shown delayed ossification of sternobrae and an increased incidence of extra sternobrae when exposed by inhalation.

===== SECTION 4 - FIRST AID MEASURES =====

EYES: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids. Get medical aid immediately.

SKIN: Get medical aid. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

INGESTION: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.

INHALATION: Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

NOTES TO PHYSICIAN: Treat symptomatically and supportively.

None reported.

===== SECTION 5 - FIRE FIGHTING MEASURES =====

GENERAL INFORMATION: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Vapors mixed with air in proper proportion will propagate a flame.

EXTINGUISHING MEDIA: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.

Use water spray to cool fire-exposed containers.

AUTOIGNITION TEMPERATURE: 1033 F (556.11 C)

FLASH POINT: Not applicable.

EXPLOSION LIMITS:

LOWER: 15.1 @ 103 C
UPPER: 17.3 @ 148 C

===== SECTION 6 - ACCIDENTAL RELEASE MEASURES =====

GENERAL INFORMATION: Use proper personal protective equipment as indicated in Section 8.

SPILLS/LEAKS: Absorb spill with inert material, (e.g., dry sand or earth), then place into a chemical waste container. Remove all sources of ignition. Use a spark-proof tool.

===== SECTION 7 - HANDLING AND STORAGE =====

HANDLING:

Wash thoroughly after handling.
Remove contaminated clothing and wash before reuse.
Use with adequate ventilation.
Loosen closure cautiously before opening.
Do not get on skin and clothing.
Keep container tightly closed.
Avoid contact with heat, sparks and flame.
Do not ingest or inhale.

STORAGE:

Keep away from heat, sparks, and flame.
Store in a tightly closed container.
Keep from contact with oxidizing materials.
Store in a cool, dry, well-ventilated area away from incompatible substances.

===== SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION =====

ENGINEERING CONTROLS: Local exhaust ventilation may be necessary to control any air contaminants to within their TLVs during the use of this product.

EXPOSURE LIMITS:

CHEMICAL NAME	ACGIH	NIOSH	OSHA - FINAL PELS
Methane, dichloro-	50 ppm; 174 mg/m3	Reduce exposure to lowest feasible concentration	500 ppm TWA; C 1000 ppm; C 1000 ppm

OSHA VACATED PELS:

METHANE, DICHLORO-: 500 ppm TWA; 2000 ppm STEL (5 min in any 3 hrs); C 1000 ppm

PERSONAL PROTECTIVE EQUIPMENT:

EYES: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133.

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SKIN: Wear appropriate protective gloves to prevent skin exposure.

CLOTHING: Wear appropriate protective clothing to prevent skin exposure.

RESPIRATORS: Follow the OSHA respirator regulations found in 29 CFR 1010.134. Always use a NIOSH-approved respirator when necessary.

===== SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

MOLECULAR FORMULA: CHCl2

===== SECTION 10 - STABILITY AND REACTIVITY =====

CHEMICAL STABILITY: Stable.

CONDITIONS TO AVOID: Incompatible materials, ignition sources, excess heat, strong oxidants.

INCOMPATIBILITIES WITH OTHER MATERIALS: Incompatible with strong oxidizers. Can react dangerously with nitrogen tetroxide, liquid oxygen, potassium, sodium, sodium-potassium alloys, lithium, potassium hydroxide with N-methyl-N-nitroso urea, potassium t-butoxide, and finely powdered aluminum and magnesium.

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrogen chloride, phosgene, carbon monoxide, carbon dioxide.

HAZARDOUS POLYMERIZATION: Has not been reported.

===== SECTION 11 - TOXICOLOGICAL INFORMATION =====

RTECS#:

CAS # 75-09-2: PA8050000

LD50/LC50:

CAS# 75-09-2:

INHALATION, MOUSE: LC50 = 14400 ppm/7H;
INHALATION, RAT: LC50 = 88 gm/m3/30M;
ORAL, RAT: LD50 = 1600 mg/kg.

CARCINOGENICITY:

METHANE, DICHLORO-:

ACGIH: A2-suspected human carcinogen
CALIFORNIA: Carcinogen
NIOSH: Occupational carcinogen
NTP: Suspect carcinogen
OSHA: Possible Select carcinogen
IARC: Group 2B carcinogen

EPIDEMIOLOGY: An historical cohort study of persons occupationally exposed to methylene chloride revealed no significantly increased cancer or ischemic heart disease mortality compared to a group of nonexposed employees as well as general population controls. The most recent update and expansion of this study demonstrated no unusual mortality patterns for hypothesized causes of death and no evidence of a dose-response relationship with respect to career exposure and latency. See IARC volume 41 for a more detailed discussion.

TERATOGENICITY: Specific developmental abnormalities

(musculoskeletal/urogenital): inl-mus TCLo: 1250 ppm/tH

REPRODUCTIVE EFFECTS: No data available.

NEUROTOXICITY: No data available.

MUTAGENICITY: No data available.

OTHER STUDIES: No data available.

===== SECTION 12 - ECOLOGICAL INFORMATION =====

ECOTOXICITY: This chemical has a moderate potential to affect some aquatic organisms. It is resistant to biodegradation, and has a low potential to persist in the aquatic environment. 96-hr. EC50 (loss of equilibrium); Fathead minnow: 99 mg/L; 96-hr. EC10: 66.3 mg/L. Bluegill sunfish: 96-hr. LC50=220 mg/L; Water flea: 24-hr. LC50-2270 mg/L; No observed effect level: 1550 mg/L.

ENVIRONMENTAL FATE: This material is not likely to bioconcentrate.

PHYSICAL/CHEMICAL: Not available.

===== SECTION 13 - DISPOSAL CONSIDERATIONS =====

Dispose of in a manner consistent with federal, state, and local regulations.

RCRA D-SERIES MAXIMUM CONCENTRATION OF CONTAMINANTS: Not listed.
RCRA D-SERIES CHRONIC TOXICITY REFERENCE LEVELS: Not listed.
RCRA F-SERIES: Not listed.
RCRA P-SERIES: Not listed.
RCRA U-SERIES: Waste number U080

This material is banned from land disposal according to RCRA.

===== SECTION 14 - TRANSPORT INFORMATION =====

US DOT:

SHIPPING NAME: DICHLOROMETHANE
HAZARD CLASS: 6.1
UN NUMBER: UN1593
PACKING GROUP: III

IMO:

SHIPPING NAME: DICHLOROMETHANE
HAZARD CLASS: 6.1
UN NUMBER: 1593
PACKING GROUP: 3

IATA:

SHIPPING NAME: DICHLOROMETHANE
HAZARD CLASS: 6.1
UN NUMBER: 1593
PACKING GROUP: 3

RID/ADR:

SHIPPING NAME: DICHLOROMETHANE
DANGEROUS GOODS CODE: 6.1(15C)
UN NUMBER: 1593

CANADIAN TDG:

SHIPPING NAME: METHYLENE CHLORIDE
HAZARD CLASS: 6.1
UN NUMBER: UN1593

===== SECTION 15 - REGULATORY INFORMATION =====

FEDERAL:

TSCA: CAS# 75-09-2 is listed on the TSCA inventory.

HEALTH & SAFETY REPORTING LIST: CAS# 75-09-2: Effective Date: October 4, 1982

CHEMICAL TEST RULES: None of the chemicals in this product are under a Chemical Test Rule.

SECTION 12B: None of the chemicals are listed under TSCA Section 12b.

TSCA SIGNIFICANT NEW USE RULE: None of the chemicals in this material have a SNUR under TSCA.

CERCLA/SARA:

SECTION 302 (RQ): None of the chemicals in this material have an RQ.

SECTION 302 (TPQ): None of the chemicals in this product have a TPQ.

SECTION 313: This material contains Methane, dichloro- (CAS# 75-09-2, 100%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

CLEAN AIR ACT:

CAS# 75-09-2 is listed as a hazardous air pollutant (HAP).
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

CLEAN WATER ACT:

None of the chemicals in this product are listed as Hazardous Substances under the CWA.

CAS# 75-09-2 is listed as a Priority Pollutant under the Clean Water Act.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA: None of the chemicals in this product are considered highly hazardous by OSHA.

STATE:

Methane, dichloro- can be found on the following state right to know lists: California, Florida, Pennsylvania, Minnesota, Massachusetts.

The following statement(s) is(are) made in order to comply with the California Safe Drinking Water Act:

This product contains Methane, dichloro-, a chemical known to the state of California to cause cancer.

CALIFORNIA NO SIGNIFICANT RISK LEVEL: CAS# 75-09-2: No significant risk level = 50 micro g/day

INTERNATIONAL:

CANADA:

http://jupiter.ports/msds/data/129

CAS# 75-09-2 is listed on Canada's DSL/NDSL List.
CAS# 75-09-2 is listed on Canada's Ingredient Disclosure List.

EUROPEAN LABELING IN ACCORDANCE WITH EC DIRECTIVES:

HAZARD SYMBOLS: Not available.
RISK PHRASES:
SAFETY PHRASES:

EXPOSURE LIMITS: OEL-AUSTRALIA: TWA 100 ppm (350 mg/m3); OEL-AUSTRIA: TWA 100 ppm (360 mg/m3). OEL-BELGIUM: TWA 50 ppm (174 mg/m3); Carcinogen. OEL-CZECHOSLOVAKIA: TWA 500 mg/m3; STEL 2500 mg/m3. OEL-DENMARK: TWA 50 ppm (175 mg/m3); Skin; Carcinogen. OEL-FINLAND: TWA 100 ppm (350 mg/m3); STEL 250 ppm (870 mg/m3). OEL-FRANCE: TWA 100 ppm (360 mg/m3); STEL 500 ppm (1800 mg/m3). OEL-GERMANY: TWA 100 ppm (360 mg/m3); Carcinogen. OEL-HUNGARY: STEL 10 mg/m3; Carcinogen. OEL-JAPAN: TWA 100 ppm (350 mg/m3). OEL-THE NETHERLANDS: TWA 100 ppm (350 mg/m3); STEL 500 ppm. OEL-THE PHILLIPINES: TWA 500 ppm (1740 mg/m3). OEL-POLAND: TWA 50 mg/m3. OEL-RUSSIA: TWA 100 ppm; STEL 50 mg/m3. OEL-SWEDEN: TWA 35 ppm (120 mg/m3); STEL 70 ppm (25 mg/m3); Skin. OEL-SWITZERLAND: TWA 100 ppm (360 mg/m3); STEL 500 ppm. OEL-THAILAND: TWA 500 mg/m3; STEL 1000 mg/m3. OEL-TURKEY: TWA 500 ppm (1740 mg/m3). OEL-UNITED KINGDOM: TWA 100 ppm (350 mg/m3); STEL 250 ppm. OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV. OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGIH TLV

===== SECTION 16 - ADDITIONAL INFORMATION =====

ADDITIONAL INFORMATION: No additional information available.

MSDS CREATION DATE: January 11, 1995

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

MULTIGRAPHICS -- CLEAN PRINT - CLEANING SOLUTION,DESENSITIZE
MATERIAL SAFETY DATA SHEET
NSN: 6750012976177
Manufacturer's CAGE: 09177
Part No. Indicator: A
Part Number/Trade Name: CLEAN PRINT

General Information

Item Name: CLEANING SOLUTION,DESENSITIZE
Company's Name: MULTIGRAPHICS *
Company's Street: 1800 W CENTRAL ROAD *
Company's City: MT.PROSPECT *
Company's State: IL *
Company's Country: US *
Company's Zip Code: 60056-2293 *
Company's Emerg Ph #: 312-870-5121 (DAY) 398-1900 (NIGHT) *
Company's Info Ph #: 312-870-5121/708-870-5087 *
Distributor/Vendor # 1: AM MULTIGRAPHICS (804-353-0111) *
Distributor/Vendor # 1 Cage: 1A714 *
Safety Data Action Code: C
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 01APR89
Safety Data Review Date: 12SEP96 *
Supply Item Manager: CX *
MSDS Serial Number: BJRJG
Hazard Characteristic Code: J6
Unit Of Issue: PT
Unit Of Issue Container Qty: 1 PINT

Ingredients/Identity Information

Proprietary: YES
Ingredient: PROPRIETARY
Ingredient Sequence Number: 01

Proprietary: YES
Ingredient: PROPRIETARY
Ingredient Sequence Number: 02

Proprietary: YES
Ingredient: PROPRIETARY
Ingredient Sequence Number: 03

Proprietary: YES
Ingredient: PROPRIETARY
Ingredient Sequence Number: 04

Physical/Chemical Characteristics

Appearance And Odor: ORANGE LIQUID. MILD SOLVENT ODOR.
Boiling Point: 212F,100C
Vapor Pressure (MM Hg/70 F): UNKNOWN
Vapor Density (Air=1): UNKNOWN
Specific Gravity: 1.025
Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: <1 (WATER = 1)
Solubility In Water: 100%
pH: 12.5
Corrosion Rate (IPY): UNKNOWN

Fire and Explosion Hazard Data

Flash Point: NONE
Flash Point Method: TCC
Extinguishing Media: NON-FLAMMABLE. USE EXTINGUISHING MEDIA APPROPIATE FOR SURROUNDING FIRE.

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Special Fire Fighting Proc: WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND A FULL FACED SELF CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER SPRAY.
Unusual Fire And Expl Hazrds: COMBUSTION OR HEAT OF FIRE MAY PRODUCE HAZARDOUS DECOMPOSITION PRODUCTS AND VAPORS.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): NONE
Materials To Avoid: STRONG ACIDS.
Hazardous Decomp Products: CARBON MONOXIDE, CARBON DIOXIDE.
Hazardous Poly Occur: NO

Health Hazard Data

Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: HEALTH HAZARDS- ACUTE: EYE BURNS AND SKIN IRRITATION. CHRONIC: NONE SPECIFIED BY MANUFACTURER.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Signs/Symptoms Of Overexp: EYES: IRRITATION, BURNS. SKIN: IRRITATION. INGESTION: GASTROINTESTINAL IRRITATION.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES: FLUSH WITH LARGE AMOUNTS OF WATER FOR AT NOT APPLICABLE. INGESTION: DO NOT INDUCE VOMITING. GET IMMEDIATE MEDICAL AID.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: VENTILATE AREA. USE APPROPIATE PROTECTIVE CLOTHING AND EQUIPMENT. CLEAN SPILLS WITH WARM WATER AND SOAP. ABSORB IN INERT MATERIAL, AND PLACE IN APPROPIATE DISPOSAL CONTAINER AND COVER. FLUSH AREA WITH PLENTY OF WATER.
Neutralizing Agent: 5% ACETIC ACID SOLUTION.
Waste Disposal Method: CONTACT YOUR LOCAL ENVIRONMENTAL OFFICER. DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.
Precautions-Handling/Storing: AVOID FREEZING. STORE BETWEEN 40F AND 140F.
Other Precautions: READ AND FOLLOW LABEL PRECAUTIONS. AVOID EXCESSIVE SKIN CONTACT.

Control Measures

Respiratory Protection: NONE NORMALLY REQUIRED.
Ventilation: NO SPECIAL REQUIREMENT. *
Protective Gloves: NEOPRENE.
Eye Protection: GOGGLES.
Other Protective Equipment: APRON. EYE WASH STATION.
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING AND BEFORE SMOKING OR EATING.
Suppl. Safety & Health Data: NONE.

Transportation Data

Trans Data Review Date: 91087
DOT PSN Code: DWG
DOT Proper Shipping Name: CORROSIVE LIQUIDS, N.O.S.
DOT Class: 8
DOT ID Number: UN1760
DOT Pack Group: III
DOT Label: CORROSIVE
IMO PSN Code: ESH
IMO Proper Shipping Name: CORROSIVE LIQUID, N.O.S.
IMO Regulations Page Number: 8147
IMO UN Number: 1760
IMO UN Class: 8

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IMO Subsidiary Risk Label: -
IATA PSN Code: HKW
IATA UN ID Number: 1760
IATA Proper Shipping Name: CORROSIVE LIQUID, N.O.S. *
IATA UN Class: 8
IATA Label: CORROSIVE
AFI PSN Code: HKW
AFI Prop. Shipping Name: CORROSIVE LIQUID, N.O.S.
AFI Class: 8
AFI ID Number: UN1760
AFI Pack Group: III
AFI Label: CORROSIVE
AFI Basic Pac Ref: 12-5
N.O.S. Shipping Name: SODIUM METASILICATE.

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Disposal Data

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Label Data

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Label Required: YES
Technical Review Date: 28MAR91
MFR Label Number: NONE
Label Status: F
Common Name: CLEAN PRINT
Chronic Hazard: YES
Signal Word: DANGER!
Acute Health Hazard-Slight: X
Contact Hazard-Severe: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: HEALTH HAZARDS- ACUTE: EYE BURNS AND SKIN IRRITATION. CHRONIC: NONE SPECIFIED BY MANUFACTURER. AVOID FREEZING. STORE BETWEEN 40F AND 140F. FIRST AID: EYES: FLUSH WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES .SEE DOCTOR. SKIN: WASH WITH SOAP AND WATER. INHALATION: NOT APPLICABLE. INGESTION: DO NOT INDUCE VOMITING. GET IMMEDIATE MEDICAL AID.
Protect Eye: Y
Protect Skin: Y
Label Name: MULTIGRAPHICS
Label Street: 1800 W CENTRAL ROAD
Label City: MT.PROSPECT
Label State: IL
Label Zip Code: 60056-2293
Label Country: US
Label Emergency Number: 708-870-5121 (DAY) 398-1900 (NIGHT)
Year Procured: 1991

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http://haz1.siri.org:80/msds/h/q344/q121794

MULTIGRAPHICS -- ELECTROSTATIC SOLUTION
MATERIAL SAFETY DATA SHEET
CAS# 13943-58-3
MSDS BCHHW

'SN: 675000N001225
.nufacturer's CAGE: 09177
.art No. Indicator: A
Part Number/Trade Name: ELECTROSTATIC SOLUTION

General Information

Company's Name: MULTIGRAPHICS
Company's Street: 1800 W CENTRAL ROAD
Company's City: MT.PROSPECT
Company's State: IL
Company's Country: US
Company's Zip Code: 60056-2293
Company's Emerg Ph #: 312-870-5121 (DAY) 398-1900 (NIGHT)
Company's Info Ph #: 312-870-5121/708-870-5087
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Date MSDS Prepared: 01APR89
Safety Data Review Date: 20SEP95
MSDS Serial Number: BCHHW
Hazard Characteristic Code: N1
NRC/State License Number: N/A
Net Propellant Weight-Ammo: N/A

Ingredients/Identity Information

Proprietary: NO
Ingredient: FERRATE (4-), HEXACYANO-, TETRAPOTASSIUM; (POTASSIUM HEXACYANOFERRATE)
Ingredient Sequence Number: 01
Percent: 2-5
'IIOSH (RTECS) Number: LJ8219000
AS Number: 13943-58-3
JSHA PEL: NOT APPLICABLE
ACGIH TLV: 5 MG/M3

Proprietary: NO
Ingredient: NON HAZARDOUS INGREDIENTS
Ingredient Sequence Number: 02
NIOSH (RTECS) Number: 1000314NH
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Physical/Chemical Characteristics

Appearance And Odor: YELLOWISH GREEN LIQUID,SLIGHT ALMOND ODOR
Boiling Point: 212F,100C
Melting Point: N/A
Vapor Pressure (MM Hg/70 F): 15 @ 25C
Specific Gravity: 1.08 (H*2O=1)
Evaporation Rate And Ref: SLOWER/WATER (BU AC=1)
Solubility In Water: COMPLETE
pH: 4.5

Fire and Explosion Hazard Data

Flash Point: NONE
Lower Explosive Limit: N/A
Upper Explosive Limit: N/A
Extinguishing Media: USE MEDIA SUITABLE FOR SURROUNDING FIRE CONDITIONS (FP N).
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: CATASTROPHIC ACCIDENTS, INVOLVING LGE QTYS OF PROD & ACCOMPANIED BY FIRE OR CONT W/LGE QTYS OF STRONG ACID, WILL REQ RESPONSE PERS TO WEAR PROPER (SUP DAT)

Reactivity Data

Stability: YES
Cond To Avoid (Stability): STRONG LIGHT & HEAT.
Materials To Avoid: CHLORINE BLEACH & STRONG ACIDS.
Hazardous Decomp Products: PRODUCT WILL SLOWLY DECOMPOSE W/FORMATION OF HYDROCYANIC ACID, COMPLEX CYANOFERRATES & CYANIDE.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT.

Health Hazard Data

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: EYES:MAY CAUSE IRRITATION. SKIN:PRLONGED LARGE DOSES MAY CAUSE GI IRRITATION. HEXACYANOFERRATE SALTS ARE CONSIDERED TO BE OF SLIGHT TOXICITY TO HUMANS, REGARDLESS OF WHETHER EXPOSURE IS ACUTE DERMAL, ACUTE INGESTION OR CHRONIC (EFTS OF OVEREXP)
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT.
Signs/Symptoms Of Overexp: HLTH HAZ:SYSTEMIC. ANY EFFECT ON THE HUMAN BODY IS SLIGHT, TEMPORARY & REVERSIBLE & THE EFFECT DISAPPEARS FOLLOWING TERMINATION OF EXPOSURE.
Med Cond Aggravated By Exp: NONE.
Emergency/First Aid Proc: INHAL:REMOVE TO FRESH AIR. SUPPORT BREATHING (GIVE OXYGEN/ARTIFICIAL RESPIRATION). CALL MD (FP N). EYES:FLUSH W/WATER FOR AT LEAST 15 MINS. IF IRRITATION PERSISTS, SEEK MEDICAL AID. SKIN:WASH W/SOAP & WATER. INGEST:INDUCE VOMITING. GET MEDICAL AID IMMEDIATELY.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: FLUSH W/WATER TO DRAIN.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: SMALL QTYS EMPLOYED IN NORM USE MAY BE FLUSHED W/ WATER TO DRAIN. DO NOT MIX W/ACID WASTES. LGR QTYS SHOULD NOT BE DUMPED INTO WATERWAY. CHECK FED, STATE & LOC REGS REGARDING DISP OF HEXACYANOFERRATE SALTS. (GENERALLY 2 PPM MAX IN STREAMS/LAKES).
Precautions-Handling/Storing: STORE IN A COOL, DARK PLACE AWAY FROM STRONG ACIDS & FIRE HAZARDS. READ LABEL PRECAUTIONS. DO NOT REUSE CONTAINER.
Other Precautions: NONE SPECIFIED BY MANUFACTURER.

Control Measures

Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N). NOT APPLICABLE.
Ventilation: NORMAL AIR CONDITIONING.
Protective Gloves: IMPERVIOUS GLOVES (FP N).
Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).
Other Protective Equipment: NOT APPLICABLE.
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.
Suppl. Safety & Health Data: EXPLO HAZ:EQUIP DUE TO & DEPENDENT UPON THE QUANTITIES OF CYANIDE.

Transportation Data

Trans Data Review Date: 83209
DOT PSN Code: ZZZ
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
IMO PSN Code: ZZZ
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION
IATA PSN Code: ZZZ
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
AFI PSN Code: ZZZ
AFI Prop. Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
Additional Trans Data: NOT REGULATED FOR SHIPPING.

http://haz1.siri.org:80/msds/h/q344/q121794

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Disposal Data

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Label Data

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Label Required: YES
Technical Review Date: 24FEB93
Label Status: G
Common Name: ELECTROSTATIC SOLUTION
Chronic Hazard: NO
Signal Word: CAUTION!
Acute Health Hazard-Slight: X
Contact Hazard-Slight: X
Fire Hazard-None: X
Reactivity Hazard-None: X
CONTACT MAY CAUSE EYE AND SKIN IRRITATION. INGESTION MAY CAUSE GASTROINTESTINAL IRRITATION. CHRONIC: NONE LISTED BY MANUFACTURER.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: AM INTERNATIONAL INC, MULTIGRAPHICS DIVISION
Label Street: 1800 WEST CENTRAL ROAD
Label City: MT PROSPECT
Label State: IL
Label Zip Code: 60056
Label Country: US
Label Emergency Number: 708-398-1900

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http://haz1.siri.org/msds/h/q361/q130030
CAS# 7697-37-2 MSDS BPDWV

MULTIGRAPHICS -- MULTILITH CYLINDER CLEANER 83-5-101395 - SOLUTION, DEGREASING
MATERIAL SAFETY DATA SHEET
NSN: 6850000666630
Manufacturer's CAGE: 09177
Part No. Indicator: A
Part Number/Trade Name: MULTILITH CYLINDER CLEANER 83-5-101395

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General Information

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Item Name: SOLUTION, DEGREASING
Company's Name: MULTIGRAPHICS
Company's Street: 1800 W CENTRAL ROAD
Company's City: MT.PROSPECT
Company's State: IL
Company's Country: US
Company's Zip Code: 60056-2293
Company's Emerg Ph #: 708-870-5121 (DAY) 398-1900 (NIGHT)
Company's Info Ph #: 708-870-5121
Distributor/Vendor # 1: AM MULTIGRAPHICS
Distributor/Vendor # 1 Cage: 1A714
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 003
Status: SP
Date MSDS Prepared: 01APR89
Safety Data Review Date: 31OCT92
Supply Item Manager: CX
MSDS Preparer's Name: UNKNOWN
MSDS Serial Number: BPDWV
Specification Number: NONE
Spec Type, Grade, Class: NOT APPLICABLE
Hazard Characteristic Code: J6
Unit Of Issue: PT
Unit Of Issue Container Qty: 1
Type Of Container: STD COML PKG
Net Unit Weight: 1.2 LBS

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Ingredients/Identity Information

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Proprietary: NO
Ingredient: NITRIC ACID (SARA III)
Ingredient Sequence Number: 01
Percent: 4
NIOSH (RTECS) Number: QU5775000
CAS Number: 7697-37-2
OSHA PEL: 2 PPM/4 STEL
ACGIH TLV: 2 PPM/4 STEL; 9293
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO
Ingredient: ALPHA-ALUMINA (ALUMINUM OXIDE) (EPA LISTS ONLY FIBROUS FORMS) (SARA III)
Ingredient Sequence Number: 02
Percent: 10-15
NIOSH (RTECS) Number: BD1200000
CAS Number: 1344-28-1
OSHA PEL: 15 MG/M3 TDUST
ACGIH TLV: 10 MG/M3 TDUST; 9293
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO
Ingredient: WATER
Ingredient Sequence Number: 03
Percent: 79
NIOSH (RTECS) Number: ZC0110000
CAS Number: 7732-18-5
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NOT ESTABLISHED

Proprietary: NO
Ingredient: ALUMINUM SULFATE (SARA III)
Ingredient Sequence Number: 04
Percent: 10-15
NIOSH (RTECS) Number: BD1700000
CAS Number: 10043-01-3
OSHA PEL: 2 MG/M3
ACGIH TLV: 2 MG/M3; 9293
Other Recommended Limit: NONE RECOMMENDED

Proprietary: NO
Ingredient: SILICA GEL
Ingredient Sequence Number: 05
Percent: 2-5
NIOSH (RTECS) Number: VV7310000
CAS Number: 112945-52-5
OSHA PEL: 6 MG/M3 TDUST
ACGIH TLV: 10 MG/M3 TDUST
Other Recommended Limit: NONE RECOMMENDED

Physical/Chemical Characteristics

Appearance And Odor: WHITE, MILKY SOLUTION
Boiling Point: 212F,100C
Specific Gravity: 1.08
Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: SLOWER THAN WATER
Solubility In Water: APPRECIABLE
Percent Volatiles By Volume: 50
Viscosity: UNKNOWN
pH: 3
Corrosion Rate (IPY): UNKNOWN
Autoignition Temperature: NONE

Fire and Explosion Hazard Data

Flash Point: NONE
Extinguishing Media: NONCOMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE CONDITIONS.
Special Fire Fighting Proc: WEAR A NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE EQUIPMENT WHEN FIGHTING FIRES. USE WATER SPRAY TO COOL FIRE EXPOSED CONTAINERS.
Unusual Fire And Expl Hazrds: NONE

Reactivity Data

Stability: YES
Cond To Avoid (Stability): NOT APPLICABLE
Materials To Avoid: STRONG ALKALIS
Hazardous Decomp Products: CARBON MONOXIDE AND CARBON DIOXIDE
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT APPLICABLE

Health Hazard Data

LD50-LC50 Mixture: ORAL LD50 (RAT) IS UNKNOWN
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: EYE, SKIN, GASTRO AND RESPIRATORY TRACT IRRITATION.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: THIS COMPOUND CONTAINS NO INGREDIENTS AT CONCENTRATIONS OF 0.1% OR GREATER THAT ARE CARCINOGENS OR SUSPECT CARCINOGENS.
Signs/Symptoms Of Overexp: EYE, SKIN, GASTRO & RESPIRATORY TRACT IRRITATION.

Med Cond Aggravated By Exp: NONE KNOWN
Emergency/First Aid Proc: EYES: IMMEDIATELY FLUSH WITH RUNNING WATER FOR
T LEAST 15 MINUTES WHILE LIFTING EYELIDS OPEN. IF IRRITATION DEVELOPS OR
ERSISTS, GET MEDICAL ATTENTION. SKIN: WASH WITH SOAP AND PLENTY OF WATER.
IF IRRITATION DEVELOPS OR PERSISTS, GET MEDICAL ATTENTION. VAPOR INHALATION
UNLIKELY: REMOVE TO FRESH AIR. GET MEDICAL ATTENTION IF REQUIRED.
INGESTION: DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: ABSORB WITH INERT MATERIAL AND PLACE IN DISPOSCAL CONTAINER. NEUTRALIZE AND FLUSH SPILL AREA WITH WATER TO FLUSH RESIDUE.
Neutralizing Agent: SODIUM BICARBONATE
Waste Disposal Method: DISPOSE IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
Precautions-Handling/Storing: STORE IN A COOL, DRY PLACE. KEEP CONTAINERS CLOSED WHEN NOT IN USE. PROTECT FROM PHYSICAL DAMAGE
Other Precautions: NONE

Control Measures

Respiratory Protection: NONE NORMALLY REQUIRED.
Ventilation: USE ADEQUATE MECHANICAL VENTILATION.
Protective Gloves: RUBBER
Eye Protection: SAFETY GLASSES/CHEMICAL SPLASH GOGGLES
Other Protective Equipment: READ AND FOLLOW PRECAUTIONS ON LABEL. DO NOT REUSE BOTTLE.
Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING, DRINKING OR SMOKING. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.
Suppl. Safety & Health Data: NONE

Transportation Data

Trans Data Review Date: 92305
DOT PSN Code: DWC
DOT Proper Shipping Name: CORROSIVE LIQUIDS, N.O.S.
DOT Class: 8
DOT ID Number: UN1760
DOT Pack Group: I
DOT Label: CORROSIVE
IMO PSN Code: ESH
IMO Proper Shipping Name: CORROSIVE LIQUID, N.O.S.
IMO Regulations Page Number: 8147
IMO UN Number: 1760
IMO UN Class: 8
IMO Subsidiary Risk Label: -
IATA PSN Code: HKM
IATA UN ID Number: 1760
IATA Proper Shipping Name: CORROSIVE LIQUID, N.O.S. *
IATA UN Class: 8
IATA Label: CORROSIVE
AFI PSN Code: HKM
AFI Prop. Shipping Name: CORROSIVE LIQUID, N.O.S.
AFI Class: 8
AFI ID Number: UN1760
AFI Pack Group: I
AFI Label: CORROSIVE
AFI Special Prov: A7
AFI Basic Pac Ref: 12-4
Additional Trans Data: MFGR. STATES THAT MATERIAL IS REGULATED.

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 31OCT92

MFR Label Number: NOT APPLICABLE
Label Status: F
Common Name: MULTILITH CYLINDER CLEANER
Signal Word: CAUTION!
Acute Health Hazard-Slight: X
Contact Hazard-Slight: X
Fire Hazard-None: X
Reactivity Hazard-None: X
Special Hazard Precautions: EYE, SKIN, GASTRO & RESPIRATORY TRACT IRRITATION. STORE IN A COOL, DRY PLACE. KEEP CONTAINERS CLOSED WHEN NOT IN USE. IN CASE OF SPILL: ABSORB WITH INERT MATERIAL & PLACE IN DISPOSCAL CONTAINER. NEUTRALIZE & FLUSH SPILL AREA WITH WATER TO FLUSH RESIDUE. FIRST AID: EYES: IMMEDIATELY FLUSH WITH RUNNING WATER FOR AT LEAST 15 MINUTES WHILE LIFTING EYELIDS OPEN. IF IRRITATION DEVELOPS OR PERSISTS, GET MEDICAL ATTENTION. SKIN: WASH WITH SOAP AND WATER. IF IRRITATION DEVELOPS OR PERSISTS, GET MEDICAL ATTENTION. VAPOR INHALATION UNLIKELY: REMOVE TO FRESH AIR. GET MEDICAL ATTENTION IF REQUIRED. INGESTION: DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION.
Protect Eye: Y
Protect Skin: Y
Label Name: MULTIGRAPHICS
Label Street: 1800 W CENTRAL ROAD
Label City: MT.PROSPECT
Label State: IL
Label Zip Code: 60056-2293
Label Country: US
Label Emergency Number: 708-870-5121 (DAY) 398-1900 (NIGHT)
==========
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NAPHTHA, FLUID, SOLVENT

ASHLAND CHEMICAL INC.
Subsidiary Of Ashland Oil Inc
P.O. BOX 2219
COLUMBUS, OHIO 43216
(614) 889-3333

24-HOUR
Emergency
Telephone
1(800) 274-5263 o
1(800) ASHLAND

95-14-3500

000049

VM&P NAPHTHA

THIS MSDS COMPLIES WITH 29 CFR 1910.1200 (THE HAZARD COMMUNICATION STANDARD)

Product Name: VM&P NAPHTHA
CAS NUMBER: 64742-89-8

MARTIN MARIETTA
ATTN: CRESHAWANNA
P.O. BOX 628
PIKETON, OH 45661

05 92 011 5111434-980

PRODUCT:
INVOICE: REQST
INVOICE DATE: 01/15/92
TO:

Data Sheet No: 0014122-006
Prepared: 03/04/86
Supersedes: 09/25/84

CAS# 64742-89-8

SECTION I - PRODUCT IDENTIFICATION

General or Generic ID: ALIPHATIC HYDROCARBON

DOT Hazard Classification: FLAMMABLE LIQUID (173.115)

SECTION II - COMPONENTS

IF PRESENT, IARC, NTP AND OSHA CARCINOGENS AND CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SARA TITLE III SECTION 313 ARE IDENTIFIED IN THIS SECTION. SEE DEFINITION PAGE FOR CLARIFICATION

INGREDIENT	% (by WT)	PEL	TLV	Note
ALIPHATIC PETROLEUM DISTILLATES CAS #: 64742-89-8	100	300 PPM	300 PPM	(1)

Notes:

(1) NIOSH RECOMMENDS A LIMIT OF 350 MG/CUM - 8 HOUR TIME WEIGHTED AVERAGE, 1800 MG/CUM AS DETERMINED BY A 15 MINUTE SAMPLE.

VM&P NAPHTHA CONTAINS LESS THAN 8% XYLENE, CAS# 1330-20-7, WHICH HAS A PEL/TLV OF 100 PPM, STEL OF 150 PPM; AND LESS THAN 2% ETHYL BENZENE, CAS# 100-41-4, WHICH HAS A PEL/TLV OF 100 PPM, STEL OF 125 PPM. XYLENE AND ETHYL BENZENE ARE SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF SARA TITLE III.

OSHA SHORT TERM EXPOSURE LIMIT (STEL) FOR VM&P NAPHTHA IS 400 PPM.

SECTION III - PHYSICAL DATA

Boiling Point	for PRODUCT	240.00 - 285.00 Deg F (115.55 - 140.55 Deg C)
Vapor Pressure	for PRODUCT	15.00 mm Hg @ 100.00 Deg F (37.77 Deg C)
Specific Vapor Density	AIR = 1	3.8
Specific Gravity		.727 - .750 @ 60.00 Deg F (15.55 Deg C)
Percent Volatiles		
Evaporation Rate	(ETHER = 1)	

SECTION IV - FIRE AND EXPLOSION INFORMATION

FLASH POINT(TCC) 50.0 Deg F (10.0 Deg C)

EXPLOSIVE LIMIT (PRODUCT) LOWER - .9%

EXTINGUISHING MEDIA: REGULAR FOAM OR CARBON DIOXIDE OR DRY CHEMICAL

HAZARDOUS DECOMPOSITION PRODUCTS: MAY FORM TOXIC MATERIALS:, CARBON DIOXIDE AND CARBON MONOXIDE, VARIOUS HYDROCARBONS, ETC.

FIREFIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN THE POSITIVE PRESSURE DEMAND MODE WHEN FIGHTING FIRES.

SPECIAL FIRE & EXPLOSION HAZARDS: VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL ALONG THE GROUND OR MAY BE MOVED BY VENTILATION AND IGNITED BY PILOT LIGHTS, OTHER FLAMES, SPARKS, HEATERS, SMOKING, ELECTRIC MOTORS, STATIC DISCHARGE, OR OTHER IGNITION SOURCES AT LOCATIONS DISTANT FROM MATERIAL HANDLING POINT.

NEVER USE WELDING OR CUTTING TORCH ON OR NEAR DRUM (EVEN EMPTY) BECAUSE PRODUCT (EVEN JUST RESIDUE) CAN IGNITE EXPLOSIVELY.

ALL FIVE GALLON PAILS AND LARGER METAL CONTAINERS INCLUDING TANK CARS AND TANK TRUCKS SHOULD BE GROUNDED AND/OR BONDED WHEN MATERIAL IS TRANSFERRED.

NFPA CODES: HEALTH- 1 FLAMMABILITY- 3 REACTIVITY- 0

SECTION V - HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LEVEL	300	PPM
THRESHOLD LIMIT VALUE	300	PPM

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CONTINUED ON PAGE: 2

SECTION V-HEALTH HAZARD DATA (Continued)

EFFECTS OF ACUTE OVEREXPOSURE:

EYES - CAN CAUSE SEVERE IRRITATION, REDNESS, TEARING, BLURRED VISION.
SKIN - PROLONGED OR REPEATED CONTACT CAN CAUSE MODERATE IRRITATION, DEFATTING, DERMATITIS.
BREATHING - EXCESSIVE INHALATION OF VAPORS CAN CAUSE NASAL AND RESPIRATORY IRRITATION, CENTRAL NERVOUS SYSTEM EFFECTS INCLUDING DIZZINESS, WEAKNESS, FATIGUE, NAUSEA, HEADACHE AND POSSIBLE UNCONSCIOUSNESS, AND EVEN DEATH.
SWALLOWING - CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING, AND DIARRHEA. ASPIRATION OF MATERIAL INTO THE LUNGS CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.

FIRST AID:

IF ON SKIN: THOROUGHLY WASH EXPOSED AREA WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. LAUNDER CONTAMINATED CLOTHING BEFORE RE-USE.

IF IN EYES: FLUSH WITH LARGE AMOUNTS OF WATER, LIFTING UPPER AND LOWER LIDS OCCASIONALLY. GET MEDICAL ATTENTION.

IF SWALLOWED: DO NOT INDUCE VOMITING, KEEP PERSON WARM, QUIET, AND GET MEDICAL ATTENTION. ASPIRATION OF MATERIAL INTO THE LUNGS DUE TO VOMITING CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.

IF BREATHED: IF AFFECTED, REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN. IF BREATHING HAS STOPPED GIVE ARTIFICIAL RESPIRATION. KEEP PERSON WARM, QUIET AND GET MEDICAL ATTENTION.

PRIMARY ROUTE(S) OF ENTRY:

INHALATION, SKIN CONTACT

SECTION VI-REACTIVITY DATA

HAZARDOUS POLYMERIZATION: CANNOT OCCUR

STABILITY: STABLE

INCOMPATIBILITY: AVOID CONTACT WITH:, STRONG OXIDIZING AGENTS

SECTION VII-SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

SMALL SPILL: ELIMINATE ALL SOURCES OF IGNITION SUCH AS FLARES, FLAMES (INCLUDING PILOT LIGHTS), AND ELECTRICAL SPARKS.

ABSORB LIQUID ON PAPER, VERMICULITE, FLOOR ABSORBENT, OR OTHER ABSORBENT MATERIAL AND TRANSFER TO HOOD.

LARGE SPILL: ELIMINATE ALL IGNITION SOURCES (FLARES, FLAMES INCLUDING PILOT LIGHTS, ELECTRICAL SPARKS). PERSONS NOT WEARING PROTECTIVE EQUIPMENT SHOULD BE EXCLUDED FROM AREA OF SPILL UNTIL CLEAN-UP HAS BEEN COMPLETED. STOP SPILL AT SOURCE. DIKE AREA OF SPILL TO PREVENT SPREADING. PUMP LIQUID TO SALVAGE TANK. REMAINING LIQUID MAY BE TAKEN UP ON SAND, CLAY, EARTH, FLOOR ABSORBENT, OR OTHER ABSORBENT MATERIAL AND SHOVELED INTO CONTAINERS.

PREVENT RUN-OFF TO SEWERS, STREAMS OR OTHER BODIES OF WATER. IF RUN-OFF OCCURS, NOTIFY PROPER AUTHORITIES AS REQUIRED, THAT A SPILL HAS OCCURED.

WASTE DISPOSAL METHOD:

SMALL SPILL: ALLOW VOLATILE PORTION TO EVAPORATE IN HOOD. ALLOW SUFFICIENT TIME FOR VAPORS TO COMPLETELY CLEAR HOOD DUCT WORK. DISPOSE OF REMAINING MATERIAL IN ACCORDANCE WITH APPLICABLE REGULATIONS.

LARGE SPILL: DESTROY BY LIQUID INCINERATION.

CONTAMINATED ABSORBENT MAY BE DEPOSITED IN A LANDFILL IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

DESTROY BY LIQUID INCINERATION WITH OFF-GAS SCRUBBER.

SECTION VIII-PROTECTIVE EQUIPMENT TO BE USED

RESPIRATORY PROTECTION: IF WORKPLACE EXPOSURE LIMIT(S) OF PRODUCT OR ANY COMPONENT IS EXCEEDED (SEE SECTION II), A NIOSH/MSHA APPROVED AIR SUPPLIED RESPIRATOR IS ADVISED IN ABSENCE OF PROPER ENVIRONMENTAL CONTROL. OSHA REGULATIONS ALSO PERMIT OTHER NIOSH/MSHA RESPIRATORS (NEGATIVE PRESSURE TYPE) UNDER SPECIFIED CONDITIONS (SEE YOUR SAFETY EQUIPMENT SUPPLIER). ENGINEERING OR ADMINISTRATIVE CONTROLS SHOULD BE IMPLEMENTED TO REDUCE EXPOSURE.

VENTILATION: PROVIDE SUFFICIENT MECHANICAL (GENERAL AND/OR LOCAL EXHAUST) VENTILATION TO MAINTAIN EXPOSURE BELOW TLV(S).

PROTECTIVE GLOVES: WEAR RESISTANT GLOVES SUCH AS:, NITRILE RUBBER, NEOPRENE

EYE PROTECTION: CHEMICAL SPLASH GOGGLES IN COMPLIANCE WITH OSHA REGULATIONS ARE ADVISED; HOWEVER, OSHA REGULATIONS ALSO PERMIT OTHER TYPE SAFETY GLASSES. (CONSULT YOUR SAFETY EQUIPMENT SUPPLIER)

OTHER PROTECTIVE EQUIPMENT: TO PREVENT REPEATED OR PROLONGED SKIN CONTACT, WEAR IMPERVIOUS CLOTHING AND BOOTS.

SECTION IX-SPECIAL PRECAUTIONS OR OTHER COMMENTS

CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTIED.SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUES (VAPOR, LIQUID, AND/OR SOLID), ALL HAZARD PRECAUTIONS GIVEN IN THE DATA SHEET MUST BE OBSERVED.

THE INFORMATION ACCUMULATED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE WHETHER ORIGINATING WITH THE COMPANY OR NOT. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE TO THEIR CIRCUMSTANCES.

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PORTS MSDS #: 5423

PRODUCT: NITRIC ACID

PART NUMBER: A509-500

FORMULA: HNO3

KEYWORD: ACID

PORTS NUMBER: 03-401-1025; 03-401-1028; 66-001-6158

PORTS MISC INFO:
01-01-1025
01-01-1028

PORTS RATING: HFR=300

MANUFACTURER:
FISHER SCIENTIFIC CO.
1 REAGENT LANE, P.O. BOX 375
FAIR LAWN
NJ

07410
PHONE: PHONE: 201-796-7100
EMERGENCY PHONE: 201-796-7100

===== Physical/Chemical Characteristics =====

Boiling Point. . . . EQ 186.8 F
Melting Point. . . . EQ -43.6 F
Freezing Point . . . EQ -43.6 F
Sour Point . . . . . NG
Softening Point. . . NG

Specific Gravity . . EQ 1.50 NOTE: DENSITY.
Vapor Pressure . . . EQ 6.8 NOTE: MMHG.
Vapor Density. . . . NA NOTE: NOT AVAILABLE.
Percent Volatiles. . NG
Evaporation Rate . . NA NOTE: NOT AVAILABLE.
pH . . . . . EQ 1.0
Molecular Weight . . EQ 63.0119
Viscosity. . . . . NA NOTE: NOT AVAILABLE.
Solubility in Water. SOLUBLE IN WATER.
Odor/Appearance/Other Characteristics:
TRANSPARENT, CLEAR OR YELLOWISH LIQUID, STRONG, ACRID ODOR.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . . NA NOTE: NOT AVAILABLE.
Flash Point, Open Cup . . . NA NOTE: NOT AVAILABLE.
Fire Point. . . . . NG
Auto Ignition. . . . . NA NOTE: NOT AVAILABLE.
Explosive/Flammable Limits
Lower (LEL). . . . . NA NOTE: NOT AVAILABLE.
Upper (UEL). . . . . NA NOTE: NOT AVAILABLE.

Shipping Regulations
UN/NA Number. UN2031
D.O.T. Hazard Class. . . 8
Label . . . . . NOT GIVEN
Proper Shipping Name . . NITRIC ACID

==========

Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 12/20/94

==== Component Information =====

NITRIC ACID
OSHA PEL (PPM):
OSHA PEL (MG/M3): 5
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 5.2
STEL (PPM):
STEL (MG/M3): 10
Product %: BT 69 71
C.A.S. No.: 7697372
Note:
PEL (FINAL & VACATED) & TLV: 2 PPM / OSHA & ACGIH STEL: 4 PPM.

WATER
OSHA PEL (PPM): N*
OSHA PEL (MG/M3):
ACGIH TLV (PPM): N*
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: BT 29 31
C.A.S. No.: 7732185
Note:
PEL (FINAL & VACATED), TLV & NIOSH: NONE LISTED.

===== SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION =====

RODUCT NAME: Nitric Acid
16550

MSDS NAME: Nitric Acid

CATALOG NUMBERS: A198C 212, A198C-212, A198C4X 212, A200 212, A200 500, A200 612GAL, A200-212, A200-500, A200-612G, A200-612GAL, A200-612GL, A200C-2.5, A200C-212, A200CAX 212, A200C4X212 1, A200FP 500, A200S 500, A200S-2.5, A200S-212, A200S-500, A200S4X212, A200SI 212, A200SI-21, A200SI-212, A200SI21201, A206C 212, A206C-212, A206C4X 212, A467 500, A467-1, A467-2, A467-250, A467-500, A4672, A483 212, A483-212, A509 212, A509 212 002, A509 500, A509-212, A509-500, A509212001, A509SK212, S719721MF, S71972MF, S71972SC, S75623-2, S75623-3, S76523

SYNONYMS: Azotic acid, engravers nitrate, hydrogen nitrate.

DATE: 04/25/96

CAT NO.: A200500

FOR INFORMATION CALL: 201-796-7100
EMERGENCY NUMBER: 201-796-7100
FOR CHEMTREC ASSISTANCE CALL: 800-424-9300

COMPANY IDENTIFICATION:

MANUFACTURER'S NAME AND ADDRESS:

FISHER SCIENTIFIC
1 REAGENT LANE
FAIR LAWN, NJ 07410
(201) 796-7100

===== SECTION 2 - COMPOSITION, INFORMATION ON INGREDIENTS =====

SEE COMPONENT INFORMATION.

CHEMICAL NAME	EINECS#
Nitric acid	unlisted
Water	unlisted

===== SECTION 3 - HAZARDS IDENTIFICATION =====

EMERGENCY OVERVIEW:

APPEARANCE: Clear, colorless to yellow liquid with a strong, acrid odor.

Danger! Oxidizer. Contact with other material may cause fire. Corrosive. Cause eye, skin, and digestive tract burns. Causes severe respiratory tract irritation. May cause perforation of the digestive tract and erosion of teeth.

TARGET ORGANS: None.

POTENTIAL HEALTH EFFECTS:

EYE:

Causes severe eye burns.
May irreversible eye injury.

SKIN:

May cause severe skin irritation.
Causes skin burns.
May cause deep, penetrating ulcers of the skin.

INGESTION:

Causes gastrointestinal tract burns.
May cause perforation of the digestive tract.

INHALATION:

May be fatal if inhaled.
Effects may be delayed.
May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema.

CHRONIC:

Repeated inhalation may cause chronic bronchitis.
Repeated exposure may cause erosion of teeth.

===== SECTION 4 - FIRST AID MEASURES =====

EYES: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids.

Get medical aid immediately.
Do NOT allow victim to rub or keep eyes closed.

SKIN: Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Get medical aid if irritation develops or persists.
Wash clothing before reuse.

INGESTION: DO NOT induce vomiting and seek IMMEDIATE MEDICAL ADVICE.

INHALATION: Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

NOTES TO PHYSICIAN: Treat symptomatically and supportively.

No specific antidote exists.

===== SECTION 5 - FIRE FIGHTING MEASURES =====

GENERAL INFORMATION: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Strong oxidizer. Contact with combustible materials may cause a fire.
Use water spray to keep fire-exposed containers cool.
Substance is noncombustible.

EXTINGUISHING MEDIA: Substance is noncombustible; use agent most appropriate to extinguish surrounding fire.

AUTOIGNITION TEMPERATURE: Not available.

FLASH POINT: Not available.

EXPLOSION LIMITS:

LOWER: Not available.
UPPER: Not available.

===== SECTION 6 - ACCIDENTAL RELEASE MEASURES =====

GENERAL INFORMATION: Use proper personal protective equipment as indicated in Section 8.

SPILLS/LEAKS: Absorb spill with inert material, (e.g., dry sand or earth), then place into a chemical waste container. Wear a self contained breathing apparatus and appropriate Personal protection. (See Exposure Controls, Personal Protection Section.

===== SECTION 7 - HANDLING AND STORAGE =====

HANDLING:

Wash thoroughly after handling.
Remove contaminated clothing and wash before reuse.
Use with adequate ventilation.
Do not get on skin or in eyes.
Do not ingest or inhale.

STORAGE: Store in a cool, dry, well-ventilated area away from incompatible substances.

===== SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION =====

ENGINEERING CONTROLS: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

EXPOSURE LIMITS:

CHEMICAL NAME	ACGIH	NIOSH	OSHA - FINAL PELS
Nitric acid	2ppm; 5.2 mg/m3; 4 ppm STEL; 10 mg/m3 STEL	2 ppm TWA; 5 mg/m3 TWA; 4 ppm STEL; 10 mg/m3 STEL	2 ppm TWA; 5 mg/m3 TWA
Water	none listed	none listed	none listed

OSHA VACATED PELS:

NITRIC ACID: 2 ppm TWA; 5 mg/m3 TWA; 4 ppm STEL; 10 mg/m3 STEL

WATER: No OSHA Vacated PELs are listed for this chemical.

PERSONAL PROTECTIVE EQUIPMENT:

EYES: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133.

SKIN: Wear appropriate protective gloves to prevent skin exposure.

CLOTHING: Wear appropriate protective clothing to prevent skin exposure.

RESPIRATORS: Follow the OSHA respirator regulations found in 29CFR 1010.134. Always use a NIOSH-approved respirator when necessary.

===== SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

DECOMPOSITION TEMPERATURE: Not available.

MOLECULAR FORMULA: HNO3

===== SECTION 10 - STABILITY AND REACTIVITY =====

CHEMICAL STABILITY: Decomposes when in contact with air, light, or organic matter.

CONDITIONS TO AVOID: High temperatures, incompatible materials, moisture, reducing agents.

INCOMPATIBILITIES WITH OTHER MATERIALS: Reacts with over 150 chemical combinations. Refer to NFPA Fire Protection Guide for specifics. Reacts explosively with organic materials and combustibles.

HAZARDOUS DECOMPOSITION PRODUCTS: Nitrogen oxides.

HAZARDOUS POLYMERIZATION: Has not been reported.

===== SECTION 11 - TOXICOLOGICAL INFORMATION =====

RTECS#:

CAS# 7697-37-2: QU5775000 QU5900000
CAS# 7732-18-5: ZC0110000

LD50/LC50:

CAS# 7732-18-5: Oral rat: LD50 = 90 mL/kg.

CARCINOGENICITY:

NITRIC ACID: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.
WATER: Not listed by ACGIH, IARC, NIOSH, NTP, or, OSHA.

EPIDEMIOLOGY: No information available.

TERATOGENICITY:

EFFECTS ON NEWBORN: Biochemical and metabolic, Oral-rat TDLo=2345 mg/kg (female 18D post)

FETOTOXICITY: Stunted fetus, Oral-rat TDLo=21150 mg/kg (female 1-21D post)

REPRODUCTIVE EFFECTS: No information available.

NEUROTOXICITY: No information available.

MUTAGENICITY: No information available.

http://jupiter.ports/msds/data/5423

OTHER STUDIES: None.

==== SECTION 12 - ECOLOGICAL INFORMATION =====

ECOTOXICITY:

MOSQUITO FISH: TLm=72 ppm/96H (fresh water)
COCKLE: LC50=330-1000 ppm/48H (salt water)

ENVIRONMENTAL FATE: No information available.

PHYSICAL/CHEMICAL: No information available.

PHYSICAL/CHEMICAL: None.

===== SECTION 13 - DESPOSAL CONSIDERATIONS =====

Dispose of in a manner consistent with federal, state, and local regulations.

RCRA D-SERIES MAXIMUM CONCENTRATION OF CONTAMINANTS: Not listed.
RCRA D-SERIES CHRONIC TOXICITY REFERENCE LEVELS: Not listed.
RCRA F-SERIES: Not listed.
RCRA P-SERIES: Not listed.
RCRA U-SERIES: Not listed.

Non listed as a material banned from land disposal according to RCRA.

===== SECTION 14 - TRANSPORT INFORMATION =====

US DOT:

SHIPPING NAME: NITRIC ACID
HAZARD CLASS: 8
UN NUMBER: UN2031
PACKING GROUP: I

IMO:

SHIPPING NAME: NITRIC ACID
HAZARD CLASS: 8
UN NUMBER: 2031
PACKING GROUP: 2

IATA:

SHIPPING NAME: NITRIC ACID
HAZARD CLASS: 8
UN NUMBER: 2031
PACKING GROUP: 2

RID/ADR:

SHIPPING NAME: NITRIC ACID, OTHER THAN RED FUMING, WITH LESS THAN 70% ACID
DANGEROUS GOODS CODE: 8(2B)
UN NUMBER: 2031

CANADIAN TDG:

SHIPPING NAME: NITRIC ACID
HAZARD CLASS: 8(9.2)
UN NUMBER: UN2031

===== SECTION 15 - REGULATORY INFORMATION =====

FEDERAL:

TSCA:

CAS# 7697-37-2 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

HEALTH & SAFETY REPORTING LIST: None of the chemicals are on the Health & fety Reporting List.

CHEMICAL TEST RULES: None of the chemicals in this product are under a Chemical Test Rule.

SECTION 12B: None of the chemicals are listed under TSCA Section 12b.

TSCA SIGNIFICANT NEW USE RULE: None of the chemicals in this material have a SNUR under TSCA.

CERCLA/SARA:

SECTION 302 (RQ): None of the chemicals in this material have an RQ.

SECTION 302 (TPQ): CAS# 7697-37-2: 1000 pounds

SECTION 313: This material contains Nitric acid (CAS# 7697-37-2, 69-71%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

CLEAN AIR ACT:

This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

CLEAN WATER ACT:

CAS# 7697-37-2 is listed as a Hazardous Substance under the CWA.

None of the chemicals in this product are listed as Priority Pollutants ıder the CWA.

None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA: CAS# 7697-37-2 is considered highly hazardous by OSHA.

STATE:

Nitric acid can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

Not present on state lists from CA, PA, MN, MA, FL, or NJ.

CALIFORNIA NO SIGNIFICANT RISK LEVEL: None of the chemicals in this product are listed.

INTERNATIONAL:

CANADA:

CAS# 7697-37-2 is listed on Canada's DSL/NDSL List.
CAS# 7732-18-5 is listed on Canada's DSL/NDSL List.
CAS# 7697-37-2 is listed on Canada's Ingredient Disclosure List.
CAS# 7732-18-5 is not listed on Canada's Ingredient Disclosure List.

EUROPEAN LABELING IN ACCORDANCE WITH EC DIRECTIVES:

HAZARD SYMBOLS: Not available
RISK PHRASES:
SAFETY PHRASES:

EXPOSURE LIMITS: OEL-ARAB REPUBLIC OF EGYPT: TWA 2 ppm (5 mg/m3). OEL-AUSTRALIA: TWA 2 ppm (5 mg/m3); STEL 4 ppm (10 mg/m3). OEL-BELGIUM: TWA 2 ppm (5.2 mg/m3); STEL 4 ppm (10 mg/m3). OEL-CZECHOSLOVAKIA: TWA 2.5 mg/m3;

STEL 5 mg/m3. OEL-DENMARK: TWA 2 ppm (5 mg/m3). OEL-FINLAND: TWA 2 ppm (5 mg/m3); STEL 5 ppm (13 mg/m3); Skin. OEL-FRANCE: TWA 2 ppm (5 mg/m3); STEL 4 ppm (10 mg/m3). OEL-GERMANY: TWA 10 ppm (25 mg/m3). OEL-HUNGARY: STEL 5 mg/m3. -JAPAN: TWA 2 ppm (5.2 mg/m3). OEL-THE PHILIPPINES: TWA 2 ppm (5 mg/m3). OEL-POLAND-POLAND: TWA 10 mg/m3. OEL-RUSSIA: TWA 2 ppm; STEL 2 mg/m3; Skin. OEL-SWEDEN: TWA 2 ppm (5 mg/m3); STEL 5 ppm (13 mg/m3). OEL-SWITZERLAND: TWA 2 ppm (5 mg/m3); STEL 4 ppm (1 mg/m3). OEL-THAILAND: TWA 2 ppm (5 mg/m3). OEL-TURKEY: TWA 2 ppm (5 mg/m3). OEL-UNITED KINGDOM: TWA 2 ppm (5 mg/m3); STEL 4 ppm (10 mg/m3). OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV. OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGIH TLV.

===== SECTION 16 - ADDITIONAL INFORMATION =====

ADDITIONAL INFORMATION: No additional information available.

MSDS CREATION DATE: December 20, 1994

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

http://jupiter.ports/msds/data/5259

PORTS MSDS #: 5259

PRODUCT: PHOSPHORIC ACID

PART NUMBER:

FORMULA: H3PO4

KEYWORD: ACID

PORTS NUMBER: 03-401-1045

PORTS MISC INFO:
01-01-1045

PORTS RATING: HFR=310

MANUFACTURER:
MALLINCKRODT, INC.
P.O. BOX 800
PARIS
KY

40362
PHONE: PHONE:
EMERGENCY PHONE: 314-539-1600

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 316 F	NOTE: 158'C.
Melting Point. . . .	EQ 70 F	NOTE: 21'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ 1.69	NOTE: DENSITY: 14.08.
Vapor Pressure . . .	EQ 2.16	NOTE: MMHG, 20'C.
Vapor Density. . . .	EQ 3.4	
Percent Volatiles. .	NG	
Evaporation Rate . .	N*	NOTE: NO INFORMATION FOUND
pH	NG	
Molecular Weight . .	EQ 98.00	
Viscosity.	NG	

Solubility in Water. MISCIBLE IN ALL PORTIONS IN WATER.
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS SYRUPY LIQUID, ODORLESS.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NG
Flash Point, Open Cup . . .	NG
Fire Point.	NG
Auto Ignition.	NG
Explosive/Flammable Limits	
Lower (LEL).	NG
Upper (UEL).	NG

Shipping Regulations

UN/NA Number. . . .	NG
D.O.T. Hazard Class. . .	CORROSIVE MATERIAL
Label	NOT GIVEN
Proper Shipping Name . .	NOT GIVEN

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Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 9/05/85

http://jupiter.ports/msds/data/5259

artificial respiration. If breathing is difficult, give oxygen. In all cases call a physician.

E HEALTH HAZARD INFORMATION SECTION.

DOT HAZARD CLASS: Corrosive Material

===== PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

===== FIRE AND EXPLOSION INFORMATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

FIRE: Not considered to be a fire hazard. Contact with most metals causes formation of flammable and explosive hydrogen gas.

EXPLOSION: Not considered to be an explosion hazard.

FIRE EXTINGUISHING MEDIA: Use any means suitable for extinguishing surrounding fire. Water spray may be used to keep fire exposed containers cool. If water is used, use in abundance to control heat and acid build-up.

SPECIAL INFORMATION: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

NFPA RATINGS: HEALTH: 2, FLAMMABILITY: 0, REACTIVITY: 0

==== REACTIVITY DATA =====

STABILITY: Stable under ordinary conditions of use and storage. Substance can supercool without crystallizing.

HAZARDOUS DECOMPOSITION PRODUCTS: Toxic fumes of phosphorous oxides.

HAZARDOUS POLYMERIZATION: Will not occur.

INCOMPATIBILITIES: Strong caustics, metals, sulfides, and sulfites. A strong mineral acid, contact with water can cause liberation of much heat and violent spattering.

===== LEAK/SPILL DISPOSAL INFORMATION =====

Dike and cover leaking or spilled liquid with dirt, vermiculite, kitty-liter or other inert absorbent. Cover spill with sodium bicarbonate or soda ash and mix. Clean-up personnel require protetive clothing and respiratory protection from vapors and mists. Neutralized waste may be containerized and disposed in a RCRA approved waste disposal facility. Flush area of spill with dilute soda ash solution and discard to sewer.

REPORTABLE QUANTITY (RQ)(CWA/CERCLA): 5000 lbs.

Ensure compliance with local, state and federal regulations.

===== HEALTH HAZARD INFORMATION =====

EXPOSURE/HEALTH EFFECTS:

INHALATION: Inhalation is not an expected hazard unless misted or heated to high temperatures. Mist or vapor inhalation can cause irritation to the nose, throat, and upper respiratory tract. Severe exposures can lead to a chemical pneumonitis.

http://jupiter.ports/msds/data/5259

INGESTION: Corrosive. May cause sore throat, abdominal pain, nausea, and severe burns of the mouth, throat, and stomach.

SKIN CONTACT: Corrosive. May cause redness, pain, and severe skin burns.

EYE CONTACT: Corrosive. May cause redness, pain, blurred vision, eye burns, and permanent eye damage.

CHRONIC EXPOSURE: No information found.

AGGRAVATION OF PRE-EXISTING CONDITIONS: Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

FIRST AID:

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

INGESTION: If swallowed, DO NOT induce vomiting. Give large quantities of water or milk if available. Call a physician immediately. Never give anything by mouth to an unconscious person.

SKIN EXPOSURE: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Call a physician immediately.

EYE EXPOSURE: Wash eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

TOXICITY DATA (RTECS, 1986):

ORAL RAT LD50: 1530 mg/kg

SKIN RABBIT LD50: 2740 mg/kg

AQUATIC TOXICITY RATING TLm 96: 1000-10 ppm

===== OCCUPATIONAL CONTROL MEASURES =====

AIRBORNE EXPOSURE LIMITS:

OSHA PERMISSIBLE EXPOSURE LIMIT (PEL): 1 mg/m3 (TWA)

ACGIH THRESHOLD LIMIT VALUE (TLV): 1 mg/m3 (TWA), 3 mg/m3 (STEL)

VENTILATION SYSTEM: A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition for details.

PERSONAL RESPIRATORS (NIOSH APPROVED): If the TLV is exceeded a full facepiece chemical cartridge respirator may be worn, in general, up to 100 times the TLV or the maximum use concentration specified by the respirator supplier, whichever is less. Alternatively, a supplied air full facepiece respirator or airlined hood may be worn.

SKIN PROTECTION: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls to prevent skin contact.

EYE PROTECTION: Use chemical safety goggles and/or full face shield where splashing is possible. Contact lenses should not be worn when working with this material. Maintain eye wash wash fountain and quick-drench facilities in work area.

===== STORAGE AND SPECIAL INFORMATION =====

Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture, incompatibilities, and direct sunlight. Corrosive to mild steel. Store in rubber lined or 316 stainless steel designed for phosphoric acid.

===== ADDENDUM =====

THIS ADDENDUM MUST NOT BE DETACHED FROM THE MSDS. IDENTIFIES SARA 313 SUBSTANCE(S). ANY COPYING OR REDISTRIBUTION OF THE MSDS MUST INCLUDE A COPY OF THIS ADDENDUM.

(CHEM.KEY: PHACD)

REGULATORY STATUS:

HAZARD CATEGORIES FOR SARA SECTION 311/312 REPORTING:

ACUTE	CHRONIC	FIRE	PRESSURE	REACTIVE
X				

PRODUCT OR COMPONENTS OF PRODUCT	SARA EHS SECT.302 RQ(LBS.)	SARA EHS SECT.302 TPQ(LBS.)	SARA SECTION 313 CHEMICALS NAME LIST	SARA SECTION 313 CHEMICALS CHEMICAL CATEGORY
PHOSPHORIC ACID Phosphoric acid (7664-38-2) 85%	No	No	No	No

	CERCLA SEC.103 RQ(LBS.)	RCRA SEC.261.33
PHOSPHORIC ACID Phosphoric acid (7664-38-2) 85%		

SARA SECTION 302 EHS RQ: Reportable Quantity of Extremely Hazardous Substance, listed at 40 CFR 355.

SARA SECTION 302 EHS TPQ: Threshold Planning Quantity of Extremely Hazardous Substance. An asterisk(*) following a Threshold Planning Quantity signifies that if the material is a solid and has a particle size equal to or larger than 100 micrometers, the Threshold Planning Quantity = 10,000 LBS.

SARA SECTION 313 CHEMICALS: Toxic Substances subject to annual release reporting requirements listed at 40 CFR 372.65.

CERCLA SEC.103: Comprehensive Environmental Response, Compensation and Liability Act (Superfund). Releases to air, land or water of these hazardous substances which exceed the Reportable Quantity (RQ) must be reported to the National Response Center, (800-424-8802); Listed at 40 CFR 302.4

RCRA: Resource Conservation and Reclamation Act. Commercial chemical product wastes designated as acute hazards and toxic under 40 CFR 261.33

===== SPECIAL NOTES =====

Mallinckrodt provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. Individuals receiving this information must exercise their independent judgment in determining its appropriateness for a particular purpose.

MALLINCKRODT MAKES NO REPRESENTATIONS, OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE INFORMATION SET FORTH HEREIN OR TO THE PRODUCT TO WHICH THE INFORMATION

REFERS. ACCORDINGLY, MALLINCKRODT WILL NOT BE RESPONSIBLE FOR DAMAGES RESULTING FROM USE OF OR RELIANCE UPON THIS INFORMATION.

http://jupiter.ports/msds/data/625

PORTS MSDS #: 625

PRODUCT: POTASSIUM FERRICYANIDE

PART NUMBER:

FORMULA: K3-FE-C6-N6

KEYWORD: CYANIDE

PORTS NUMBER: 034165960; 03-416-5960

PORTS MISC INFO:
NOT GIVEN

PORTS RATING: HFR=200

MANUFACTURER:
SPECTRUM CHEMICAL MFG. CORP.
14422 S. SAN PEDRO STREET
GARDENA
CA

90248
PHONE: PHONE: 310-516-8000
EMERGENCY PHONE: 310-516-8000

===== Physical/Chemical Characteristics =====

Boiling Point. . . . NG
Melting Point. . . . N* NOTE: DECOMPOSES.
Freezing Point . . . NG
Pour Point . . . . . NG
Softening Point. . . NG

Specific Gravity . . EQ 1.85
Vapor Pressure . . . NG
Vapor Density. . . . NG
Percent Volatiles. . NG
Evaporation Rate . . NG
pH . . . . . NG
Molecular Weight . . EQ 329.26
Viscosity. . . . . NG
Solubility in Water. 33% @39'F / SOLVENT SOLUBILITY: ACETONE.
Odor/Appearance/Other Characteristics:
RUBY RED MONOCLINIC CRYSTALS OR POWDER.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . . NG
Flash Point, Open Cup . . . NG
Fire Point. . . . . NG
Auto Ignition. . . . . NG
Explosive/Flammable Limits
Lower (LEL). . . . . NG
Upper (UEL). . . . . NG

Shipping Regulations
UN/NA Number. . . . . NG
D.O.T. Hazard Class. . . NOT GIVEN
Label . . . . . NOT GIVEN
Proper Shipping Name . . NOT GIVEN

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Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 3/24/93

===== Component Information =====

POTASSIUM FERRICYANIDE
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 100
C.A.S. No.: 13746662
Note:
NO OCCUPATIONAL EXPOSURE LIMITS ESTABLISHED BY OSHA, ACGIH, OR NIOSH.

===== SUBSTANCE IDENTIFICATION =====

SUBSTANCE: POTASSIUM FERRICYANIDE

TRADE NAMES/SYNONYMS: POTASSIUM FERRICYANATE; TRIPOTASSIUM HEXACYANOFERRATE; RED PRUSSIATE OF POTASH; RED POTASSIUM PRUSSIATE; FERRATE(3-), HEXAKIS (CYANO-C)-, TRIPOTASSIUM; TRIPOTASSIUM FERRIC HEXACYANIDE; TRIPOTASSIUM FERRICYANIDE; TRIPOTASSIUM IRON HEXACYANIDE; KODAK FARMER'S REDUCER, PART A (KODAK); KODAK POTASSIUM FERRICYANIDE; K3FE (CN) 6; OHS19380

CHEMICAL FAMILY: INORGANIC SALT

MOLECULAR FORMULA: K3-FE-C6-N6

MOLECUAR WEIGHT: 329.26

AS NUMBER: 13746-66-2

RTECS NUMBER: LJ8225000

CERCLA RATINGS (SCALE 0-3):

HEALTH = 2
FIRE = 0
REACTIVITY = 0
PERSISTENCE = 3

NFPA RATINGS (SCALE 0-4):

HEALTH = 1
FIRE = 0
REACTIVITY = 0

PHONE: (310) 516-8000

EMERGENCY CONTACT:

CHEMTREC: (800) 424-9300

SPECTRUM TECHNICAL SERVICES (310) 516-8000

MANUFACTURER'S NAME AND ADDRESS:

SPECTRUM CHEMICAL MFG. CORP.
14422 S. SAN PEDRO STREET
GARDENA, CA 90248-9985

===== COMPONENTS AND CONTAMINANTS =====

SEE COMPONENT INFORMATION.

http://jupiter.ports/msds/data/625

OTHER CONTAMINANTS: NONE

==== PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

SOLVENT SOLUBILITY: ACETONE; SLIGHTLY SOLUBLE IN ALCOHOL

===== FIRE AND EXPLOSION DATA =====

FIRE AND EXPLOSION HAZARD: NEGLIGIBLE FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

FIREFIGHTING MEDIA: DRY CHEMICAL, WATER SPRAY OR REGULAR FOAM (1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5).

FOR LARGER FIRES: USE WATER SPRAY, FOG OR ALCOHOL-RESISTANT FOAM (1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5).

FIREFIGHTING: MOVE CONTAINER FROM FIRE AREA IF YOU CAN DO IT WITHOUT RISK. FIGHT FIRE FROM MAXIMUM DISTANCE. STAY AWAY FROM ENDS OF TANKS. DIKE FIRE-CONTROL WATER FOR LATER DISPOSAL; DO NOT SCATTER THE MATERIAL (1990 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.5, GUIDE PAGE 55).

USE AGENT SUITABLE FOR TYPE OF FIRE. DO NOT USE WATER ON MATERIAL. FOR LARGE FIRES USE WATER IN FLOODING QUANTITIES AS FOG AND SPRAY. AVOID BREATHING POISONOUS VAPORS, KEEP UPWIND.

===== TOXICITY =====

OTASSIUM FERRICYANIDE:

TOXICITY DATA: 2970 MG/KG ORAL-MOUSE LD50; 1600 MG/KG ORAL-RAT LDLO; MUTAGENIC DATA (RTECS).

CARACINOGEN STATAUS: NONE

ACUTE TOXICITY LEVEL: MODERATELY TOXIC BY INGESTION.

TARGET EFFECTS: NO DATA AVAILABLE.

===== HEALTH EFFECTS AND FIRST AID =====

INHALATION:

POTASSIUM FERRICYANIDE:

ACUTE EXPOSURE: NO SPECIFIC DATA AVAILABLE. FERRICYANIDE SALTS DO NOT READILY RELEASE CYANIDE. HOWEVER, CERTAIN INDUSTRIAL PROCESSES MAY RELEASE CYANIDE, WHICH IS A CHEMICAL ASPHYXIANT.

CHRONIC EXPOSURE: NO DATA AVAILABLE.

FIRST AID: REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. MAINTAIN AIRWAY AND BLOOD PRESSURE AND ADMINISTER OXYGEN IF AVAILABLE. KEEP AFFECTED PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. ADMINISTRATION OF OXYGEN SHOULD BE PERFORMED BY QUALIFIED PERSONNEL. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT:

POTASSIUM FERRICYANIDE:

ACUTE EXPOSURE: NO DATA AVAILABLE, MAY BE IRRITATING.

CHRONIC EXPOSURE: NOT DATA AVAILABLE.

FIRST AID: REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT:

POTASSIUM FERRICYANIDE:

ACUTE EXPOSURE: NO DATA AVAILABLE, MAY BE IRRITATING.
CHRONIC EXPOSURE: NO DATA AVAILABLE.

FIRST AID: WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:

POTASSIUM FERRICYANIDE:

ACUTE EXPOSURE: 2970 MG/KG IS THE LETHAL DOSE IN MICE. SYMPTOMS OF POISONING HAVE NOT BEEN REPORTED. INGESTION OF CYANIDE SALTS MAY CAUSE IRREGULAR RESPIRATION, A SUDDEN LOSS OF CONSCIOUSNESS, FOLLOWED BY VIOLENT CONVULSIONS, PARALYSIS AND DEATH FROM RESPIRATORY ARREST. THERE IS INSUFFICIENT DATA TO DETERMINE WHETHER CYANIDE IS RELEASED FROM INGESTION OF FERRICYANIDES.

CHRONIC EXPOSURE: NO DATA AVAILABLE.

FIRST AID: IN CASE OF INGESTION OF LARGE AMOUNTS, INDUCE VOMITING. GET MEDICAL ATTENTION. (DEICHMANN AND GERARDE, TOXICOLOGY OF DRUGS AND CHEMICALS)

ANTIDOTE: THE FOLLOWING ANTIDOTE HAS BEEN RECOMMENDED. HOWEVER, THE DECISION AS TO WHETHER THE SEVERITY OF POISONING REQUIRES ADMINISTRATION OF ANY ANTIDOTE AND ACTUAL DOSE REQUIRED SHOULD BE MADE BY QUALIFIED MEDICAL PERSONNEL.

FOR CYANIDE POISONING: IF SYMPTOMS OF CYANIDE POISONING ARE EVIDENT, ADMINISTER IMMEDIATELY BEFORE ANY OTHER FIRST AID MEASURES. ADMINISTER AMYL NITRITE (AMYL NITRITE PERLES) BY INHALATION FOR 15 TO 30 SECONDS OF EVERY MINUTE, WHILE SODIUM NITRITE SOLUTION IS BEING PREPARED. DISCONTINUE AMYL NITRITE AND IMMEDIATELY INJECT 10 ML OF A 3% SOLUTION OF SODIUM NITRITE INTRAVENOUSLY OVER A PERIOD OF 2 TO 4 MINUTES. IF NECESSARY, INJECT A NON-STERILE SOLUTION. DO NOT REMOVE THE NEEDLE. CAUTION: APPROPRIATE ADJUSTMENTS IN THE DOSE SHOULD BE MADE ON A BODY WEIGHT BASIS. THROUGH THE SAME NEEDLE, INFUSE INTRAVENOUSLY 50 ML OF A 25% AQUEOUS SOLUTION OF SODIUM THIOSULFATE. THE INJECTION SHOULD TAKE ABOUT 10 MINUTES. OTHER CONCENTRATIONS (5 TO 50%) ARE PERMISSIBLE IF THE TOTAL DOSE IS HELD AT APPROXIMATELY 12 GRAMS. OXYGEN THERAPY MAY BE OF VALUE IN COMBINATION WITH NITRITE AND THIOSULFATE THERAPY. IF SYMPTOMS RECUR, THE INJECTIONS OF NITRITE AND THIOSULFATE MAY BE REPEATED AT HALF THE ABOVE DOSES. IN VERY SEVERE POISONING IT IS SAFER AND PERHAPS MORE EFFICIENT TO KEEP REPEATING THE THIOSULFATE INJECTIONS INSTEAD OF THE NITRITE (GOSSELIN, SMITH, HODGE, CLINICAL TOXICOLOGY OF COMMERCIAL PRODUCTS, 5TH ED.). ANTIDOTE SHOULD BE ADMINISTERED BY QUALIFIED MEDICAL PERSONNEL.

===== REACTIVITY =====

REACTIVITY: STABLE UNDER NORMAL TEMPERATURES AND PRESSURES IN A CLOSED CONTAINER. AQUEOUS SOLUTIONS MAY DECOMPOSE ON EXPOSURE TO LIGHT.

INCOMPATIBILITIES:

POTASSIUM FERRICYANIDE:

ACIDS: DECOMPOSITION WITH LIBERATION OF HYDROCYANIC ACID.

AMMONIA: POSSIBLE EXPLOSION ON CONTACT.

CHROMIUM TRIOXIDE (CHROMIC ANHYDRIDE): EXPLOSION ON HEATING ABOVE 196 C.

HYDROCHLORIC ACID: FORMATION OF ENDOTHERMIC COMPLEX FERRICYANIC ACID.

SODIUM NITRITE: FORMATION OF EXPLOSIVE COMPOUND.

DECOMPOSITION: THERMAL DECOMPOSITON PRODUCTS MAY INCLUDE HIGHLY TOXIC FUMES OF HYDROGEN CYANIDE.

POLYMERIZATION: HAZARDOUS POLYMERIZATION HAS NOT BEEN REPORTED TO OCCUR UNDER NORMAL TEMPERATURES AND PRESSURES.

===== STORAGE AND DISPOSAL =====

OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE.

STORAGE: STORE AWAY FROM INCOMPATIBLE SUBSTANCES.

CONDITIONS TO AVOID: NONE REPORTED.

===== SPILL AND LEAK PROCEDURES =====

OCCUATIONAL SPILL: NO SPECIAL PRECAUTIONS INDICATED.

===== PROTECTIVE EQUIPMENT =====

ENTILATION: PROVIDE LOCAL EXHAUST VENTILATION SYSTEM.

RESPIRATOR: THE FOLLOWING RESPIRATORS ARE RECOMMENDED BASED ON INFORMATION FOUND IN THE PHYSICAL DATA, TOXICITY AND HEALTH EFFECTS SECTIONS. THEY ARE RANKED IN ORDER FROM MINIMUM TO MAXIMUM RESPIRATORY PROTECTION.

THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAMINATION LEVELS FOUND IN THE WORK PLACE, MUST BE BASED ON THE SPECIFIC OPERATION, MUST NOT EXCEED THE WORKING LIMITS OF THE RESPIRATOR AND MUST BE JOINTLY APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH AND THE MINE SAFETY AND HEALTH ADMINISTRATION (NIOSH-MSHA).

ANY DUST AND MIST RESPIRATOR.

ANY AIR-PURIFYING RESPIRATOR WITH A HIGH-EFFICIENCY PARTICULATE FILTER.

ANY POWERED AIR-PURIFYING RESPIRATOR WITH A DUST AND MIST FILTER.

ANY POWERED AIR-PURIFYING RESPIRATOR WITH A HIGH-EFFICIENCY PARTICULATE FILTER.

ANY TYPE 'C' SUPPLIED-AIR RESPIRATOR OPERATED IN THE PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE OR CONTINUOUS-FLOW MODE.

ANY SELF-CONTAINED BREATHING APPARATUS.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

ANY SELF-CONTAINED BREATHING APPARATUS THAT HAS A FULL FACEPIECE AND IS OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE.

ANY SUPPLIED-AIR RESPIRATOR THAT HAS A FULL FACEPIECE AND IS OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE IN COMBINATION WITH AN AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN PRESSURE-DEMAND OR

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OTHER POSITIVE-PRESSURE MODE.

CLOTHING: EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE (IMPERVIOUS) CLOTHING AND EQUIPMENT TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE.

GLOVES: EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT CONTACT WITH THIS SUBSTANCE.

EYE PROTECTION: EMPLOYEE MUST WEAR SPLASH-PROOF OR DUST-RESISTANT SAFETY GOGGLES TO PREVENT EYE CONTACT WITH THIS SUBSTANCE.

EMERGENCY EYE WASH: WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES MAY BE EXPOSED TO THIS SUBSTANCE. THE EMPLOYER SHOULD PROVIDE AN EYE WASH FOUNTAIN WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

===== SPECIAL NOTES =====

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CREATION DATE: 12/18/84

REVISION DATE: 03/24/93

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CHEM SERVICE -- PROPANOL, O-233
MATERIAL SAFETY DATA SHEET
NSN: 681000N066037
Manufacturer's CAGE: 8Y898
Part No. Indicator: A
Part Number/Trade Name: PROPANOL, O-233

General Information

Company's Name: CHEM SERVICE INC
Company's P. O. Box: 3108
Company's City: WEST CHESTER
Company's State: PA
Company's Country: US
Company's Zip Code: 19381
Company's Emerg Ph #: 215-692-3026
Company's Info Ph #: 215-692-3026
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 01SEP88
Safety Data Review Date: 06NOV95
MSDS Serial Number: CBDCW

Ingredients/Identity Information

Proprietary: NO
Ingredient: PROPIONALDEHYDE; (PROPANOL) (SARA 313) (CERCLA)
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: UE0350000
CAS Number: 123-38-6
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

Physical/Chemical Characteristics

Appearance And Odor: COLORLESS LIQUID.
Boiling Point: 120F,49C
Melting Point: -114F,-81C
Vapor Density (Air=1): 0.807
Solubility In Water: SOLUBLE

Fire and Explosion Hazard Data

Flash Point: 15.8F,-9.0C
Extinguishing Media: CARBON DIOXIDE, DRY CHEMICAL POWDER OR WATER SPRAY.

CAS# 123-38-6
MSDS CBDCW
Propanol

Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: NONE SPECIFIED BY MANUFACTURER.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.
Materials To Avoid: INCOMPATIBLE WITH STRONG OXIDIZING AGENTS, STRONG BASES, STRONG REDUCING AGENTS.
Hazardous Decomp Products: DECOMPOSITION LIBERATES TOXIC FUMES.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NONE SPECIFIED BY MANUFACTURER.

Health Hazard Data

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: CONTACT LENSES SHOULD NOT BE WORN IN LABORATORY. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS-AVOID DIRECT PHYSICAL CONTACT! CAN BE HARMFUL IF INHALED, SWALLOWED, ABSORBED THROUGH SKIN. CAN CAUSE EYE AND SKIN IRRITATION. DUST AND/OR VAPORS CAN CAUSE IRRITATION TO RESPIRATORY TRACT. CAN BE IRRITATING TO MUCOUS MEMBS.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: AN ANTIDOTE IS SUBSTANCE INTENDED TO COUNTERACT EFT OF POIS. IT SHOULD BE ADMIN ONLY BY MD/TRAINED EMER PERS. MED ADVICE CAN BE OBTAINED FROM POIS CTL CTR. EYES:FLUSH CONTINUOUSLY W/ WATER FOR @ LST 15 MIN. SKIN:FLUSH W/WATER FOR 15-20 MIN. IF NO BURNS HAVE OCCURRED, USE SOAP & WATER TO CLEANSE SKIN. REMOVE & WASH CONTAM CLTHG. GET MED ATTN IF NEC. INHAL:REMOVE TO FRESH AIR. ADMIN OXYG IF (SUPDAT)

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE AREA. WEAR APPROPRIATE OSHA-REGULATED EQUIPMENT. VENTILATE AREA. ABSORB ON VERMICULITE OR SIMILAR MATERIAL. SWEEP UP AND PLACE IN AN APPROPRIATE CONTAINER. HOLD FOR DISPOSAL. WASH CONTAMINATED SURFACES TO REMOVE ANY RESIDUE.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL

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REGULATIONS (FP N). BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER.
Precautions-Handling/Storing: AVOID CONTACT WITH SKIN, EYES AND CLOTHING. KEEP TIGHTLY CLOSED AND STORE IN A COOL, DRY PLACE. STORE ONLY WITH COMPATIBLE CHEMICALS.
Other Precautions: PERSONS NOT SPECIFICALLY & PROPERLY TRAINED SHOULD NOT HNDL CHEM/ITS CNTNR. PROD IS FURNISHED FOR LAB USE ONLY! PRODS MAY NOT BE USED AS DRUGS, COSMETICS, AGRICULTURAL/PESTICIDAL PRODS, FOOD ADDITIVES/AS HOUSEHOLD CHEMS.

Control Measures

Respiratory Protection: USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N). USE APPROPRIATE OSHA/MSMA APPROVED SAFETY EQUIPMENT.
Ventilation: THIS CHEMICAL SHOULD BE HANDLED ONLY IN A HOOD.
Protective Gloves: IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).
Other Protective Equipment: ANSI APPROVED EMERGENCY EYE WASH AND DELUGE SHOWER (FP N).
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.
Suppl. Safety & Health Data: FIRST AID PROC:PATIENT IS HAVING DFCLTY BRTHG. IF PATIENT HAS STOPPED BRTHG ADMIN CPR. CONTINUE LIFE SUPPORTING MEASURES UNTIL MED ASSISTANCE HAS ARRIVED. INGEST:CALL MD IMMED (FP N).

Transportation Data

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 06NOV95
Label Status: B
Common Name: PROPANOL, 0-233
Chronic Hazard: NO
Signal Word: DANGER!
Acute Health Hazard-Moderate: X
Contact Hazard-Moderate: X
Fire Hazard-Severe: X
Reactivity Hazard-Slight: X
Special Hazard Precautions: FLAMMABLE. SLIGHTLY TOXIC. ACUTE:ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS-AVOID DIRECT PHYSICAL CONTACT! CAN BE HARMFUL IF INHALED, SWALLOWED, ABSORBED THROUGH SKIN. CAN CAUSE EYE AND

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SKIN IRRITATION. DUST AND/OR VAPORS CAN CAUSE IRRITATION TO RESPIRATORY TRACT. CAN BE IRRITATING TO MUCOUS MEMBRANES. CHRONIC:NONE SPECIFIED BY MANUFACTURER.
Protect Eye: X
Protect Skin: X
Protect Respiratory: X
Label Name: CHEM SERVICE INC
Label P.O. Box: 3108
Label City: WEST CHESTER
Label State: PA
Label Zip Code: 19381
Label Country: US
Label Emergency Number: 215-692-3026

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21-18-0225

REAGENT PACK, VESSEL SOLUTION, GENERATOR SOLUTION, NEUTRALIZING SOLUTION

SERAGEN, INC.
P.O. Box 1210
Indianapolis, IN 46206 U.S.A.
(317) 266-2000

720-20

CAS# 110-86-1

MATERIAL SAFETY DATA SHEET

AQUATEST REAGENTS

Seragen Diagnostics firmly believes that safe use of laboratory reagents requires knowledge of the physical, chemical, and hazardous properties of the substances. Material Safety Data Sheets (MSDSs) are the primary vehicle for transmitting this detailed information.

In evaluating Seragen products, a number of guidelines are observed.

1. Most Seragen reagents are mixtures, not "pure" substances. Since minimal objective scientific information is available on the hazards of the mixtures, they are assumed to have the same hazards as the component parts.

2. An individual MSDS is prepared for each component determined to be a health hazard and which comprises 1% or greater of the mixture. For chemicals identified as carcinogens, a MSDS is prepared if the concentration is 0.1% or greater.

3. An individual MSDS is prepared for each component which has been determined to present a physical hazard.

4. MSDSs are prepared in accordance with the rules presented in Hazard Communication; Final Rule, 29 CFR Part 1910, Department of Labor, Occupational Safety and Health Administration, November 25, 1983.

5. For AQUATEST REAGENTS individual MSDSs are provided as follows:

	PYRIDINE	PYRIDINE FREE
Vessel Solution H7972-6 2712202	Part A- Pyridine, Sulfur Dioxide Part B- Methanol, Karl Fischer Reagent (Pyridine, Ethylene Glycol Monomethyl Ether, Sulfur Dioxide, Iodine)	Methanol Chloroform Sulfur Dioxide Iodide
Generator Solution H7972-5 2712201	Methanol, Karl Fischer Reagent	2-Methoxyethanol Iodine Sulfur Dioxide
Neutralizing Solution H7972-8 2712204	Methanol	Not Applicable

SERAGEN DIAGNOSTICS
P.O. Box 1210
Indianapolis, IN 46206 USA

MATERIAL SAFETY DATA SHEET

SECTION I IDENTIFICATION OF PRODUCT

Chemical Name
PYRIDINE

Formula
C_5H_5N

Synonym or Cross Reference
AZINE, AZABENZENE

CAS Number
110-86-1

SECTION II HAZARDOUS INGREDIENTS

Material
PYRIDINE

Nature of Hazard
FLAMMABLE, TOXIC

SECTION III PHYSICAL DATA

Boiling Point
239°F (115°C)

Melting Point
-41°C

Vapor Pressure (mm Hg)
760

Specific Gravity
1.0

Vapor Density (Air = 1)
2.7

Percent Volatile By Volume (%)
N/A

Water Solubility
YES

Evaporation Rate
(NA =)

Appearance
COLORLESS LIQUID WITH SHARP, PENETRATING AND NAUSEOUS ODOR

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point (closed cup)
68°F

Flammable Limits	Lower	Upper
	1.8	12.4

Fire Extinguishing Media
ALCOHOL FOAM, DRY CHEMICAL, CARBON DIOXIDE

Special Fire Fighting Procedures
WEAR SELF-CONTAINED BREATHING APPARATUS

Unusual Fire and Explosion Hazards
VAPOR IS HEAVIER THAN AIR AND MAY TRAVEL CONSIDERABLE DISTANCE TO A SOURCE OF IGNITION

SECTION V HEALTH HAZARD DATA

Threshold Limit Value
5 ppm

Effects of Overexposure
TOXIC BY INHILATION AND INGESTION

First Aid Procedures

SKIN: WASH WITH STRONG SOAP IMMEDIATELY. RINSE THOROUGHLY

PYRIDINE (Cont'd)

SECTION VI REACTIVITY DATA

.lity	Unstable Stable X	Conditions to Avoid N/A

Incompatibility (material to avoid)
ACIDS; POWERFUL OXIDIZING MATERIALS

Hazardous Decomposition Products
N/A

Hazardous Polymerization	May Occur Will Not Occur X	Conditions to Avoid N/A

SECTION VII SPILL AND DISPOSAL PROCEDURES

Steps to be Taken in Case Material is Released or Spilled

COVER WITH SAND, SODA ASH MIXTURE.

Waste Disposal Method
INCINERATE OR LAND FILL IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

SECTION VIII SPECAIL PROTECTION INFORMATION

Respiratory Protection (specify type)
WEAR SELF CONTAINED BREATHING APPARATUS

:ilation	Local Exhaust YES Mechanical (general) YES	Special N/A Other N/A

Protective Gloves RUBBER	Eye Protection CHEMICAL SAFETY GOGGLES

Other Protective Equipment
N/A

SECTION IX SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storing
OUTSIDE OR DETACHED STORAGE IS PREFERABLE. INSIDE STORAGE SHOULD BE IN A STANDARD FLAMMABLE LIQUID STORAGE ROOM OR CABINET.

Other Precautions
N/A

Prepared By

Revision Date 3/20/85

Michael J. Sullivan
nager of Regulatory Affairs
17) 266-2080

PORTS MSDS #: 348

PRODUCT: STANDARD, SELENIUM 1000PPM IN 10% NITRIC

PART NUMBER:

FORMULA: Se

KEYWORD: STANDARD

PORTS NUMBER: 00190042-100

PORTS MISC INFO:
LAB MSDS# 812

PORTS RATING: HFR=300

MANUFACTURER:
VHG LABS INC.
180 ZACHARY RD #5
MANCHESTER
NH

03109
PHONE: PHONE: 603-622-7660
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	~ 212 F	NOTE: ~100'C.
Melting Point. . . .	~ 32 F	NOTE: ~0'C.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	~ 1	
Vapor Pressure . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Vapor Density. . . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Percent Volatiles. .	~ 99	NOTE: @ 21'C.
Evaporation Rate . .	NA	NOTE: NOT APPLI/NOT AVAIL.
pH	NA	NOTE: NOT APPLI/NOT AVAIL.
Molecular Weight . .	EQ 78.96	NOTE: FORMULA WT.
Viscosity.	NG	

Solubility in Water. COMPLETE (100%).
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID, ODORLESS / ODOR THRESHOLD: NOT APPLICABLE/NOT AVAILABLE.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NA	NOTE: NOT APPLI/NOT AVAIL.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	NA	NOTE: NOT APPLI/NOT AVAIL.
Explosive/Flammable Limits		
Lower (LEL).	NA	NOTE: NOT APPLI/NOT AVAIL.
Upper (UEL).	NA	NOTE: NOT APPLI/NOT AVAIL.

Shipping Regulations

UN/NA Number.	NG
D.O.T. Hazard Class. . .	NG
Label	NOT GIVEN
Proper Shipping Name . .	CHEMICALS, N.O.S. (NON-REGULATED)

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Preparer/Contact Information: QUALITY ASSURANCE DEPARTMENT

Date Prepared/Revised 2/01/93

http://jupiter.ports/msds/data/348

===== Component Information =====

SELENIUM
OSHA PEL (PPM):
OSHA PEL (MG/M3): 0.2
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 0.2
STEL (PPM): NG
STEL (MG/M3):
Product %: EQ 1.0
C.A.S. No.: 7782492

NITRIC ACID
OSHA PEL (PPM):
OSHA PEL (MG/M3): 5
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 5
STEL (PPM):
STEL (MG/M3): 10
Product %: EQ 10
C.A.S. No.: 7697372
Note:
PEL & TLV: 2 PPM / STEL: 4 PPM.

WATER
OSHA PEL (PPM): NE
OSHA PEL (MG/M3):
ACGIH TLV (PPM): NE
ACGIH TLV (MG/M3):
STEL (PPM): NG
STEL (MG/M3):
Product %: BA
C.A.S. No.: 7732185
Note:
NE = NOT ESTABLISHED / BA = BALANCE.

===== SECTION I - PRODUCT IDENTIFICATION =====

PRODUCT NAME: Selenium Plasma Emission Standard - 10,000 micrograms/ml

COMMON SYNONYMS: N/A

CHEMICAL FAMILY: Plasma Emission Standards

FORMULA: Se

FORMULA WT.: 78.96

CAS NO.: N/A

NIOSH/RTECS NO.: QU5775000

PRODUCT USE: Laboratory Reagent

REVISION DATE: 02/01/93

TEL: (603) 622-7660

FAX: 622-5180

MANUFACTURER'S NAME AND ADDRESS:

VHG LABS, INC.
CHEMICAL PRODUCTS AND SERVICES

180 ZACHARY ROAD #5
MANCHESTER, NH 03109

===== SECTION II - COMPONENTS =====

SEE COMPONENT INFORMATION.

===== SECTION III - PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

ODOR THRESHOLD (PPM): N/A

COEFFICIENT WATER/OIL DISTRIBUTION: N/A

===== SECTION IV - FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT (CLOSED CUP): N/A

AUTOIGNITION TEMPERATURE: N/A

FLAMMABLE LIMITS:

UPPER: N/A
LOWER: N/A

FIRE EXTINGUISHING MEDIA: Use extinguishing media appropriate for surrounding fire.

SPECIAL FIRE-FIGHTING PROCEDURES: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode.

UNUSUAL FIRE & EXPLOSION HAZARDS: Reacts with most metals to produce hydrogen gas, which can form an explosive mixture with air.

TOXIC GASES PRODUCED: Oxides of nitrogen.

EXPLOSION DATA-SENSITIVITY TO MECHANICAL IMPACT: None identified.

EXPLOSION DATA-SENSITIVITY TO STATIC DISCHARGE: None identified.

===== SECTION V - HEALTH HAZARD DATA =====

THRESHOLD LIMIT VALUE (TLV/TWA): 5 mg/m3 (2 ppm)

TLV is for Nitric acid.

SHORT-TERM EXPOSURE LIMIT (STEL): 10 mg/m3 (4 ppm)

STEL is for Nitric acid.

PERMISSIBLE EXPOSURE LIMIT (PEL): 5 mg/m3 (2 ppm)

PEL is for Nitric acid.

TOXICITY OF COMPONENTS:

ORAL RAT LD50 FOR SELENIUM: 6700 mg/kg

INTRAVENOUS RAT LD50 FOR SELENIUM: 6 mg/kg

INHALATION-1HR RAT LC50 FOR NITRIC ACID: 2500 ppm

INTRAPERITONEAL MOUSE LD50 FOR WATER: 190 g/kg

INTRAVENOUS MOUSE LD50 FOR WATER: 25 g/kg

CARCINOGENICITY: NTP: No IARC: No Z LIST: No OSHA REG: No

CARCINOGENICITY: None identified

REPRODUCTIVE EFFECTS: None identified

EFFECTS OF OVEREXPOSURE:

INHALATION: Headache, nausea, vomiting, dizziness, irritation of respiratory system

SKIN CONTACT: Severe irritation

EYE CONTACT: Severe irritation

SKIN ABSORPTION: None identified

INGESTION: Burns to mouth, throat, and stomach, kidney dysfunction

CHRONIC EFFECTS: None identified

TARGET ORGANS: Respiratory system, eyes, skin, teeth

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Damaged skin, eye disorders, cardiopulmonary disease

PRIMARY ROUTES OF ENTRY: Inhalation, ingestion, skin contact, eye contact

EMERGENCY AND FIRST AID PROCEDURES:

INGESTION: CALL A PHYSICIAN. If swallowed, do NOT induce vomiting f conscious, give water, milk, or milk of magnesia.

INHALATION: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

SKIN CONTACT: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

EYE CONTACT: In case of eye contact, immediately flush with plenty of water for at least 15 minutes.

SARA/TITLE III HAZARD CATEGORIES AND LISTS:

ACUTE: Yes CHRONIC: Yes FLAMMABILITY: No PRESSURE: No REACTIVITY: No

EXTREMELY HAZARDOUS SUBSTANCE: Yes Contains Nitric Acid (RQ = 1,000 LBS, TPQ = 1,000 LBS)

CERCLA HAZARDOUS SUBSTANCE: Yes Contains Nitric Acid (RQ = 1,000 LBS)

SARA 313 TOXIC CHEMICALS: Yes Contains Nitric Acid

TSCA INVENTORY: Yes

===== SECTION VI - REACTIVITY DATA =====

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Heat

INCOMPATIBLES: Strong bases, strong reducing agents, alkalies, most common

metals

DECOMPOSITION PRODUCTS: Oxides of nitrogen

===== SECTION VII - SPILL & DISPOSAL PROCEDURES =====

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE: Wear self-contained breathing apparatus and full protective clothing. Stop leak if you can do so without risk. Ventilate area. Neutralize spill with soda ash or lime. With clean shovel, carefully place material into clean, dry container and cover; remove from area. Flush spill area with water.

DISPOSAL PROCEDURE: Dispose in accordance with all applicable federal, state, and local environmental regulations.

EPA HAZARDOUS WASTE NUMBER: D002 (Corrosive Waste)

===== SECTION VIII - PROTECTION INFORMATION =====

EYE/FACE PROTECTION: Goggles & Shield

PROTECTIVE CLOTHING: Lab Coat & Apron

PROTECTIVE GLOVES: Rubber

VENTILATION REQUIREMENTS: Vent Hood

===== SECTION IX - STORAGE DATA AND ADDITIONAL INFORMATION =====

STORAGE REQUIREMENTS: Keep container tightly closed. Store in secure poison area. Isolate from incompatible materials.

===== SECTION X - TRANSPORTATION DATA AND ADDITIONAL INFORMATION =====

DOMESTIC (D.O.T.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)

INTERNATIONAL (I.M.O.):

PROPER SHIPPING NAME: Chemicals, n.o.s. (non-regulated)
MARINE POLLUTANTS: No

N/A = Not Applicable or Not Available
N/E = Not Established

The information in this Material Safety Data Sheet meets the requirements of the United States OCCUPATIONAL SAFETY AND HEALTH ACT and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) and the Canadian WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM. This document is intended only as a guide to the appropriate precautionary handling of the material by a person trained in, or supervised by a person trained in, chemical handling. The user is responsible for determining the application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes.

Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, VHG cannot warn of all of the potential dangers of use or interaction with other chemicals or materials. VHG warrants that the chemical meets the specifications set forth on the label.

VHG DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR PURPOSE.

http://jupiter.ports/msds/data/348

The user should recognize that this product can cause severe injury and even death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION.

Approved by Quality Assurance Department.

http://haz1.siri.org:80/ h/q107/q429.html

FOSECO -- NAPAC - SODIUM METAL (NATRIUM)
MATERIAL SAFETY DATA SHEET
NSN: 681000F025680
Manufacturer's CAGE: 2W462
Part No. Indicator: A
Part Number/Trade Name: NAPAC

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General Information

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Item Name: SODIUM METAL (NATRIUM)
Company's Name: FOSECO INC
Company's Street: 20200 SHELDON RD
Company's City: BROOK PARK
Company's State: OH
Company's Country: US
Company's Zip Code: 44142-1315
Company's Emerg Ph #: 216-826-4548
Company's Info Ph #: 216-826-4548
Distributor/Vendor # 1: INDUSTRIAL & FOUNDRY SUPPLY CO
Distributor/Vendor # 1 Cage: 6L984
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SE
Date MSDS Prepared: 20MAR90
Safety Data Review Date: 09DEC92
MSDS Preparer's Name: TREVOR HARDY
Preparer's Company: FOSECO INC
Preparer's St Or P. O. Box: 20200 SHELDON RD
Preparer's City: BROOK PARK
Preparer's State: OH
Preparer's Zip Code: 44142-1315
MSDS Serial Number: BPSNG

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Ingredients/Identity Information

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Proprietary: NO
Ingredient: SODIUM METAL (NATRIUM)
Ingredient Sequence Number: 01
Percent: 100%
NIOSH (RTECS) Number: VY0686000
CAS Number: 7440-23-5

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Physical/Chemical Characteristics

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Appearance And Odor: SILVER WHITE METAL, NO ODOR.
Boiling Point: 1637F

CAS# 7440-23-5
MSDS BPSNG
Sodium

http://haz1.siri.org:80 's/h/q107/q429.html

Vapor Pressure (MM Hg/70 F): 1.2

Fire and Explosion Hazard Data

Extinguishing Media: SODA ASH/DRY SODIUM CHLORIDE/GRAPHITE. DON'T USE WATER/CO2/CALCIUM CHLORIDE/SODA ACID/CONVENTIONAL DRY POWDER.
Unusual Fire And Expl Hazrds: DANGEROUS WHEN EXPOSED TO HEAT/FLAME/BY CHEMICAL REACTION W/WATER/OXIDIZING AGENTS. HEATED SODIUM IS SPONTANEOUSLY FLAMMABLE. AUTOIGNITION TEMP: 239F.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): HEAT, OPEN FLAME, MOISTURE
Materials To Avoid: WATER, OXIDIZING MATERIALS, HALOGENS, ACIDS, & HALOGENATED HYDROCARBONS
Hazardous Decomp Products: IN USE AS SODIUM MODIFIER FOR ALUMINUM WILL EVOLVE SODIUM OXIDE, HYDROGEN, & HEAT
Hazardous Poly Occur: NO

Health Hazard Data

Route Of Entry - Inhalation: NO
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: SKIN/EYES: THERMAL & CHEMICAL BURNS.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NONE
Emergency/First Aid Proc: SKIN: REMOVE ALL UNREACTED SODIUM. WASH IMMEDIATELY W/WATER. EYES: REMOVE ALL UNREACTED SODIUM. FLUSH IMMEDIATELY W/WATER FOR AT LEAST 15 MINS. SEE EYE DOCTOR. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: FOR DAMAGED CANS: PLACE IN AIR TIGHT METAL CONTAINER FILLED W/KEROSENE.
Waste Disposal Method: DISPOSE OF IN ACCORDANCE W/LOCAL, STATE, & FEDERAL REGULATIONS. THIS IS A HAZARDOUS MATERIAL. FLAMMABLE SOLID.
Precautions-Handling/Storing: STORE IN COOL, DRY, FIRE-PROOF AREA AWAY FROM OPEN FLAMES, HEAT, & WATER OR WATER VAPOR.

Control Measures

http://haz1.siri.org:80/h/q107/q429.html

Respiratory Protection: NONE REQUIRED IN NORMAL USE.
Protective Gloves: INSULATING
Eye Protection: SAFETY GLASSES
Suppl. Safety & Health Data: THE SODIUM METAL IS SUPPLIED IN A VACUUM PACKED ALUMINUM CAN WHICH IS SAFE TO HANDLE PROVIDING THE CAN IS KEPT IN TACT.

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Transportation Data

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Disposal Data

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Label Data

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Label Required: YES
Technical Review Date: 09DEC92
Label Date: 19NOV92
Label Status: F
Common Name: NAPAC SODIUM METAL (NATRIUM)
Chronic Hazard: NO
Signal Word: WARNING!
Acute Health Hazard-Moderate: X
Contact Hazard-Moderate: X
Fire Hazard-Slight: X
Reactivity Hazard-Slight: X
Special Hazard Precautions: SKIN/EYES: THERMAL & CHEMICAL BURNS. TARGET ORGANS: LIVER, KIDNEY, CENTRAL NERVOUS SYSTEM, & LUNGS.
Protect Eye: Y
Protect Skin: Y
Label Name: FOSECO INC
Label Street: 20200 SHELDON RD
Label City: BROOK PARK
Label State: OH
Label Zip Code: 44142-1315
Label Country: US
Label Emergency Number: 216-826-4548
Year Procured: UNK

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URL for this msds http://siri.org. If you wish to change, add to, or delete information in this archive please sent updates to dan@siri.org.

===== STORAGE AND DISPOSAL =====

OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE.

STORAGE: STORE IN A COOL, DRY, WELL-VENTILATED LOCATION. SEPARATE FROM ACIDS, WATER, METALS. IMMEDIATELY REMOVE AND PROPERLY DISPOSE OF ANY SPILLED MATERIAL. (NFPA 49, HAZARDOUS CHEMICALS DATA, 1991)

STORE AWAY FROM INCOMPATIBLE SUBSTANCES.

DISPOSAL: DISPOSAL MUST ME IN ACCORDANCE WITH STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE, 40 CFR 262. EPA HAZARDOUS WASTE NUMBER D002.

100 POUND CERCLA SECTION 103 REPORTABLE QUANTITY.

CONDITIONS TO AVOID: MAY BURN BUT DOES NOT IGNITE READILY. FLAMMABLE, POISONOUS GASES MAY ACCUMULATE IN TANKS AND HOPPER CARS. MAY IGNITE COMBUSTIBLES (WOOD, PAPER, OIL, ETC.).

===== SPILL AND LEAK PROCEDURES =====

SOIL SPILL: DIG HOLDING AREA SUCH AS LAGOON, POND OR PIT FOR CONTAINMENT.

USE PROTECTIVE COVER SUCH AS A PLASTIC SHEET TO PREVENT MATERIAL FROM DISSOLVING IN FIRE EXTINGUISHING WATER OR RAIN.

WATER SPILL: ADD SUITABLE AGENT TO NEUTRALZED SPILLED MATERIAL TO PH-7.

OCCUPATIONAL SPILL: DO NOT TOUCH SPILLED MATERIAL. STOP LEAK IF YOU CAN DO IT WITHOUT RISK. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER ABSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR LATER DISPOSAL. FOR SMALL DRY SPILLS, WITH CLEAN SHOVEL PLACE MATERIAL INTO CLEAN, DRY CONTAINER AND COVER. MOVE CONTIANERS FROM SPILL AREA. FOR LARGER SPILLS, DIKE FAR AHEAD OF SPILL FOR LATER DISPOSAL. KEEP UNNECESSARY PEOPLE AWAY. ISOLATE HAZARD AREA AND DENY ENTRY.

REPORTABLE QUANTITY (RQ): 1000 POUNDS

THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) SECTION 304 REQUIRES THAT A RELEASE EQUAL TO OR GREATER THAN THE REPORTABLE QUANTITY FOR THIS SUBSTANCE BE IMMEDIATELY REPORTED TO THE LOCAL EMERGENCY PLANNING COMMITTEE AND THE STATE EMERGENCY RESPONSE COMMISSION (40 CFR 355.40). IF THE RELEASE OF THIS SUBSTANCE IS REPORTAABLE UNDER CERCLA SECTION 103, THE NATIONAL RESPONSE CENTER MUST BE NOTIFIED IMMEDIATELY AT (800) 424-8802 OR (202) 426-2675 IN THE METROPOLITAN WASHINGTON, D.C. AREA (40 CFR 302.6).

===== PROTECTIVE EQUIPMENT =====

VENTILATION: PROVIDE LOCAL EXHAUST VENTILATION SYSTEM TO MEET PUBLISHED EXPOSURE LIMITS.

RESPIRATOR: THE FOLLOWING RESPIRATORS AND MAXIMUM USE CONCENTRATIONS ARE RECOMMENDATIONS BY THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, NIOSH POCKET GUIDE TO CHEMICAL HAZARDS; NIOSH CRITERIA DOCUMENTS OR BY THE U.S. DEPARTMENT OF LABOR, 29 CFR 1910 SUBPART Z.

THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAMINATION LEVELS FOUND IN THE WORK PLACE, MUST NOT EXCEED THE WORKING LIMITS OF THE RESPIRATOR AND BE JOINTLY APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH AND THE MINE SAFETY AND HEALTH ADMINISTRATION (NIOSH-MSHA).

SODIUM HYDROXIDE:

50 MG/M3: ANY POWERED AIR-PURIFYING RESPIRATOR WITH A DUST AND MIST

FILTER. ANY SUPPLIED-AIR RESPIRATOR OPERATED IN A CONTINUOUS FLOW MODE.

100 MG/M3: ANY SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE. ANY SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE. ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR WITH A HIGH EFFICIENCY PARTICULATE FILTER.

250 MG/M3: ANY SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE AND OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

ESCAPE: ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR WITH A HIGH EFFICIENCY PARTICULATE FILTER. ANY APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OF HEALTH CONDITIONS: ANY SELF-CONTAINED BREATHING APPARATUS THAT HAS A FULL FACEPIECE AND IS OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE.

ANY SUPPLIED-AIR RESPIRATOR THAT HAS A FULL FACEPIECE AND IS OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE IN COMBINATION WITH AN AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE.

CLOTHING: EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE (IMPERVIOUS) CLOTHING AND EQUIPMENT TO PREVENT ANY POSSIBILITY OF SKIN CONTACT WITH THIS SUBSTANCE.

GLOVES: EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT CONTACT WITH THIS SUBSTANCE.

EYE PROTECTION: EMPLOYEE MUST WEAR SPLASH-PROOF OR DUST-RESISTANT SAFETY GOGGLES AND A FACESHIELD TO PREVENT CONTACT WITH THIS SUBSTANCE.

EMERGENCY WASH FACILITIES: WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES AND/OR SKIN MAY BE EXPOSED TO THIS SUBSTANCE, THE EMPLOYER SHOULD PROVIDE AN EYE WASH FOUNTAIN AND QUICK DRENCH SHOWER WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

===== SPECIAL NOTES =====

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CREATION DATE: 12/17/84

REVISION DATE: 07/14/93

THE STATEMENTS CONTAINED HEREIN ARE OFFERED FOR INFORMATIONAL PURPOSES ONLY AND ARE INTENDED TO BE FOLLOWED ONLY BY PERSONS HAVING RELATED TECHNICAL SKILLS AND AT THEIR OWN DISCRETION AND RISK. SINCE CONDITIONS AND MANNER OF USE ARE OUTSIDE OUR CONTROL, WE MAKE NO WARRANTIES, EXPRESS OR IMPLIED, AND NO LIABILITY IN CONNECTION WITH ANY USE OF THIS INFORMATION.

http://www.chem.utah.edu/MSDS/S/SULFAMIC_ACID

MSDS for SULFAMIC ACID / Page 1

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1 - PRODUCT IDENTIFICATION

PRODUCT NAME: SULFAMIC ACID
FORMULA: NH2SO3H
FORMULA WT: 97.09
CAS NO.: 05329-14-6
NIOSH/RTECS NO.: WO5950000
COMMON SYNONYMS: AMIDOSULFONIC ACID; AMIDOSULFURIC ACID; SULFAMIDIC ACID; SULPHAMIC ACID
PRODUCT CODES: 4975,V145,4898,V147
EFFECTIVE: 11/26/86
REVISION #03

PRECAUTIONARY LABELLING

BAKER SAF-T-DATA(TM) SYSTEM

HEALTH	-	2	MODERATE
FLAMMABILITY	-	0	NONE
REACTIVITY	-	2	MODERATE
CONTACT	-	3	SEVERE (CORROSIVE)

HAZARD RATINGS ARE 0 TO 4 (0 = NO HAZARD; 4 = EXTREME HAZARD).

LABORATORY PROTECTIVE EQUIPMENT

GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES

PRECAUTIONARY LABEL STATEMENTS

WARNING
CAUSES BURNS
HARMFUL IF SWALLOWED

DO NOT GET IN EYES, ON SKIN, ON CLOTHING.
AVOID BREATHING DUST. KEEP IN TIGHTLY CLOSED CONTAINER. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING.

SAF-T-DATA(TM) STORAGE COLOR CODE: WHITE (CORROSIVE)

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2 - HAZARDOUS COMPONENTS

CAS# 05329-14-6
Sulfamic Acid

COMPONENT	%	CAS NO.
SULFAMIC ACID	90-100	5329-14-6

3 - PHYSICAL DATA

BOILING POINT: N/A VAPOR PRESSURE(MM HG): N/A

MELTING POINT: 205 C (401 F) DECOMPOSES VAPOR DENSITY(AIR=1): 3.3

SPECIFIC GRAVITY: 2.11 (H2O=1) EVAPORATION RATE: N/A (BUTYL ACETATE=1)

SOLUBILITY(H2O): APPRECIABLE (MORE THAN 10 %) % VOLATILES BY VOLUME: 0

APPEARANCE & ODOR: WHITE, ODORLESS CRYSTALS.

4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (CLOSED CUP N/A

FLAMMABLE LIMITS: UPPER - N/A % LOWER - N/A %

FIRE EXTINGUISHING MEDIA
USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.

SPECIAL FIRE-FIGHTING PROCEDURES
FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE. MOVE CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK. USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL.

UNUSUAL FIRE & EXPLOSION HAZARDS
CLOSED CONTAINERS EXPOSED TO HEAT MAY EXPLODE.
NOTE: DECOMPOSES AT MELTING POINT.

TOXIC GASES PRODUCED

AMMONIA, SULFUR DIOXIDE, NITROGEN OXIDES

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5 - HEALTH HAZARD DATA

CARCINOGENICITY: NTP: NO IARC: NO Z LIST: NO OSHA REG: NO

EFFECTS OF OVEREXPOSURE
DUST MAY IRRITATE NOSE AND THROAT.
DUST MAY IRRITATE SKIN OR EYES.
CONTACT WITH SKIN OR EYES MAY CAUSE SEVERE IRRITATION OR BURNS.
INGESTION MAY CAUSE GASTROINTESTINAL PAIN.

TARGET ORGANS
EYES, SKIN

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
NONE IDENTIFIED

ROUTES OF ENTRY
EYE CONTACT, SKIN CONTACT, INGESTION, INHALATION

EMERGENCY AND FIRST AID PROCEDURES
CALL A PHYSICIAN.

IF SWALLOWED, IF CONSCIOUS, IMMEDIATELY INDUCE VOMITING.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. FLUSH SKIN WITH WATER.

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6 - REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

INCOMPATIBLES: CHLORINE AND CHLORINE COMPOUNDS, NITRITES, NITRATES, CARBONATES, METAL OXIDES, CHEMICALLY ACTIVE METALS,

STRONG BASES

DECOMPOSITION PRODUCTS: AMMONIA, OXIDES OF SULFUR, OXIDES OF NITROGEN

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7 - SPILL AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE
WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING.
WITH CLEAN SHOVEL, CAREFULLY PLACE MATERIAL INTO CLEAN, DRY CONTAINER AND COVER; REMOVE FROM AREA. FLUSH SPILL AREA WITH WATER.

J. T. BAKER NEUTRASORB(R) OR NEUTRASOL(R) "LOW NA+" ACID NEUTRALIZERS ARE RECOMMENDED FOR SPILLS OF SOLUTIONS OF THIS PRODUCT.

DISPOSAL PROCEDURE
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS.

EPA HAZARDOUS WASTE NUMBER: D002 (CORROSIVE WASTE)

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8 - PROTECTIVE EQUIPMENT

VENTILATION: USE ADEQUATE GENERAL OR LOCAL EXHAUST VENTILATION TO KEEP FUME OR DUST LEVELS AS LOW AS POSSIBLE.

RESPIRATORY PROTECTION: NONE REQUIRED WHERE ADEQUATE VENTILATION CONDITIONS EXIST. IF AIRBORNE CONCENTRATION IS HIGH, A DUST/MIST RESPIRATOR IS RECOMMENDED. IF CONCENTRATION EXCEEDS CAPACITY OF RESPIRATOR, A SELF-CONTAINED BREATHING APPARATUS IS ADVISED.

EYE/SKIN PROTECTION: SAFETY GOGGLES, UNIFORM, APRON, RUBBER GLOVES ARE RECOMMENDED.

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9 - STORAGE AND HANDLING PRECAUTIONS

SAF-T-DATA(TM) STORAGE COLOR CODE: WHITE (CORROSIVE)

SPECIAL PRECAUTIONS
KEEP CONTAINER TIGHTLY CLOSED. STORE IN CORROSION-PROOF AREA.
ISOLATE FROM INCOMPATIBLE MATERIALS.

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10 - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC (D.O.T.)

PROPER SHIPPING NAME	CORROSIVE SOLID, N.O.S. (SULFAMIC ACID)
HAZARD CLASS	CORROSIVE MATERIAL (SOLID)
UN/NA	UN1759
LABELS	CORROSIVE

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME	SULPHAMIC ACID
HAZARD CLASS	8
UN/NA	UN2967
LABELS	CORROSIVE

PORTS MSDS #: 5150

PRODUCT: SULFURIC ACID

PART NUMBER:

FORMULA: H2SO4

KEYWORD: ACID

PORTS NUMBER: 03-401-1075; 03-450-0110

PORTS MISC INFO:
01-01-1075
95-01-0120

PORTS RATING: HFR=302

MANUFACTURER:
ASARCO, INC.
180 MAIDEN LANE
NEW YORK
NY

10038
PHONE: PHONE: 212-510-2000
EMERGENCY PHONE:

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	BT 529 538 F	NOTE: 276-281'C.
Melting Point. . . .	EQ -20 F	NOTE: @ 93.19%; -1'C @ 98%
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	BT 1.835 1.844	
Vapor Pressure . . .	EQ .005	NOTE: MMHG @ 20'C, 90%.
Vapor Density. . . .	NA	NOTE: NOT APPLICABLE.
Percent Volatiles. .	NG	
Evaporation Rate . .	NA	NOTE: NOT APPLICABLE.
pH	EQ .9	NOTE: 1% SOLUTION.
Molecular Weight . .	EQ 98.08	
Viscosity.	NG	
Solubility in Water.	COMPLETE.	

Odor/Appearance/Other Characteristics:
OILY, COLORLESS TO SLIGHTLY YELLOW, CLEAR-TURBID LIQ. / ODOR THRESH:~1 MG/M3.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NA	NOTE: NOT APPLICABLE.
Flash Point, Open Cup . . .	NA	NOTE: NOT APPLICABLE.
Fire Point.	NG	
Auto Ignition.	NA	NOTE: NOT APPLICABLE.
Explosive/Flammable Limits		
Lower (LEL).	NA	NOTE: NOT APPLICABLE.
Upper (UEL).	NA	NOTE: NOT APPLICABLE.

Shipping Regulations

UN/NA Number.	UN1830
D.O.T. Hazard Class. . .	CORROSIVE MATERIAL
Label	NOT GIVEN
Proper Shipping Name . .	NOT GIVEN

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Preparer/Contact Information: SULFURIC ACID SALES DEPARTMENT, 800 433-2243

http://jupiter.ports/msds/data/5150

Date Prepared/Revised 12/08/94

==== Component Information =====

SULFURIC ACID
OSHA PEL (PPM):
OSHA PEL (MG/M3): 1.0
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 1.0
STEL (PPM): NG
STEL (MG/M3):
Product %: BT 93 99
C.A.S. No.: 7664939

===== A. PRODUCT/COMPANY IDENTIFICATION =====

PRODUCT NAME: SULFURIC ACID

TRADE NAME (COMMON NAME OR SYNONYM): Sulfuric Acid, Oil of Vitriol

CHEMICAL NAME: Sulfuric Acid

ASARCO PRODUCT CODE #: 1860

FORMULA: H2SO4

MOLECULAR WEIGHT: 98.08

14605

ISSUED DATE: 1/7/83
REVISED DATE: 12/8/94

PHONE: 212-510-2000

CONTACT:

GENERAL INFORMATION:

DEPARTMENT OF ENVIRONMENTAL SCIENCES:

DAY: 801-262-2459
NIGHT: 801-561-3044

FIRST AID INFORMATION - (MEDICAL DEPT.): 415-457-0383

TRANSPORTATION EMERGENCIES - CHEMTREC: 800-424-9300

MANUFACTURER'S NAME AND ADDRESS:

ASARCO INCORPORATED
180 MAIDEN LANE
NEW YORK, NEW YORK 10038

===== B. COMPOSITION/INFORMATION ON INGREDIENTS =====

SEE COMPONENT INFORMATION.

===== C. HAZARDS IDENTIFICATION =====

PRIMARY ROUTES OF ENTRY:

INGESTION: X
INHALATION: X
SKIN:

CARCINOGENICITY: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mists containing sulfuric acid" as carcinogenic to humans. This classification does not apply to sulfuric acid or sulfuric acid solutions.

WARNING: This product contains a chemical known to the state of California to cause cancer.

ACUTE OVEREXPOSURE (SYMPTOMS AND EFFECTS):

Inhalation of fumes or mists can cause irritation or corrosive burns to the upper respiratory system. Lung irritation and pulmonary edema can occur.

Ingestion can cause irritation and corrosive burns to throat, mouth, and stomach. Can be fatal if swallowed.

Causes severe burns or irritation on skin contact.

Liquid contact with the eyes can cause irritation, corneal burns, and blindness. Mist contact may irritate or burn.

CHRONIC OVEREXPOSURE (SYMPTOMS AND EFFECTS): Long term exposure to high levels of acid fumes may cause erosion of teeth followed by jaw necrosis, bronchial irritation, coughing, and bronchial pneumonia, or gastrointestinal disturbances.

MEDICAL CONDITIONS POSSIBLY AGGRAVATED: Acute and chronic respiratory diseases.

===== D. FIRST AID MEASURES =====

INHALATION: Remove from exposure; place individual under care of a physician.

INGESTION: Drink large amounts of water (or milk, if available) to dilute the acid. DO NOT INDUCE VOMITING!

SKIN AND EYE: Immediately flush with plenty of water for at least 15 minutes. Remove contaminated clothing. GET PROMPT MEDICAL ATTENTION!

===== E. FIRE FIGHTING MEASURES =====

FLASH POINT: Not Applicable

AUTO IGNITION TEMPERATURE: Not Applicable

FLAMMABLE LIMITS IN AIR (% BY VOL.): Not Applicable

UNUSUAL FIRE AND EXPLOSION HAZARDS: Flammable and explosive hydrogen gas can be generated inside metal drums and storage tanks. Concentrated acid can ignite combustible materials on contact. Acid plus active metal can also form explosive concentrations of hydrogen.

FIRE EXTINGUISHING AGENTS RECOMMENDED: If involved in a fire, use water spray; avoid spraying water into containers. If only a small amount of combustibles is present, smother fire with dry chemical.

FIRE EXTINGUISHING AGENTS TO AVOID: Direct stream of water may cause spattering.

SPECIAL FIRE FIGHTING PRECAUTIONS: Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in fire. At high temperatures, sulfuric acid or sulfur trioxide mists can be released from vented or ruptured containers. If water is added to concentrated sulfuric acid, violent spattering can occur and considerable heat may be evolved.

===== F. RELEASE MEASURES =====

http://jupiter.ports/msds/data/5150

SPILLS OR LEAKS: Dilute small spills or leaks cautiously with plenty of water. Neutralize with alkali such as soda ash or lime. Adequate ventilation is required for soda ash due to release of CO2 gas. No smoking in spill area. Major spills must be handled by a predetermined plan. Diking with soda ash is recommended. Attempt to keep out of sewer.

===== G. HANDLING AND STORAGE =====

NORMAL HANDLING:

Do not get in eyes, on skin, or clothing. Do not breathe vapor or mists.

Use protective equipment as outlined in Section H.

Do not add water to acid. When diluting, always add acid to water cautiously and with agitation. Use with adequate ventilation.

STORAGE: Protect from physical damage. Store in cool, well-ventilated area away from combustibles and reactive chemicals. Keep out of sun and away from heat. Keep containers in upright position. No smoking in storage areas.

===== H. EXPOSURE CONTROLS/PERSONAL PROTECTION =====

ENGINEERING CONTROLS: Adequate ventilation to maintain mist below permissible exposure limits. Packaging, unloading areas, or open processing equipment may require mechanical ventilation.

PERSONAL HYGIENE: Avoid inhalation or ingestion. Practice good housekeeping and personal hygiene procedures. Wash thoroughly before eating or smoking. Do not wear contaminated clothing home.

PECIAL PRECAUTIONS/PROCEDURES/LABEL INSTRUCTIONS: Loosen closures carefully.

NFPA CLASSIFICATION: 3H, 0F, 2R, W/-
LABEL SIGNAL WORD: DANGER

RESPIRATORY PROTECTION: When airborne exposures may exceed OSHA/ACGIH permissible air concentrations, the minimum respiratory protection recommended is a negative pressure air purifying respirator with cartridges that are NIOSH/MSHA approved against dusts and mists having a TWA not less than 0.05 mg/cu.m.

EYES AND FACE: Chemical goggles or faceshield required.

OTHER CLOTHING AND EQUIPMENT: Rubber gloves and apron or equivalent required when handling sulfuric acid. Full protective clothing recommended when handling large quantities of sulfuric acid.

===== I. PHYSICAL/CHEMICAL PROPERTIES =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

MELTING POINT (DEGREES C): 93.19% at -29 C, 98% at -1C

VAPOR PRESSURE (MM HG): 95% = 0.0015 AT 35 C

===== J. STABILITY AND REACTIVITY =====

STABILITY: Stable

CONDITIONS TO AVOID: Not Applicable

INCOMPATIBILITY (MATERIALS TO AVOID): Sulfuric acid is not flammable but highly reactive and capable of igniting finely divided combustible materials

on contact. Reacts violently with water and organic materials with evolution of heat. Extremely hazardous in contact with many materials, particularly carbides, chlorates, fulminates, nitrates, picrates, powdered metals and other combustible materials. Attacks many metals releasing hydrogen. Examples of common inorganic chemicals that should be avoided include: sodium carbonate, sodium hydroxide, elemental sodium, potassium permanganate, ammonium hydroxide, and potassium chlorate. Common organic chemicals that have been reported as being incompatible with sulfuric acid include: ethylene glycol, aniline, and ethylene diamine.

HAZARDOUS DECOMPOSITION PRODUCTS: Sulfur Trioxide Mist

HAZARDOUS POLYMERIZATION: Will not occur

CONDITIONS TO AVOID: Not Applicable

===== K. TOXICOLOGICAL INFORMATION =====

LD50 (SPECIES, ROUTE):

SULFURIC ACID: 2140 mg/kg (rat, oral)

LC50 (SPECIES):

SULFURIC ACID: 510 mg/cu.m/2 hrs. (rat)

MUTAGENICITY: Not available

===== L. ECOLOGICAL =====

ECOTOXICITY: Not available

ENVIRONMENTAL FATE: Not available

===== M. DISPOSAL CONSIDERATIONS =====

WASTE DISPOSAL METHODS, (DISPOSER MUST COMPLY WITH FEDERAL, STATE, AND LOCAL DISPOSAL OR DISCHARGE LAWS): If hazardous under 40 CFR 261, Subparts B and C, material must be treated or disposed in a facility meeting the requirements of 40 CFR 264 or 265. If non-hazardous, material should be disposed in a facility meeting the requirements of 40 CFR 257.

EPA HAZARDOUS WASTE NUMBER: D002 (corrosive)

40 CFR 261:

RCRA STATUS OF UNUSED MATERIAL: If discarded in unaltered form, material should be tested to determine if it must be classified as a hazardous waste for disposal purposes. Under specific circumstances, application can be made to the EPA Administrator to have a particular waste designated non-hazardous.

===== N. TRANSPORT =====

DOT REGULATION AND ID (OR PIN) NUMBER: Sulfuric acid is regulated as a corrosive material with an identification number of UN1830.

===== O. REGULATORY INFORMATION =====

WHMIS CLASSIFICATION, SARA REGULATION AND OTHER INFORMATION:

WHMIS Classifies this material as Class C, D1A, and E.

TSCA STATUS: On TSCA Inventory

http://jupiter.ports/msds/data/5150

REGULATED UNDER SARA TITLE III:

SECT. 302: Sulfuric Acid
SECT. 311/312: Immediate and Delayed
SECT. 313 CHEMICALS: Sulfuric Acid

CERCLA REPORTABLE QUANTITY: 1000 pounds for Sulfuric Acid.

===== P. REFERENCES =====

PERMISSIBLE CONCENTRATION REFERENCES: OSHA regulations for airborne contaminants 29 CFR 1910.1000 and 1018; ACGIH Threshold Limit Values for Chemical Substances.

HAZARD INFORMATION REFERENCES:

DOCUMENTATION OF THE THRESHOLD LIMIT VALUES, 6th Ed., ACGIH
PATTY'S INDUSTRIAL HYGIENE AND TOXICOLOGY, Vol. 2A, 3rd Rev. Ed.
HANDBOOK OF TOXIC AND HAZARDOUS CHEMICALS; Sittig, Marshall; 1981
NFPA FIRE PROTECTION GUIDE ON HAZARDOUS MATERIALS, 10th Ed.
TOMES PLUS DATABASE; Micromedex, Inc. Vol. 17, 1993
DATATOX DATABASE; Spectrum Research, Inc., Version 2.0, 1992

GENERAL:

HANDBOOK OF CHEMISTRY AND PHYSICS, 57th Ed., 1967-77, Weast , R.C.,Editor, CRC Inc.

===== Q. ADDITIONAL INFORMATION =====

INFORMATION (HAZARDS, FIRST AID, ETC.) IS ABBREVIATED. MORE INFORMATION IS CONTAINED IN REFERENCES FOUND IN SECTION P.

ADDITIONAL INFORMATION CONTACT:

ASARCO INCORPORATED
SULFURIC ACID SALES DEPARTMENT
P.O. BOX 5747
TUCSON, AZ 85703-0747
(800) 433-2243

THIS MATERIAL SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION, AND INVESTIGATION. ASARCO INCORPORATED PROVIDES NO WARRANTIES, EITHER EXPRESS OR IMPLIED, AND ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE DATA CONTAINED HEREIN.

MSDS for TETRACHLOROETHYLENE Page 1

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1 - PRODUCT IDENTIFICATION

PRODUCT NAME: TETRACHLOROETHYLENE
FORMULA: CL2C:CCL2
FORMULA WT: 165.83
CAS NO.: 00127-18-4
NIOSH/RTECS NO.: KX3850000
COMMON SYNONYMS: PERCHLOROETHYLENE; ETHYLENE TETRACHLORIDE; CARBON BICHLORIDE; CARBON DICHLORIDE
PRODUCT CODES: 9218,9453,5380,9465
EFFECTIVE: 02/12/87
REVISION #03

PRECAUTIONARY LABELLING

BAKER SAF-T-DATA(TM) SYSTEM

HEALTH	-	3	SEVERE (CANCER CAUSING)
FLAMMABILITY	-	0	NONE
REACTIVITY	-	0	NONE
CONTACT	-	3	SEVERE (LIFE)

HAZARD RATINGS ARE 0 TO 4 (0 = NO HAZARD; 4 = EXTREME HAZARD).

LABORATORY PROTECTIVE EQUIPMENT

GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

PRECAUTIONARY LABEL STATEMENTS

DANGER
HARMFUL IF SWALLOWED OR INHALED
EXCEPTIONAL HEALTH AND CONTACT HAZARDS - READ MATERIAL SAFETY DATA SHEET
NOTE: REPORTED AS CAUSING CANCER IN LABORATORY ANIMALS. EXERCISE DUE CARE.
NOTE: THIS MATERIAL OR ITS VAPORS IN CONTACT WITH FLAMES OR HOT GLOWING SURFACES MAY FORM CORROSIVE ACID FUMES.
KEEP AWAY FROM HEAT, SPARKS, FLAME. DO NOT GET IN EYES, ON SKIN, ON CLOTHING. AVOID BREATHING VAPOR. KEEP IN TIGHTLY CLOSED CONTAINER. USE WITH ADEQUATE VENTILATION. WASH THOROUGHLY AFTER HANDLING.

SAF-T-DATA(TM) STORAGE COLOR CODE: BLUE (HEALTH)

CAS# 00127-18-4
Tetrachloroethylene

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2 - HAZARDOUS COMPONENTS

COMPONENT	%	CAS NO.
TETRACHLOROETHYLENE	90-100	127-18-4

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3 - PHYSICAL DATA

BOILING POINT: 121 C (250 F) VAPOR PRESSURE(MM HG): 13

MELTING POINT: -22 C (-8 F) VAPOR DENSITY(AIR=1): 5.8

SPECIFIC GRAVITY: 1.62 (H2O=1) EVAPORATION RATE: 2.80 (BUTYL ACETATE=1)

SOLUBILITY(H2O): NEGLIGIBLE (LESS THAN 0.1 %) % VOLATILES BY VOLUME: 100

APPEARANCE & ODOR: COLORLESS LIQUID WITH ETHER OR CHLOROFORM ODOR.

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4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (CLOSED CUP N/A NFPA 704M RATING: 2-0-0

FLAMMABLE LIMITS: UPPER - N/A % LOWER - N/A %

FIRE EXTINGUISHING MEDIA
USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.

SPECIAL FIRE-FIGHTING PROCEDURES
FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE. MOVE CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK. USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL.

UNUSUAL FIRE & EXPLOSION HAZARDS
CLOSED CONTAINERS EXPOSED TO HEAT MAY EXPLODE.

TOXIC GASES PRODUCED
HYDROGEN CHLORIDE, PHOSGENE, CARBON MONOXIDE, CARBON DIOXIDE

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5 - HEALTH HAZARD DATA

ACCEPTABLE MAXIMUM PEAK ABOVE THE ACCEPTANCE CEILING CONCENTRATION FOR AN EIGHT-HOUR SHIFT = 300 PPM FOR 5 MINUTES IN ANY 3 HOURS. (PEL) CEILING = 200 PPM

THRESHOLD LIMIT VALUE (TLV/TWA): 335 MG/M3 (50 PPM)

SHORT-TERM EXPOSURE LIMIT (STEL): 1340 MG/M3 (200 PPM)

PERMISSIBLE EXPOSURE LIMIT (PEL): MG/M3 (100 PPM)

TOXICITY: LD50 (ORAL-RAT)(MG/KG) - 8850
LD50 (IPR-MOUSE)(MG/KG) - 4700

CARCINOGENICITY: NTP: NO IARC: NO Z LIST: NO OSHA REG: NO

EFFECTS OF OVEREXPOSURE
INHALATION OF VAPORS MAY CAUSE HEADACHE, NAUSEA, VOMITING, DIZZINESS, DROWSINESS, IRRITATION OF RESPIRATORY TRACT, AND LOSS OF CONSCIOUSNESS. LIQUID MAY BE IRRITATING TO SKIN AND EYES. PROLONGED SKIN CONTACT MAY RESULT IN DERMATITIS. EYE CONTACT MAY RESULT IN TEMPORARY CORNEAL DAMAGE.

INGESTION MAY CAUSE NAUSEA, VOMITING, HEADACHES, DIZZINESS, GASTROINTESTINAL IRRITATION.
CHRONIC EFFECTS OF OVEREXPOSURE MAY INCLUDE DAMAGE TO KIDNEYS, LIVER, LUNGS, BLOOD, OR CENTRAL NERVOUS SYSTEM.

TARGET ORGANS
LIVER, KIDNEYS, EYES, UPPER RESPIRATORY SYSTEM, CENTRAL NERVOUS SYSTEM

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
NONE IDENTIFIED

ROUTES OF ENTRY
INHALATION, INGESTION, EYE CONTACT, SKIN CONTACT

EMERGENCY AND FIRST AID PROCEDURES
CALL A PHYSICIAN.
IF SWALLOWED, DO NOT INDUCE VOMITING.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. FLUSH SKIN WITH WATER.

SOME EXPERIMENTS WITH TEST ANIMALS INDICATED THAT THIS SUBSTANCE MAY BE ANTICIPATED TO BE A CARCINOGEN.

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6 - REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: HEAT, FLAME, OTHER SOURCES OF IGNITION

INCOMPATIBLES: STRONG OXIDIZING AGENTS, ALKALI METALS, ALUMINUM

DECOMPOSITION PRODUCTS: HYDROGEN CHLORIDE, PHOSGENE, CARBON MONOXIDE, CARBON DIOXIDE

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7 - SPILL AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE
WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING.
STOP LEAK IF YOU CAN DO SO WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS.
TAKE UP WITH SAND OR OTHER NON-COMBUSTIBLE ABSORBENT MATERIAL AND PLACE INTO CONTAINER FOR LATER DISPOSAL. FLUSH SPILL AREA WITH WATER.

DISPOSAL PROCEDURE
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS.

EPA HAZARDOUS WASTE NUMBER: U210 (TOXIC WASTE)

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8 - PROTECTIVE EQUIPMENT

VENTILATION:	USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET TLV REQUIREMENTS.
RESPIRATORY PROTECTION:	RESPIRATORY PROTECTION REQUIRED IF AIRBORNE CONCENTRATION EXCEEDS TLV. AT CONCENTRATIONS UP TO 50 PPM, A CHEMICAL CARTRIDGE RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE IS RECOMMENDED. ABOVE THIS LEVEL, A SELF-CONTAINED BREATHING APPARATUS IS RECOMMENDED.
EYE/SKIN PROTECTION:	SAFETY GOGGLES AND FACE SHIELD, UNIFORM, PROTECTIVE SUIT, POLYVINYL ALCOHOL GLOVES ARE RECOMMENDED.

9 - STORAGE AND HANDLING PRECAUTIONS

SAF-T-DATA(TM) STORAGE COLOR CODE: BLUE (HEALTH)

SPECIAL PRECAUTIONS
KEEP CONTAINER TIGHTLY CLOSED. STORE IN SECURE POISON AREA.
STORE IN A COOL, WELL-VENTILATED AREA AWAY FROM SOURCES OF HEAT, FLAME, OR IGNITION.

10 - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC (D.O.T.)

PROPER SHIPPING NAME	TETRACHLOROETHYLENE (AIR ONLY)
HAZARD CLASS	ORM-A
UN/NA	UN1897
LABELS	NONE
REPORTABLE QUANTITY	1 LBS.

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME	TETRACHLOROETHYLENE
HAZARD CLASS	6.1
UN/NA	UN1897
LABELS	HARMFUL - STOW AWAY FROM FOOD STUFFS

http://jupiter.ports/msds/data 5454

PORTS MSDS #: 5454

PRODUCT: TOLUENE

PART NUMBER:

FORMULA: C7H8

KEYWORD: SOLVENT

PORTS NUMBER: 03-420-5721

PORTS MISC INFO:
01-20-5721

PORTS RATING: HFR=341

MANUFACTURER:
BURDICK & JACKSON
1953 SOUTH HARVEY STREET
MUSKEGON
MI

49442
PHONE: PHONE: 616-726-3171
EMERGENCY PHONE: 616-726-3171

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	EQ 231.12 F	NOTE: 110.62'C.
Melting Point. . . .	NG	
Freezing Point . . .	EQ -139.0 F	NOTE: -94.99'C.
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .867	NOTE: @ 20'C.
Vapor Pressure . . .	EQ 28.5	NOTE: MMHG @ 20'C.
Vapor Density. . . .	EQ 3.2	
Percent Volatiles. .	~ 100	
Evaporation Rate . .	~ 2	NOTE: BUAC=1.
pH	NG	
Molecular Weight . .	EQ 92.14	
Viscosity.	NG	

Solubility in Water. 0.074% @ 20'C.
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS LIQUID WITH A SWEET PUNGENT ODOR.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 36 F	NOTE: 2'C, TCC.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	EQ 896 F	NOTE: 480'C.

Explosive/Flammable Limits
Lower (LEL). . . . . EQ 1.2
Upper (UEL). . . . . EQ 7.1

Shipping Regulations
UN/NA Number. UN1294
D.O.T. Hazard Class. . . FLAMMABLE LIQUID, 3
Label . . . . . NOT GIVEN
Proper Shipping Name . . TOLUENE

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Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 12/01/93

===== Component Information =====

TOLUENE
OSHA PEL (PPM): 100
OSHA PEL (MG/M3):
ACGIH TLV (PPM): 100
ACGIH TLV (MG/M3):
STEL (PPM): 150
STEL (MG/M3):
Product %: ~ 100
C.A.S. No.: 108883
Note:
OSHA, ACGIH & NIOSH STEL / NIOSH 10 HR TWA: 100 PPM / PEL CEIL: NOT LISTED.

===== IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

PRODUCT: TOLUENE

CHEMICAL NAME: Toluene

CHEMICAL FAMILY: Aromatic Hydrocarbon

SYNONYMS: Toluol, Methylbenzene

DOT PROPER SHIPPING NAME: Toluene

DOT HAZARD CLASS: Flammable Liquid, Hazard Class 3, P.G. II

AS NUMBER: 108-88-3

REVISION DATE: December, 1993

REVISION NO: 1

INFORMATION/EMERGENCY TELEPHONE NUMBER: 616-726-3171

CHEMTREC TELEPHONE NUMBER: 800-424-9300

CANADIAN EMERGENCY TELEPHONE NUMBER: 613-996-6666

MANUFACTURER'S NAME AND ADDRESS:

BURDICK & JACKSON
1953 SOUTH HARVEY STREET
MUSKEGON, MI 49442 USA

===== PHYSICAL AND CHEMICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

STABILITY: Stable

HAZARDOUS POLYMERIZATION: Not expected to occur.

CONDITIONS TO AVOID: Heat, sparks, open flame, open containers, and poor ventilation.

MATERIALS TO AVOID: Strong oxidizing agents and strong acids.

HAZARDOUS DECOMPOSITION PRODUCTS: Incomplete combustion can generate carbon monoxide and other toxic vapors.

===== FIRE AND EXPLOSION HAZARD DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Volatile and flammable.

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical and foam.

SPECIAL FIRE FIGHTING PROCEDURES: Water will not be effective in extinguishing a fire and may spread it, but a water spray can be used to cool exposed containers. Wear full protective clothing and self-contained breathing apparatus. Heat will build pressure and rupture closed storage containers.

===== HAZARDOUS COMPONENTS =====

SEE COMPONENT INFORMATION.

===== HEALTH HAZARDS =====

OCCUPATIONAL EXPOSURE LIMITS:

OSHA:

TWA: 100 ppm
STEL: 150 ppm
CEILING: Not listed

ACGIH:

TLV-TWA: 100 ppm
TLV-STEL: 150 ppm

NIOSH:

10 HOUR TWA: 100 ppm
STEL: 150 ppm

CONCENTRATION IMMEDIATELY DANGEROUS TO HEALTH:

OSHA/NIOSH: 2,000 ppm

ODOR THRESHOLD:

NSC: 1 ppm
NIOSH: 10-15 ppm

CARCINOGENIC DATA: Toluene is not listed as a carcinogen by IARC, NTP, OSHA, or ACGIH. RTEC reports mutagenic effects on humans and teratogenic effects on animals.

PRIMARY ROUTES OF ENTRY: Toluene may exert its effects through inhalation, skin absorption, and ingestion.

INDUSTRIAL EXPOSURE: ROUTE OF EXPOSURE/SIGNS AND SYMPTOMS:

INHALATION: Exposure can cause anesthesia, dizziness, nausea, and respiratory tract irritation.

EYE CONTACT: Liquid and high vapor concentration can cause irritation and possible corneal damage.

SKIN CONTACT: Prolonged or repeated skin contact can cause irritation and dermatitis through defatting of skin.

INGESTION: Causes irritation of the gastrointestinal tract and may cause

systemic effects from absorption.

EFFECTS OF OVEREXPOSURE: Toluene is a primary skin irritant and a central nervous system depressant. Acute poisoning affects the nervous system leading to coma. Chronic exposure depresses the bone marrow, but without the severe or fatal damage present in benzene poisoning. Liver enlargement is also possible. Deliberate concentration and inhalation can cause liver, kidney, and brain damage.

MEDICAL CONDITION AGGRAVATED BY EXPOSURE: Preclude from exposure those individuals with disease of eyes, liver and central nervous system, and those susceptible to dermatitis.

EMERGENCY FIRST AID:

INHALATION: Immediately remove to fresh air. If not breathing, administer mouth-to-mouth rescue breathing. If there is no pulse administer cardiopulmonary resuscitation (CPR). Contact physician immediately.

EYE CONTACT: Rinse with copious amounts of water for at least 15 minutes. Get emergency medical assistance.

SKIN CONTACT: Flush thoroughly for at least 15 minutes. Wash affected skin with soap and water. Remove contaminated clothing and shoes. Wash clothing before re-use, and discard contaminated shoes. Get emergency medical assistance.

INGESTION: Call local Poison Control Center for assistance. Contact physician immediately. ASPIRATION HAZARD - DO NOT INDUCE VOMITING.

===== SAFETY MEASURES AND EQUIPMENT =====

VENTILATION: Adequate ventilation is required to protect personnel from exposure to chemical vapors exceeding the PEL and to minimize fire hazards. The choice of ventilation equipment, either local or general, will depend on the conditions of use, quantity of material, and other operating parameters.

RESPIRATORY: Use approved respirator equipment. Follow NIOSH and equipment manufacturer's recommendations to determine appropriate equipment (air-purifying, air-supplied, or self-contained breathing apparatus).

EYES: Safety glasses are considered minimum protection. Goggles or face shield may be necessary depending on quantity of material and conditions of use.

SKIN: Protective gloves and clothing are recommended. The choice of material must be based on chemical resistance and other user requirements. Generally, viton or nitrile rubber offer acceptable chemical resistance. Individuals who are acutely and specifically sensitive to toluene may require additional protective equipment.

STORAGE: Toluene should be protected from temperature extremes and direct sunlight. Proper storage of Toluene must be determined based on other materials stored and their hazards and potential chemical incompatibility. In general, Toluene should be stored in an acceptably protected and secure flammable liquid storage room.

OTHER: Emergency eye wash fountains and safety showers should be available in the vicinity of any potential exposure. Ground and bond metal containers to minimize static sparks.

===== SPILL AND DISPOSAL DATA =====

SPILL CONTROL: Protect from ignition. Wear protective clothing and use approved respirator equipment. Absorb spilled material in an absorbent recommended for solvent spills and remove to a safe location for disposal by approved methods. If released to the environment, comply with all regulatory

notification requirements. CERCLA Reportable Quantity: 1,000 pounds.

WASTE DISPOSAL: Dispose of Toluene as an EPA hazardous waste. Contact state environmental agency for listing of licensed hazardous waste disposal facilities and applicable regulations. Hazardous waste number: U220 (toxic); F005 (toxic, ignitable).

HAZARD CLASSIFICATION:

IMMEDIATE HEALTH: Yes (Irritant)
DELAYED HEALTH: Yes
FIRE: Yes
SUDDEN RELEASE: No
REACTIVE: No

CHEMICAL LISTINGS:

EXTREMELY HAZARDOUS SUBSTANCES: No
CERCLA HAZARDOUS SUBSTANCES: Yes
TOXIC CHEMICALS: Yes

Toluene is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40CFR Part 372. This product does not contain any other toxic chemical above 1% concentration or a carcinogen above 0.1% concentration.

KEY:

ca	Approximately	STEL	Short Term Exposure Level (15 minutes)
na	Not Applicable	TLV	Threshold Limit Value
C	Ceiling	TWA	Time Weighted Average
		BuAc	Butyl Acetate

CERCLA Comprehensive Environmental Response, Compensation and Liability Act of 1980

NSC National Safety Council ("Fundamentals of Industrial Hygiene, "3rd Ed., 1988)

===== SPECIAL NOTES =====

BURDICK & JACKSON'S DISCLAIMER: The information and recommendations presented in this Material Safety Data Sheet are based on sources believed to be reliable on the date hereof. Burdick & Jackson makes no representation on its completeness or accuracy. It is the user's responsibility to determine the product's suitability for its intended use, the product's safe use, and the product's proper disposal. No representations or warranties, either express or implied, of merchantability or fitness for a particular purpose or of any other nature are made with respect to the information provided in this Material Safety Data Sheet or to the product to which such information refers. Burdick & Jackson neither assumes nor authorizes any other person to assume for it, any other or additional liability or responsibility resulting from the use of, or reliance upon, this information.

MSDS BMQXG

HEWLETT PACKARD -- TONER (PRE-MIXED), 17278A
MATERIAL SAFETY DATA SHEET
SN: 685000N024529
Manufacturer's CAGE: 98220
Part No. Indicator: A
Part Number/Trade Name: TONER (PRE-MIXED), 17278A

General Information

Company's Name: HEWLETT PACKARD CO
Company's Street: 16399 W BERNARDO DR
Company's City: SAN DIEGO
Company's State: CA
Company's Country: US
Company's Zip Code: 92127-1899
Company's Emerg Ph #: 619-487-4100
Company's Info Ph #: 619-487-4100
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 29JUN89
Safety Data Review Date: 13FEB92
MSDS Serial Number: BMQXG
Hazard Characteristic Code: N/

Ingredients/Identity Information

Proprietary: NO
Ingredient: ISOPAR-G; (SOLVENT, ISOPAR-G (MFR CAS NO 64742-48-9))
Ingredient Sequence Number: 01
Percent: >97
NIOSH (RTECS) Number: 1000360IP
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE
Other Recommended Limit: 300 PPM (MFR)

Proprietary: NO
Ingredient: DYESTUFF; (POLYMER & DYE STUFF)
Ingredient Sequence Number: 02
Percent: <3
NIOSH (RTECS) Number: 1001201DS
OSHA PEL: NOT APPLICABLE
ACGIH TLV: NOT APPLICABLE

Physical/Chemical Characteristics

Appearance And Odor: BLACK LIQUID; FAINT PETROLEUM HYDROCARBON ODOR.
Boiling Point: 311F,155C
Melting Point: <0F,<-18C
Vapor Pressure (MM Hg/70 F): <10 @ 25C
Vapor Density (Air=1): 5.0
Specific Gravity: <0F, <-18C
Evaporation Rate And Ref: 0.30 (BUTYL ACETATE= 1)
Solubility In Water: <0.1%

Fire and Explosion Hazard Data

Flash Point: 100F,38C
Flash Point Method: TCC
Lower Explosive Limit: 0.8%
Upper Explosive Limit: 7%
Extinguishing Media: DRY CHEMICAL, CO*2, FOAM AND MIST. WATER MAY BE INEFT, BUT SHOULD BE USED TO KEEP FIRE-EXPSD CNTNRS COOL.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP (FP N). WATER NOT REC AS EXTING MEDIA AS IT SPREADS HYDROCARBON FIRES. MINIMIZE BRTHG GASES, VAPS & FUMES.
Unusual Fire And Expl Hazrds: NONE, HOWEVER, IT IS FLAMMABLE WHEN EXPOSED TO A DIRECT FLAME OR EXCESSIVE TEMPERATURES.

http://haz1.siri.org:80/msds/h/q351/q125182

Reactivity Data

Stability: YES
Cond To Avoid (Stability): NOT APPLICABLE.
Materials To Avoid: STRONG OXIDANTS (LIQUID CHLORINE, CONC O*2, CHROMIC ACID).
Hazardous Decomp Products: NONE, HOWEVER, MOST PRODUCTS OF COMBUSTION ARE TOXIC.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

Health Hazard Data

LD50-LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: NO
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: (ACUTE & CHRONIC) BRIEF PERIODS OF HIGH EXPOSURE CAN CAUSE DIZZINESS, IRRITATION OF MUCOUS MEMBRANES, AND DROWSINESS. CHRONIC EXPOSURE TO CONCENTRATIONS BELOW 300 PPM ARE NOT CURRENTLY BELIEVED TO PRODUCE LONG TERM ADVERSE EFFECTS.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: EXCESSIVE EXPOSURE CAN CAUSE HEADACHE, NAUSEA, AND EYE IRRITATION. SEVERE EXPOSURE CAN CAUSE MILD DEPRESSION AND/ OR RESPIRATORY IRRITATION AND DIFFICULTY IN BREATHING. SKIN CONTACT CAN CAUSE DRYING AND CHAPPING. EYE CONTACT CAN CAUSE IRRITATION OF CONJUNCTIVA.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: INGEST: GET MD IMMEDIATELY. DO NOT INDUCE VOMITING AS IT MAY ASPIRATE IN LUNGS AND CAUSE PNEUMONIA-LIKE DISORDERS. WASH THOROUGHLY WITH SOAP AND WATER. INHAL: REMOVE TO FRESH AIR. SUPPORT BREATHING (GIVE O*2/ARTIFICIAL RESPIRATION) (FP N).

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EXTINGUISH IGNITION SOURCES, PROVIDE VENTILATION, SOAK UP WITH INERT ABSORBENT AND PLACE IN A FLAMMABLE WASTE CONTAINER. IN CERTAIN SITUATIONS, SPILL REPORTS MAY NEED TO BE SUBMITTED TO LOCAL AUTHORITIES.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: CONSULT FEDERAL, STATE AND LOCAL AUTHORITIES FOR APPROVED WASTE DISPOSAL METHOD. HAZARD CLASSIFICATION: FLAMMABLE LIQUID. ID NUMBER: UN#1993.
Precautions-Handling/Storing: KEEP CONTAINER CLOSED, AVOID HANDLING NEAR HEAT, STRONG LIGHTS, SPARKS, OPEN FLAMES, AND STRONG OXIDANT.
Other Precautions: AVOID BREATHING VAPORS AND PROLONGED OR REPEATED SKIN CONTACT.

Control Measures

Respiratory Protection: NONE WHEN USED IN WELL-VENTILATED AREAS ACCORDING TO DIRECTIONS. NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
Ventilation: MECHANICAL (GENERAL): GENERAL OFFICE VENTILATION.
Protective Gloves: NEOPRENE OR NITRILE GLOVES.
Eye Protection: CHEM WORK GOGG/FULL LENGTH FSHLD (FP N).
Other Protective Equipment: NO SPECIFIC REQUIREMENT WHEN USED ACCORDING TO DIRECTIONS.
Work Hygienic Practices: AVOID BREATHING VAPORS, AND AVOID PROLONGED OR REPEATED SKIN CONTACT.
Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

Transportation Data

Trans Data Review Date: 92128
DOT PSN Code: GJL
DOT Proper Shipping Name: FLAMMABLE LIQUIDS, N.O.S.

DOT Class: 3
DOT ID Number: UN1993
DOT Pack Group: III
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: HIA
IMO Proper Shipping Name: FLAMMABLE LIQUID, N.O.S.
IMO Regulations Page Number: 3345
IMO UN Number: 1993
IMO UN Class: 3.3
IATA PSN Code: MCA
IATA UN ID Number: 1993
IATA Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. *
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFI PSN Code: MCA
AFI Prop. Shipping Name: FLAMMABLE LIQUIDS, N.O.S.
AFI Class: 3
AFI ID Number: UN1993
AFI Pack Group: III
AFI Label: FLAMMABLE LIQUID
AFI Basic Pac Ref: 7-7

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Disposal Data

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Label Data

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Label Required: YES
Technical Review Date: 12FEB92
Label Date: 12FEB92
Label Status: G
Common Name: TONER (PRE-MIXED), 17278A
Chronic Hazard: NO
Signal Word: WARNING!
Acute Health Hazard-Slight: X
Contact Hazard-Moderate: X
Fire Hazard-Moderate: X
Reactivity Hazard-None: X
Special Hazard Precautions: FLAMMABLE. KEEP AWAY FROM HEAT, SPARKS, OPEN FLAME. ACUTE: EYE CONTACT CAN CAUSE IRRITATION OF CONJUNCTIVA. SKIN CONTACT CAN CAUSE DRYING AND CHAPPING. EXCESSIVE EXPOSURE CAN CAUSE HEADACHE, NAUSEA, RESPIRATORY IRRITATION, DIZZINESS, DROWSINESS. CHRONIC: NONE SPECIFIED BY MANUFACTURER.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: HEWLETT PACKARD CO
Label Street: 16399 W BERNARDO DR
Label City: SAN DIEGO
Label State: CA
Label Zip Code: 92127-1899
Label Country: US
Label Emergency Number: 619-487-4100

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URL for this msds http://siri.org. If you wish to change, add to, or delete information in this archive please sent updates to dan@siri.org.

http://jupiter.ports/msds/data/5335

PORTS MSDS #: 5335

PRODUCT: TRICHLOROETHYLENE

PART NUMBER:

FORMULA: CHCL=CCL2

KEYWORD: DEGREASER

PORTS NUMBER: NNN

PORTS MISC INFO:
95-20-7820

PORTS RATING: HFR=210

MANUFACTURER:
PPG INDUSTRIES, INC.
ONE PPG PLACE
PITTSBURGH
PA

15272
PHONE: PHONE:
EMERGENCY PHONE: 304-843-1300

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	BT 187 190 F	NOTE: 86-88'C @ 760 MM HG.
Melting Point. . . .	EQ -123.5 F	NOTE: -86.4'C.
Freezing Point . . .	EQ -123.5 F	NOTE: -86.4'C.
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ 1.465	NOTE: @ 20/20'C.
Vapor Pressure . . .	EQ 57.8	NOTE: MM HG, @ 20'C.
Vapor Density. . . .	EQ 4.54	
Percent Volatiles. .	EQ 100	
Evaporation Rate . .	EQ .28	NOTE: ETHYL ETHER=1.
pH	BT 6.7 7.5	
Molecular Weight . .	NG	
Viscosity.	NG	

Solubility in Water. 0.11% BY WEIGHT.
Odor/Appearance/Other Characteristics:
CLEAR, COLORLESS LIQUID WITH ETHER-LIKE ODOR / BULK

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	NO	NOTE: NONE.
Flash Point, Open Cup . . .	NO	NOTE: NONE.
Fire Point.	NG	
Auto Ignition.	NG	
Explosive/Flammable Limits		
Lower (LEL).	EQ 7.8	NOTE: VOLUME.
Upper (UEL).	EQ 52	NOTE: VOLUME.

Shipping Regulations

UN/NA Number.	UN1710
D.O.T. Hazard Class. . .	6.1
Label	NOT GIVEN
Proper Shipping Name . .	TRICHLOROETHYLENE

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Preparer/Contact Information: R. KENNETH LEE, MANAGER, PRODUCT SAFETY

Date Prepared/Revised 5/31/94

===== Component Information =====

TRICHLOROETHYLENE
OSHA PEL (PPM): 50
OSHA PEL (MG/M3):
ACGIH TLV (PPM): 50
ACGIH TLV (MG/M3):
STEL (PPM): 200
STEL (MG/M3):
Product %: GT 99
C.A.S. No.: 79016
Note:
STABILIZED / OSHA STEL / ACGIH STEL: 100 PPM / PPG

===== IDENTIFICATION =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

TRADE NAME: TRICHLOROETHYLENE

CHEMICAL NAME/SYNONYMS: TRICHLOROETHENE, TRICHLORETHYLENE, TRICHLOR

CHEMICAL FAMILY: HALOGENATED HYDROCARBONS

MSDS NUMBER: 0085

EDITION: 013

CAS NUMBER: 000079 01 6

U.S. DOT HAZARD CLASS: 6.1 (HARMFUL - STOW AWAY FROM FOODSTUFFS)

SUBSIDIARY RISK: N/A

PACKING GROUP: III

REPORTABLE QUANTITY: 100 LBS/45.4 KG

MSDS NUMBER: 0085

EDITION: 013

* DO NOT SHIP LIGHTLY STABILIZED GRADES IN ALUMINUM TRAILERS.

24-HOUR EMERGENCY ASSISTANCE: (304) 843-1300

MANUFACTURER'S NAME AND ADDRESS:

PPG INDUSTRIES, INC.
ONE PPG PLACE
PITTSBURGH, PA 15272

===== PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

HEAT OF SOLUTION: N/A

===== INGREDIENTS =====

SEE COMPONENT INFORMATION.

MATERIAL

TRICHLOROETHYLENE (STABILIZED)

NOTE: TESTED MIXTURE

===== FIRE/EXPLOSION HAZARD DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

EXTINGUISHING MEDIA: WATER, DRY CHEMICALS OR CARBON DIOXIDE

SPECIAL FIRE FIGHTING PROCEDURES: FIRE FIGHTERS SHOULD WEAR NIOSH/MSHA-
APPROVED PRESSURE-DEMAND, SELF-CONTAINED BREATHING APPARATUS FOR POSSIBLE
EXPOSURE TO HYDROGEN CHLORIDE AND POSSIBLY TRACES OF PHOSGENE.

UNUSUAL FIRE AND EXPLOSION HAZARDS: VAPORS CONCENTRATED IN A CONFINED OR
POORLY VENTILATED AREA CAN BE IGNITED UPON CONTACT WITH A HIGH ENERGY SPARK,
FLAME, OR HIGH INTENSITY SOURCE OF HEAT. THIS CAN OCCUR AT CONCENTRATIONS
RANGING BETWEEN 7.8-52% BY VOL. DECOMPOSITION OR BURNING CAN PRODUCE HYDROGEN
CHLORIDE OR POSSIBLY TRACES OF PHOSGENE.

===== HEALTH HAZARD DATA =====

TOXICITY DATA:

LC50 INHALATION: LCLO(RATS) - 8000 PPM/4 HOUR
LD50 DERMAL: NOT DETERMINED
SKIN/EYE IRRITATION: SEE EFFECTS OF OVEREXPOSURE SECTION
LD50 INGESTION: (RAT) - 4900-7000 MG/KG
FISH, LC50 (LETHAL CONCENTRATION): SEE EFFECTS OF OVEREXPOSURE SECTION

CLASSIFICATION:

INHALATION: SLIGHTLY TOXIC
SKIN: NOT DETERMINED
SKIN/EYE: SKIN-MILDLY IRRITATING/EYE-IRRITANT
INGESTION: SLIGHTLY TO MODERATELY TOXIC
AQUATIC: SEE EFFECTS OF OVEREXPOSURE SECTION

===== EFFECTS OF OVEREXPOSURE =====

IS CHEMICAL LISTED AS A CARCINOGEN OR POTENTIAL CARCINOGEN:

NTP: NO
IARC: NO
OSHA: NO

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: NONE KNOWN

PERMISSIBLE EXPOSURE LIMITS:

OSHA: 50 PPM, 8-HOUR TWA (TIME-WEIGHTED AVERAGE); 200 PPM, 15-MINUTE STEL
(SHORT-TERM EXPOSURE LIMIT); 29 CFR 1910.1000, TABLE Z.2, REV. 3/1/89.

NOTE: THE 1971 LIMIT IS 100 PPM, 8-HOUR TWA.

ACGIH: 50 PPM, 8 HOUR TWA; 100 PPM, 15-MINUTE STEL.

http://jupiter.ports/msds/data/5335

PPG INTERNAL PERMISSIBLE EXPOSURE LIMIT: 50 PPM, 8-HOUR TWA.

ACUTE:

INHALATION: TRICHLOROETHYLENE IS A CENTRAL NERVOUS SYSTEM DEPRESSANT WHICH CAN CAUSE IRRITATION OF THE RESPIRATORY TRACT, DIZZINESS, NAUSEA, HEADACHE, LOSS OF COORDINATION AND EQUILIBRIUM, POSSIBLE CENTRAL NERVOUS SYSTEM DAMAGE, UNCONSCIOUSNESS AND DEATH IN CONFINED OR POORLY VENTILATED AREAS. FATALITIES FOLLOWING SEVERE ACUTE EXPOSURE HAVE BEEN ATTRIBUTED TO VENTRICULAR FIBRILLATION RESULTING IN CARDIAC FAILURES.

EYE/SKIN: LIQUID SPLASHED IN THE EYE CAN RESULT IN DISCOMFORT, PAIN AND IRRITATION. PROLONGED OR REPEATED CONTACT WITH LIQUID ON THE SKIN CAN CAUSE IRRITATION AND DERMATITIS. THE PROBLEM MAY BE ACCENTUATED BY LIQUID BECOMING TRAPPED AGAINST THE SKIN BY CONTAMINATED CLOTHING AND SHOES, AND SKIN ABSORPTION CAN OCCUR.

INGESTION: SWALLOWING OF THIS MATERIAL MAY RESULT IN IRRITATION OF THE MOUTH AND GI TRACT ALONG WITH OTHER EFFECTS AS LISTED ABOVE FOR INHALATION. VOMITING AND SUBSEQUENT ASPIRATION INTO THE LUNGS MAY LEAD TO CHEMICAL PNEUMONIA AND PULMONARY EDEMA WHICH IS A POTENTIALLY FATAL CONDITION.

CHRONIC: PROLONGED EXPOSURE ABOVE THE OSHA PERMISSIBLE LIMITS MAY RESULT IN LIVER AND KIDNEY DAMAGE. TRICHLOROETHYLENE HAS BEEN EXTENSIVELY STUDIED FOR CHRONIC EFFECTS IN ANIMALS. WHILE THERE ARE STUDIES IN WHICH TUMORS WERE INDUCED IN MICE, THERE IS NO EVIDENCE THAT TRICHLOROETHYLENE POSES A CARCINOGENIC RISK TO HUMANS. TRICHLOROETHYLENE IS LISTED IN GROUP 3 BY IARC AND IS NOT LISTED BY NTP OR OSHA.

TOXICITY DATA:

AQUATIC DATA:

SHEEPSHEAD MINNOWS: 96-HOUR LC50 - 52 MG/L SLIGHTLY TOXIC
MYSID SHRIMP: 96-HOUR LC50 - 14 MG/L SLIGHTLY TOXIC
MARINE ALGA: 96-HOUR EC50 - 95 MG/L SLIGHTLY TOXIC

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH-TO-MOUTH. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

EYE OR SKIN CONTACT: FLUSH EYES AND SKIN WITH PLENTY OF WATER (SOAP AND WATER FOR SKIN) FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. IF IRRITATION OCCURS, CONSULT A PHYSICIAN. THOROUGHLY CLEAN

CONTAMINATED CLOTHING AND SHOES BEFORE REUSE OR DISCARD.

INGESTION:

IF CONSCIOUS: DRINK LARGE QUANTITIES OF WATER. DO NOT INDUCE VOMITING.
TAKE IMMEDIATELY TO A HOSPITAL OR PHYSICIAN.

IF UNCONSCIOUS: OR IN CONVULSIONS, TAKE IMMEDIATELY TO A HOSPITAL. DO NOT
ATTEMPT TO GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

NOTES TO PHYSICIAN (INCLUDES ANTIDOTES): ONLY ADMINISTER ADRENALINE AFTER
CAREFUL CONSIDERATION FOLLOWING TRICHLOROETHYLENE OVEREXPOSURE. INCREASED
SENSITIVITY OF THE HEART TO ADRENALINE MAY BE CAUSED BY OVEREXPOSURE TO
TRICHLOROETHYLENE.

===== REACTIVITY DATA =====

STABILITY: STABLE.

CONDITIONS TO AVOID: AVOID OPEN FLAMES, HOT GLOWING SURFACES OR ELECTRIC
ARCS.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

CONDITIONS TO AVOID: NONE.

INCOMPATIBILITY (MATERIALS TO AVOID): AVOID CONTAMINATION WITH CAUSTIC SODA,
CAUSTIC POTASH OR OXIDIZING MATERIALS. SHOCK SENSITIVE COMPOUNDS MAY BE
FORMED.

HAZARDOUS DECOMPOSITION PRODUCTS: HYDROGEN CHLORIDE AND POSSIBLY TRACES OF
PHOSGENE.

===== SPILL OR LEAK PROCEDURES =====

STEPS TO BE TAKEN IF MATERIAL IS SPILLED OR RELEASED: IMMEDIATELY EVACUATE
THE AREA AND PROVIDE MAXIMUM VENTILATION. UNPROTECTED PERSONNEL SHOULD MOVE
UPWIND OF SPILL. ONLY PERSONNEL EQUIPPED WITH PROPER RESPIRATORY AND SKIN/EYE
PROTECTION (SEE SPECIAL PROTECTION INFORMATION SECTION) SHOULD BE PERMITTED
IN AREA. DIKE AREA TO CONTAIN SPILL. TAKE PRECAUTIONS AS NECESSARY TO PREVENT
CONTAMINATION OF GROUND AND SURFACE WATERS. RECOVER SPILLED MATERIAL ON
ADSORBENTS, SUCH AS SAWDUST OR VERMICULITE, AND SWEEP INTO CLOSED CONTAINERS
FOR DISPOSAL. AFTER ALL VISIBLE TRACES, INCLUDING IGNITABLE VAPORS, HAVE BEEN
REMOVED, THOROUGHLY WET VACUUM THE AREA. DO NOT FLUSH TO SEWER. IF AREA OF
SPILL IS POROUS, REMOVE AS MUCH CONTAMINATED EARTH, GRAVEL, ETC. AS NECESSARY
AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL.

WASTE DISPOSAL METHOD: CONTAMINATED SAWDUST, VERMICULITE OR POROUS

SURFACE
MUST BE DISPOSED OF IN A PERMITTED HAZARDOUS WASTE MANAGEMENT
FACILITY.
RECOVERED LIQUIDS MAY BE REPROCESSED OR INCINERATED OR MUST BE
TREATED IN A
PERMITTED HAZARDOUS WASTE MANAGEMENT FACILITY. CARE MUST BE TAKEN
WHEN USING
OR DISPOSING OF CHEMICAL MATERIALS AND/OR THEIR CONTAINERS TO
PREVENT
ENVIRONMENTAL CONTAMINATION. IT IS YOUR DUTY TO DISPOSE OF THE
CHEMICAL
MATERIALS AND/OR THEIR CONTAINERS IN ACCORDANCE WITH THE CLEAN AIR
ACT, THE
CLEAN WATER ACT, THE RESOURCE CONSERVATION AND RECOVERY ACT, AS
WELL AS ANY
OTHER RELEVANT FEDERAL, STATE, OR LOCAL LAWS/REGULATIONS REGARDING
DISPOSAL.

===== SPECIAL PROTECTION INFORMATION =====

RESPIRATORY PROTECTION: USE A HALF OR FULL FACEPIECE ORGANIC VAPOR
CHEMICAL
CARTRIDGE OR CANISTER RESPIRATOR WHEN CONCENTRATIONS EXCEED THE
PERMISSIBLE
LIMITS. USE SELF-CONTAINED BREATHING APPARATUS (SCBA) OR FULL
FACEPIECE
AIRLINE RESPIRATOR WITH AUXILIARY SCBA OPERATED IN THE
PRESSURE-DEMAND MODE
FOR EMERGENCIES AND FOR ALL WORK PERFORMED IN STORAGE VESSELS,
POORLY
VENTILATED ROOMS, AND OTHER CONFINED AREAS. RESPIRATORS MUST BE
APPROVED BY
NIOSH/MSHA. THE RESPIRATOR USE LIMITATIONS MADE BY NIOSH/MSHA AND
BY THE
MANUFACTURER MUST BE OBSERVED. RESPIRATORY PROTECTION PROGRAMS MUST
BE IN
ACCORDANCE WITH 29CFR 1910.134.

VENTILATION (TYPE): USE LOCAL EXHAUST OR DILUTION VENTILATION AS
APPROPRIATE
TO CONTROL EXPOSURES TO BELOW PERMISSIBLE LIMITS.

EYE PROTECTION: SPLASHPROOF GOGGLES

GLOVES: VITON(R), SILVER SHIELD(R), POLYVINYL ALCOHOL (DEGRADES IN
WATER).

OTHER PROTECTIVE EQUIPMENT: BOOTS, APRONS, OR CHEMICAL SUITS SHOULD
BE USED
WHEN NECESSARY TO PREVENT SKIN CONTACT. PERSONAL PROTECTIVE
CLOTHING AND USE
OF EQUIPMENT MUST BE IN ACCORDANCE WITH 29 CFR 1910.132 AND 29 CFR
1910.133.

===== SPECIAL PRECAUTIONS =====

PRECAUTIONS TO BE TAKEN DURING HANDLING AND STORING:

DO NOT USE IN POORLY VENTILATED OR CONFINED SPACES WITHOUT PROPER
RESPIRATORY PROTECTION (SEE SPECIAL PROTECTION INFORMATION
SECTION).

TRICHLOROETHYLENE VAPORS ARE HEAVIER THAN AIR AND WILL COLLECT IN
LOW
AREAS.

KEEP CONTAINER CLOSED WHEN NOT IN USE.

STORE ONLY IN CLOSED, PROPERLY LABELED CONTAINERS.

LIQUID OXYGEN OR OTHER STRONG OXIDANTS MAY FORM EXPLOSIVE MIXTURES WITH TRICHLOROETHYLENE.

THIS MATERIAL OR ITS VAPORS WHEN IN CONTACT WITH FLAMES, HOT GLOWING SURFACES OR ELECTRIC ARCS CAN DECOMPOSE TO FORM HYDROGEN CHLORIDE GAS AND TRACES OF PHOSGENE..

AVOID CONTAMINATION OF WATER SUPPLIES. HANDLING, STORAGE AND USE PROCEDURES MUST BE CAREFULLY MONITORED TO AVOID SPILLS OR LEAKS. ANY SPILL OR LEAK HAS THE POTENTIAL TO CAUSE UNDERGROUND WATER CONTAMINATION WHICH MAY, IF SUFFICIENTLY SEVERE, RENDER A DRINKING WATER SOURCE UNFIT FOR HUMAN CONSUMPTION. CONTAMINATION THAT DOES OCCUR CANNOT BE EASILY CORRECTED.

A CHLORINATED SOLVENT USED AS A FLASHPOINT SUPPRESSANT MUST BE ADDED IN SUFFICIENT QUANTITY OR THE RESULTANT MIXTURE MAY HAVE A FLASHPOINT LOWER THAN THE FLAMMABLE COMPONENT.

DO NOT USE CUTTING OR WELDING TORCHES ON DRUMS THAT CONTAINED TRICHLORO-ETHYLENE UNLESS PROPERLY PURGED AND CLEANED.

DO NOT SHIP LIGHTLY STABILIZED GRADES IN ALUMINUM TRAILERS. THE ONLY EXCEPTION IS TYPE 145 VAPOR DEGREASING GRADE.

OTHER PRECAUTIONS: DO NOT BREATHE VAPORS. HIGH VAPOR CONCENTRATIONS CAN CAUSE DIZZINESS, UNCONSCIOUSNESS OR DEATH. LONG-TERM OVEREXPOSURE MAY CAUSE LIVER/KIDNEY INJURY AND POSSIBLE CENTRAL NERVOUS SYSTEM DAMAGE.

USE ONLY WITH ADEQUATE VENTILATION. VENTILATION MUST BE SUFFICIENT TO LIMIT EMPLOYEE EXPOSURE TO TRICHLOR BELOW PERMISSIBLE EXPOSURE LIMITS. OBSERVANCE OF LOWER LIMITS IS ADVISABLE (OUTLINED IN EFFECTS OF OVEREXPOSURE SECTION). EYE IRRITATION, DIZZINESS AND/OR DRUNKENNESS ARE SIGNS OF OVEREXPOSURE.

AVOID CONTACT WITH EYES. WILL CAUSE IRRITATION AND PAIN.

AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. MAY CAUSE IRRITATION OR DERMATITIS.

DO NOT SWALLOW. SWALLOWING MAY CAUSE INJURY OR DEATH.

DO NOT EAT, DRINK, OR SMOKE IN WORK AREAS.

COMMENTS:

TSCA: TRICHLOROETHYLENE IS ON THE TSCA INVENTORY UNDER CAS #79-01-6.

SARA TITLE III: A) 311/312 CATEGORIES - ACUTE AND CHRONIC, B) LISTED IN

SECTION 313 UNDER TRICHLOROETHYLENE, C) NOT LISTED AS AN "EXTREMELY HAZARDOUS SUBSTANCE" IN SECTION 302.

CERCLA: LISTED IN TABLE 302.4 OF 40 CFR PART 302 AS A HAZARDOUS SUBSTANCE WITH A REPORTABLE QUANTITY OF 100 POUNDS. RELEASES TO AIR, LAND OR WATER WHICH EXCEED THE RQ MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802.

RCRA: WASTE TRICHLOR AND CONTAMINATED SOILS/MATERIALS FROM SPILL CLEANUP AND U228 HAZARDOUS WASTE AS PER 40 CFR 261.33 AND MUST BE DISPOSED OF ACCORDINGLY UNDER RCRA. SEE 40 CFR 261.33(C) AND 261.7 (B) (3) FOR CLEANING REQUIREMENTS FOR EMPTY CONTAINERS.

CALIFORNIA PROP. 65: THIS PRODUCT IS A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

NEW JERSEY RIGHT-TO-KNOW: ALSO CONTAINS BUTYLENE OXIDE (CAS NO. 106-88-7)

CANADIAN WHMIS: A) SENSITIZATION TO PRODUCT: NONE KNOWN, B) REPRODUCTIVE TOXICITY: NONE KNOWN, C) ODOR THRESHOLD: NOT KNOWN, D) PRODUCT USE: DEGREASING SOLVENT, E) REQUIRES POISON SYMBOL (CLASS D.1).

REVISIONS MADE TO 7/12/93, 12TH EDITION: DATE, EDITION, NOTE REGARDING ALUMINUM TRAILERS ADDED TO IDENTIFICATION SECTION AND HANDLING PRECAUTIONS (SPECIAL PRECAUTIONS SECTION), UPDATED PERMISSIBLE EXPOSURE LIMITS (EFFECTS OF OVEREXPOSURE SECTION).

A B DICK -- #4-4345,4-4347,4-4349;UNIVERSAL BLANKET WAS - LITHOGRAPHPIC BLANDET-ROLL
MATERIAL SAFETY DATA SHEET
NSN: 6850010096234 MSDS BGCZQ
Manufacturer's CAGE: 17638
Part No. Indicator: B
Part Number/Trade Name: #4-4345,4-4347,4-4349;UNIVERSAL BLANKET WAS

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General Information

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Item Name: LITHOGRAPHPIC BLANDET-ROLLER WASH
Company's Name: A.B.DICK COMPANY
Company's Street: 5700 WEST TOUHY AVENUE
Company's City: CHICAGO
Company's State: IL
Company's Country: US
Company's Zip Code: 60648-4606
Company's Emerg Ph #: 312-763-1900
Company's Info Ph #: 312-763-1900
Record No. For Safety Entry: 002
Tot Safety Entries This Stk#: 002
Status: SM
Date MSDS Prepared: 06JUN89
Safety Data Review Date: 06MAY91
Supply Item Manager: CX
MSDS Preparer's Name: KENNETH W.PINTER
MSDS Serial Number: BGCZQ
Specification Number: O-L-298
Spec Type, Grade, Class: TYPE I
Hazard Characteristic Code: F4
Unit Of Issue: CN
Unit Of Issue Container Qty: 5.0 GL
Type Of Container: CAN
Net Unit Weight: 32.1 LBS

==========

Ingredients/Identity Information

==========

Proprietary: NO
Ingredient: PARAFFIN WAX
Ingredient Sequence Number: 01
Percent: 45.2
NIOSH (RTECS) Number: RV0350000
CAS Number: 8002-74-2
OSHA PEL: 2 MG/M3 (FUME)
ACGIH TLV: 2 MG/M3 (FUME); 9192

Proprietary: NO
Ingredient: NAPHTHALENE (SARA III)
Ingredient Sequence Number: 02
Percent: 47.2
NIOSH (RTECS) Number: QJ0525000
CAS Number: 91-20-3
OSHA PEL: 10 PPM/15 STEL
ACGIH TLV: 10 PPM/15 STEL; 9192

Proprietary: NO
Ingredient: NAPHTA (PETROLEUM SPIRITS OR BENZIN)
Ingredient Sequence Number: 03
Percent: 6.6
NIOSH (RTECS) Number: DE3030000
CAS Number: 8030-30-6
OSHA PEL: 100 PPM
ACGIH TLV: NOT ESTABLISHED

Proprietary: NO
Ingredient: OLEFINS
Ingredient Sequence Number: 04
Percent: 1.0
NIOSH (RTECS) Number: 1000795OL
ACGIH TLV: UNKNOWN

Proprietary: NO
Ingredient: NAPHTHA, MEDIUM ALIPHATIC (SEE INGREDIENTS # I,2,3,4 AND SUPP. HEALTH DATA)
Ingredient Sequence Number: 05
Percent: 100.0
NIOSH (RTECS) Number: 1003692SN
CAS Number: 64742-88-7
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED
Other Recommended Limit: NONE SPECIFIED

Physical/Chemical Characteristics

Appearance And Odor: WATER-WHITE LIQUID;SWEET NAPHTHA ODOR.
Boiling Point: 305F,152C
Vapor Pressure (MM Hg/70 F): 8
Vapor Density (Air=1): 4.73
Specific Gravity: 0.774
Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: N/A(EXPECT RAPID)
Solubility In Water: NEGLIGIBLE
Percent Volatiles By Volume: 100
Corrosion Rate (IPY): UNKNOWN

Fire and Explosion Hazard Data

Flash Point: 1F,-17C
Flash Point Method: TCC
Lower Explosive Limit: 1.1
Upper Explosive Limit: 6.1
Extinguishing Media: USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL.
Special Fire Fighting Proc: WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND A FULL FACED SELF CONTAINED BREATHING APPARATUS. EVACUATE AREA. COOL FIRE EXPOSED CONTAINERS WITH WATER SPRAY.
Unusual Fire And Expl Hazrds: FORMS COMBUSTIBLE AND/OR EXPLOSIVE MIXTURE WITH AIR.AND/OR OXYGEN.HEAVIER THAN AIR;SEE SUPP DATA.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): HIGH HEAT, OPEN FLAMES AND OTHER SOURCES OF IGNITION
Materials To Avoid: NOTE LEL,UEL:FORMS COMBUSTIBLE,EXPLOSIVE MIX W AIR, OXYGEN
Hazardous Decomp Products: NONE;COMBUSTION PRODUCTS. ARE CO*2,H*2O
Hazardous Poly Occur: NO

Health Hazard Data

Signs/Symptoms Of Overexp: EYE:IRRITNT;INHALE,SKIN ABSORB:INTOXICATION, NARCOSIS,NUCOUS MEMBRANE IRRITNT;INGEST:MAY BE FATAL.
Emergency/First Aid Proc: INHALE:REMOVE TO FRESH AIR,GIVE CPR/O*2 IF NEED;EYES:FLUSH W LG AMTS H*2O FOR 15 MIN;SKIN:FLUSH W LG AMTS SOAP /H*2O; INGEST:DO NOT INDUCE VOMIT;CALL DR IMMEDIATELY FOR INGEST,INHALE,EYES.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: EVACUATE UNPROTECTED PERSONS.ELIM IGNITION SOURCES.STOP LEAK.H*2O SPARY COOL CONT/DIVERT SPILL FROM FIRE/HEAT.PROVIDE DIKE W COMMERCIAL ABSORBENT,PUMP INTO COVERED DRUMS.
Waste Disposal Method: KEEP IN COVERED DRUMS,PENDING DISPOSAL.HANDLE & DISPOSE IN FULL REGS.COMPLIANCE.MFG SUGGESTS APPROVED INCINERATION.
Precautions-Handling/Storing: STORE IN COOL,DRY,WELL VENTILATED,LOW RIRE RISK AREA.PROTECT FROM PHYSICAL DAMAGE.AVOID ANY PHYSICAL CONTACT.KEEP CONTAINERS TIGHTLY CLOSED.
Other Precautions: AVOID PROLONGED OR REPEATED CONTACT W CHEMICAL.REMOVE & WASH CONTAMINATED CLOTHING.USE NON-SPARKING TOOLS.GROUND ALL CONTAINERS WHEN TRANSFERRING LIQUID.PROHIBIT OPEN FLAME.

Control Measures

Respiratory Protection: DO NOT INHALE VAPORS:IF EXPOSED,SELF CNTND/AIR
BRTHG APP.
Ventilation: MECHANICAL(GEN./LOCAL EXHAUST);FLOOR LEVEL EXHAUST W LG QTY.
Protective Gloves: IMPERVIOUS/RUBR
Eye Protection: SAFETY/CHEM GOGGLES
Other Protective Equipment: NORMAL FULL WORK CLOTHING COVERING ARMS,LEGS.
Suppl. Safety & Health Data: MSDS DATED JULY 2,1985(MFGR USES ALIPHATIC HYDROCARBON (MIXED C*9 & C*10)IN THIS MSDS AS HAZARDOUS INGREDIENTS. CAS#64742-88-7,100%,TLV=500PPM,OF THE MIXTURE)MFR USES THIS PART# AFTER MAY,1979.

Transportation Data

Trans Data Review Date: 91126
DOT PSN Code: GJL
DOT Proper Shipping Name: FLAMMABLE LIQUIDS, N.O.S.
DOT Class: 3
DOT ID Number: UN1993
DOT Pack Group: III
DOT Label: FLAMMABLE LIQUID
IMO PSN Code: HIA
IMO Proper Shipping Name: FLAMMABLE LIQUID, N.O.S.
IMO Regulations Page Number: 3345
IMO UN Number: 1993
IMO UN Class: 3.3
IATA PSN Code: MCA
IATA UN ID Number: 1993
IATA Proper Shipping Name: FLAMMABLE LIQUID, N.O.S. *
IATA UN Class: 3
IATA Label: FLAMMABLE LIQUID
AFI PSN Code: MCA
AFI Prop. Shipping Name: FLAMMABLE LIQUIDS, N.O.S.
AFI Class: 3
AFI ID Number: UN1993
AFI Pack Group: III
AFI Label: FLAMMABLE LIQUID
AFI Basic Pac Ref: 7-7
Additional Trans Data: SEE PRECAUTIONS; P/N CHANGE OCCURS IN APRIL '79. OLD ITEM UNDER P/N INDICATOR A.

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 06MAY91
Label Status: F
Common Name: #4-4345,4-4347,4-4349;UNIVERSAL BLANKET WASH
Signal Word: WARNING!
Acute Health Hazard-Moderate: X
Contact Hazard-Moderate: X
Fire Hazard-Moderate: X
Reactivity Hazard-None: X
Special Hazard Precautions: COMBUSTIBLE MATERIAL,MAY BE IGNITED BY HEAT, OPEN FLAMES OR SPARKS.MAY BE POISONOUS IF INHALED OR ABSORBED THROUGH SKIN. VAPORS CAUSE DIZZINESS OR SUFFOCATION. CONTACT MAY IRRITATE OR BURN SKIN AND EYES. FIRE MAY PRODUCE IRRITATING OR POISONOUS GASES. RUNOFF FROM FIRE CONTROL OR DILUTION WATER MAY CAUSE POLLUTION.DO NOT TAKE INTERNALLY.DO NOT BREATHE VAPORS OR MIST.AVOID CONTACT WITH EYES AND SKIN.KEEP AWAY FROM HEAT,OPEN FLAMES AND SPARKS.FIRST AID:IF INGESTED OR INHALED,REMOVE TO FRESH AIR AND CONSULT A PHYSICIAN.FOR EYES AND SKIN,FLUSH WITH PLENTY OF WATER FOR ABOUT 15-20 MINUTES AND SEEK MEDICAL ATTENTION IMMEDIATELY IF IRRITATION PERSISTS
Protect Eye: Y
Protect Skin: Y

Protect Respiratory: Y
Label Name: A.B.DICK COMPANY
Label Street: 5700 WEST TOUHY AVENUE
Label City: CHICAGO
Label State: IL
Label Zip Code: 60648-4606
Label Country: US
Label Emergency Number: 312-763-1900

==========

URL for this msds http://siri.org. If you wish to change, add to, or delete information in this archive please sent updates to dan@siri.org.

PORTS MSDS #: 892

PRODUCT: XYLENES

PART NUMBER:

FORMULA:

KEYWORD: ORGANIC

PORTS NUMBER: 660240511-10; 66-024-0511

PORTS MISC INFO:
NOT GIVEN

PORTS RATING: HFR=230

MANUFACTURER:
CHEM SERVICE
P.O. BOX 3108
WEST CHESTER
PA

19381
PHONE: PHONE: 215-692-3026
EMERGENCY PHONE: 215-692-3026

===== Physical/Chemical Characteristics =====

Boiling Point. . . .	BT 279 291 F	NOTE: 137-144'C.
Melting Point. . . .	NA	NOTE: NOT AVAILABLE.
Freezing Point . . .	NG	
Pour Point	NG	
Softening Point. . .	NG	
Specific Gravity . .	EQ .860	NOTE: DENSITY.
Vapor Pressure . . .	NA	NOTE: NOT AVAILABLE.
Vapor Density. . . .	NA	NOTE: NOT AVAILABLE.
Percent Volatiles. .	NG	
Evaporation Rate . .	NA	NOTE: NOT AVAILABLE.
pH	NG	
Molecular Weight . .	NG	
Viscosity.	NG	

Solubility in Water. INSOLUBLE (IMMISCIBLE).
Odor/Appearance/Other Characteristics:
COLORLESS LIQUID, AROMATIC ODOR.

===== Fire & Explosive Hazard Data =====

Flash Point, Closed Cup . .	EQ 84 F	NOTE: 29'C.
Flash Point, Open Cup . . .	NG	
Fire Point.	NG	
Auto Ignition.	NG	
Explosive/Flammable Limits		
Lower (LEL).	NO	NOTE: NONE.
Upper (UEL).	NO	NOTE: NONE.

Shipping Regulations

UN/NA Number.	NG
D.O.T. Hazard Class. . .	NG
Label	NOT GIVEN
Proper Shipping Name . .	NOT GIVEN

==========

Preparer/Contact Information: NOT GIVEN

Date Prepared/Revised 1/07/93

http://jupiter.ports/msds/data/8

===== Component Information =====

XYLENES
OSHA PEL (PPM):
OSHA PEL (MG/M3): 435
ACGIH TLV (PPM):
ACGIH TLV (MG/M3): 434
STEL (PPM): NG
STEL (MG/M3):
Product %: NG
C.A.S. No.: 1330207
Note:
MIXED / PEL & TLV: 100 PPM.

===== SECTION I PRODUCT SPECIFICATIONS =====

PRODUCT NAME: Xylenes (mixed)

CAT NO.: 0-2294

CAS NO.: 1330-20-7

08/11/94

LAST REVISED: January 7, 1993

EMERGENCY PHONE: 215-692-3026

SUPPLIED BY:

CHEM SERVICE, INC.
PO BOX 3108
WEST CHESTER, PA 19381
(215) 692-3026

===== SECTION II TOXICITY DATA =====

ORAL RAT OR MOUSE LD50	RTECS#	OSHA PEL (TWA)	ACGIH TLV (TWA)
4300mg/kg	ZE2100000	100 ppm(435 mg/m3)	100 ppm (434mg/m3)

This compound is considered to be slightly toxic.
This statement is based upon OSHA's assessment of the LD50

CARCINOGENICITY:

OSHA: NO
IARC: NO
NTP: NO
ACGIH: NO
NIOSH: NO
OTHER: YES

===== SECTION III PHYSICAL DATA =====

SEE PHYSICAL/CHEMICAL CHARACTERISTICS OR FIRE & EXPLOSIVE HAZARD DATA.

===== SECTION IV FIRE AND EXPLOSION HAZARD DATA =====

FLASH POINT: 29 C This is a flammable chemical.

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical powder or spray.

No explosion limits are available for this compound.

=== SECTION V HEALTH HAZARD DATA =====

Contact lenses should not be worn in the laboratory.

All chemicals should be considered hazardous - Avoid direct physical contact!

Suspected Carcinogen-may produce cancer. May be harmful if absorbed through the skin.

May be harmful if inhaled. May be harmful if swallowed. Can cause eye irritation.

Can cause skin irritation. Dust and/or vapors can cause irritation to respiratory tract.

Can be irritating to mucous membranes. Narcotic at high concentrations.

May be fatal if swallowed! Chronic exposure may cause bronchitis.

Can cause nervous system injury. Exposure can cause liver damage.

Exposure can cause kidney damage. Can cause blood disorders.

May be rapidly absorbed thru the skin with potential adverse health effects.

Can cause an allergic skin reaction.

Prolonged exposure may cause nausea/headache/dizziness and/or eye damage.

Can cause gastro-intestinal disturbances. May be fatal if inhaled!

==== SECTION VI FIRST AID =====

An antidote is a substance intended to counteract the effect of a poison. It should be administered only by a physician or trained emergency personnel. Medical advice can be obtained from a POISON CONTROL CENTER.

IN CASE OF CONTACT: Flush eyes continuously with water for 15-20 minutes. Flush skin with water for 15-20 minutes. If no burns have occurred - use soap and water to cleanse skin. If inhaled remove patient to fresh air. Administer oxygen if patient is having difficulty breathing. If patient is in cardiac arrest administer CPR.

Continue life supporting measures until medical assistance has arrived.

===== SECTION VII REACTIVITY DATA =====

Incompatible with strong oxidizing agents. Decomposition liberates toxic fumes. Flammable.

===== SECTION VIII SPILL OR LEAK PROCEDURES =====

SPILL OR LEAKS: Evacuate area. Wear appropriate OSHA regulated equipment. Ventilate area. Absorb on vermiculite or similar material. Sweep up and place in an appropriate container. Hold for disposal. Wash contaminated surfaces to remove any residues.

DISPOSAL: Burn in a chemicals incinerator equipped with an afterburner and scrubber.

===== SECTION IX PRECAUTIONS TO BE TAKEN IN HANDLING =====

This chemical should be handled only in a hood. Eye shields should be worn. Use appropriate OSHA/MSHA approved safety equipment. Avoid contact with skin, eyes and clothing. Do not breathe vapors. Keep tightly closed.

Store in a cool dry place. Store only with compatible chemicals.

===== SECTION X SPECIAL PRECAUTIONS AND COMMENTS =====

The above information is believed to be correct on the date it is published and must not be considered all inclusive. The information has been obtained only by a search of available literature and is only a guide for handling the chemicals. OSHA regulations require that if other hazards become evident, an upgraded MSDS must be made available to the employee within three months. Responsibility for updates lies with the employer and not with CHEM SERVICE, INC. Persons not specifically and properly trained should not handle this chemical or its container. This MSDS is provided without any warranty expressed or implied, including merchantability or fitness for any particular purpose.

This product is furnished FOR LABORATORY USE ONLY! Our products may NOT BE USED as drugs, cosmetics, agricultural or pesticidal products, food additives or as household chemicals.

DOE/OR/11-3037V3&D0

RCRA Part B Permit Renewal Application for the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio

Volume 3.

Appendix D-1 Engineering Drawings

Date Issued — February 21, 2000

Prepared by
EQ Midwest, Inc.
Cincinnati, OH
under subcontract 23900-SC-SM002F

Prepared for the
U.S. Department of Energy
Office of Environmental Restoration and Waste Management

BECHTEL JACOBS COMPANY LLC
managing the
Environmental Management Activities at the
Portsmouth Gaseous Diffusion Plant

Bechtel Jacobs Company LLC
P.O. Box 900
Piketon, Ohio 45661

under contract DE-AC05-98OR22700
for the
U.S. DEPARTMENT OF ENERGY

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FEB 22 2000

RECORD COPY

This document has received the appropriate
reviews for release to the public.

SUBMISSION DATE: February 21, 2000

Appendix D-1

Engineering Drawings

DX-761-997A—X-326 - Plan View of all permitted areas

DX-761-2265-M—Plans for a Hazardous or Mixed Waste Container

DX-761-2286-M—Plans for Large Storage Container

DX-761-2331-M—Plans for a 5" x 15" Tin Container

DX-761-2340-M—Plans for the X-744G Polybottle

X-326-13A—X-326 Roof Plan - South Half

X-326-23A—X-326 Plans for Wall Sections

X-7725-0011-C—X-7725 Foundation Excavation and Backfill Sections

X-7725-0601-A—X-7725 Exterior Details - Roofing and Siding

X-7725-970-S—X-7725 Typical Storage Arrays

X-7725-971-S—X-7725 Typical Curb Detail - Sheet 1

X-7725-972-S—X-7725 Typical Curb Detail - Sheet 2

X-7725-973-S—X-7725 Typical Curb Detail - Sheet 3

X-7725-974-S—X-7725 Area B Dike Plan

X-7725-975-S—X-7725 Area G Dike Plan

X-7725-976-S—X-7725 Area A Dike Plan - Sheet 1

X-7725-977-S—X-7725 Area A Dike Plan - Sheet 2

X-7725-978-S—X-7725 Area H Dike Plan

X-7725-979-S—X-7725 Area M Dike Plan

X-7725-980-S—X-7725 Area P1 Dike Plan

X-7725-981-S—X-7725 Area C Dike Plan

X-7725-982-S—X-7725 Area 4A Dike Plan

X-7725-983-S—X-7725 Area 4B Dike Plan

X-7725-984-S—X-7725 Area 4C Dike Plan

X-7725-985-S—X-7725 Area 4E Dike Plan

X-7725-986-S—X-7725 Area D Dike Plan

X-7725-987-S—X-7725 Areas E & F Dike Plan - Sheet 1

X-7725-988-S—X-7725 Areas E & F Dike Plan - Sheet 2

X-7725-989-S—X-7725 Area J Dike Plan

SUBMISSION DATE: February 21, 2000

Appendix D-1 (cont.)

X-7725-990-S—X-7725 Area K Dike Plan

X-7725-991-S—X-7725 Area L Dike Plan

X-7725-992-S—X-7725 Area Q Dike Plan

X-7725-993-S—X-7725 Area M1 Dike Plan

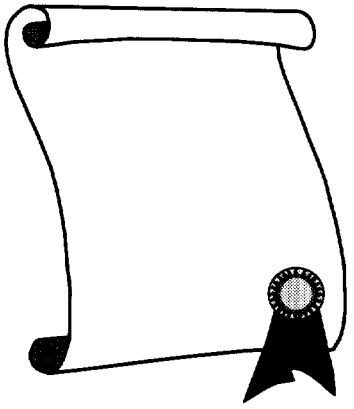
X-7725-994-S—X-7725 Area P Dike Plan

X-7725-995-S—X-7725 Area P3 Dike Plan

X-7725-996-S—X-7725 Area N Dike Plan

X-7725-997-S—X-7725 Area N1 Dike Plan

X-7725-998-S—Typical Curb Detail - Sheet 4



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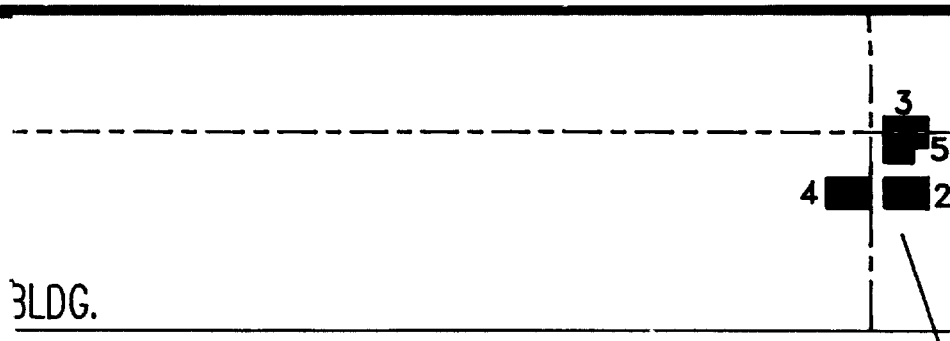

KEY PLAN

SCALE: NONE

1" X 1" X 1/8" ANGLE DIKE
FENCING

AGE AREA FLOOR FINISH: CHEMICALLY RESISTANT
FORCED CONCRETE FLOOR: 6" THICK W/ 6 x 6 -
GN ALLOWABLE FLOOR LOAD IN STORAGE AREAS =
IAL FLOOR LOAD IN STORAGE AREAS = 165 PSF.
R IS NOT SLOPED.

	DATE	
	5/23/91	
	5/23/91	
	5/23/91	

UNITED STATES DEPART

MARTIN MARIETTA MARTIN

P.O. BOX 628 PIKETO
ACTING UNDER CONTRACT DE-AC05-760R00001 VI

PROJECT

SUBPROJECT

TITLE

X-326 BUI
RCRA STORAG

SCALE	DWG
1'=15'-0" U.N.O.	DX-761

INFO

	DATE	
		UNITED STATES DEPARTM
	4/14/89	MARTIN MARIETTA MARTIN M
	4/17/89	P.O. BOX 628 PIKETON ACTING UNDER CONTRACT DE-AC05-760R00001 WITH
	4/17/89	PROJECT PROJECT 10900
	7/20/89	SUBPROJECT
		TITLE HAZARDOUS WASTE STORAGE
		SCALE NONE — DWG DX-761-

E USE

: WITH AMERICAN WELDING SOCIETY (AWS) D1.3, L

D.
) MORE THAN 15% OF THE THICKNESS OF THE TH

IALL BE QUALIFIED ACCORDING TO AWS D1.3, AWS
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ALL BE LIQUID LEAK TIGHT. CONTINUOUS WELDS O

EQUIRED. INSPECTION BY AWS CERTIFIED WELDING

FY IN WRITING THE CONTAINERS HAVE PASSED AL
JIREMENTS OF THIS DRAWING AND 49 CFR 173.42

) FABRICATION DRAWINGS AND DESIGN CALCULATI
START OF WORK.

IN
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	DATE
;	3-10-89
RFER	3-10-89
NI	3-10-89
	4-13-89

UNITED STATES DEPAR

MARTIN MARIETTA MARTIN

P.O. BOX 628 PIKET
ACTING UNDER CONTRACT DE-AC05-760R00001

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SUBPROJECT

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LARGE STORAGE C
DRY, SOLID CONTAI

SCALE	DW
NONE	DX-761-

NDICATES THAT THIS
MAY NOT BE
ALLY OR PHYSICALLY
CATION MANAGEMENT.

IEERING DESIGN CONTROLS
MEET A DOUBLE
NCSA-PLANT_025, & PLANT_006.

Classification/UCNI Review: INFORMA
Thomas N. Bonner 4028
Reviewer ADC #
Date: 12/20/99

UNITED STATES DEPARTMENT OF

89

MARTIN MARIETTA MARTIN MARIETTA ENER

89

P.O. BOX 628 PIKETON, OHIO 45661
ACTING UNDER CONTRACT DE-AC05-760R00001 WITH THE U.S. DEPARTMEN

89

PROJECT

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SUBPROJECT

TITLE

Z-CAN 5" X 15"
TIN CONTAINER

3 02-999-0303

SCALE	DWG NO
FULL	DX-761-2331-M-

TEM NOTE:

AWING No. INDICATES THAT THIS DRAWING
; SYSTEM THAT MAY NOT BE ALTERED
ONALLY OR PHYSICALLY WITHOUT
GURATION MANAGEMENT.

)ICATE ENGINEERING DESIGN CONTROLS
:CESSARY TO MEET A DOUBLE

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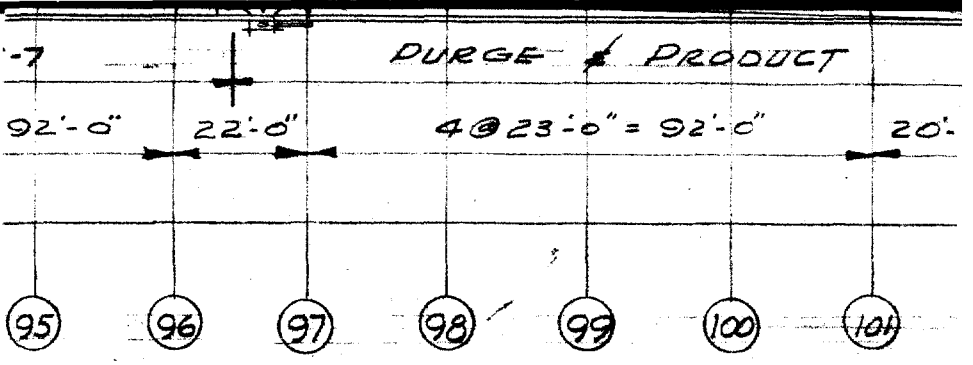
	3/19/90	UNITED STATES ENRICHME
	3/20/90	LOCKHEED MARTIN — LOCKHEED M P.O. BOX 628 PIKETON, ACTING UNDER CONTRACT USEC-HQ-96-C-0001 WITH T
	3/19/90	TITLE 744G POLYETH
	3/22/90	BOTTLE
	DATE	15-999-03
FACILITY 744G		DWG NO DX-761-2340-M



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GIFFELS & VA
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DETROIT 26, I

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& DETA

DRAWING APPROVED — DATE	DRAWING APPROVE
8-3-53 ENGINEER	R. A. WALKE 8-14-53 CARBIDE CARBON CHE

DRAWN	DATE	CHECKED
K.H. GREIMEL L.C. HEALY	8/3/53	N.E.

IN CHARGE	DATE	CHIEF
E. GABERT	8/3/53	L.V. C

PROJECT	BUILDING
"X" PORTSMOUTH AREA	X-32

THRU WEST WALL SECTION TH
-IST DUCT TYPE "D" EXHAUST

471
16

472
15.

SCALE 1/4" = 1'-0"

MF —

SEQUENCE

IFICATION CANCELLED OR
GED TO UNCLASSIFIED
ORITY Log # 2720
Smalley DATE 6/5/91
IED BY W. T. Brown
6/5/91

RAL DRAWINGS
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ROOMS
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DUCT TYPE A, B & E
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AWINGS

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DRAWING APPROVED — DATE	DRAWING APPR
C J Steigbeder 8-3-53 ENGINEER	R.A. WA. 8-14 CARBIDE CARBO

DRAWN	DATE	CHECKE
T.W. ZOEDES R.W. GOULD	8/3/53	N.

IN CHARGE	DATE	CHIEF
E. GABERT	8/3/53	L.

PROJECT	BUILDING
"X" PORTSMOUTH AREA	X-3

NOTES:

1. FOR GENERAL NOTES SEE DRA
2. FOR REFERENCE DRAWINGS S
3 FOR OTHER NOTES AND LEG
DWG. X-7725-0010-C.
4. TEMPORARY DRAINAGE SY

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	2/1/80
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TITLE FOUNDATION EXCA
BACKFILL SECTION

CP-3-1	PLANT PORTSMOUTH OHIO	BLDG. 7725
SCALE AS NOTED	ID	X-7

2

GALVANIZED STEEL CONFORMIN
GRADE A, COATING G 90, "SHEE
COATED (GALVANIZED) BY THE
STRUCTURAL (PHYSICAL) QUALIT
PROCEDURES AND WELDER QUA
BE IN ACCORDANCE WITH THE
WELDING CODE". GALVANIZED R
CONFORM TO MIL-P-21035 "HI
GALVANIZED REPAIR PAINT".
GRIND SMOOTH ROUGH EDGES
ROUGH SURFACES OF THE INST
DAMAGED GALVANIZED SURFAC
REPAIR PAINT IN ACCORDANCE
URER'S INSTRUCTIONS.

JG

INDICATE
NG

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INFOR

	DATE
	10/16/79
	8/11/80
	8/15/80
	9/19/80
	8/19/80
	9/11/80

UNITED STATE
DEPARTMENT OF

BECHTE

JOB NO
12757

SAN FRANCISC

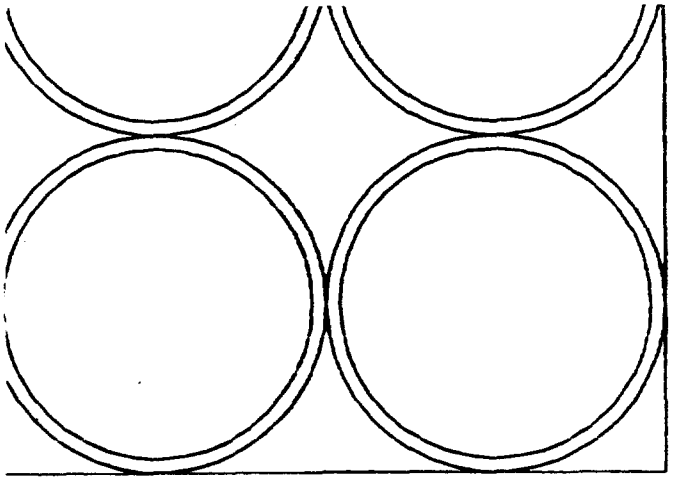
PROJECT GAS CENTRIFUGE ENR

SUBPROJECT RECYCLE/ASSEMBLY

TITLE
EXTERIOR DETAILS –
ROOFING & SIDING

CD-3-2B	PLANT PORTSMOUTH OHIO	BLDG. 7725	
SCALE 3"=1'-0"	ID	X-7725-	

2



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JRATION

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INFORMATION ONLY

B

X-7725-970-S

ARIETTA MARTIN MARIETTA ENERGY SYSTEMS, INC.

'ARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC-05-84OR21400
Oak Ridge, Tennessee • Paducah, Kentucky

-)UTH X-7725 RCRA PERMIT
-ICAL STORAGE ARRAYS

A

RCRA TYP STOR ARRAY						TYPE P
PLANT POTSX	BLDG X-7725	FL 1	SHEET 01	OF 01		CLASS U
ID AP09606	X-7725-970-S					REV 1

JMBER OF MODELS IN THIS DRAWING= 1

ROOM FINISH. AFTER
APPLY A 2" WIDE STRIP
INGS, RAMPS AND
R. MINIMUM WIDTH
RD 595 CHIP #13538.

BLE TO EACH RELATED DRAWING.
AND DETAIL REFERENCE.

PLICABLE TO EACH RELATED
S 7 & 8.

ICAL CURB DETAILS SHT 2
ICAL CURB DETAILS SHT 3
A B DIKE PLAN
A G DIKE PLAN
A A DIKE PLAN SHT 1
A A DIKE PLAN SHT 2
A H DIKE PLAN SHT 1
A M DIKE PLAN
A P1 DIKE PLAN
A C DIKE PLAN
A 4A DIKE PLAN
A 4B DIKE PLAN
A 4C DIKE PLAN
A 4E DIKE PLAN
A D DIKE PLAN
A E DIKE PLAN
A F DIKE PLAN
A J DIKE PLAN
A K DIKE PLAN
A L DIKE PLAN
A Q DIKE PLAN
A M1 DIKE PLAN
A P DIKE PLAN
A P3 DIKE PLAN
A N DIKE PLAN
A N1 DIKE PLAN
ICAL CURB DETAILS SHT 4

DRAWING PRODUCED ON **CADAM**

INFORMATION ONLY

MARIETTA MARTIN MARIETTA ENERGY SYSTEMS, INC.

ARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC-05-76OR00001 eng 26
Oak Ridge, Tennessee • Portsmouth, Ohio

OUTH X-7725 RCRA PERMIT
YPICAL CURB DETAILS
SHEET 1

RCRA CURB DETS SHT 1						TYPE P
50 S	PLANT PORTS	BLDG X-7725	FL 1	SHEET 01	OF 01	CLASS U
ID MAP09606	X-7725-971-S					REV 1

NUMBER OF MODELS IN THIS DRAWING= 1

X-7725-971-S

C B A

ND BREAK

5

CABLE TO EACH RELATED DRAWING.
ON AND DETAIL REFERENCE.
LICABLE TO EACH RELATED DRAWING.

YPICAL CURB DETAILS SHT 1
YPICAL CURB DETAILS SHT 3
REA B DIKE PLAN
REA G DIKE PLAN
REA A DIKE PLAN SHT 1
REA A DIKE PLAN SHT 2
REA H DIKE PLAN SHT 1
REA M DIKE PLAN
REA P1 DIKE PLAN
REA C DIKE PLAN
REA 4A DIKE PLAN
REA 4B DIKE PLAN
REA 4C DIKE PLAN
REA 4E DIKE PLAN
REA D DIKE PLAN
REA E DIKE PLAN
REA F DIKE PLAN
REA J DIKE PLAN
REA K DIKE PLAN
REA L DIKE PLAN
REA Q DIKE PLAN
REA M1 DIKE PLAN
REA P DIKE PLAN
REA P3 DIKE PLAN
REA N DIKE PLAN
REA N1 DIKE PLAN
YPICAL CURB DETAILS SHT 4

INFORMATION ONLY

DRAWING PRODUCED ON **CADAM**

MARIETTA MARTIN MARIETTA ENERGY SYSTEMS, INC.

ARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC-05-76OR00001 eng 26
Oak Ridge, Tennessee • Portsmouth, Ohio

OUTH X-7725 RCRA PERMIT
YPICAL CURB DETAIL
SHEET 2

RCRA CURB DETS SHT 2 | TYPE P

50	PLANT	BLDG	FL	SHEET	OF	CLASS
S	PORTS	X-7725	1	01	01	U

ID		REV
MAP096	X-7725-972-S	1

NUMBER OF MODELS IN THIS DRAWING= 1

C

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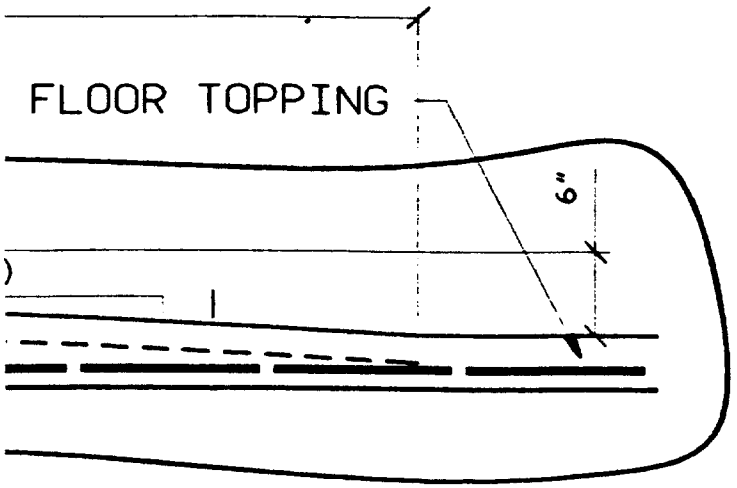
X-7725-972-S

REA E DIKE PLAN
REA F DIKE PLAN
REA J DIKE PLAN
REA K DIKE PLAN
REA L DIKE PLAN
REA Q DIKE PLAN
REA MI DIKE PLAN
REA P DIKE PLAN
REA P3 DIKE PLAN
REA N DIKE PLAN
REA NI DIKE PLAN
YPICAL CURB DETAILS SHT 4



INFORMATION ONLY

WING PRODUCED ON **CADAM**

ETTA MARTIN MARIETTA ENERGY SYSTEMS, INC.

OF ENERGY under U.S. GOVERNMENT contract DE-AC-05-760R00001 eng 26
Ridge, Tennessee • Portsmouth, Ohio

TH X-7725 RCRA PERMIT
ICAL CURB DETAIL
SHEET 3

RA CURB DETS SHT 3					TYPE P
PLANT PORTS	BLDG X-7725	FL 1	SHEET 01	OF 01	CLASS U
096	X-7725-973-S				REV 1

ER OF MODELS IN THIS DRAWING= 1

X-7725-973-S

C

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A

C

X-7725-974-S

B

E FOLLOWING CODES:

INFORMATION ONLY

40 CFR 264.175

INALLY PRODUCED ON CADAM

RIETTA MARTIN MARIETTA ENERGY SYSTEMS, INC.
EPARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC-05-760R00001 eng 26
OAK RIDGE, Tennessee ■ Portsmouth, Ohio

JTH X-7725 RCRA PERMIT
AREA B
DIKE PLAN

A

AREA B DIKE PLAN					TYPE P
PLANT GCEP	BLDG X-7725	FL 1	SHEET 01	OF 01	CLASS U
ID AP096	X-7725-974-S				REV 1

1

1

CURB DETAILS, SHEET 1
CURB DETAILS, SHEET 2
CURB DETAILS, SHEET 3

FOLLOWING CODES:

INFORMATION ONLY

0 CFR 264.175

IALLY PRODUCED ON CADAM

MARTIN MARIETTA ENERGY SYSTEMS, INC.
F ENERGY under U.S. GOVERNMENT contract DE-AC-05-76OR00001 and 26
:, Tennessee • Portsmouth, Ohio

X-7725 RCRA PERMIT
AREA G
DIKE PLAN

RA AREA G

	BLDG	FL	SHEET	OF	TYPE / CLASS
	X-7725	1	01	01	P / U

X-7725-975-S REV 1

X-7725-975-S

1

1

CURB DETAILS, SHEET 1
CURB DETAILS, SHEET 2
CURB DETAILS, SHEET 3

E FOLLOWING CODES:

INFORMATION ONLY

40 CFR 264.175

GINALLY PRODUCED ON CADAM

MARTIN MARIETTA ENERGY SYSTEMS, INC.
ENERGY under U.S. GOVERNMENT contract DE-AC-05-76OR00001 eng 26
Tennessee = Portsmouth, Ohio

X-7725 RCRA PERMIT
A DIKE PLAN
SHEET 1

E PLAN-SHEET 1 | TYPE P

	BLDG	FL	SHEET	OF	CLASS
S	X-7725	1	01	01	U

X-7725-976-S | REV 2

X-7725-976-S

C B A

1

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CONCRETE COLUMN

R CONTROLLER

C

CURB DETAILS, SHEET 1
CURB DETAILS, SHEET 2
CURB DETAILS, SHEET 3

X-7725-977-S

FOLLOWING CODES:

INFORMATION ONLY

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40 CFR 264

INALLY PRODUCED ON CADAM

MARTIN MARIETTA ENERGY SYSTEMS, INC.
UT OF ENERGY under U.S. GOVERNMENT contract DE-AC-05-76OR00001 eng 26
OGE, Tennessee ▪ Portsmouth, Ohio

H X-7725 RCRA PERMIT
EA A DIKE PLAN
SHEET 2

A

KE PLAN-SHEET 1 | TYPE P

NT RTS	BLDG X7725	FL 1	SHEET 01	OF 01	CLASS U

S | X-7725-977-S | REV 2

1

1

C

CURB DETAILS, SHEET 1
CURB DETAILS, SHEET 2
CURB DETAILS, SHEET 3

X-7725-978-S

FOLLOWING CODES:

INFORMATION ONLY

B

40 CFR 264.175

ALLY PRODUCED ON CADAM

MARTIN MARIETTA ENERGY SYSTEMS, INC.
MENT OF ENERGY under U.S. GOVERNMENT contract DE-AC-05-76OR00001 eng 25
RIDGE, Tennessee • Portsmouth, Ohio

H X-7725 RCRA PERMIT
AREA H
DIKE PLAN

A

25 RCRA AREA H					TYPE P
LANT GCEP	BLDG X-7725	FL 1	SHEET 01	OF 01	CLASS U
606	X-7725-978-S				REV 1

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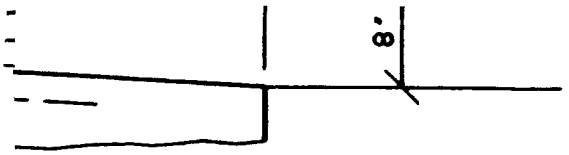

CURB DETAILS, SHEET 1
CURB DETAILS, SHEET 2
CURB DETAILS, SHEET 3

FOLLOWING CODES:

INFORMATION ONLY

0 CFR 264.175

ALLY PRODUCED ON CADAM

MARTIN MARIETTA ENERGY SYSTEMS, INC.
ENERGY under U.S. GOVERNMENT contract DE-AC-05-76OR00001 eng 26
Tennessee ▪ Portsmouth, Ohio

5 RCRA PERMIT
AREA M
IKE PLAN

EA M DIKE PLAN | TYPE P

-S	BLDG X7725	FL 1	SHEET 01	OF 01	CLASS U

X-7725-979-S | REV 2

1

X-7725-979-S

C

B

A

1

CONCRETE COLUMN
JR CONTROLLER

CURB DETAILS, SHEET 1
CURB DETAILS, SHEET 2
CURB DETAILS, SHEET 3
CURB DETAILS, SHEET 4

FOLLOWING CODES:

INFORMATION ONLY

10 CFR 264.175

NALLY PRODUCED ON CADAM

MARTIN MARIETTA ENERGY SYSTEMS, INC.
OF ENERGY under U.S. GOVERNMENT contract DE-AC-05-76OR00001 eng 26
KGE, Tennessee • Portsmouth, Ohio

X-7725 RCRA PERMIT
AREA P1
DIKE PLAN

CRA AREA P1					TYPE P
NT EP	BLDG X-7725	FL 1	SHEET 01	OF 01	CLASS U
6	X-7725-980-S				REV 1

X-7725-980-S

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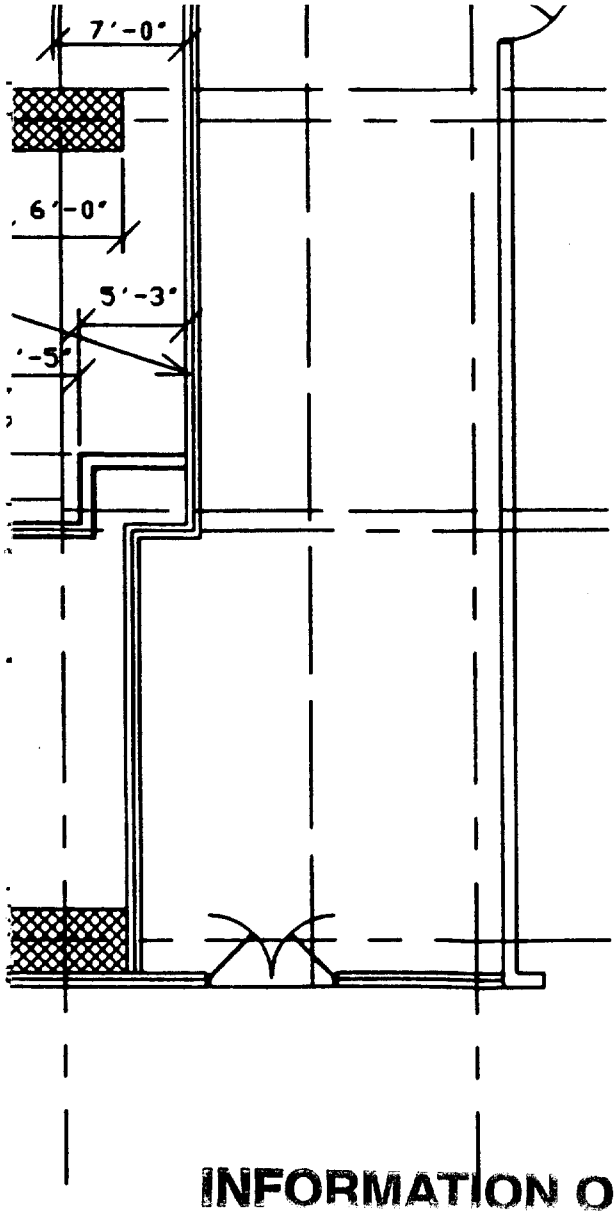

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X-7725-981-S

INFORMATION ONLY

MARTIN MARIETTA ENERGY SYSTEMS, INC.
ENERGY under U.S. GOVERNMENT contract DE-AC-05-760R00001 and 26
Tennessee ■ Portsmouth, Ohio

X-7725 RCRA PERMIT
AREA C
DIKE PLAN

RA AREA C

	BLDG	FL	SHEET	OF	TYPE / CLASS
	X-7725	1	01	01	P / U

X-7725-981-S REV 2

1

1

CURB DETAILS, SHEET 1
CURB DETAILS, SHEET 2
CURB DETAILS, SHEET 3

FOLLOWING CODES:

INFORMATION ONLY

0 CFR 264.175

NG PRODUCED ON CADAM

MARTIN MARIETTA ENERGY SYSTEMS, INC.
OF ENERGY under U.S. GOVERNMENT contract DE-AC-05-760R00001 eng 26
E. Tennessee • Portsmouth, Ohio

5 RCRA PERMIT
AREA 4 A
IKE PLAN

RCRA AREA 4A					TYPE P
P	BLDG X-7725	FL 4	SHEET 01	OF 01	CLASS U
X-7725-982-S					REV 3

X-7725-982-X

C
B
A

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C

- CURB DETAILS, SHEET 1
- CURB DETAILS, SHEET 2
- CURB DETAILS, SHEET 3

FOLLOWING CODES:

X-7725-983-S

INFORMATION ONLY

B

40 CFR 264.175

NALLY PRODUCED ON CADAM

MARTIN MARIETTA ENERGY SYSTEMS, INC.
ENT OF ENERGY under U.S. GOVERNMENT contract DE-AC-05-76OR00001 eng 26
RIDGE, Tennessee • Portsmouth, Ohio

25 RCRA PERMIT
AREA 4 B
DIKE PLAN

A

RCRA AREA 4B					TYPE P
ANT CEP	BLDG X-7725	FL 4	SHEET 01	OF 01	CLASS U
96	X-7725-983-S				REV 2

1

1

CURB DETAILS, SHEET 1
CURB DETAILS, SHEET 2
CURB DETAILS, SHEET 3

FOLLOWING CODES:

INFORMATION ONLY

0 CFR 264.175

LLY PRODUCED ON CADAM

MARTIN MARIETTA ENERGY SYSTEMS, INC.
OF ENERGY under U.S. GOVERNMENT contract DE-AC-05-76OR00001 eng 26
E, Tennessee # Portsmouth, Ohio

5 RCRA PERMIT
AREA 4C
IKE PLAN

RCRA AREA 4C					TYPE P
T :P	BLDG X-7725	FL 4	SHEET 01	OF 01	CLASS U
X-7725-984-S					REV 2

1

X-7725-984-S

C
B
A
1

CIATED DRAWINGS:

TH X-7725 RCRA PERMIT, TYPICAL CURB
TH X-7725 RCRA PERMIT, TYPICAL CURB
TH X-7725 RCRA PERMIT, TYPICAL CURB

F REFERENCE

COMPLIANCE WITH THE FOLL

AT ACCESS RAMPS

INFORM

IN COMPLIANCE WITH 40 CF

THIS DRAWING ORIGINALLY

ES	BK MILES	12/91	
RW	M. OAKLEY	12/91	
HK	K.K. ESPENSHADE	1/29/92	
ECT	B.K. MILES	1/29/92	
EPT & PLANT	J.D. HUGGINS	1/29/92	
E	FRANK BULLOCK	2/10/92	
R			
J			
EQ			
ROVALS		DATE	

MARTIN MARIETTA MARTIN
operated for the DEPARTMENT OF ENERGY under
OAK RIDGE, Tennessee

X-7725 RC
AREA
DIKE

X-7725 RCF

1	48	49	50	PLANT	BL
3	C	S	S	GCEP	X-7

SCALE 1/8 | ID MAP 096 | X-7

2 PLOT DATE: 4/26/94

R CONTROLLER

CIATED DRAWINGS:

ITH X-7725 RCRA PERMIT, TYPICAL CURE
ITH X-7725 RCRA PERMIT, TYPICAL CURE
ITH X-7725 RCRA PERMIT, TYPICAL CURE

JF REFERENCE

J COMPLIANCE WITH THE FOL

AT ACCESS RAMPS

IN COMPLIANCE WITH 40 (

THIS DRAWING ORIGIALL

DES B.K. MILES	11/91	MARTIN MARIETTA operated for the DEPARTMENT OF ENERGY OAK RIDGE, Tenness
DRW M. OAKLEY	11/91	
CHK K.K. ESPENSHADE	1/09/92	
SECT B.K. MILES	1/09/92	PORTSMOUTH X-
DEPT & PLANT J.D. HUGGINS	1/09/92	
PE FRANK BULLOCK	1/23/92	
CR		
PJ		X-7725 R
REQ		1 3 | 48 C | 49 S | 50 S | PLANT GCEP
		SCALE 1/8"=1'-0" | ID MAP096 | X
APPROVALS	DATE	
2	PLOT DATE: 4/26/94	

ERENCE DRAWING

X-7725-1403-S

CIATED DRAWINGS:

'H X-7725 RCRA PERMIT, TYPICAL CURB
'H X-7725 RCRA PERMIT, TYPICAL CURB
'H X-7725 RCRA PERMIT, TYPICAL CURB .

F REFERENCE

COMPLIANCE WITH THE FOLL

INFO

AT ACCESS RAMPS

IN COMPLIANCE WITH 40 CF

THIS DRAWING ORIGINALLY P

ES	B.K. MILES	11/91
RW	M. OAKLEY	11/91
HK	K.K. ESPENSHADE	1/09/92
ECT	B.K. MILES	1/09/92
EPT & PLANT	J.D. HUGGINS	1/09/92
E	FRANK BULLOCK	1/23/92
R		
J		
EQ		
ROVALS		DATE

MARTIN MARIETTA MARTIN
operated for the DEPARTMENT OF ENERGY under
OAK RIDGE, Tennessee

PORTSMOUTH X-77
AREAS E, & F
SHEE

X-7725 RCRA AI

1	48	49	50	PLANT	BLDG
3	C	S	S	GCEP	X-77

SCALE 1/8"=1'-0" | ID MAP096 | X-7

2 PLOT DATE: 4/26/94

TRUCTURAL CONCRETE COLUI

)LL-UP DOOR CONTROLLER

:IATED DRAWINGS:

H X-7725 RCRA PERMIT, TYPICAL CURB
H X-7725 RCRA PERMIT, TYPICAL CURB
H X-7725 RCRA PERMIT, TYPICAL CURB

- REFERENCE

COMPLIANCE WITH THE FOLL

AT ACCESS RAMPS INFORMA

IN COMPLIANCE WITH 40 CF

THIS DRAWING ORIGINALLY P

S	B.K. MILES	11/91
W	M. OAKLEY	11/91
K	K.K. ESPENSHADE	1/09/92
CT	B.K. MILES	1/09/92
PT & PLANT	J.D. HUGGINS	1/09/92
	FRANK BULLOCK	1/23/92
Q		
IVALS		DATE

MARTIN MARIETTA MARTIN
operated for the DEPARTMENT OF ENERGY under
OAK RIDGE, Tennessee

PORTSMOUTH X-77
AREAS E & F
SHEE

X-7725 RCRA AI

1	48	49	50	PLANT	BLDG
3	C	S	S	GCEP	X-77

SCALE 1/8"=1'-0" | ID MAP096 | X-7

2 PLOT DATE: 4/26/94

CIATED DRAWINGS:

'H X-7725 RCRA PERMIT, TYPICAL CURB
'H X-7725 RCRA PERMIT, TYPICAL CURB
'H X-7725 RCRA PERMIT, TYPICAL CURB
'H X-7725 RCRA PERMIT, TYPICAL CURB

F REFERENCE

COMPLIANCE WITH THE FOLI

AT ACCESS RAMPS **INFORM**

IN COMPLIANCE WITH-40 CF

THIS DRAWING ORIGINALLY

ES	B.K. MILES	10/91
RW	M. OAKLEY	10/91
HK	K.K. ESPENSHADE	1/29/92
ECT	B.K. MILES	1/29/92
EPT & PLANT	J.D. HUGGINS	1/29/92
E	FRANK BULLOCK	2/7/92
R		
J		
EQ		
ROVALS		DATE

MARTIN MARIETTA MARTI
operated for the DEPARTMENT OF ENERGY unde
OAK RIDGE, Tennessee

PORTSMOUTH X-7
ARI
DIKE

X-7725 RC

1	48	49	50	PLANT	BL
3	C	S	S	GCEP	X-

SCALE	ID	
1/8"=1'-0"	MAP09606	X-

2 PLOT DATE: 4/26/94

CIATED DRAWINGS:

TH X-7725 RCRA PERMIT, TYPICAL CURB
TH X-7725 RCRA PERMIT, TYPICAL CURB
TH X-7725 RCRA PERMIT, TYPICAL CURB

F REFERENCE

COMPLIANCE WITH THE FOLL

AT ACCESS RAMPS

INFORM

IN COMPLIANCE WITH 40 CF

THIS DRAWING ORIGINALLY

ES	B.K. MILES	10/91
RW	M. OAKLEY	10/91
HK	K.K. ESPENSHADE	1/29/92
ECT	B.K. MILES	1/29/92
EPT & PLANT	J.D. HUGGINS	1/29/92
E	FRANK BULLOCK	2/10/92
R		
J		
EQ		
ROVALS		DATE

MARTIN MARIETTA MARTI
operated for the DEPARTMENT OF ENERGY under
OAK RIDGE, Tennessee

PORTSMOUTH X-77
ARE
DIKE

X-7725 RC

1	48	49	50	PLANT	BLI
3	C	S	S	GCEP	X-7

SCALE	ID	
1/8"=1'-0"	MAP09606	X-7

2 PLOT DATE: 4/26/94

CIATED DRAWINGS:

'H X-7725 RCRA PERMIT, TYPICAL CURB
'H X-7725 RCRA PERMIT, TYPICAL CURB
'H X-7725 RCRA PERMIT, TYPICAL CURB

F REFERENCE

COMPLIANCE WITH THE FOL

AT ACCESS RAMPS

INFOR

IN COMPLIANCE WITH 40 C

THIS DRAWING ORIGINALLY F

ES	B.K. MILES	11/91	
RW	M. OAKLEY	11/91	
HK	K.K. ESPENSHADE	1/29/92	
ECT	B.K. MILES	1/29/92	
EPT & PLANT	J.D. HUGGINS	1/29/92	
E	FRANK BULLOCK	2/7/92	
R			
J			
EQ			
ROVALS		DATE	

MARTIN MARIETTA MARTI
operated for the DEPARTMENT OF ENERGY und
OAK RIDGE, Tennessee

PORTSMOUTH X-7
ARI
DIKE

X-7725 RC

1	48	49	50	PLANT	BL
3	C	S	S	GCEP	X-

SCALE	ID	
1/8"=1'-0"	MAP09606	X-

2 PLOT DATE: 4/26/94

▩ STRUCTURAL CONCRETE
⊕ ROLL-UP DOOR CONTROL

CIATED DRAWINGS:

'H X-7725 RCRA PERMIT, TYPICAL CURB
'H X-7725 RCRA PERMIT, TYPICAL CURB
'H X-7725 RCRA PERMIT, TYPICAL CURB

F REFERENCE

COMPLIANCE WITH THE FOLL

INFO

AT ACCESS RAMPS

IN COMPLIANCE WITH 40 CF

THIS DRAWING ORIGINALLY F

ES	B.K. MILES	11/91
RW	M. OAKLEY	11/91
HK	K.K. ESPENSHADE	1/29/92
ECT	B.K. MILES	1/29/92
EPT & PLANT	J.D. HUGGINS	1/29/92
E	FRANK BULLOCK	2/7/92
R		
J		
EQ		
ROVALS		DATE

MARTIN MARIETTA MARTI
operated for the DEPARTMENT OF ENERGY under
OAK RIDGE, Tennessee

PORTSMOUTH X-7
ARE
DIKE

X-7725 RC

1	48	49	50	PLANT	BL
3	C	S	S	GCEP	X-

SCALE 1/8"=1'-0" | ID MAP09606 | X-

2 PLOT DATE: 4/26/94

:IATED DRAWINGS:

H X-7725 RCRA PERMIT, TYPICAL CURB D
H X-7725 RCRA PERMIT, TYPICAL CURB D
H X-7725 RCRA PERMIT, TYPICAL CURB D

F REFERENCE

COMPLIANCE WITH THE FOLL

AT ACCESS RAMPS

INFOR

IN COMPLIANCE WITH 40 CF

THIS DRAWING ORIGINALLY PR

S	BK MILES	11/91
/	M. OAKLEY	11/91
(	K.K. ESPENSHADE	1/29/92
CT	B.K. MILES	1/29/92
PT & PLANT	J.D. HUGGINS	1/29/92
	FRANK BULLOCK	2/7/92
)		
VALS		DATE

MARTIN MARIETTA — MARTIN
operated for the DEPARTMENT OF ENERGY under U
OAK RIDGE, Tennessee

X-7725 RCR
AREA
DIKE

AREAS M1 I

1	48	49	50	PLANT	BLDG
3	C	S	S	PORTS	X772

SCALE 1/8"=1'-0" | ID MAP09 | X-7

2 PLOT DATE: 4/26/94

CIATED DRAWINGS:

H X-7725 RCRA PERMIT, TYPICAL CURB
H X-7725 RCRA PERMIT, TYPICAL CURB
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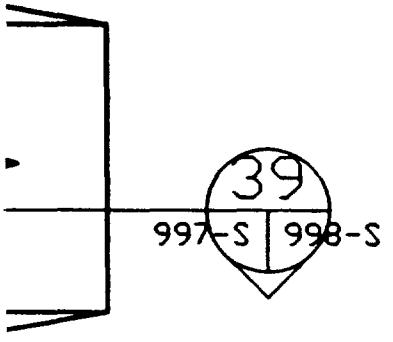

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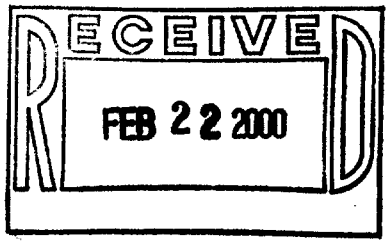
RCRA Part B Permit Renewal Application

**At the Portsmouth Gaseous Diffusion Plant,
Piketon, Ohio**

Volume 4. Appendix I-1 and I-2

This document has received the appropriate
reviews for release to the public. Date: 02/15/00



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contributed to the preparation of this document and should not be considered an eligible contractor for its review.

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RCRA Part B Permit Renewal Application for the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio

Volume 4.

Appendix I-1 Closure Plan for the X-326 Unit
Appendix I-2 Closure Plan for the X-7725 Unit

Date Issued — February 21, 2000

Prepared by
EQ Midwest, Inc.
Cincinnati, OH
under subcontract 23900-SC-SM002F

Prepared for the
U.S. Department of Energy
Office of Environmental Restoration and Waste Management

BECHTEL JACOBS COMPANY LLC
managing the
Environmental Management Activities at the
Portsmouth Gaseous Diffusion Plant

Bechtel Jacobs Company LLC
P.O. Box 900
Piketon, Ohio 45661

under contract DE-AC05-98OR22700
for the
U.S. DEPARTMENT OF ENERGY

This document has received the appropriate
reviews for release to the public.

SUBMISSION DATE: FEBRUARY 21, 2000

APPENDIX I-1

CLOSURE PLAN FOR THE X-326 UNIT

Closure Plan for the X-326 Storage Unit

Portsmouth Gaseous Diffusion Plant

Date Issued — February 21, 2000

Prepared for the
U.S. Department of Energy
Office of Environmental Restoration and Waste Management

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ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
ALARA	As low as reasonably achievable
ANSI	American National Standards Institute
CFR	Code of Federal Regulations
COC	Chain-of-Custody
CPR	Cardiovascular Pulmonary Resuscitation
DAC	Derived Air Concentration
DBA	Decibel
dm	Decimeter
DOE	United States Department of Energy
DOT	United States Department of Transportation
dpm	Disintegrations per minute
EPA	United States Environmental Protection Agency
ESH	Environmental, Safety and Health
HASP	Health and Safety Plan
HWP	Hazardous Work Permit
ID	Identification
IDLH	Immediately Dangerous to Life and Health
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MPH	Miles per hour
Mrem/hr	Millirem/hour
MSDS	Materials Safety Data Sheet
MSHA	Mine Safety and Health Administration
NEPA	National Environmental Policy Act
NIOSH	National Institute for Occupational Safety and Health
NPDES	National Pollutant Discharge Elimination System
OAC	Ohio Administrative Code
Ohio EPA	Ohio Environmental Protection Agency
OSHA	Occupational Safety and Health Administration
PAL	Plant Allowable Limit
PCB	Polychlorinated biphenyl
PED	Plant Emergency Director
PELs	Permissible Exposure Limits
PID	Photo-ionization detector
PORTS	Portsmouth Gaseous Diffusion Plant
PPE	Personal Protective Equipment
ppm	Parts per million
PVC	Polyvinyl chloride
QA/QC	Quality Assurance/Quality Control
QAS	Quality Assurance Standard
RCRA	Resource Conservation and Recovery Act
rem	Units of radiation
RFD	Request For Disposal

RFI	RCRA Facility Investigation
SCBA	Self Contained Breathing Apparatus
SOPs	Standard Operating Procedures
SSHO	Site Safety and Health Officer
SW-846	Publication of the U.S. EPA - Solid Waste Office
TAL	Inorganic Target Analyte List
TCL	Target Compound List
TLVs	Threshold Limit Values
TSCA	Toxic Substances Control Act
µCi/mL	Micro-Curie per milliliter
U.S. EPA	United States Environmental Protection Agency
UL	Underwriters' Laboratory
USCG	United States Coast Guard
U.S. GPO	United States Government Printing Office
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
°F	Degrees Fahrenheit
"	inch
'	foot

CLOSURE PLAN FOR THE X-326 STORAGE UNIT

1. FACILITY DESCRIPTION

1.1 General Description

The Portsmouth Gaseous Diffusion Plant (PORTS) is owned by DOE and is contractor managed by Bechtel Jacobs Company LLC. For the purposes of this permit application, DOE and Bechtel Jacobs Company LLC are Co-Operators of the X-326 and X-7725 Hazardous Waste Storage Units.

PORTS is located at 39°00'30" N latitude and 83°00'28" W longitude on a 3,714-acre federally owned reservation in Pike County, Ohio. Pike County, one of the state's lesser populated counties, encompasses an area of approximately 444 square miles. The site is located approximately equidistant between Chillicothe and Portsmouth, Ohio. The plant site is approximately 4 miles southeast of Piketon, Ohio, 1.5 miles east of U.S. Route 23, 2 miles east of the Scioto River, and 70 miles south of Columbus, Ohio (see Figure 1).

PORTS has operated since 1954, enriching uranium for national defense and commercial nuclear reactors. That enrichment is accomplished by the gaseous diffusion process. As of 1993, all uranium enrichment operations at PORTS are conducted by the United States Enrichment Corporation, formed as a government-owned corporation by the Energy Policy Act of 1992, that became private in July 1998. As such, DOE's mission at the PORTS site has changed to environmental restoration, waste management, removal of highly enriched uranium, and operation of nonleased facilities.

As a result of historical and current enrichment operations, and as is typical of large industrial plants, a wide variety of hazardous wastes are generated. These include analytical laboratory wastes, spent solvents, electroplating wastes, paint wastes, sludges, corrosive wastes, and environmental restoration generated wastes. Table 1 provides a listing of solid waste management units at PORTS.

The X-326 Storage Unit is located in the central part of the PORTS site (see Figure 2). The X-326 Building has been in use since 1956 for the enrichment of uranium hexafluoride. The structure is 2,230 feet long, 552 feet wide, and 62 feet high. It contains 58 acres of floor space. The X-326 Building is totally enclosed with a built-up roof, transite walls, and concrete floors. There are six areas of the building, totaling approximately 31,888 square feet, designated for the storage of hazardous wastes. The storage areas are located on the first floor towards the south end of the building (see Figure 3).

The X-326 Storage Unit is intended for the storage of high assay uranium bearing hazardous wastes until further uranium classification, or off-site shipment for recovery, treatment, or disposal is completed. Waste types to be stored in the X-326 hazardous waste storage areas may include any or all of the waste codes specified in the Part A Permit Application.

Six areas have been delineated for the storage of hazardous wastes in the X-326 building. These are: Areas 1, 2, 3, 4, and 5, and the "L" Cage (the "L" Cage consists of both the east cage and the west cage). Storage area floors are primed and finished with a urethane-based sealant. All storage areas are surrounded by a 1" x 1" x 1/8" angle iron dike set in a chemically resistant elastomeric sealant. The floors are 0.8 feet thick and constructed of concrete.

1.1.1 Topographic Map

The U.S. Geological Survey (USGS) topographic map for the facility is shown on Attachment I-1. Topographic details of the X-326 Storage Unit area are shown on Figure 3.

1.1.2 Solid Waste Management Units

All Solid Waste Management Units (SWMUs) at the PORTS facility are noted as such on Table 1 and the units are shown on Attachment I-2. A detailed description and list of wastes managed and/or disposed at these units is found in the PORTS RFI Description of Current Conditions (DOCC) for Quadrants I-IV. Section 6 of the Quadrant III DOCC provides detailed information for the X-326 facility. Appendix A of this closure plan contains the title page and table of contents for the Quadrant III DOCC.

1.2 Hydrogeologic Information

1.2.1 Geologic and Hydrologic Settings

The PORTS facility lies near the western margin of the Appalachian Highlands within the Appalachian Plateau Province. The physiography of this area is typified by rugged, irregularly dissected hills and ridges separated by generally mature drainage systems. The topographic highs are erosional remnants of the more competent units of the Paleozoic bedrock which underlie the area.

The facility lies to the south of the terminus of Pleistocene glaciation, however, two distinct physiographic features of glacial origin are present in the area. The most prominent of these features are large flat expanses of glacio-lacustrine deposits which fill preglacial topographic depressions. Deeply incised stream valleys which formed during periods of high flow resulting from glacial meltwater are also present locally.

Most of these valleys are partially filled with alluvial material and many are occupied by streams which are orders of magnitude smaller than the ones which originally formed the valleys.

The PORTS facility is situated on one of the glacio-lacustrine deposits formed when drainage of the preglacial Teays River was obstructed and prehistoric Lake Tight was impounded. Lake Tight occupied both the main Teays River valley and many of its tributary valleys, including the Portsmouth and Newark River valleys. Fine-grained sediments accumulated within Lake Tight, forming lacustrine deposits of silt and clay as much as 50 feet thick. Figure 4 exhibits regional stratigraphic information at the PORTS facility.

Bedrock in the area consists of sedimentary strata of marine origin which were deposited during the Paleozoic Era. The formations which comprise the bedrock beneath the PORTS facility belong to the Waverly Group, and they are described below.

The Cuyahoga Formation is comprised of sandstone, conglomerate, and shale. Locally the Cuyahoga is predominantly composed of gray shale, and it is present on both the east and west side of the facility where it outcrops on the hills. The Cuyahoga formation is 250 to 300 feet thick.

The Sunbury shale is described as a hard, "bony", fissile shale. It is typically highly carbonaceous and black in color. The unit averages 20 feet in thickness throughout its known range, and it has been reported to have a maximum thickness of about 30 feet. However, the formation is highly variable, and in the vicinity of the PORTS facility the Sunbury averages only 8 to 10 feet in thickness. The Sunbury may have been removed from some areas due to erosion either before the deposition of the Lake Tight sediments (Teays formation) or in relatively recent times.

The Berea sandstone is comprised of a fine-grained sandstone interspersed with thin shale beds and laminae. The unit is gray to brown in color and 25 to 40 feet thick in the subject area. The sandstone beds range in thickness from 6 inches to 2 feet and are described as weather resistant, with "regular jointing" at right angles to bedding surfaces. In Pike County the uppermost 6 to 10 feet of the unit is reported to be massive with few bedding planes or shale laminae. Below this upper unit a 20 to 35 foot thick blue and gray sandstone interbedded with shale is present. This unit is reported to increase in shale content downsection so that it exhibits a gradational contact with the underlying Bedford shale.

The Bedford shale is a thinly bedded, calcareous shale interfingered with thin, fine-grained argillaceous sandstones. The unit ranges from 90 to 100 feet in thickness and has a bluegray to red colored, clay-like shale comprising the upper zone. The lower portion of the unit is similar physically to the upper zone but is red in color.

The Paleozoic strata are inclined (dip) very slightly to the east, so that subsequent erosion, before the formation of Lake Tight, exposed the Sunbury shale in the eastern part of the area and the underlying Berea sandstone to the west. These formations thus comprise the bedrock in their former outcrop areas, now buried beneath the sediments of Lake Tight.

An assemblage of unconsolidated sediments, the Teays formation, covers the bedrock over much of the area of the PORTS facility. The Teays is comprised mainly of two members: the Gallia sand and the Minford clay. The Gallia sand is the basal unit, consisting largely of sand and gravel deposits of fluvial origin. Muscovite and feldspar are present as accessory minerals, and local bedrock fragments are common to the base of the unit in some areas. The Gallia is normally 5 to 10 feet in thickness, and it interfaces sharply with underlying bedrock. The Minford clay, overlying the Gallia member, consists of up to 40 feet of mostly lacustrine silty clay. The Teays formation represents the glacio-lacustrine sedimentary environment of the prehistoric Lake Tight. The thickness of the Teays formation is controlled by the topography of the erosional surface of the bedrock; it is thickest in low areas on the bedrock surface and may be absent on bedrock highs.

Two types of aquifers with differing hydrogeologic characteristics exist in the area of the facility:

a bedrock aquifer and a complex alluvial aquifer. These water-bearing systems generally behave as two distinct and hydraulically separate aquifers; however, at some locations within the PORTS facility the two systems have been demonstrated to be interconnected.

The uppermost aquifer system in the area is the Teays formation which consists of unconsolidated Pleistocene valley fill comprised variously of clay, sand, silt, and gravel of both fluvial and lacustrine origins. This unit ranges in thickness from 0 to 50 feet primarily as a result of the underlying erosion surface. The aquifer system on the Piketon Reservation becomes more complex within the Big Run and Little Beaver Creek channels. These units are thin fluvial deposits, typically being only a few feet in thickness.

The alluvial aquifers are generally comprised of two separate units: a basal sand and gravel, and an overlying finer grained lacustrine deposit. The basal unit is the Gallia sand member. The Gallia sand grades upward from a coarse sand or gravel to a fine sand, and is composed primarily of subangular to subrounded quartz. The Minford clay (or Minford silt) member overlies the Gallia sand and consists of silt and laminated clays. This unit is generally 15 to 25 feet thick at the site but reportedly exhibits a maximum thickness of 80 feet in nearby locations.

Permeability in these alluvial aquifers is primarily a function of the intergranular pore space, and consequently it varies according to the nature of the sediments. The hydraulic conductivities of the various materials present ranges from 2×10^{-7} cm/sec for the lacustrine silts and clays to as high as 1×10^{-3} cm/sec for the sand and gravel.

The bedrock aquifer includes both sandstones and shales. Permeability in both rock types is mainly attributed to secondary porosity, resulting from fractures and fissures. No significant differences appear to exist in the permeabilities of the different rock types near the surface of the bedrock, which are probably controlled by fractures. However, as the degree of weathering decreases and overburden pressure increases with depth, the aperture of the fractures that compose the secondary porosity system may decrease. Therefore, the components of the primary porosity system, grain size, grain shape and packing arrangement, may exert a greater influence over hydraulic conductivity as the distance from the surface of the bedrock becomes greater. Packer tests indicate that the Berea sandstone is more permeable than the Bedford shale. The Bedford shale has an average hydraulic conductivity of 2.66×10^{-5} cm/sec in the vicinity of the site. Hydraulic conductivities on the order of 10^{-4} cm/sec have been reported for the Berea sandstone in this area.

The Sunbury shale is present beneath the X-326 building along the eastern margin of Quadrant III. However, to the west of the building the Sunbury is not present. Beneath the Gallia, the Sunbury shale where present, acts as a barrier to the vertical flow of groundwater thereby inhibiting the contamination of the Berea. The lower vertical boundary is the Bedford shale which lies beneath the Berea. The unit is composed primarily of shale and also limits the downward flow of groundwater. This is true for all quadrants.

Near the X-326 facility the Minford clay is approximately 12 to 32 feet thick and the Minford Silt is approximately 10 to 16 feet thick. The Gallia formation is estimated to be approximately 3 to 7 feet thick. Stratigraphic and construction logs of the wells are included in Appendix B.

1.3 X-326 Storage Unit Description

1.3.1 Waste Managed

The X-326 Storage Unit was designed and intended for the storage of high assay uranium bearing wastes until further processing for uranium recovery or treatment through a permitted process, such as an NPDES-permitted discharge. The wastes that may be stored in the X-326 Storage Unit include aqueous laboratory solutions, spent laboratory solvents, and decontaminated solutions from several other buildings on the plantsite.

Wastes stored in the X-326 Storage Unit may include:

D001	Ignitables
D002	Corrosive (acid and alkaline)
D004-D043	TC Characteristic
F001	
F002	
F003	
F005	

Radioactive RCRA Wastes
TSCA/RCRA Mixed Wastes*
Radioactive TSCA/RCRA Mixed Wastes*

* Note - Storage area will store PCB waste if waste is also RCRA hazardous.

The wastes are stored in DOT approved 5, 20, 30, 55 or 85 gallon containers, 5-inch cans or 10-liter polyethylene bottles. The drums are stored on steel supports, and the bottles are placed into support sleeves which are raised above the floor to prevent contact with potentially inadvertent standing liquid introduced into the area.

1.3.2 X-326 Storage Unit Description

The X-326 Storage Unit is located in the south end on the first floor of the X-326 process building. Attachment I-3 contains the floor plan for the X-326 Storage Unit. The X-326 building is totally enclosed with a built-up roof, transite walls and concrete floors. Although heat is generated from the diffusion process, temperature is moderated with the use of large fans for ventilating the building. The area around the building is sloped to direct run-on and run-off water to the PORTS storm sewer system.

Approximately 31,888 square feet of the X-326 is designated as storage space and will be used as required until final closure is initiated. The storage area dimensions and containment capacity for the six areas within the X-326 Storage Unit are delineated in Table 2.

Six waste areas in the X-326 building are delineated for storage: areas 1, 2, 3, 4, 5 and the "L" Cage (the "L" Cage consists of both the East Cage and the West Cage). Storage area floors for 1, 2, 3, 4 and 5 are sealed, primed and finished with a urethane-based sealant. The "L" Cage area has had any

existing concrete cracks (these were hairline cracks in the surface of the concrete and not significant structural faults) sealed with a polyurethane caulking sealant and recoated with one coat of chemically-resistant urethane sealant. All storage areas are surrounded by a 1" x 1" x 1/8" angle iron dike set in a chemically resistant elastomeric sealant. The floors are 0.8 feet thick and constructed out of concrete (Attachment I-4 provides a general cross-section of the X-326 building).

1.4 References to Other Environmental Permits

The PORTS facility operates in conformance with requirements established by a number of federal and state statutes and regulations, Ohio EPA Directors Findings and Orders, Executive Orders, DOE Orders, permits and/or submitted applications criteria, and compliance and settlements agreements. The PORTS facility maintains compliance status with regard to major environmental statutes under the following: Ohio EPA air permits and registered air emission sources; National Pollutant Discharge Elimination System (NPDES) permit 0IO00000; a Part B Permit; TSCA regulated storage areas; and Ohio State Fire Marshal Underground Storage Unit (UST) Registrations.

1.5 Anticipated Waivers or Exemptions

No waivers or exemptions are anticipated to be requested or required for the closure of this facility. The PORTS facility, including the X-326 Storage Unit, is owned by the U.S. Department of Energy, a Federal Agency.

1.6 Closure and Post-Closure Cost Estimates

In accordance with Ohio Adrninistrative Code (OAC) 3745-55-40(C), closure and post-closure cost estimates are not required for this Federal Facility.

1.7 Financial Assurance

In accordance with OAC 3745-55-40(C), financial assurance is not required for this Federal Facility.

1.8 Liability Coverage

In accordance with OAC 3745-55-40(C), liability coverages are not required for this Federal Facility.

2. CLOSURE PROCEDURES

The closure described in this plan is intended to minimize the need for further maintenance. It eliminates -- to the extent necessary to protect human health and the environment -- post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off or hazardous waste decomposition products to the ground or surface waters or to the atmosphere. Closure will be accomplished by the removal of waste and decontamination of the X-326 Storage Unit floors, diking and associated surfaces.

2.1 Estimate of the Quantity of Inventory to be Removed

The maximum capacity of the X-326 Storage Unit is delineated in Table 3. Wastes stored in the X-326 Storage Unit are discussed in Section 1.3.1.

2.2 Procedures for Handling Removed Inventory

All wastes removed from the facility will be stored on-site at X-7725, shipped off-site for treatment and/or disposal, or treated on site. All wastes will be disposed in strict compliance with all applicable environmental regulations. Any wastes removed from the facility for disposal will be removed in an acceptable manner to transportation vehicles appropriate for waste transport. All transportation will take place via hazardous waste transporters registered with the Public Utilities Commission of Ohio and U.S. EPA and possessing a registration number from each of these entities. All waste disposed will be manifested using the uniform hazardous waste manifest (U.S. EPA form 8700-22 and 8700-22A) in accordance with Ohio Administrative Code 3745-52-20 before transportation off-site.

2.3 Procedures for decontamination and Disposal

2.3.1 Surface Decontamination

The X-326 Storage Unit storage area surfaces consist of urethane painted/coated concrete surfaces and associated 1" x 1" x 1/8" angle iron diking. The urethane material is extremely resistant to chipping and cracking. Structural joints are filled with a caulking which is also extremely resistant to cracking.

Each of the six storage areas of the X-326 Storage Unit will be decontaminated as discussed herein. Those areas where PCB and PCB contaminated waste were stored will be sampled for PCBs to determine if PCB contamination exists. Standard 100 cm^2 wipe samples will be randomly collected in accordance with 40 CFR 761.125 (PCB Spill Cleanup Policy). Additional samples will be collected from areas that appear stained as identified by a certified professional engineer. Any areas exhibiting PCB contamination above 10 $\mu g/100\ cm^2$ will be decontarninated according to procedures specified in 40 CFR 761.125 before undergoing RCRA decontamination. Prior to decontamination of a storage area, the area will be divided into zones for decontamination verification. Before decontamination procedures begin, a certified professional engineer will determine the perimeter of the zones based upon visual inspection. Areas of apparent surface staining, contamination or structural faults will be noted for special evaluation in zone and/or

sampling consideration. The inner and outer surfaces of the 1" diked outer periphery of the storage areas will be decontaminated. Decontamination zones will be limited in size in these areas to accommodate the decontamination technique utilized. Washwater in these areas will be immediately collected to ensure it does not migrate from areas being decontaminated. Sorbent material will also be placed on the floor approximately 1 foot from the outer edge of the 1" dike and utilized as diking to eliminate wastewater migration. Any floor drains in these areas will be temporarily sealed to prevent migration. To decontaminate the X-326 Storage Unit, personnel will use a brush, mops, and/or a high pressure hot water spray to wash down the floor. All decontamination procedures will strictly adhere to the health and safety requirements outlined in the X-326 Storage Unit HASP (Section 4.0). Minimal detergent solutions will be used to facilitate the proposed treatment of any generated liquid waste. As the floor is cleaned, the liquid spray will be collected and placed into containers. The areas where the contaminated material and liquid wastes are transferred to containers will be curbed and overlain with Visqueen or equivalent plastic sheeting to provide spill containment.

Chemical analysis of the final rinseate will be used to determine if sufficient decontamination of the surfaces has taken place. A final rinseate sample for analysis will be collected from each of the divided zones. The liquid rinseate will be analyzed for the parameters listed in Table 4. The X-326 Storage Unit surfaces will be considered clean when concentrations of liquid hazardous waste or hazardous waste constituents fall below:

a) Fifteen times the public drinking water maximum contaminant level (MCL) for hazardous waste constituents as listed in 40 CFR 141.11 and OAC 3745-81-11 for inorganics and 40 CFR 141.12 and OAC 3745-81-12 for organics;

b) If an MCL is not available for a particular contaminant, then fifteen times the maximum contaminant level goal (MCLG) as listed in 40 CFR 141.50 shall be used as the clean standard; and

c) If the product of fifteen times the MCL or MCLG exceeds 1 mg/l or if neither an MCL nor an MCLG is available for a particular contaminant, 1 mg/l shall be used as the clean standard.

If the analysis indicates contamination still exists on the floor, the decontamination procedure will be repeated. If analysis indicates contamination still exists, the contaminated floor areas may be subjected to scabbling or a similar procedure to remove the contamination. If scabbling or a similar procedure is necessary, steps to minimize or eliminate fugitive dust air emissions as discussed previously will be taken. Debris removed will be placed into containers and disposed as discussed in Section 2.3.2.

A maximum volume of 5,000 gallons of rinseate/wastewater is estimated to be generated by the above processes.

All workers involved in decontamination of the X-326 Storage Unit surfaces will comply with the health and safety procedures outlined in the X-326 Storage Unit Closure HASP contained in Section 4.0.

2.3.2 Solid Treatment or Disposal

At completion of closure for the X-326 Storage Unit, all non-disposable equipment including power tools, hand tools, hoses and other miscellaneous equipment will be decontaminated in a previously constructed decontamination area that is curbed and overlain with Visqueen or equivalent plastic sheeting to provide containment following the procedures outlined in Appendix C.

Disposable equipment and supplies generated during the X-326 Storage Unit closure will not be decontaminated but will be placed into 55-gallon DOT 17C open top drums or other structurally competent DOT approved containers on a daily basis. At project completion, all containers with disposable equipment/supplies will be disposed at an off-site facility in accordance with all applicable disposal regulations (e.g., RCRA, TSCA, NRC) or stored on-site pending disposal. Any additional solids removed such as concrete, paint chips, sealant pieces will be subjected to laboratory waste characterization and disposed as hazardous waste or as low-level radioactive waste, depending on the radioactivity of the material. It is estimated a total of 2,000 pounds of wastes will be generated in the above processes.

2.3.3 Rinseate Treatment or Disposal

All liquid wastes generated during the X-326 Storage Unit closure will be managed initially as hazardous waste. Each drum of rinseate/wastewater generated during decontamination will be tested for parameters listed in Table 4 to document the extent of contamination and insure levels are acceptable for treatment described herein. Rinseates will then be managed as a wastewater and treated through one of the facility's NPDES permitted treatment systems. Rinseate will be managed in strict compliance with the Clean Water Act. It is estimated a maximum of 5,000 gallons of liquid waste will be treated in this manner.

Rinseate may also be managed as a radioactive waste and not discharged to an NPDES treatment system depending on the radioactivity, if any, of the rinseate.

2.3.4 Soil Sampling and Analysis Program

Because the X-326 Storage Unit storage floor surface areas consist of a layer of concrete one feet thick, it is extremely unlikely that a crack could develop that would allow migration of wastes to soils below. Therefore, no soil sampling will be conducted as part of this closure. If structural cracks are discovered, PORTS will immediately contact the Ohio EPA to discuss amending the closure plan.

2.4 Description of Security System

PORTS is a controlled access facility with fencing, gates, and numerous other features that contribute to the safety and security of the facility. Security is maintained by a staff of trained security guards 24-hours a day. Routine patrols of areas outside the main complex are conducted at a minimum of once every eight hours. All security guards are equipped with two way radios and have direct communication with other protection personnel (i.e. fire department, shift superintendents, and the plant communications center). Employees are required to show

identification badges when entering all main complex gates. Visitors and contractors entering the main complex must sign a log sheet and/or obtain proper passes.

2.5 Closure Certification

Within sixty (60) days of final closure, the owner/operator and an Independent Certified Professional Engineer will submit a certification of closure to the Ohio EPA Director by registered mail, assuring that the closure has been performed and is in accordance with the approved closure plan.

2.5.1 Activities to be Conducted

The performance standards to be used in evaluating activities proposed in Section 2.2 and 2.3 are the detection limits of the individual hazardous chemicals. Samples will be collected from decontamination rinseate.

2.5.2 Testing and Analysis to be Performed

The sampling and analysis protocol for activities proposed in Section 2.2 and 2.3 will generally follow the requirements of SW-846 and the SOPs in Appendix C. All laboratory sample analytical methods will follow a specific quality assurance and quality control plan.

2.5.3 Criteria for Evaluating Adequacy

The activities proposed in Section 2.2 and 2.3 will be evaluated by an Independent Certified Professional Engineer. The Independent Certified Professional Engineer will be required to submit a report of findings and recommendations.

2.5.4 Schedule of Inspections

The areas where the activities proposed in Section 2.2 and 2.3 are to be conducted will be inspected by the independent engineer routinely. Upon the beginning of closure operations, the independent engineer will notify the Ohio EPA (District and Central Office) five days prior to any critical activity and will inspect all closure activities on a daily basis. All observation and inspection activities will be recorded in the engineer's log book. This schedule will continue until the activity has been completed, all hazardous waste has been removed, any contaminated soil or rinsewaters have been removed, and the sampling protocol has been completed. In addition to the closure performance inspection, PORTS health and safety, and building custodian personnel will be inspecting the X-326 Storage Unit closure area.

2.5.5 Types of Documentation

Documentation which will be included in the closure certification report will include the sample analysis information, volume of waste generated during closure, waste records, spill/leak reports, all sample and decontamination procedures documentation (Chain-of-Custody (COCs), sampling logs, etc.), routine and special inspection records, photography, the approved closure plan and other

related documents. In addition, the closure certifications report will contain any correspondence with outside agencies and independent evaluations which relate to the closure activity.

3. CLOSURE SCHEDULE

3.1 Expected Year of Closure

The X-326 Storage Unit is expected to undergo closure in the year 2041 upon notification of intent to close according to the schedule outlined in Table 5.

3.2 Frequency of Partial Closure

Partial closure of one or more of the six storage areas within the X-326 Storage Unit may occur prior to the expected year of closure.

3.3 Waste Removal

The X-326 stored hazardous waste will be shipped to a permitted treatment, storage, or disposal facility or transferred to an on-site storage facility. Aqueous mixed waste may be treated on-site. Any remaining waste at the time of closure will be removed accordingly. The schedule for waste removal is illustrated in Table 5.

3.4 Closure Completion

Closure is expected to be completed within 180 days of beginning closure under an Ohio EPA approved plan. Although no time extension requests are anticipated, if one should become necessary, it will be requested in accordance with demonstration requirements specified in OAC 3745-66-13.

3.5 Certification of Closure

Within 60 days of successful completion of the prescribed closure, the Department of Energy will submit to the Director of the Ohio EPA, by registered mail, a certification that the X326 unit has been closed in accordance with the specifications in the approved closure plan. In addition, the Regional Administrator, U.S. EPA Region V will be sent a copy. The certification statement will include the exact wording found in OAC 3745-50-42(D). The certification will be signed by the owner and by the Independent Certified Professional Engineer responsible for closure overlie, registered in the State of Ohio.

3.6 Survey Plat

Since the closure of the X-326 Storage Unit is expected to be "clean," filing a survey plat is not expected to be required. Should it be determined that a clean closure cannot be accomplished, the Department of Energy will immediately contact the Ohio EPA to discuss amending the closure plan. If it becomes necessary, a survey plat will be submitted to the Pike County Recorder's Office and the Director of the Ohio EPA, which indicates the location and dimensions of the unit with respect to permanently surveyed benchmarks. The plat would be prepared and certified by a professional land surveyor. The plat would contain a note, prominently displayed, which states the owners obligation to restrict disturbance of the hazardous waste unit.

3.7 Request for Extension to Deadlines for Handling Inventory or Completing Closure

There are no extensions needed at this time.

3.8 Milestones

Table 5 exhibits the time required for each phase of the X-326 Storage Unit closure.

4. HEALTH AND SAFETY PLAN

A general Health and Safety Plan (HASP) has been developed for closure of the X-326 Storage Unit at PORTS. The HASP presents the procedures to be followed which will achieve compliance with applicable federal, state and local regulations.

Prior to commencement of any closure field activities, a detailed and site specific HASP will be required to be submitted by the contractor selected to perform these closure activities. The site specific HASP will include but is not limited to the following general requirements.

- DOE orders (e.g., 5480.4, 5480.10 and 5480.11)
- Code of Federal Regulations (e.g., OSHA 29 CFR, EPA 40 CFR, and DOT 49 CFR)
- ACGIH threshold limit values (TLVs), latest edition
- Standard practice procedures for health and safety

This HASP will be available at PORTS for inspection by employees, their designated representatives, DOE, EPA and other authorized personnel. Specific safety and health hazards of each phase of site investigation operations and the requirements and procedures for employee protection will be provided in the site safety and health plan. The site safety and health plan complies with 29 CFR 1910.120 and must be developed and approved prior to hazardous waste operations. As a minimum, the site safety and health plan addresses the following items:

- Names of key personnel and alternates responsible for site safety and health and appointment of a site safety and health officer;
- Site characterization and analysis;
- A safety and health risk analysis of each site task and operation;
- Employee training;
- Selected engineering controls, administrative controls and work practices to be implemented;
- Personal protective equipment to be used by employees for each of the site tasks and operations being conducted;
- Medical surveillance requirements;
- Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used. Methods of maintenance and calibration of monitoring and sampling equipment used;
- Site control measures;
- Decontamination procedures;

- Site's standard operating procedures;

- A contingency plan meeting the requirements of paragraph (1) of 29 CFR 1910.120 for safe and effective responses to emergencies including the necessary personal protective equipment and other equipment; and

- Confined space entry procedures.

4.1 Objectives

This general HASP contains the requirements for protection of on-site personnel and the public during closure of the X-326 Storage Unit at PORTS.

The protection of individuals and the environment are major concerns during any project involving potentially hazardous substances. The objective of this HASP is to assure that safe working conditions exist at the site during the field activities. Adopted safety measures and procedures have been based on an analysis of potential hazards at PORTS.

This HASP has been developed based upon a review of the requirements and guidelines described in the EPA Standard Operating Safety Guide, U.S. Department of Labor OSHA Standards 29 CFR Part 1910 (especially, 29 CFR 1910.120 covering hazardous waste operations), NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (U.S. Department of Health and Human Services Publication No. 85-115). Subcontractors will be given copies of this general HASP and will be required to follow the procedures and protocols specified herein for development and implementation of specific site safety and health plans.

Requirements of this general HASP and associated site safety and health plans may be modified, in writing, in response to review of changing site conditions upon approval by PORTS Environmental, Safety and Health (ESH) and the Site Safety and Health Officer.

4.2 Responsibilities

All closure operations which might expose personnel to site contamination are subject to this HASP. Avoiding adverse health effects and injuries to the site workers and preventing environmental insult are dependent on the contribution of all project participants.

4.2.1 Site Safety and Health Officer (SSHO)

The Site Safety and Health Officer (SSHO) will be responsible for providing technical coordination of the health and safety program. The officer will review documentation on medical programs and training requirements to be certain that personnel fulfill OSHA requirements. After review of the site safety and health plan's hazard assessment, the health and safety officer will select appropriate air monitoring engineering controls, work practices and personal protective equipment for particular work areas. Daily activities and site access are monitored to assure that all applicable procedures are followed. Representatives of PORTS ESH and the EPA will oversee issues relating to health and

safety. The officer provides authorized personnel with the HASP-related documentation which must be available at all work sites. This documentation includes the following:

- A copy of the physician's written opinion for each employee;
- A copy of training records, which document that each employee has completed the necessary training to accomplish the job to satisfy applicable 29 CFR and 40 CFR requirements, and is trained in the use of respiratory protection equipment;
- Documentation of the fit-testing program for respiratory protection equipment (meeting the requirements of OSHA 1910.134 and the American National Standards Institute (ANSI) Z88.2-1980);
- Job-specific (e.g., drilling, drumming waste, etc.) air monitoring records;
- A copy of this HASP and appropriate site safety and health plans; and
- Assurance that operators possess current licenses/certificates to operate motorized equipment.

The SSHO will communicate the specified safety-related requirements to all personnel during the daily safety meeting. Pre-entry briefings are held prior to initiating any site activity and at other times as necessary to ensure that employees are informed of and follow the site safety and health plan.

4.2.2 PORTS ESH

PORTS ESH is ultimately responsible for ensuring that all project participants abide by the requirements set forth in this plan. Approval of each site safety and health plan must be granted by PORTS ESH prior to initiating site operations. No individual may enter a hazardous waste site unless authorized by PORTS ESH to have site access. Such access is dependent upon presentation of satisfactory documentation including a physician's written opinion and necessary training.

PORTS ESH performs periodic audits to assure field implementation of the general HASP and site safety and health plans and reviews air and personal exposure monitoring results.

Disputes over health and safety issues will be resolved by PORTS ESH and the SSHO prior to submitting a modified HASP to Ohio EPA and U.S. EPA for review. The Ohio EPA and U.S. EPA shall also be kept informed of all changes made to the HASP.

4.2.3 Field Personnel

Field personnel must be properly trained in health and safety regulations associated with handling hazardous materials and are responsible for adherence to the safety procedures during performance of the work. In no case may work be performed in a manner that conflicts either with the intent of these procedures or with the inherent safety and environmental cautions expressed. After due

warnings, any personnel who violate safety procedures will be dismissed from the site.

4.3 Hazard Evaluation

Site-specific hazard evaluations of substances known or suspected in the X-326 Storage Unit will be included in the site specific safety and health plan and reviewed prior to initiation of field activities. Appropriate personal protection levels, specific safety measures, and other pertinent information to be employed for the X-326 Storage Unit closure will also be presented in the site specific health and safety plan.

4.3.1 Radiological Hazards

Radioactive materials emit one or more of four types of potentially harmful radiation: (alpha, beta, gamma and neutron). Alpha radiation has limited penetrating ability and is usually stopped by clothing and outer layers of the skin. Alpha radiation poses little threat outside the body, but can be hazardous if materials that emit alpha radiation are inhaled or ingested. Beta radiation can cause harmful "beta burns" to the skin and change the subsurface blood system. Beta radiation is also hazardous if materials that emit beta radiation are inhaled or ingested. Use of protective clothing, coupled with scrupulous personal hygiene and decontamination, afford good protection against alpha and beta radiation. In addition, use of respiratory and other protective equipment can help keep radiation-emitting materials from entering the body by inhalation, ingestion, injection, or skin absorption.

Gamma and neutron radiation easily pass through clothing and human tissue and can also cause serious permanent damage to the body. Chemical-protective clothing affords no protection against these types of radiation.

A PORTS health physicist will be consulted prior to work. At dosage-rate levels greater than 2 millirem per hour (mrem/hr) (whole body gamma radiation), all site activities shall cease until the situation has been assessed and appropriate health and safety measures have been implemented.

All workers will submit baseline and exit bioassay urine samples for total uranium, gross alpha and technetium-99. The urine specimen will represent at least a full 24-hour period. The minimum acceptable volume is 1.0 liter. Monthly specimens for the routine bioassay program will be collected on Friday or the last day of the workshift. Additional uranium bioassay samples will be collected whenever an intake above plant allowable limits may have occurred.

The purposes of the bioassay program are to confirm the results of the air sampling program and confirm the effectiveness of the respiratory protection program.

4.3.2 Chemical Hazards

Material Safety Data Sheets will be available at the job site for those chemicals utilized during closure. The SSHO will assist in identifying technical chemical hazard issues that are not addressed or are unclear on the Material Safety Data Sheets.

4.3.3 Physical Hazards

Physical hazards on the site include electric shock, tripping, falling, noise, and heat stress. To ensure a safe work place, the SSHO will conduct and document daily safety meetings and inspections. The SSHO must be familiar with OSHA construction industry and general industry standards. The SSHO shall ensure that all workers are informed of any physical hazards related to the site.

4.3.3.1 Heavy Equipment

Some general safety concerns include:

- Follow established procedures;
- Get help whenever you are in doubt about a material's weight. Use the buddy system;
- Be sure that any gas cylinders are secured properly to heavy mobile equipment;
- Hard hats and safety glasses are to be worn at all times around heavy equipment. Additional protective gear will be worn as needed;
- Establish hand signal communication when verbal communication is difficult. Determine one person per work group to give hand signals to equipment operators;
- Only qualified/licensed people are to operate heavy equipment;
- Use chains, hoists, straps, and other safety equipment to aid in moving heavy materials consistent with hoisting and rigging standards;
- Never walk directly in back of or to the side of heavy equipment without the operators knowledge; and
- Be sure that no underground or overhead power lines, sewer lines, gas lines, or telephone lines will present a hazard in the work area.

4.3.3.2 Trenching

Not applicable.

4.3.3.3 Electrical

All electrical wiring used during the X-326 Storage Unit closure activities will satisfy the requirements of 29 CFR 1926, Subpart K, and any applicable local electric codes. Some specific electrical safety requirements follow:

- All electrical work will follow established procedures;

- All wiring will be done by a licensed electrician;
- All extension cords must have functional grounding conductors;
- All equipment that is not "double insulated" must have a functional grounding conductor;
- All electrical cords must be in good condition;
- In lieu of a documented "assured equipment grounding conductor program," ground fault protected circuits can be utilized; and
- Electrical cords and power tools will be inspected by the SSHO prior to use on the X326 Storage Unit closure. Workers will inspect their power tools and cords.

4.3.3.4 Tripping and Falling

Workers will be apprised of any potential trip hazards through daily tool box health and safety meetings.

Whenever possible, trip and fall hazards will be eliminated or clearly identified with yellow "caution" tape. Impalement hazards to workers will be corrected as soon as they are identified.

4.3.3.5 Utilities and Powerlines

Not applicable.

4.3.3.6 Noise

Workers will be protected from excessive noise exposure through equipment maintenance, noise monitoring, and hearing conservation programs which comply with 29 CFR 1910.95. The daily equipment inspection will include the exhaust system; perforated exhaust pipes and mufflers will be replaced as they are discovered. Noise level surveys in work areas and around equipment will be performed regularly and documented.

Hearing protective equipment will be required whenever continuous noise levels equal or exceed 85 DBA (slow meter response) and/or impulse/impact noise exceeds current ACGIH TLVs or OSHA 1910.95.

4.3.3.7 Heat Stress

Wearing Personal Protective Equipment (PPE) puts a hazardous waste worker at risk of developing heat stress. This can result in health effects ranging from transient heat fatigue to serious illness or death. Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker. Because heat stress is probably one of the most common (and potentially serious) illnesses at hazardous waste sites, regular monitoring and other precautions are vital.

Heat stress may be of concern especially when the dry-bulb air temperature exceeds 70 °F. One or more of the following control measures can be used to help control heat stress if ambient temperatures above 70 °F are expected:

- Provision of adequate liquids to replace lost body fluids. Employees must replace water and salt lost from sweating. Employees must be encouraged to drink more than the amount required to satisfy thirst. Thirst satisfaction is not an accurate indicator of adequate salt and fluid replacement;

- Replacement fluids can be a 0.1 percent salt water solution, commercial mixes such as Gatorade or Quick Kick, or a combination of these and fresh water;

- Establishment of a work regimen that will provide adequate rest periods for cooling down. This may require additional shifts for workers or earlier/later work schedules;

- Cooling devices such as vortex tubes or cooling vests can be worn beneath protective garments;

- All breaks are to be taken in a shaded rest area;

- Employees will remove impermeable protective garments during rest periods;

- Employees will not be assigned other tasks during rest periods; and

- To prevent heat stress, all employees will be informed of the importance of adequate rest, acclimatization, proper diet, health hazards, recognition of heat illness, and first aid.

Because the incident of heat stress depends on a variety of factors, all workers, even those not wearing protective equipment, should be monitored.

- For workers wearing permeable clothing (e.g., standard cotton or synthetic work (clothes), follow recommendations for monitoring requirements and suggested work/rest schedules in the current American Conference of Governmental Industrial Hygienists' (ACGIH) threshold limit values for heat stress. If the actual clothing worn differs from the ACGIH standard ensemble in insulation value and/or wind and vapor permeability, change the monitoring requirements and work/rest schedules accordingly.

- For workers wearing semipermeable or impermeable encapsulating ensembles, the ACGIH standard cannot be used. For these situations, workers should be monitored when the temperature in the work area is above 70 °F.

To monitor the worker, measure:

- Heart rate. Count the radial pulse during a 30-second period as early as possible in the rest period. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.

If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third; or,

- Oral temperature. Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).

  If oral temperature exceeds 99.6°F, shorten the next work cycle by one-third without changing the rest period.

  If oral temperature still exceeds 99.6 ° F at the beginning of the next rest period, shorten the following work cycle by one-third.

  Do not permit a worker to wear a semipermeable or impermeable garment when his/her oral temperature exceeds 100.6°F.

To monitor body water loss, measure weight on a scale accurate to +0.25 lb. at the beginning and end of each work day to see if enough fluids are being taken to prevent dehydration. Weights should be taken while the employee wears similar clothing or, ideally, is nude. The body water loss should not exceed 1.5 percent total body weight loss in a work day.

Initially, the frequency of physiological monitoring depends on the air temperature adjusted for solar radiation and level of physical work. The length of work cycle will be governed by frequency of the required physiological monitoring.

4.3.3.8 Cold Stress

Cold stress may be of concern, especially when a wind-chill-adjusted temperature of 10 ° F or less is expected. To control cold stress:

- Persons working outdoors in temperatures at or below freezing may be frostbitten. Extreme cold for a short time may cause severe injury to the surface of the body or result in profound generalized cooling, causing death. Areas of the body which have high surface-area-to-volume ratios such as fingers, toes, and ears, are the most susceptible;

- Two factors influence the development of cold injury: ambient temperature and the velocity of the wind. Wind chill is used to describe the chilling effect of moving air in combination with low temperature. For instance, 10 ° F with a wind of 15 miles per hour (MPH) is equivalent in chilling effect to still air at -18°F;

- As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 mph increases to 10 mph. Additionally, water conducts heat 240 times faster than air. Thus, the body cools suddenly when chemical-protective equipment is removed if the clothing underneath is perspiration soaked;

- Local injury resulting from cold is included in the generic term frostbite. There are several degrees of damage. Frostbite of the extremities can be categorized into:

- Frostbite nip or initial frostbite: Characterized by sudden blanching or whitening of skin;
- Superficial frostbite: Skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient; and
- Deep frostbite: Tissues are cold, pale, and solid; this is an extremely serious injury.
- Systemic hypothermia is caused by exposure to freezing and rapidly dropping temperature. Its symptoms are visually exhibited in five stages: (1) shivering, (2) apathy, listlessness, sleepiness, and sometimes rapid cooling of the body to less than 95 °F, (3) unconsciousness, glassy stare, slow pulse, and slow respiratory rate, (4) freezing of the extremities, and finally, (5) death.
- Thermal socks, long cotton or thermal underwear, hard hat liners and other cold weather gear can aid in the prevention of hypothermia.
- Blankets, warm drinks (other than caffeinated coffee) and warm break areas are essential.

4.3.3.9 Illumination

While work is in progress, areas accessible to employees will be illuminated not less than the intensities identified on the table located on page 4-10.

4.3.3.10 Sanitation

Provision of potable water, drinking cups, non-potable water, toilet facilities, washing facilities and other sanitation requirements will be in compliance with specifications of OSHA 1910.120 (n).

4.3.3.11 Bodies of Water

Not applicable.

4.3.3.12 Confined Space Entry

All employees required to enter into confined spaces shall observe requirements specified in ANSI Z117.1-1977 (or the latest revision thereof) and PORTS SPP H-53, "Confined Space Program." Prior to entry, employees shall have satisfactorily completed a confined space training program. Depending upon risk level, atmosphere testing for oxygen deficiency, combustible gases and toxic agents may be required. High risk entries require issuance of a hazardous work permit (HWP) by the PORTS facility custodian prior to job activities.

4.3.3.13 Site Housekeeping

Construction debris shall be handled in accordance with OSHA 1926.25.

MINIMUM ILLUMINATION INTENSITIES

FOOT-CANDLES	AREAS OR OPERATIONS
5	General site areas.
3	Excavation and waste areas, accessways, active storage areas, loading platforms, refueling and field maintenance areas.
5	Indoors: warehouse, corridors, hallways, and exitways.
5	Tunnels, shafts, and general underground work areas. (Exception: minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Mine safety and health administration approved cap lights shall be acceptable for use in the tunnel heading.)
10	General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, and indoor toilets and workrooms.)
30	First aid stations, infirmaries, and offices.

* Table 120.1 of 29 CFR 1910.120 provides additional technical information on illumination intensities.

4.4 Air Monitoring

Air monitoring will be used to identify and quantify airborne levels of hazardous substances and health hazards in order to determine the appropriate level of employee protection needed at each work site. Initial air monitoring will be conducted to identify any Immediately Dangerous to Life and Health (IDLH) and other dangerous situations, such as the presence of flammable atmospheres, oxygen-deficient environments, toxic levels of airborne contaminants, and radioactive materials. Then, periodic monitoring will be conducted when

- Work begins on a different portion of the site;
- Contaminants other than those previously identified are being handled;
- A different type of operation is initiated (e.g., drum opening as opposed to exploratory well drilling); and
- Employees are handling leaking drums or containers or working in areas with obvious liquid contamination (e.g., a spill or lagoon).

4.4.1 Radioactive Materials

Radiation and radioactive contamination will be monitored using survey instruments capable of measuring low levels of activity.

Initially, at least one breathing zone air particulate sample for the employee with the highest potential exposure will be collected per work crew per work shift during activities at the site. As results are obtained, it is anticipated that the frequency of sampling during a particular activity can be reduced. The criteria for air particulate sampling and radio nuclide counting are addressed in DOE Order 5480.11.

Radioactive air particulate samples will be counted using a gas proportional counter, or alpha scintillation counter or counter with similar capabilities. As a minimum, gross alpha emitter airborne concentration and gross beta emitter airborne concentration will be determined and documented.

Preliminary samples showing activities above 25% of applicable DAC values will be composited and sent to a laboratory for identification of the isotopes present and their concentrations. In addition, whenever the time weighted average gross alpha or gross beta airborne concentration measurements indicate that airborne radio nuclide concentrations may exceed 25% of the values provided in DOE Order 5480.11, isotopic analysis will be performed. When appropriate, several filters may be submitted as a single composite sample for isotopic analysis.

4.4.2 Chemical Hazards

Air sampling and monitoring for chemical hazards will be conducted to the extent necessary to document compliance of the project with existing regulations. Monitors used will include

direct-reading instruments and sample collecting devices. Direct reading instruments to be used during the X-326 Storage Unit closure activities may include photo ionization detectors, flame ionization detectors, colormetric tube samplers, and combustible gas/oxygen meters; sample collecting devices utilized may include filter cassettes, florisil tubes and charcoal tubes. Breathing zone samples for employees with the highest potential exposure for each contaminant will be initially taken at a minimum rate of one per work crew per shift until results obtained indicated a greater or lesser sampling frequency is warranted.

Caution must be exercised when utilizing direct-reading instruments. Since mixtures of chemicals may be encountered and direct-reading air monitoring instrument may react to the total mixture, individual concentrations of specific compounds may not be determined by these instruments. Direct-reading instruments are not to be used when negative interference is a possibility. For situations involving exclusively positive interference, it will be assumed that the mixture is made up entirely of the chemical with the lowest airborne exposure limit. This means that the composite reading obtained will be compared with lower applicable value of the ACGIH TLVs or OSHA PELs for that specific substance to determine required respiratory protection levels.

Site hazard evaluation is a dynamic and on-going process. Respiratory protection levels may change based on measured atmospheric concentrations of detected contaminants. Respiratory protection levels will be re-evaluated if chemical analytical results from samples collected during the field activities indicated that such re-evaluation is warranted; i.e., if additional compounds are detected or if airborne concentrations significantly differ from previous measurements. The results of the air monitoring will be used as on-site documentation of contaminant exposure levels and to select the appropriate level of personal protective equipment.

4.4.3 Physical Hazards

Monitoring for physical hazards will consist of on-site inspections and use of direct-reading instruments. These instruments may include sound level meters, noise dosimeters, various types of thermometers, radio frequency analyzers, illumination meters and thickness gauges.

4.4.4 Equipment Calibration and Maintenance

All monitoring equipment will be calibrated and maintained according to manufacturer's instructions.

4.5 Personal Protective Equipment

Personnel must wear protective equipment when response activities involve known or suspected atmospheric contamination, when vapors, gases, or particulates may be generated, or when direct contact with skin-affecting substances may occur. Full-face respirators protect lungs, gastrointestinal tract, and eyes against air toxicants. Chemical-resistance clothing protects the skin from contact with skin-destructive and absorbable chemical. Good personal hygiene limits or prevents ingestion of material.

Equipment to protect the body against contact with known or anticipated chemical hazards has been

divided into four categories according to the degree of protection afforded as outlined in OSHA 1910.120, Appendix B.

- Level A: Chemical-protective, totally-encapsulating suit; NIOSH-approved, full-face piece Self Contained Breathing Apparatus (SCBA) or combination SCBA/air line; chemical-resistance inner and outer gloves; chemical-resistant boots with steel toes and shanks; disposable protective suit, gloves and boots; and two-way radios. Should be worn when the highest level of respiratory, skin, and eye protection is needed.

- Level B: Chemical-resistance splash suit and coveralls (e.g., PVC saranex); NIOSH approved, full-face piece SCBA or combination SCBA/air line; chemical-resistance inner and outer boots and gloves; hard hats; and two-way radios. Should be selected when the highest level of respiratory protection is needed, but a lesser level of skin protection or when the atmosphere contains less than 19.5% oxygen.

- Level C: Chemical-resistant splash suit and coveralls; NIOSH-approved, full-face cartridge respirators; chemical-resistant inner and outer boots and gloves; hard hats; and two-way radios. Should be selected when the types of airborne substances are known, the concentrations measured, direct contact with exposed skin poses no hazard and the criteria for using air-purifying respirators are met.

- Level D: Coveralls (cloth), boots (leather or rubber) with steel toes and shanks, chemical resistant outer boots; and hard hat. This is primarily a work uniform providing minimal protection for situations when the atmosphere contains not known hazard. Optional items include face shield, safety glasses or goggles; gloves; and hearing protectors.

4.5.1 Respiratory Protection

The selection and use of respirators will be in accordance with the publications listed below:

- ANSI Z88.2 (1980) "Practices for Respiratory Protection."

- NIOSH/OSHA/USCG/EPA (1985) Occupational Health and Safety Guidance Manual on Hazardous Waste Site Activities. US GPO, Washington, D.C.

- 29 CFR 1910.134, "Respiratory Protection."

- 29 CFR 1926.58, "Asbestos."

The following requirements will be adhered to:

- As a minimum, only properly cleaned, maintained, NIOSH/MSHA-approved full-face air purifying respirators will be used on-site;

- Selection of respirator, as well as any decisions regarding upgrading or downgrading of respiratory protection, will be made by the SSHO;

- Air-purifying cartridges will be replaced on a regular basis, as determined by the SSHO;

- No employee shall be assigned to tasks requiring the use of respirators if, based upon the most recent examination, a physician determines that the employee will be unable to function normally wearing a respirator or that the safety or health of the employee or other employees will be impaired by use of a respirator. All respirator users are required to have physicals annually with the most recent physician's written opinion permitting respirator use;

- Contact lenses are not to be worn while using any type of respiratory protection;

- Air-line respirators shall be assembled according to manufacturer's specifications regarding hose length, couplings, valves, regulators, manifolds, etc. Though not anticipated, air-line respirators may need to be used on-site;

- Excessive facial hair (for example, beards) prohibits proper face fit and effectiveness of respirators. Persons required to wear full-face piece respirators of SCBAs must not have interfering facial hair. All personnel wearing full-face piece respirators of SCBAs will be required to be shaven to permit proper fit;

- Regular eyeglasses cannot be used with full-face respirators (they can break the facepiece seal). Inserts must be utilized;

- The respiratory protection program utilized on-site will be documented and in compliance with OSHA, 29 CFR 1910.134 and ANSI Z88.2-1980. This requires annual respirator-usage training and annual fit testing of the respiratory equipment (fit testing every 6 months if asbestos exposure is a possibility). Program documentation and employee records for training and fit testing must be reviewed and approved by ESH; and

- Where respirators are designated for protection against contaminants, the employee shall be permitted to change canisters or cartridges whenever an increase in breathing resistance, contaminant odor breakthrough, or other malfunction is experienced.

Based on the hazard evaluation the use of respiratory protection is anticipated to be limited for the majority of tasks involved. Level D protection (with the modifications listed in Section 4.5.2 of this HASP) has been selected for site activities unless on-site monitoring data indicates a necessity for upgrading personal protective equipment. Air monitoring will be used to identify and quantify airborne levels of hazardous substances and health hazards in order to determine the initial and ongoing job appropriate level(s) of employee protection. These monitoring procedures are discussed in Section 4.4 of this HASP (air monitoring).

4.5. Protective Clothing

Based on available health and safety information, initial protective clothing for this work shall be as follows:

- Disposable acid-resistant coveralls with hood and boot covers;
- Boots (leather or rubber) with steel toes and shanks;
- Chemical-resistant outer boots;
- Hard hat, as applicable;
- Latex inner gloves;
- Chemical-resistant outer gloves or equivalent;
- Hearing protection, as applicable;
- If not wearing a full-face piece respirator or SCBA, chemical splash goggles will be worn at all times in the work area. Contact lenses will not be permitted in the contaminated area; and
- Sleeves will be taped to gloves and cuffs taped to boots, as applicable.

Upgrading or downgrading of the selected level of protective equipment will be the decision of the SSHO based on assessment of potential hazards.

4.6 Site Control

A site control program which meets requirements specified in OSHA 1910.120(D) will be included in the site safety and health plan.

Appropriate warning signs will be posted in readily visible locations in or near contaminated work areas. Inadvertent entry by unauthorized personnel will be prevented by utilizing barricade tape to mark the boundaries of hazardous waste sites within the PORTS security fence.

Access to contaminated work areas will be restricted to persons authorized by ESH. A daily roster containing the date, the person's name, the person's signature, organization, the time of entry, and the time of exit will be kept of all persons working in such areas. Any visitors to the area must present proper identification and be authorized to be on site. Visitors must comply with all aspects of the HASP.

Each restricted access area at PORTS will be divided into three zones, an exclusion zone, a decontamination zone, and a support zone. The basic premise behind this type of procedure is to limit the transportation of contaminants to clean areas by confining and controlling activities.

4.6. Exclusion Zone

The exclusion zone includes the actual work area where contamination is likely to be the highest. This zone has the higher inhalation exposure potential and/or presents a potentially higher

probability of skin contact with cutaneous or percutaneous effecting chemicals. As its name implies, access to the exclusion zone is limited, and the exclusion zone is bounded by an access barrier. The exclusion zone is entered after donning the proper equipment and passing through the contaminant-reduction zone. The exclusion zone should be large enough to contain the working area and small enough to be easily controlled. No eating, drinking, or smoking is allowed in the exclusion zone. The hotline can be as rigid as a fence or simply signs or barrier tape. The main point is to control access into the area. Field personnel will not enter the exclusion zone alone. Entry will be in teams of at least two individuals working under the buddy system. Visitors are not permitted to enter exclusion zones.

4.6.2 Decontamination Zone

The decontamination zone includes the areas immediately surrounding the exclusion zone. This zone has the next highest inhalation hazard, but does not have a high probability of skin contact with cutaneous or percutaneous effecting chemicals. This zone is the area in which the actual decontamination of equipment and PPE takes place. As its name implies, the intent is to reduce contamination, i.e., become progressively cleaner. This means that after decontaminating auxiliary equipment, the most contaminated PPE (e.g., boots, gloves) should be doffed first, the coveralls, other PPE, and finally, the respirator. If the site is heavily contaminated, it may be necessary to have a wash station available for removing surficial contamination before starting the disrobing procedure. Visitors are not permitted to enter decontamination zones.

Personnel decontamination will be completed according to the guidance given in the Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. Personnel and personnel protective equipment will be decontaminated using water or a mixture of detergent and water. Liquid and solid wastes generated during decontamination will be properly collected and disposed. Prior to leaving this zone, workers will be frisked for radioactive contamination.

Every attempt will be made to reduce contamination on equipment and articles to levels that are as low as reasonably practicable. Whenever possible, steam cleaning and the use of detergents and water will be used in place of solvents and chemical decontaminants. Solid and liquid wastes produced during decontamination will be collected for proper disposal.

4.6.3 Support Zone

The support zone (clean zone) covers all areas immediately outside of the decontamination zone. Adverse exposure to chemical is unlikely in this zone. This zone is usually used to store supplies and as a dressing area. Personnel or equipment which have been in the exclusion zone must be decontaminated before re-entering the support zone. Visitors may enter support zones under the following conditions:

- Visitors must be under continuing escort by personnel qualified in at least 24 hours of health and safety training for hazardous waste sites;

- Visitation occurrence is irregular or intermittent and for short-term entry only; and

- Purpose of visitation is observatory in nature or involves the performance of incidental, non-hazardous tasks.

4.7 General Work Practices

- At least one copy of this general HASP and applicable site safety and health plan will be available at each work site.

- Contaminated protective equipment, such as respirators, hoses, boots, etc., will not be removed from the exclusion zone or decontamination zone until it has been cleaned, or properly packaged and labeled.

- Food and beverages will not be permitted or consumed in the restricted-access areas. Possession or use of tobacco products and the application of cosmetics are also prohibited in these areas.

- Containers will be moved only with the proper equipment and will be secured to prevent dropping or loss of control during transport.

- During activities all personnel will be required to wash their hands and face before eating, drinking, smoking, or applying cosmetics.

- Portable eyewash stations will be located in the restricted-access areas near work activities.

- All personnel will be required to field wash (hands and face) as a minimum at the end of their shift before leaving the job site if they might have been contaminated. Hands and face will be washed during breaks.

- All personnel will avoid contact with potentially contaminated substances. Walking through puddles or mud and kneeling on the ground should be avoided whenever possible.

- Equipment will not be placed on possibly contaminated surfaces.

- Field personnel must observe each other for signs of toxic exposure and heat/cold illness. Indications of adverse effects include, but are not limited to:

    * Changes in complexion and skin discoloration
    * Changes in coordination
    * Changes in demeanor
    * Excessive salivation and pupillary response
    * Changes in speech pattern

- Field personnel are cautioned to inform each other of non-visual effects of illness such

    * Headaches
    * Dizziness

* Nausea
* Blurred vision
* Cramps
* Irritation of eyes, skin, or respiratory tract

4.8 Training and Information Programs

Training and information programs must comply with requirements specified in OSHA 1910.120(E) and (I). General site workers and the SSHO are required to have satisfactorily completed an off-site 40-hour health and safety training course for conducting work at hazardous waste sites and a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. On-site supervisors (e.g., SSHO) responsible for employees performing hazardous waste operations are required to have also completed an 8-hour specialized course on management of such operations. Workers and supervisors must receive 8 hours of refresher training each year. At least one member of each crew will have current certificates in Cardiovascular Pulmonary Resuscitation (CPR) and first aid. Employees expected to respond to hazardous emergency situations shall have been trained in how to respond to expected emergencies.

Prior to beginning the fieldwork tasks, field personnel and subcontractors will be given a training program/briefing by the SSHO and ESH. This session will include, but is not limited to, the following topics:

- Names of SSHO and designated alternates
- Site history and site control measures
- Specific hazards (including toxicological data) and location of materials safety data sheets (MSDS).
- Hazard recognition and symptoms of overexposure
- Standard operation procedures and use of PPE and engineering controls
- Decontamination (personnel and equipment)
- Emergency procedures and locations of emergency equipment
- Respirator fit test and use
- Relevant aspects of the 29 CFR 1910.120(I)(2) site safety and health plan requirements listed at the beginning of this HASP

Throughout the course of the field program, field management personnel and the SSHO will be responsible for ensuring the implementation of and adherence to the health and safety program. In addition, the following items will be discussed during briefings between the project representative and personnel on-site. It should be kept in mind that these points are not exclusive, and any other potentially hazardous situation that may be known by the parties involved in this safety briefing should be outlined at the time of the meeting.

- Hazardous substances (suspected or known contaminated media that personnel may be exposed to)

- Hazard assessment (toxic effects, reactivity, warning signs)

- Levels of personal protection to be employed in work areas

- Work area monitoring and the atmospheric concentrations which warrant changes in the level of respiratory protection

- Personnel exposure emergency procedure (skin contact, inhalation, ingestion, falls, etc.): Notify ESH (or shift superintendent at ext. 3025)

- Potential or actual fire or explosion emergency procedure: Call emergency #5555. Relate location and status of the fire or explosion and injuries to personnel. Response will be immediate

- Potential or actual ionizing radiation exposure emergency procedure: Notify Energy Systems ESH of suspected or actual exposure to ionizing radiation (e.g., ingestion of uranium particulates). ESH will respond by notifying either the shift superintendent or health physics personnel as the situation warrants

- Environmental accidents emergency procedure (spread of contamination outside existing site): Call shift superintendent at ext.3025 and relate incident. The shift superintendent or his representative will be the authority at the site of the incident

- Emergency signals and/or codes: (See Part 4.11.2 of this section for a description of emergency alarms)

- Emergency routes: (This will depend upon worksite location)

Emergency phone number: 5555

4.9 Medical Surveillance

As a minimum, the medical monitoring program will satisfy the requirements of 29 CFR 1910 including, but not necessarily limited to, those provided in 29 CFR 1920.120 (the hazardous waste operations standard) and 29 CFR 1910.134 (the respiratory protection standard).

All participating personnel must have a copy of a written opinion from the examining physician dated not more than 12 months prior to on-site operations. This opinion includes the following:

- The results of the medical examination and tests;

- The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from work in hazardous waste operations or emergency response;

- The physician's recommended limitations upon the employees assigned work with special emphasis on fitness for duty, including the ability to wear any required personal protective clothing and equipment under conditions (i.e., temperature extremes) that may be expected

at the work site; and

A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further examination or treatment.

4.10 Hazardous Waste Site Emergency Procedures

The SSHO shall be notified of any on-site emergencies and be responsible for ensuring that the appropriate procedures are followed. The following standard emergency procedures will be used by on-site personnel.

4.10.1 Injury in Exclusion or Decontamination Zone

In the event of an injury in the exclusion zone, all site personnel shall exit the exclusion zone and assemble at the decontamination line. The on-site inspector will evaluate the nature of the injury and the affected person should be decontaminated to the extent practical prior to movement to the support zone. Appropriate first aid will be initiated, and an immediate request will be made for an ambulance (if necessary) and the designated medical facility notified (if required). No persons will re-enter the exclusion zone until the cause of injury or symptoms is determined.

4.10.2 Injury in the Support Zone

In the event an injury occurs in the support zone, the SSHO must be notified immediately. Appropriate first aid will be administered and, if necessary, the injured individual will be transported to the designated medical facility. If the injury does not affect the performance of site personnel, operations may continue.

4.10.3 Fire/Explosion

In the event of a fire or explosion at the site, the PORTS fire department will be alerted and all personnel should move to a safe distance from the area (See Section 4.11 for a list of emergency phone numbers).

4.10.4 Protective Equipment Failure

If any site worker experiences a failure or alteration of protective equipment that affects the protection factor, that person and designated buddy will immediately leave the exclusion zone. Re-entry to the exclusion zone will not be permitted until functionally sound equipment has been donned.

4.11 PORTS Emergency Procedures

Emergency phone numbers and directions to the nearest medical facility will be posted at conspicuous places in the support zone. The policy at PORTS is to maintain an emergency preparedness program to provide the maximum practical protection for employees, DOE and DOE contractor personnel, members of the public, and property in the event of emergencies involving

activities on the PORTS site. Because of the nature of the facility, visitors to PORTS are always accompanied by an escort. The escort will be familiar with emergency situation response, the locations of monitoring stations, etc., and can direct visitors should an emergency situation occur. The following information is provided in case of alarms or emergencies.

4.11.1 Reporting an Emergency

Any person discovering an emergency condition at a RCRA facility should immediately alert the Plant Emergency Director (PED) and the Plant Emergency Response Team by one of the following means:

- Dial 5555 on any phone. Give your name and all vital information to the answering parties. The plan emergency squad will respond;

- Actuate a red fire alarm box - if possible wait nearby to provide the emergency squad with details of the emergency;

- Use the plant radio system to notify X-300 (plant control facility); and

- Pick up a red emergency phone. X-300 will answer. Give your name and details of the emergency.

After alerting the plant emergency director and the plant emergency response team, the person discovering the emergency should do whatever can safely be done to minimize the emergency.

In all emergencies, no matter how the alarm is initiated, it is important that the PORTS cascade coordinator is on the receiving end of an initial request for the emergency response team. The only way the coordination personnel would not be included in the initial alert sent in by one of the means above would be because of a malfunction of their equipment. Any time an alarm is received by the police or fire department and cascade coordination does not respond with immediate contact of police and fire departments, it will be assumed that cascade coordination did not receive the alarm and it will be the responsibility of the fire department captain or the police console operator to pick up the red emergency phone and include the cascade coordinator in the initial alert.

4.11.2 Recognizing Emergency Alarms

The steady sounding of sirens atop the X-330 and X-326 building is an alert signal listen for a public address announcement.

- The wailing, or intermittent sounding of these sirens is a signal to take cover or protective action. It means an attack against our country has been detected.

- Building horns - a continuous blast means leave the building immediately and go to a monitoring station or assigned assembly point.

- Gas release sirens are local alarms. They are located at X-330 Tails and Side Feed Facilities, X-326 ERP and PW Sampling Areas, X-700 Furnace Stand, X-342, X-344, and the HF

Storage unit Farm. When you hear a continuous modulated high-frequency siren at one of these facilities, evacuate the area and seek a position upwind.

- Any signal consisting of a series of seven short tones, sounded three times, is a request for personnel accountability. Report in person or by phone to your home base as soon as possible.

- A radiation alarm is a continuous sounding of building horns and the local radiation cluster nitrogen horns. Flashing red lights outside will be on. Immediately leave the affected building and go to a monitoring station.

4.11.3 Monitoring Station Locations

- Trailer southeast of X-100
- Fire station (X-106)
- Frame building east of X-105
- Maintenance shop in X-533 switchyard
- Inside X-630 pumphouse, north end
- Cement building south of X-530 switchyard

Additional monitoring stations will be established as needed near investigated units. Any such proposed stations will be identified in the appropriate site safety and health plan.

4.12 Records and Reporting Requirements

The contractor will notify the DOE site office, PORTS safety department, the project manager, and the responsible field manager of a fatality or serious accident, as required in DOE Order 5484.1A. Fatal accidents will be investigated by the PORTS safety department and/or DOE representatives as the situation requires.

The contractor will be responsible for the recording and reporting of illnesses and injuries in accordance with PORTS and OSHA requirements. Copies of these reports will be provided to the contractor's project files and the Portsmouth facility's safety department personnel. Recordable occupational accidents and illnesses are those defined in DOE Order 5484.1A, "Environmental Protection, Safety, and Health Protection Information Reporting Requirements" and OSHA 29 CFR 1910 and 1926.

The contractor will submit a DOE form 5484.X "Individual Accident/Incident Report" for each occurrence for which reporting is required under DOE 5484.1A. Forms will be submitted to the Portsmouth facility's safety department and the cognizant DOE operations office. Additionally, the contractor should comply with all reporting requirements as identified in OSHA 29 CFR 1910 and 1926.

The contractor will maintain records of employee's exposures to radioactive or toxic materials or other harmful physical agents for a period of 30 years. In addition, a copy of all radiation exposures records will be transferred to the Portsmouth facility's health physics department upon employee

termination or completion of the contract. Reporting requirements of DOE Order 5484.1 will be adhered to by the contractor and Portsmouth facility.

All site workers are required by DOE Order 50003 to notify the PORTS Safety Department and cognizant DOE Site Office of any unusual occurrences. An "unusual occurrence" is any unusual or unplanned event having programmatic significance such that the event adversely affects or potentially affects the integrity of the site, the performance and reliability, or safety of the project. Notification of occurrences similar to the following will be required:

- Any substantial degradation of a barrier designed to contain radioactive or toxic material or any substantial release of radioactive or toxic material past this barrier (e.g., overflow of a water treatment pond, contaminant release into a stream, or contamination released beyond the site boundary);
- Accidents involving the transport of radioactive, hazardous, or toxic materials;
- Any fire or explosion which affects the integrity of the site or project;
- Any condition, resulting from natural events or manmade activities, which substantially affects or threatens performance, reliability, or safe operation (e.g., site flooding, wind damage, soil stability problems, personnel operation errors which create hazardous conditions);
- Any radiation or chemical exposure in excess of applicable limits;
- Any incidence or breach of access control by unauthorized personnel;
- Any acts of vandalism or major theft occurring at a site; and
- Any release of contamination outside the controlled area; including personnel, equipment, and roadways.

The contractor will maintain a central file of all enforcement inspections and reports along with violations and abatement actions that will be available for inspection by either the PORTS safety department or DOE's personnel. The contractor will also maintain a central file of formal employee health and safety complaints and reports of their disposition. Upon request, these will be made available for inspection by affected employees or their authorized representative.

The contractor will maintain documentation of all employee training, including the OSHA required 40 hours training, site specific training, new employee orientation, refresher courses, respirator fit test results, and respirator training in addition to other requirements specified by OSHA.

4.13 Complaints

A DOE Form 5480.2 (12/86) poster shall be posted at hazardous waste operation sites. Employees are encouraged to report to the SSHO either directly or through their authorized employee

representative any conditions or practices which they consider detrimental to their health or safety or which they believe are in violation of applicable health and safety standards. Such complaints may be made orally or in writing. The contractor will also have available in the workplace DOE Form F-5480.4, "Occupational Safety and Health Complaint Form," to be used in reporting violations.

Employees who believe that an imminent danger exists that threatens human or environmental health, death or serious physical harm, are encouraged to bring this matter to the immediate attention of the SSHO for resolution. In the event of the inadequate corrective action, the employee and/or authorized representative may also contact the local agency having jurisdiction, the contractor's project office, or ESH by telephone and set forth with reasonable particularity the basis for their request for an immediate inspection. Competent medical personnel, which may include a physician, will evaluate the symptoms of illnesses that could seriously affect a worker's health and safety.

SUBMISSION DATE: February 21, 2000

Table 1
Solid Waste Management Units

UNIT NUMBER	UNIT TITLE
X-231A	OIL BIODEGRADATION PLOT
X-231B	OIL BIODEGRADATION PLOT
X-701BP	NORTHEAST OIL BIODEGRADATION PLOT
X-614A	SEWAGE LIFT STATION
X-614B	SEWAGE LIFT STATION
X-614D	SEWAGE LIFT STATION
X-614P	SEWAGE LIFT STATION
X-615	ABANDONED SANITARY SEWAGE TREATMENT PLANT
X-616	EFFLUENT CONTROL FACILITY/FORMER CHROMIUM SLUDGE LAGOONS
X-617	pH ADJUSTMENT
X-622T	CARBON FILTRATION UNIT
X-622	SOUTH GROUNDWATER TREATMENT FACILITY
X-623	NORTH GROUNDWATER TREATMENT FACILITY
X-624	GROUNDWATER TREATMENT FACILITY
X-625	GROUNDWATER TREATMENT FACILITY
X-626	RECIRCULATING WATER PUMP HOUSE AND COOLING TOWER
X-630	COOLING TOWER BASIN
X-630-1 X-630-2 X-630-2	RECIRCULATING WATER PUMP HOUSE, COOLING TOWER, AND ACID HANDLING STATION
X-633	RECIRCULATING WATER PUMP HOUSE AND COOLING TOWER
X-701E	NEUTRALIZATION FACILITY
X-230G	RCW SYSTEM
X-6614E	SEWAGE LIFT STATION
X-6614J	SEWAGE LIFT STATION
X-6619	SEWAGE TREATMENT FACILITY
	SANITARY SEWER SYSTEM

SUBMISSION DATE: February 21, 2000

UNIT NUMBER	UNIT TITLE
	STORM SEWER SYSTEM
X-103	AUXILIARY OFFICE BUILDING
X-104A	INDOOR FIRING RANGE
X-114A	FIRING RANGE
X-120	OLD TRAINING FACILITY SITE
X-326	PROCESS BUILDING
X-330	PROCESS BUILDING
X-333	PROCESS BUILDING
X-343	FEED VAPORIZATION AND SAMPLING FACILITY
X-344C X-344D	HF STORAGE FACILITY AND HF NEUTRALIZATION PIT
X-600 X-600A	COAL FIRED STEAM PLANT AND COAL STORAGE YARD
X-700	CHEMICAL CLEANING FACILITY (SOILS ONLY)
X-700 X-705	PROCESS WASTE LINE SOILS
X-700T	TCE/TCA OUTSIDE STORAGE TANK (SOILS ONLY)
X-701C	NEUTRALIZATION PIT (SOILS ONLY)
X-705	DECONTAMINATION BUILDING (SOILS ONLY)
X-705A X-705B	RADIOACTIVE WASTE INCINERATION /CONTAMINATED BURNABLES STORAGE LOT (SOILS ONLY)
X-710	TECHNICAL SERVICES BUILDING AND NEUTRALIZATION PIT (SOILS ONLY)
X-720	MAINTENANCE BUILDING (SOILS ONLY)
X-736	CONSTRUCTION SPOILS AREA
X-744Y X-744G	WASTE STORAGE YARD AND BULK STORAGE BUILDING (SOILS ONLY)
X-744W	SURPLUS AND SALVAGE WAREHOUSE
X-749	CONTAMINATED MATERIALS DISPOSAL FACILITY (SOILS ONLY)
X-751	MOBILE EQUIPMENT GARAGE
X-760	PILOT INVESTIGATION BUILDING AND NEUTRALIZATION PIT (SOILS ONLY)

SUBMISSION DATE: February 21, 2000

UNIT NUMBER	UNIT TITLE
X-770	MECHANICAL TESTING FACILITY
X-3001	PROCESS BUILDING
X-3346	FEED AND WITHDRAWAL FACILITY
	BARREN AREA
	OLD NORTHWEST FIRING RANGE (RUBY HOLLOW)
	RAILROAD SPUR YARD STORAGE AREA
	TRANSFORMER CLEANING STORAGE PAD
X-530A X-530B X-530C X-530D X-530E X-530F X-530G	SWITCHYARD, SWITCH HOUSE, TEST AND REPAIR BUILDING, OIL HOUSE, VALVE HOUSE, AND GCEP OIL PUMPING STATION
X-533A X-533B X-533C X-533D X-533E X-533F X-533H	SWITCHYARD, SWITCH HOUSE, TEST AND REPAIR BUILDING, OIL HOUSE AND ASSOCIATED FRENCH DRAINS, VALVE HOUSES, AND GAS RECLAIMING CART GARAGE
X-747G	NORTHEAST CONTAMINATED MATERIAL STORAGE YARD (SOILS ONLY)
X-747F	MISCELLANEOUS MATERIALS STORAGE YARD
X-747H	NORTHWEST SURPLUS AND SCRAP YARD
	DON MARQUIS SUBSTATION (DRAINAGE COLLECTION PONDS) AND CONSTRUCTION SPOILS
X-326	CONTAINER STORAGE UNIT (L-CAGE)
X-326	PCB STORAGE UNIT
X-330	PCB STORAGE AREA
X-333	PCB STORAGE AREA
X-705B	CONTAMINATED BURNABLES STORAGE LOT
X-741	OIL DRUM STORAGE FACILITY
X-744G	UNRESTRICTED CONTAINER STORAGE UNIT

SUBMISSION DATE: February 21, 2000

UNIT NUMBER	UNIT TITLE
X-744G	RESTRICTED CONTAINER STORAGE UNIT
X-744P X-744N X-744Q	WAREHOUSES AND ASSOCIATED OLD CONSTRUCTION HEADQUARTERS
X-744S X-744T X-744U	WAREHOUSES
X-744RW	RETRIEVABLE WASTE STORAGE AREA
X-744Y	RAD WASTE STORAGE YARD
X-745B	ENRICHMENT PROCESS GAS YARD
X-745C	WEST CYLINDER STORAGE YARD
X-745E	NORTHWEST INTERNATIONAL PROCESS GAS YARD
X-745F	NORTH PROCESS GAS STOCKPILE YARD
X-752	HAZARDOUS WASTE STORAGE FACILITY
XT-847	WAREHOUSE
X-7725 X-7745R BFS FACILITY	RECYCLE & ASSEMBLY BUILDING, RECYCLE & ASSEMBLY STORAGE YARD, AND INITIAL CONSTRUCTION BULK FUEL STORAGE AREA (BULK FUEL STORAGE SWMU)
X-7725	CONTAINER STORAGE UNIT
X-7725	NON-HAZARDOUS WASTE CONTAINER STORAGE UNIT
X-7725R	STORAGE YARD
X-334	TRANSFORMER STORAGE AND CLEANING BUILDING
X-342A X-342B X-342C	FEED VAPORIZATION AND FLUORINE GENERATION BUILDING, FLUORINE STORAGE BUILDING, AND WASTE HF NEUTRALIZATION PIT
X-344 X-344A	URANIUM HEXAFLUORIDE SAMPLING FACILITY AND SETTLING TANK
X-344D	HF NEUTRALIZATION PIT
X-700CT	CHEMICAL AND PETROLEUM STORAGE CONTAINMENT TANKS
X-701C	NEUTRALIZATION PIT
X-701E	NEUTRALIZATION FACILITY

SUBMISSION DATE: February 21, 2000

UNIT NUMBER	UNIT TITLE
X-710	RADIOACTIVE WASTE PIT
X-720	NEUTRALIZATION PIT AND SOILS
X-740	WASTE OIL HANDLING FACILITY
X-750	MOBILE EQUIPMENT MAINTENANCE SHOP, FUEL STATION, AND WASTE OIL TANK
X-751	MOBILE EQUIPMENT GARAGE
X-760	NEUTRALIZATION PIT
	CHEMICAL AND PETROLEUM CONTAINMENT BASINS (EAST OF X-533A) AND EMERGENCY CONTAINMENT TANKS
	GCEP UNDERGROUND STORAGE TANKS
X-230J3	RUNOFF POND
X-230J3	WEST ENVIRONMENTAL SAMPLING BUILDING AND INTERMITTENT CONTAINMENT BASIN
X-230J5	WEST HOLDING POND AND OIL SEPARATION BASIN
X-230J6	NORTHEAST HOLDING POND, MONITORING STATION, AND SECONDARY OIL COLLECTION BASIN
X-230J7	EAST HOLDING POND AND OIL SEPARATION BASIN
X-230K	SOUTH HOLDING POND
X-611A	NORTH, MIDDLE, AND SOUTH LIME SLUDGE LAGOONS
X-611B	LIME SLUDGE LAGOON
X-621	COAL PILE RUNOFF TREATMENT FACILITY
X-701B	HOLDING POND, CONTAINMENT PONDS AND RETENTION SOILS
X-2230M	SOUTHWEST HOLDING POND, WASTE PILE AND X-617 pH ADJUSTMENT UNIT
X-2230N	WEST HOLDING POND NO. 2
X-734 X-734A X-734B	OLD SANITARY LANDFILL, CONSTRUCTION SPOILS LANDFILL, AND OLD CONSTRUCTION SPOILS LANDFILL
X-735	RCRA LANDFILL
X-735 AND X-735A	SANITARY LANDFILL AND LANDFILL UTILITY BUILDING

SUBMISSION DATE: February 21, 2000

UNIT NUMBER	UNIT TITLE
X-749 NORTH	HAZARDOUS WASTE LANDFILL
X-749 SOUTH	SOLID WASTE LANDFILL
X-749A	CLASSIFIED MATERIALS DISPOSAL UNIT
X-749B	PETER KIEWIT LANDFILL
	BIG RUN CREEK
	EAST DRAINAGE DITCH
	LITTLE BEAVER CREEK
	NORTH DRAINAGE DITCH, X-230L NORTH HOLDING POND, AND UNNAMED CONSTRUCTION FILL AREA
	NORTHEAST DRAINAGE DITCH
	WEST DRAINAGE DITCH
	5-UNIT GROUNDWATER PLUME
	7-UNIT GROUNDWATER AREA
	X-701B AREA GROUNDWATER AREA
	X-740 WASTE OIL HANDLING FACILITY (GROUNDWATER ONLY)
	X-749/X-120 GROUNDWATER PLUME

Table 2
X-326 Containment Capacity Calculations

Area Designation	1	2	3	4	5	West L	East L
Total square feet	968	3082	1400	3082	2552	11,876	8928
Available square feet	950	3058	1388	3058	2528	11,812	8644

Maximum gallons: 133,540
Total square feet: 31,888

SUBMISSION DATE: February 21, 2000

Table 3
Maximum Number of Containers, X-326 Unit

Container Volume	Maximum Number
85 gallon	1,570
55 gallon	2,400
30 gallon	2,450
20 gallon	2,450
5 gallon	2,450
2.47 gallon (polybottle)	3,000
1.7 gallon	3,000

Table 4
X-326 Sampling Parameter List

Inorganics	**Organics**
arsenic	chloromethane
barium	bromomethane
cadmium	vinyl chloride
chromium	chloroethane
lead	methylene chloride
mercury	acetone
selenium	carbon disulfide
silver	1,1-dichloroethane
	1,1-dichloroethene
cyanide	1,2-dichloroethene (total)
	chloroform
	1,2-dichloroethane
	2-butanone
	1,1,1-trichloroethane
	carbon tetrachloride
	vinyl acetate
	bromodichloromethane
	1,2-dichloropropane
	cis-1,3-dichloropropene
	trichloroethene
	dibromochloromethane
	1,1,2-trichloroethane
	benzene
	trans-1,3-dichloropropene
	bromoform
	Freon 113
	4-methyl-2-pentanone
	2-hexanone
	tetrachloroethene
	toluene
	1,1,2,2-tetrachloroethane
	chlorobenzene
	ethyl benzene
	styrene
	xylenes (total)

SUBMISSION DATE: February 21, 2000

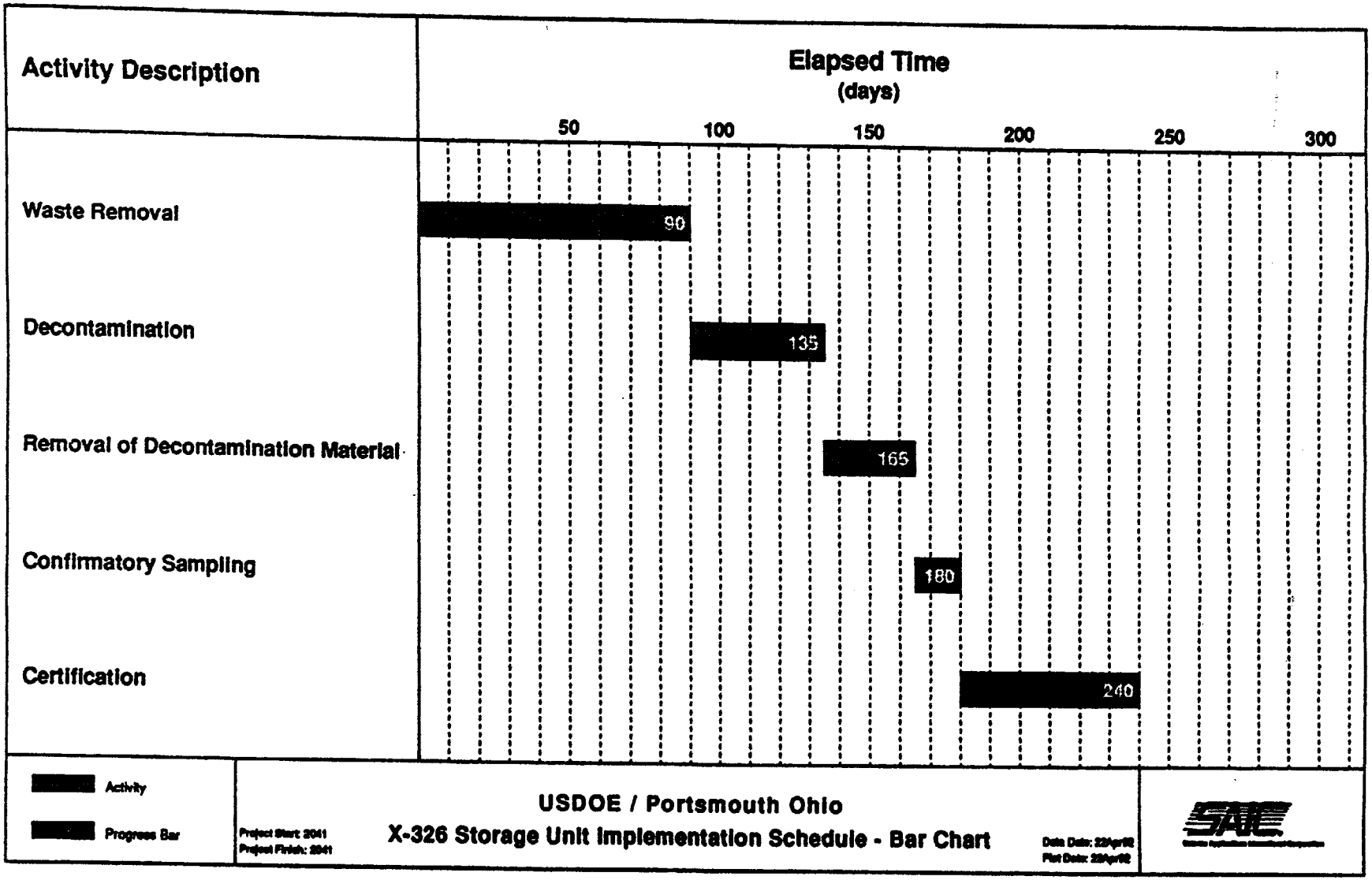

Table 5. Implementation Schedule for Closure of the X-326 Storage Unit

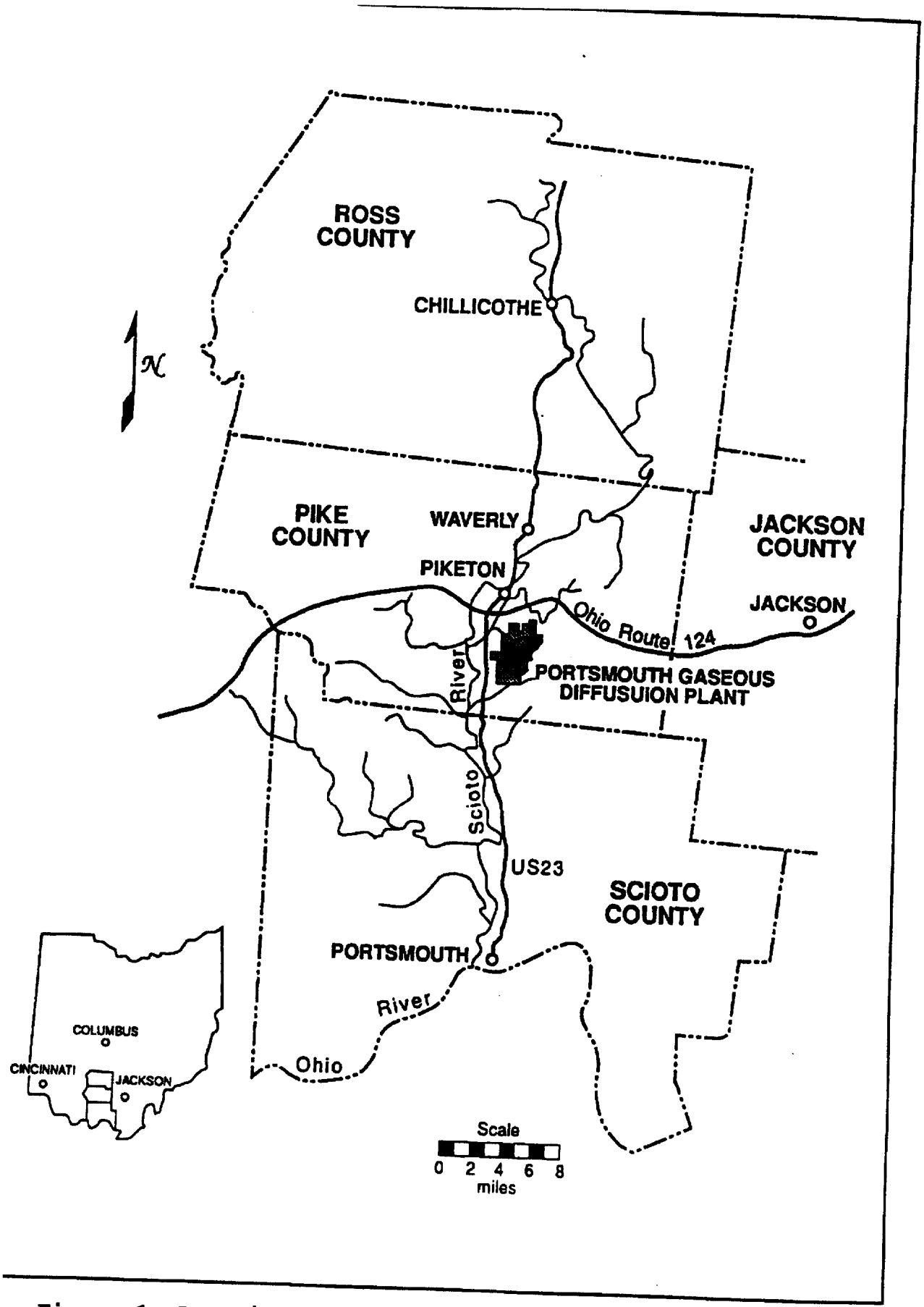

Figure 1. Location of the Portsmouth Gaseous Diffusion Plant

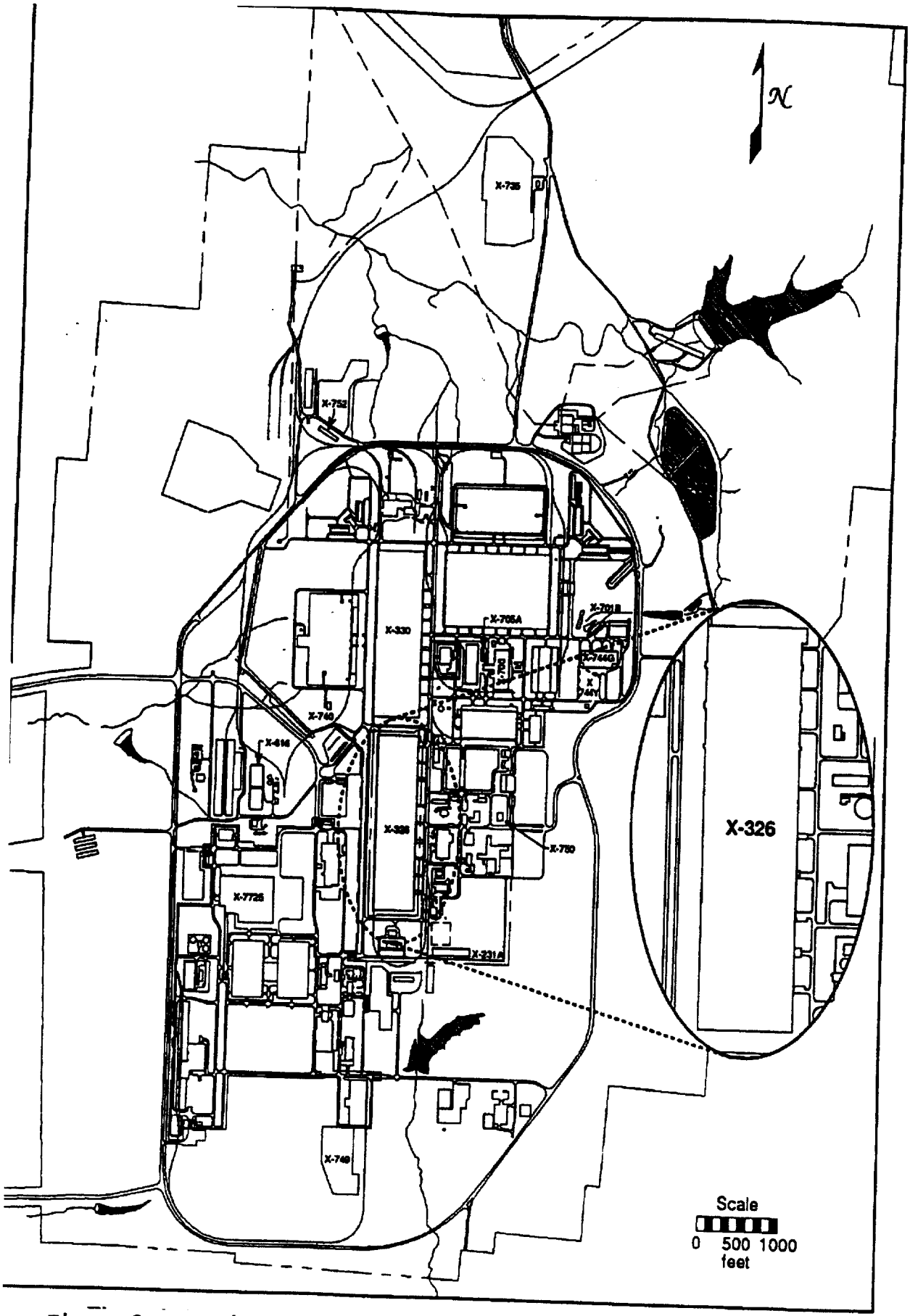

Figure 2. Location of X-326 at the Portsmouth Gaseous Diffusion Plant

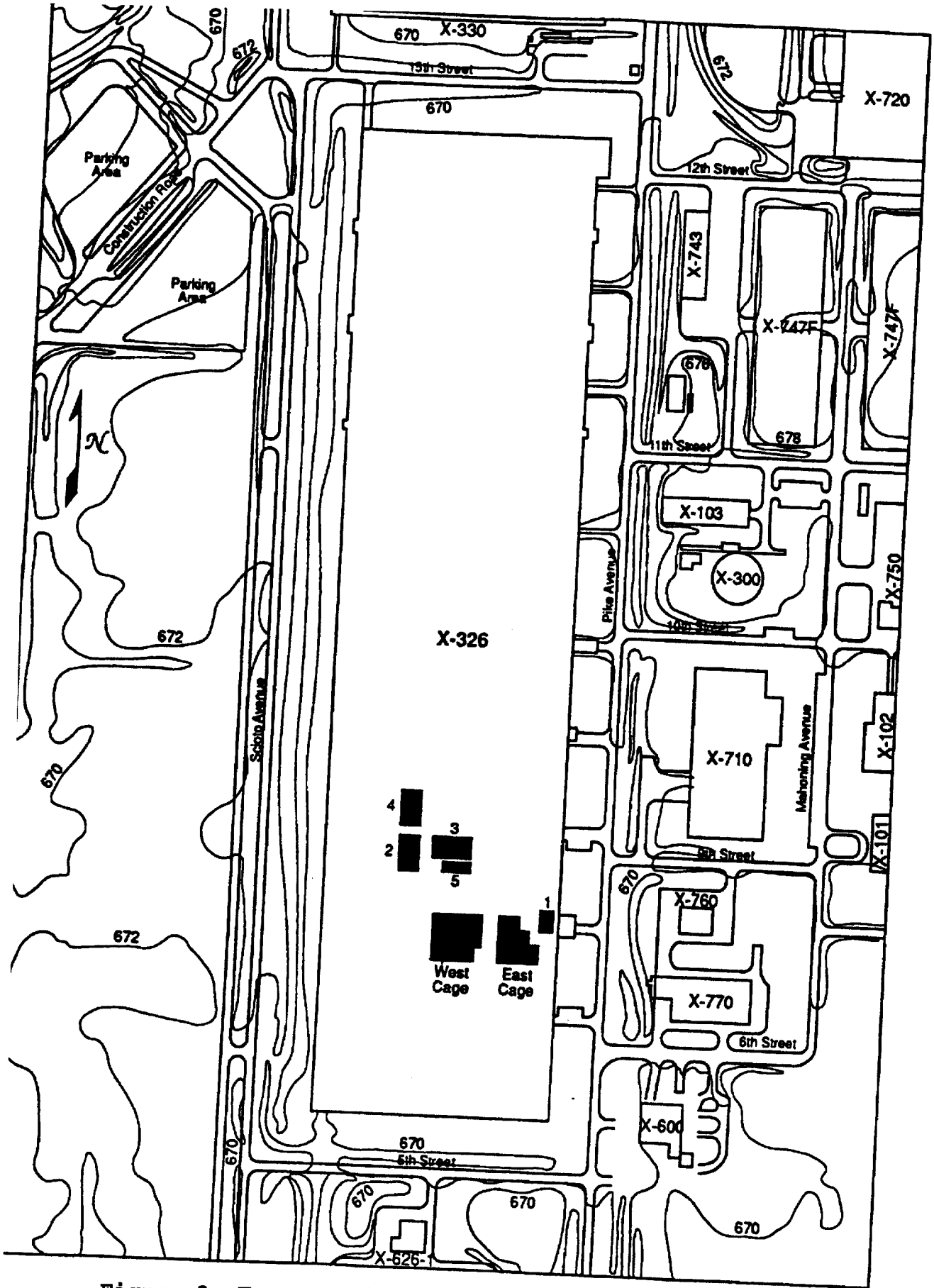

Figure 3. Topographic Details of the X-326 Facility

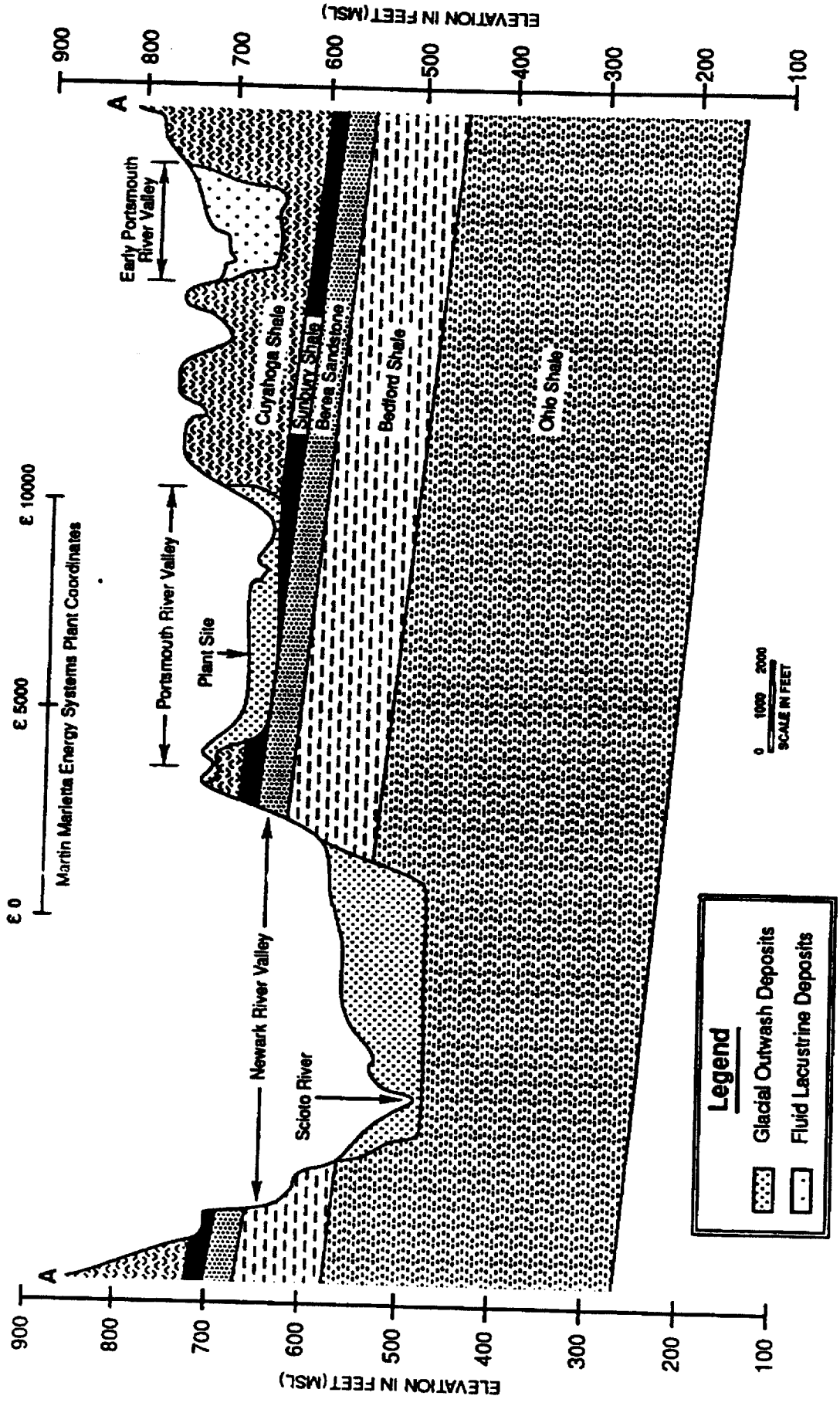

Figure 4. Regional Structural Cross Section through PORTS

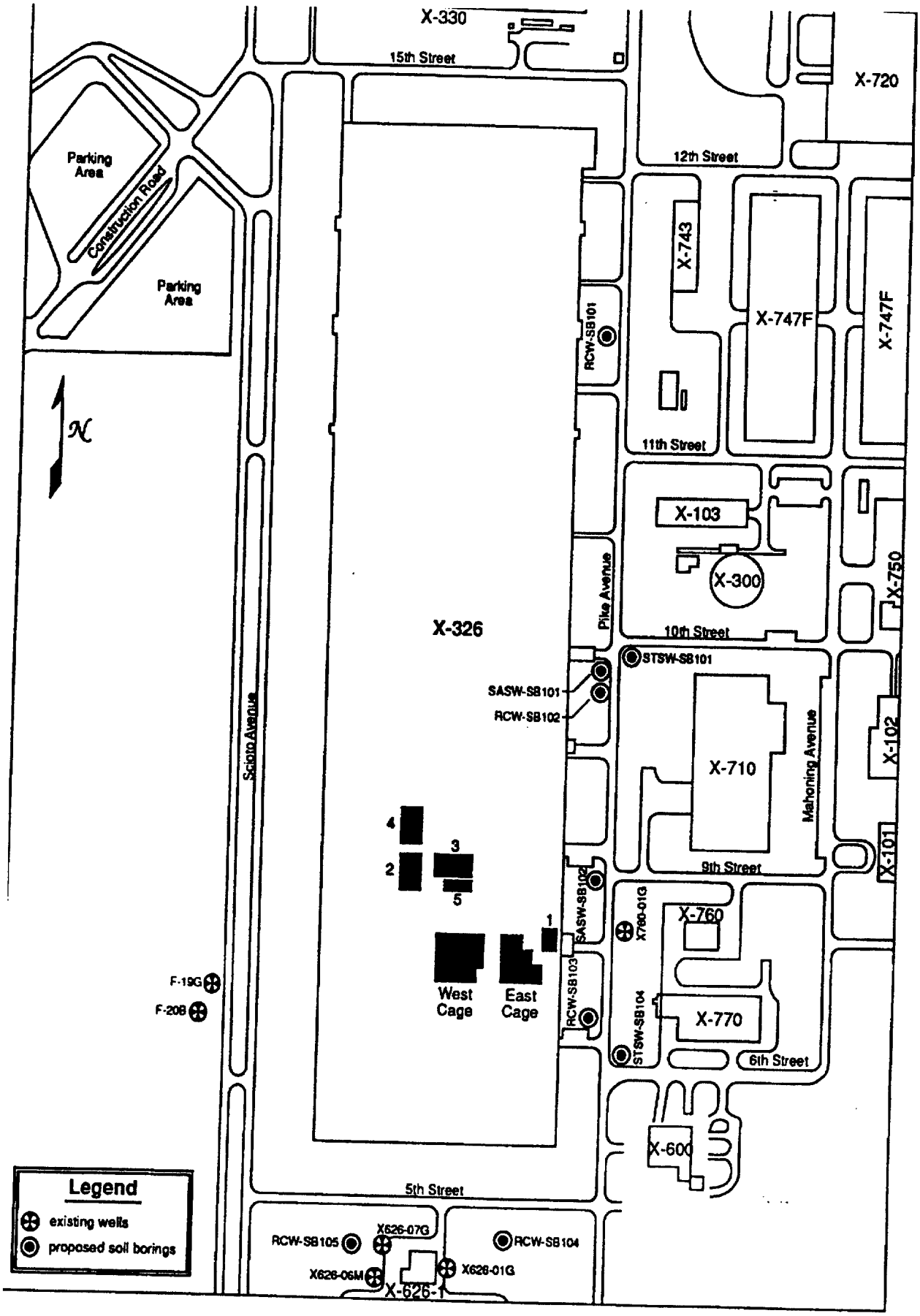

Figure 5. Existing and Proposed Wells and Soil Borings Near X-326

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APPENDIX A

Quadrant III RFI Description of Current Conditions
Title Page and Table of Contents

SUBMISSION DATE: February 21, 2000

QUADRANT III

DESCRIPTION OF CURRENT CONDITIONS

For the

PORTSMOUTH GASEOUS DIFFUSION PLANT

PIKETON, OHIO

Operated by

MARTIN MARIETTA ENERGY SYSTEMS

For

UNITED STATES DOE

UNDER CONTRACT # DE-AC05-760R00001

Prepared By

GERAGHTY & MILLER, INC.
ENVIRONMENTAL SERVICES

6209 Riverside Dr., Suite One South
Dublin, OH 43017

May 1990

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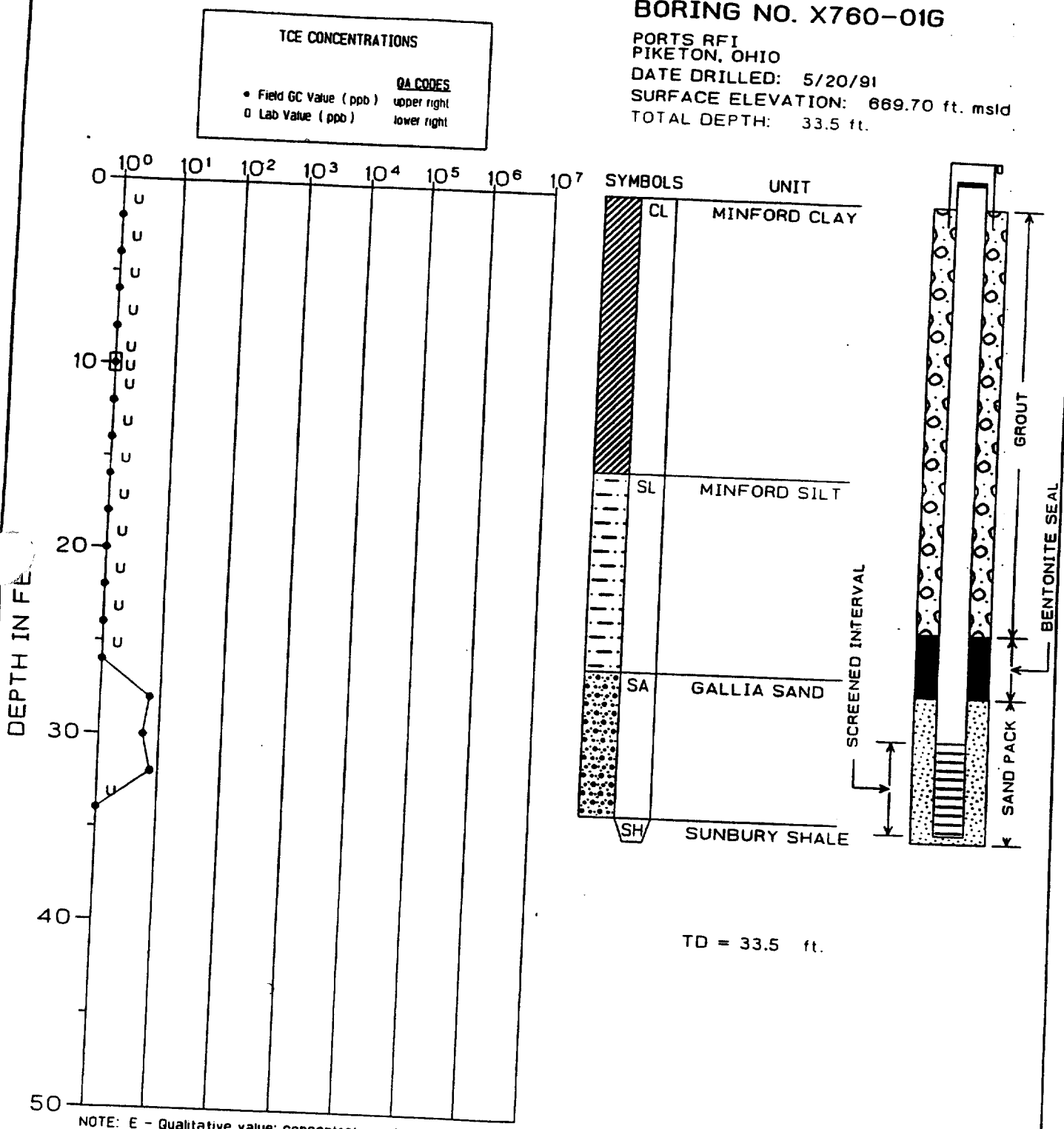
APPENDIX B

Stratigraphic and Construction Logs of Wells and Soil Borings in the Vicinity of the X-326 Storage Unit

RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

BORING NO. X760-01G

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/20/91
SURFACE ELEVATION: 669.70 ft. msld
TOTAL DEPTH: 33.5 ft.



TD = 33.5 ft.

NOTE: E - Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.
J - Qualitative value; not all quality control criteria met.
M - Qualitative value; matrix problems encountered.
U - Analyte not detected.
Q - Questionable peak
* - Unknown peaks

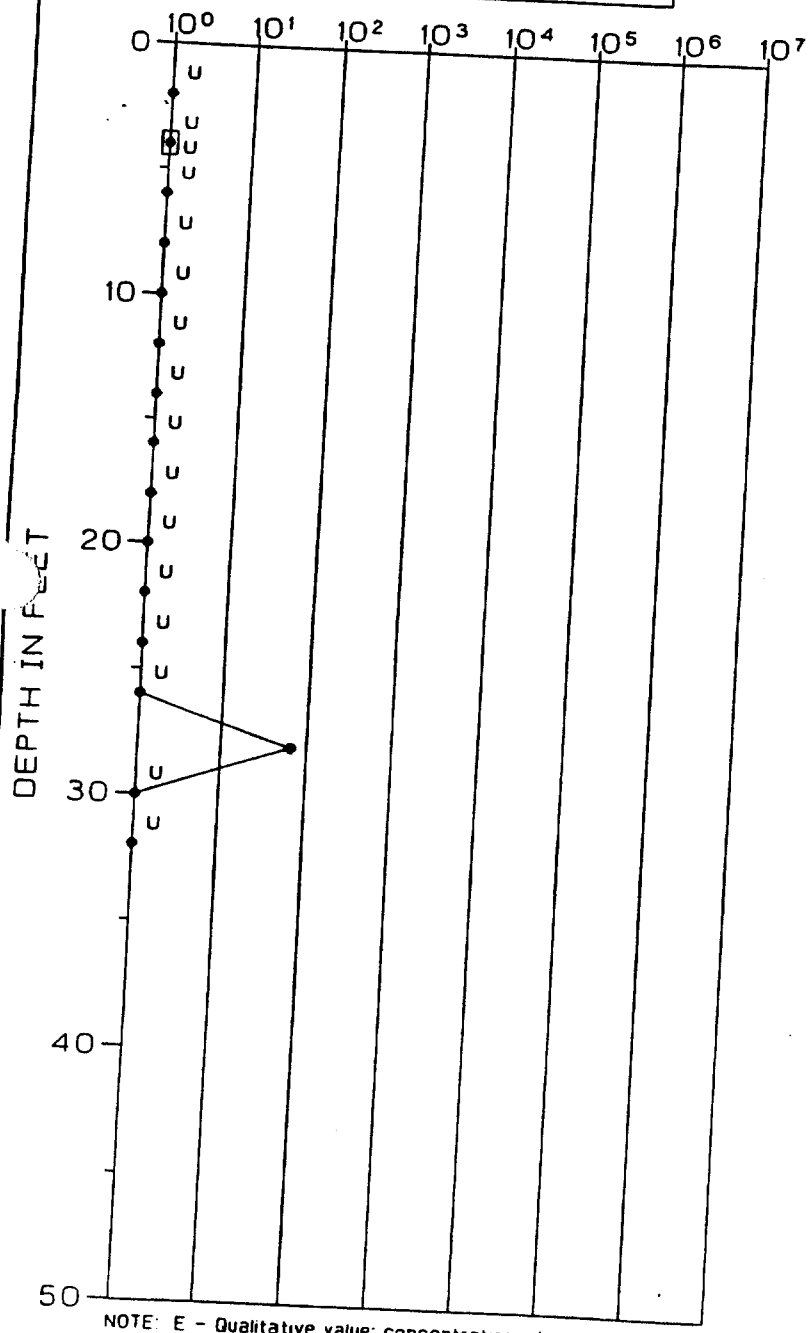
WELL LOG

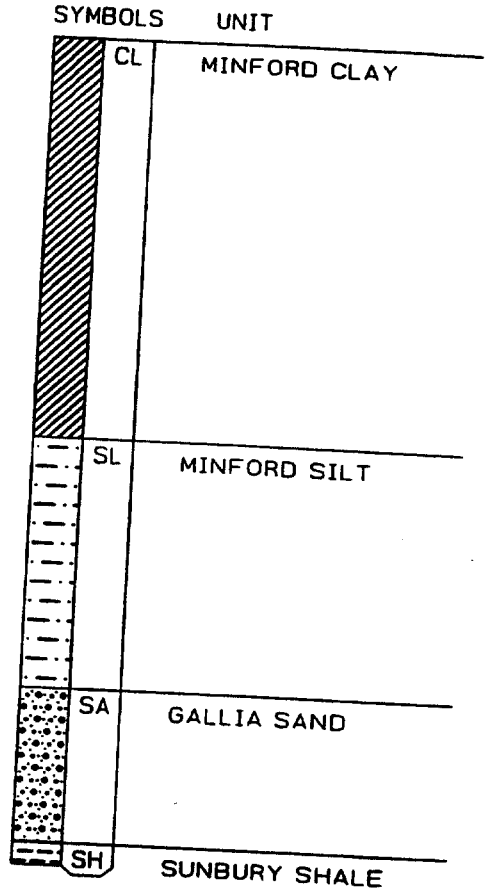
Geraghty & Miller Inc.
Environmental Services

RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

BORING NO. SASW-SB102

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/7/91
SURFACE ELEVATION: 670.90 ft. msld
TOTAL DEPTH: 33.0 ft.





TD = 33.0 ft.

NOTE: E - Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.
J - Qualitative value; not all quality control criteria met
M - Qualitative value; matrix problems encountered
U - Analyte not detected
Q - Questionable peak
* - Unknown peaks

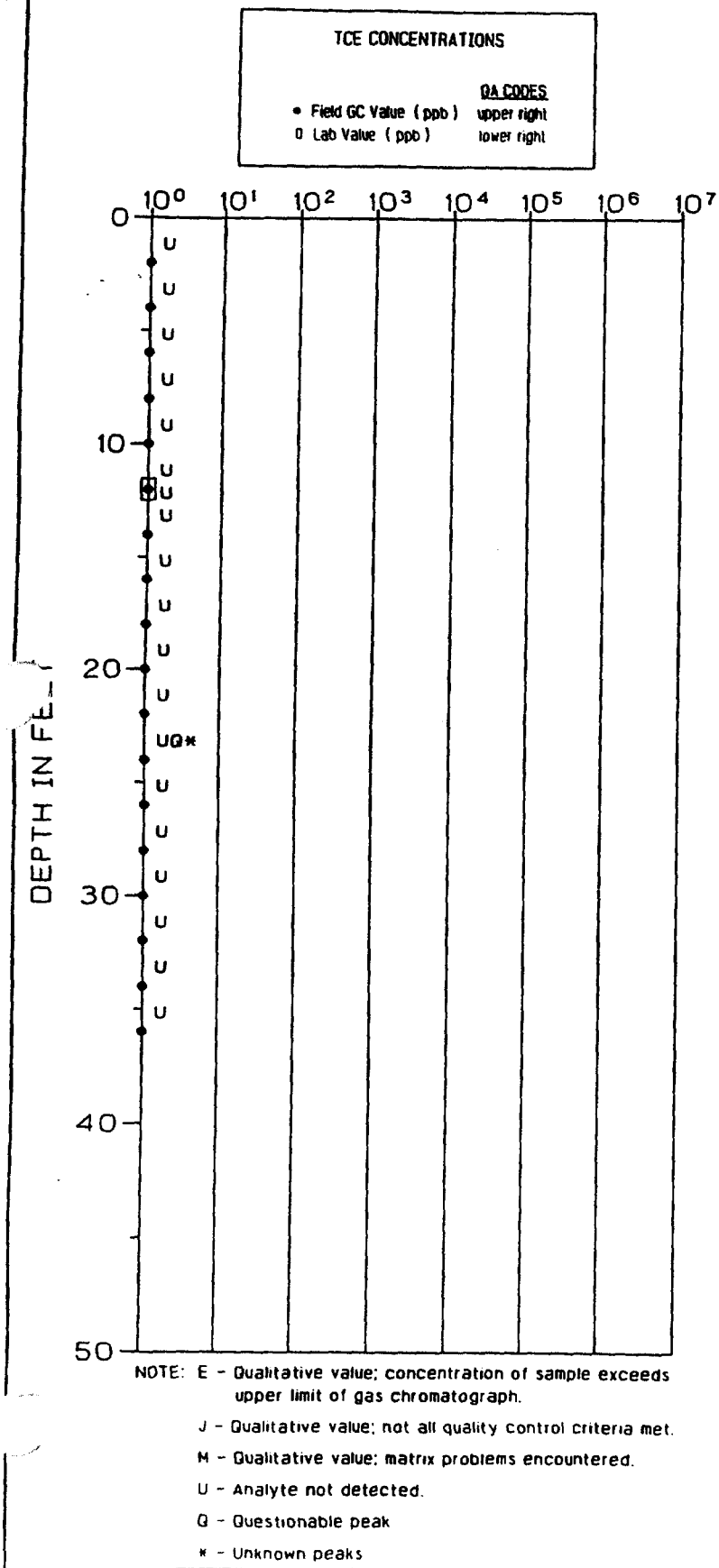
BORING LOG

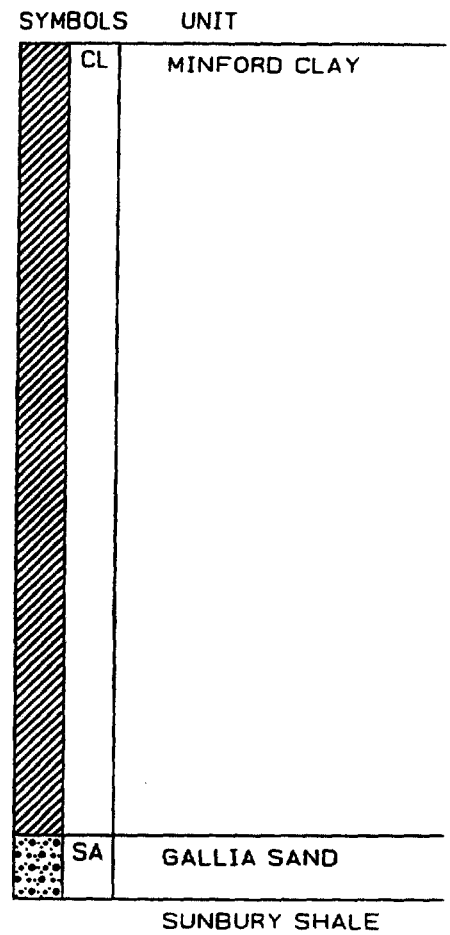
Geraghty & Miller Inc.
Environmental Services

RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

BORING NO. RCW-SB101

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/8/91
SURFACE ELEVATION: 672.20 ft. msld
TOTAL DEPTH: 34.1 ft.





TD = 34.1 ft.

NOTE: E - Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.
J - Qualitative value; not all quality control criteria met.
M - Qualitative value; matrix problems encountered.
U - Analyte not detected.
Q - Questionable peak
* - Unknown peaks

BORING LOG

Geraghty & Miller Inc.
Environmental Services

RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

BORING NO. STSW-101G

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 6/27/91
SURFACE ELEVATION: 657.70 ft. msld
TOTAL DEPTH: 19.6 ft.

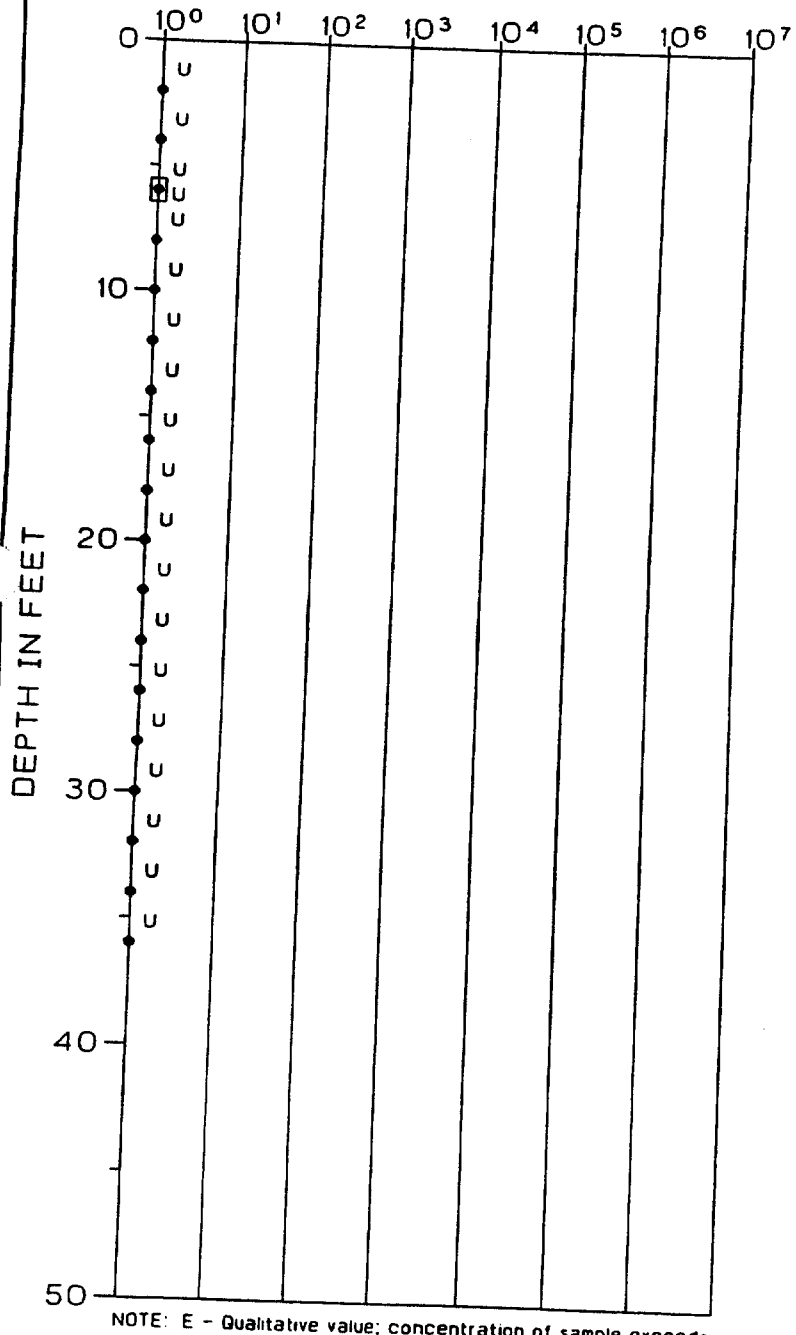
NOTE: E - Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.
J - Qualitative value; not all quality control criteria met
M - Qualitative value; matrix problems encountered
U - Analyte not detected
Q - Questionable peak
* - Unknown peaks

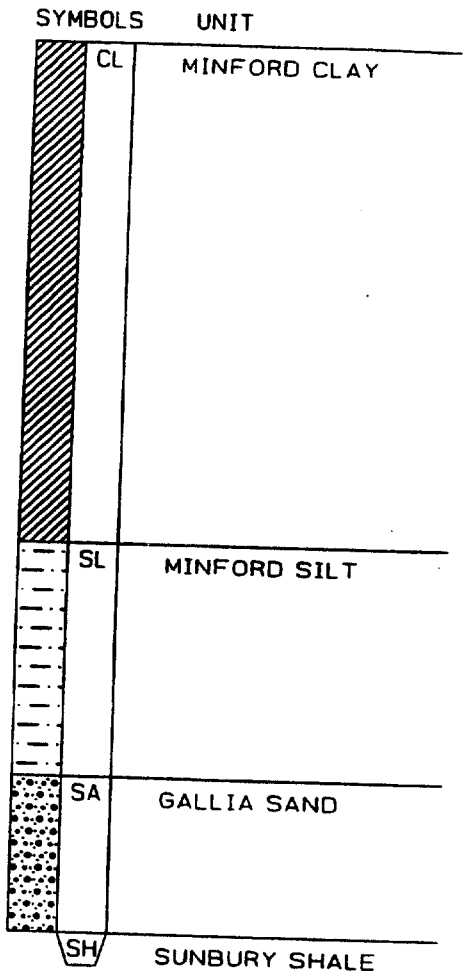
WELL LOG
Geraghty & Miller Inc.
Environmental Services

RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

BORING NO. SASW-SB101

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/21/91
SURFACE ELEVATION: 671.50 ft. msld
TOTAL DEPTH: 35.5 ft.





TD = 35.5 ft.

NOTE: E – Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.
J – Qualitative value; not all quality control criteria met.
M – Qualitative value; matrix problems encountered.
U – Analyte not detected.
Q – Questionable peak
* – Unknown peaks

BORING LOG

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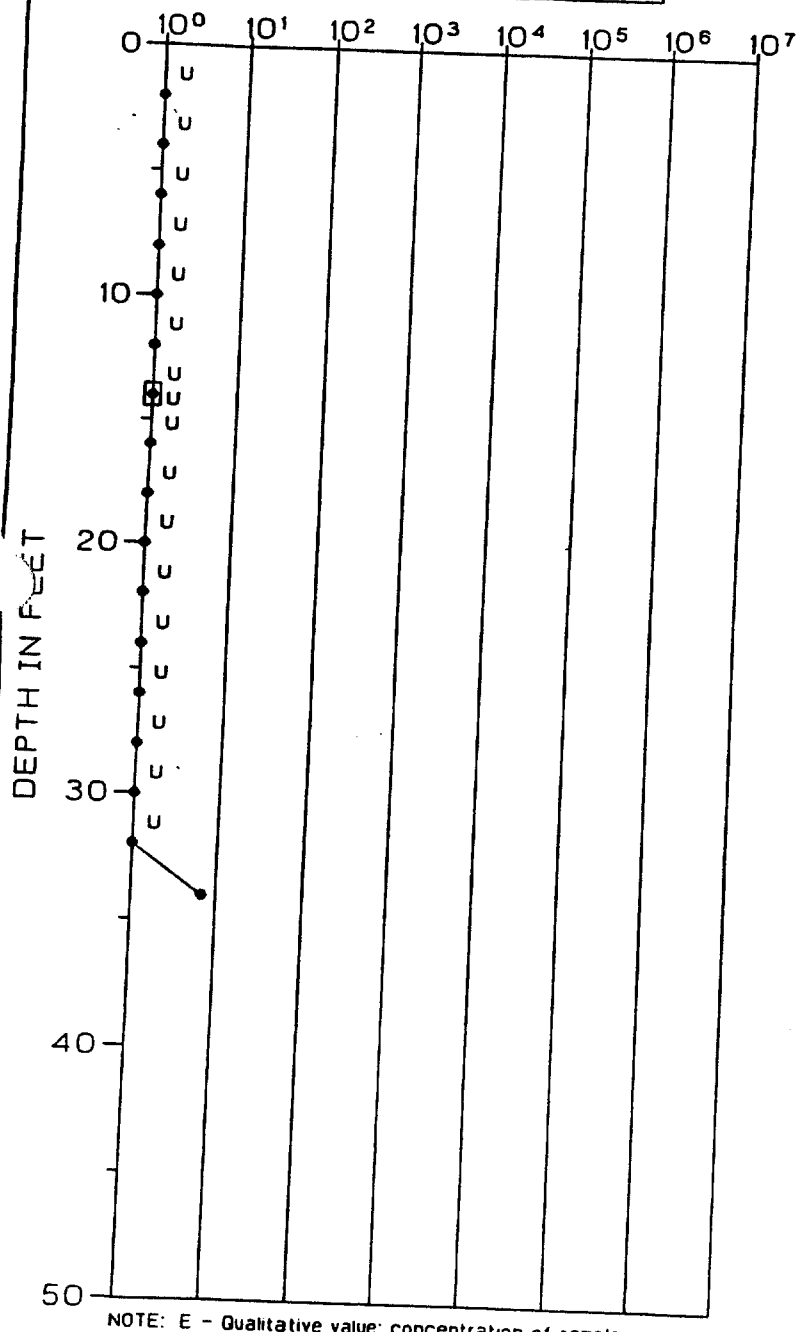
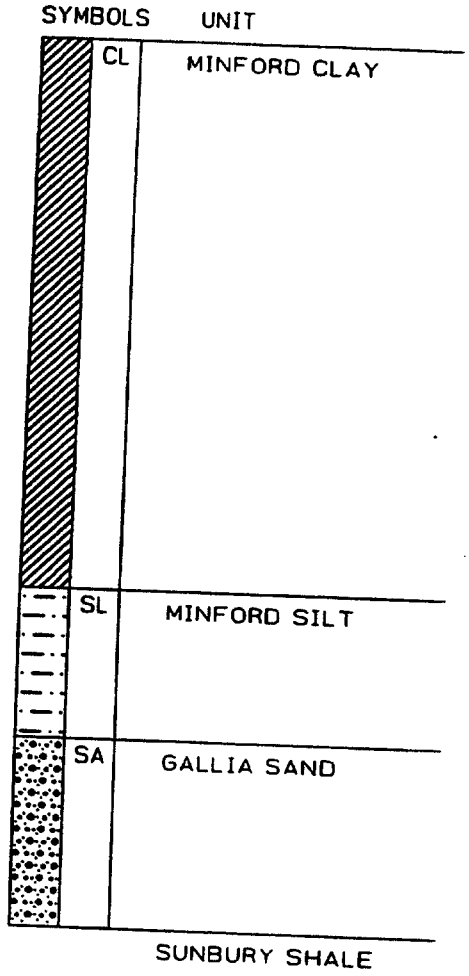
Environmental Services

RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

BORING NO. RCW-SB102

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/23/91
SURFACE ELEVATION: 670.70 ft. msld
TOTAL DEPTH: 35.5 ft.





TD = 35.5 ft.

NOTE: E – Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.
J – Qualitative value; not all quality control criteria met.
M – Qualitative value; matrix problems encountered.
U – Analyte not detected.
Q – Questionable peak
* – Unknown peaks

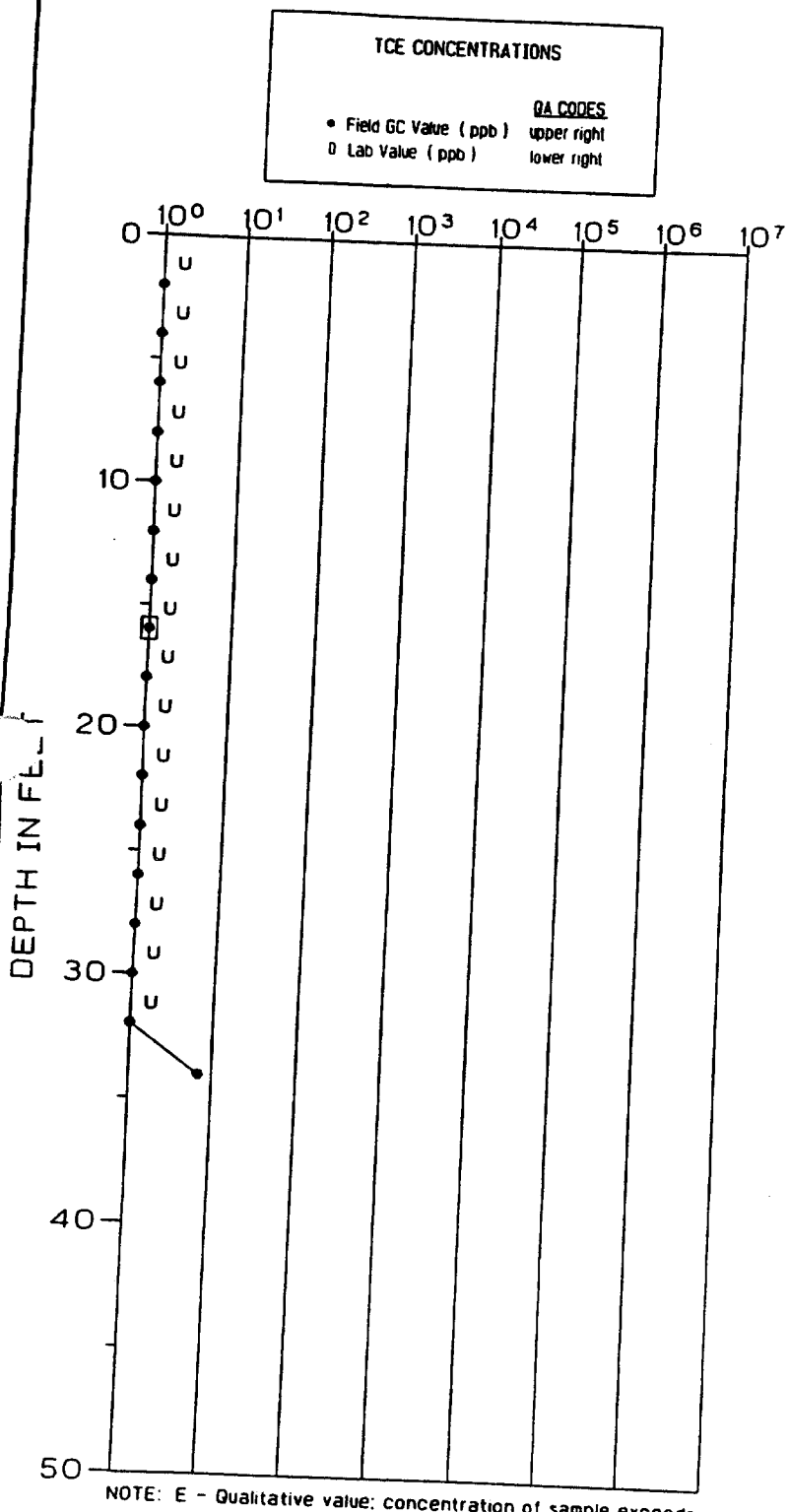
BORING LOG

Geraghty & Miller Inc.
Environmental Services

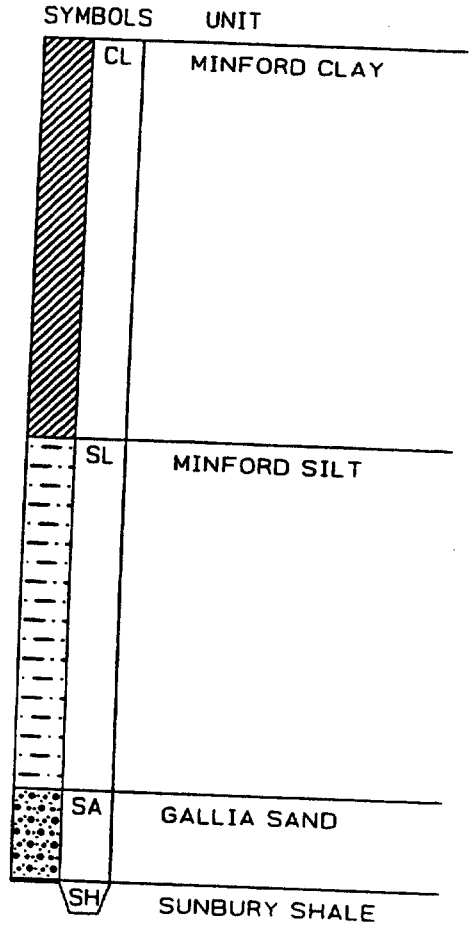
RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

BORING NO. RCW-SB103

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/22/91
SURFACE ELEVATION: 670.70 ft. msld
TOTAL DEPTH: 33.7 ft.



NOTE: E - Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.
J - Qualitative value; not all quality control criteria met.
M - Qualitative value; matrix problems encountered.
U - Analyte not detected.
Q - Questionable peak
* - Unknown peaks



TD = 33.7 ft.

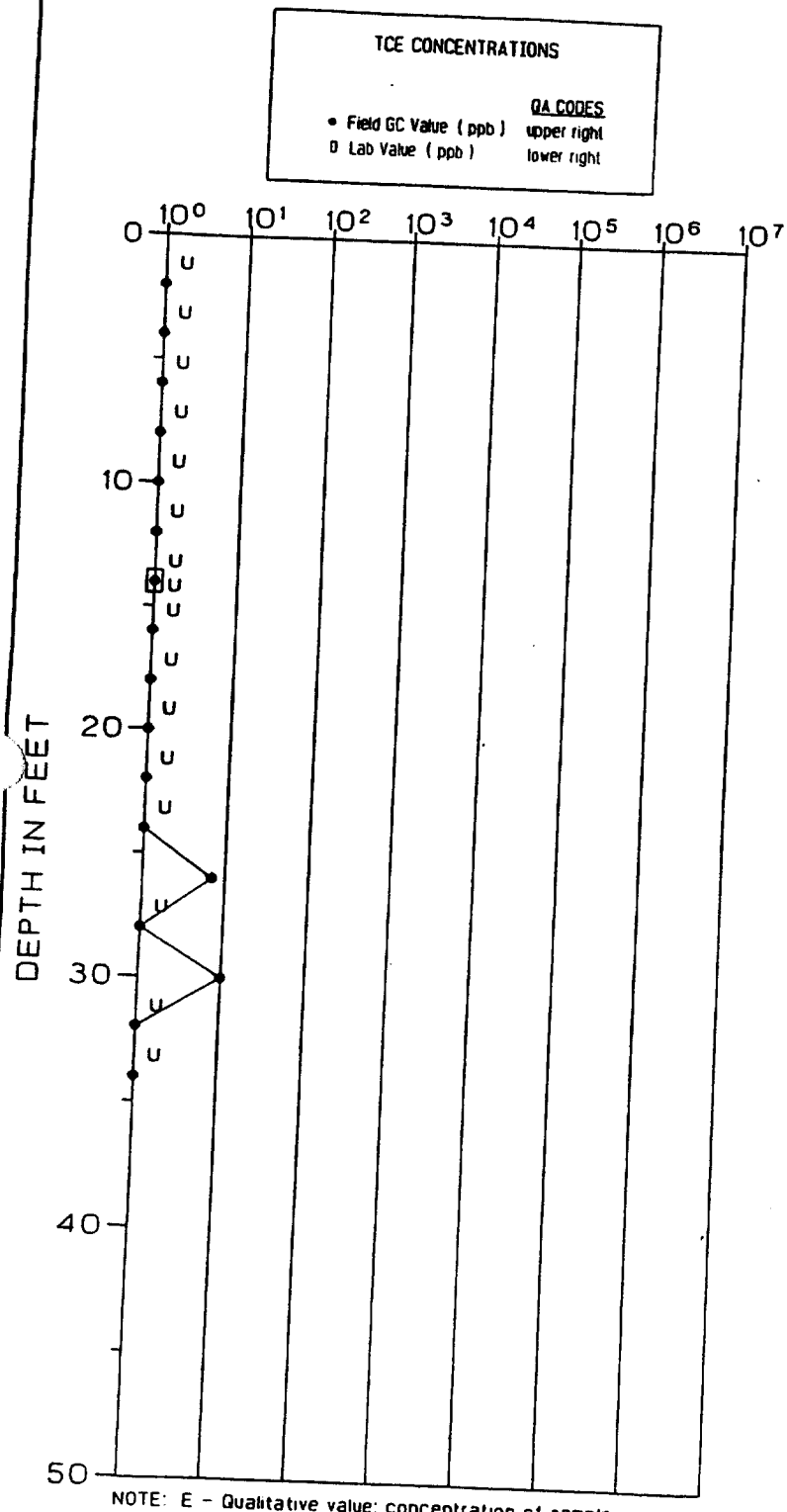
BORING LOG

Geraghty & Miller Inc.
Environmental Services

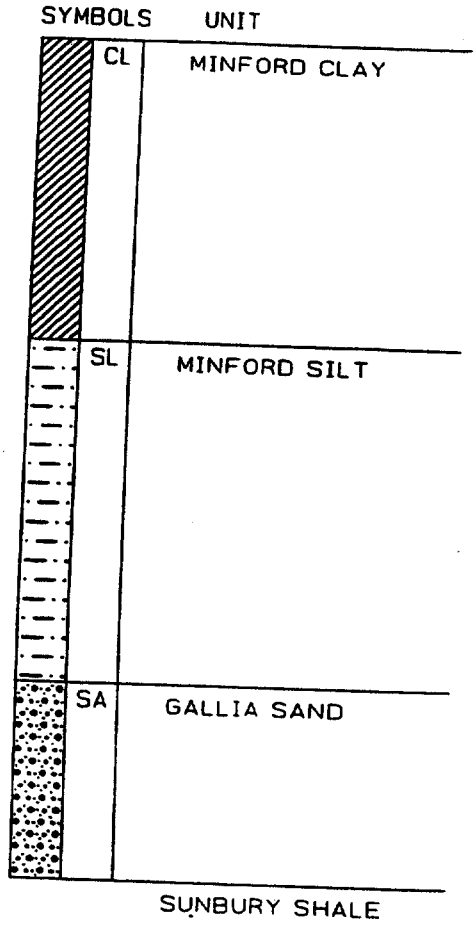
RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

BORING NO. STSW-SB104

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/3/91
SURFACE ELEVATION: 669.60 ft. msld
TOTAL DEPTH: 33.5 ft.



NOTE: E – Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.
J – Qualitative value; not all quality control criteria met
M – Qualitative value; matrix problems encountered.
U – Analyte not detected
Q – Questionable peak
* – Unknown peaks



TD = 33.5 ft.

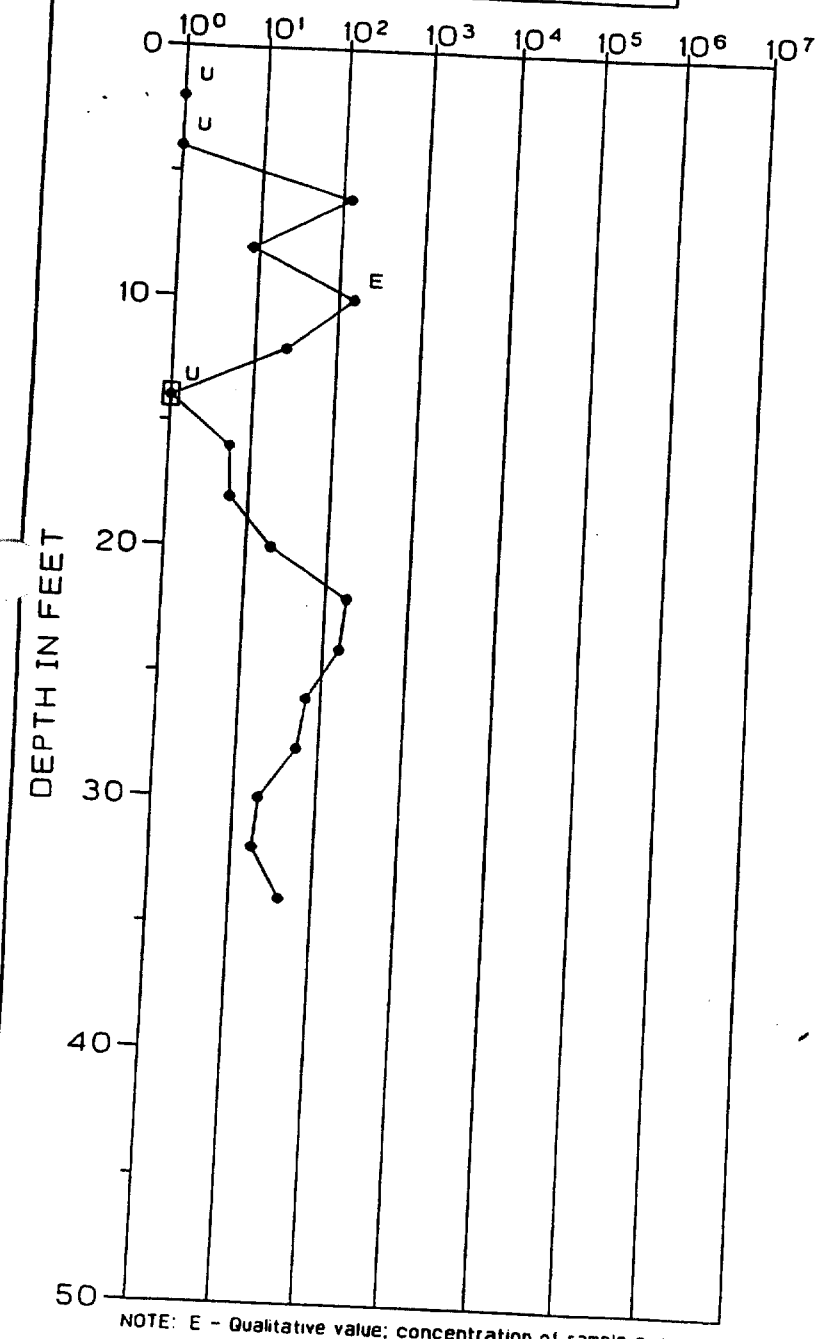
BORING LOG

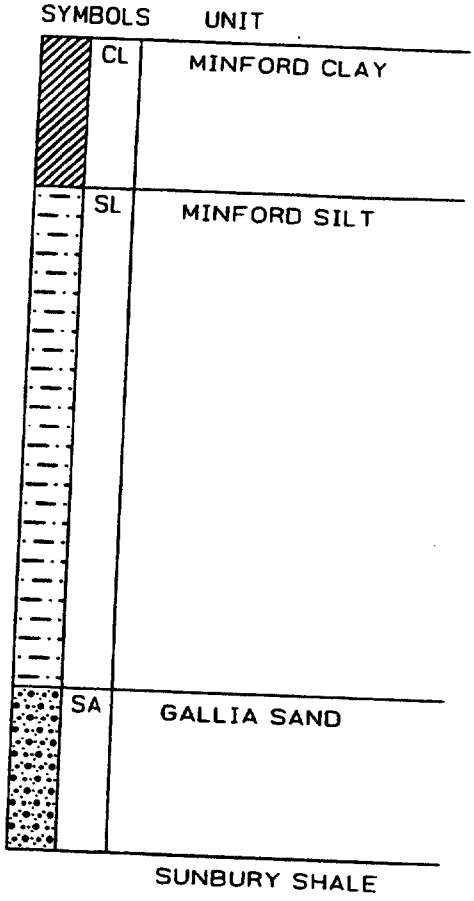
Geraghty & Miller Inc.
Environmental Services

RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

BORING NO. RCW-SB104

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/22/91
SURFACE ELEVATION: 670.50 ft. msld
TOTAL DEPTH: 32.5 ft.





TD = 32.5 ft.

NOTE: E - Qualitative value: concentration of sample exceeds upper limit of gas chromatograph.
J - Qualitative value; not all quality control criteria met.
M - Qualitative value; matrix problems encountered.
U - Analyte not detected.
Q - Questionable peak
* - Unknown peaks

BORING LOG

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Environmental Services

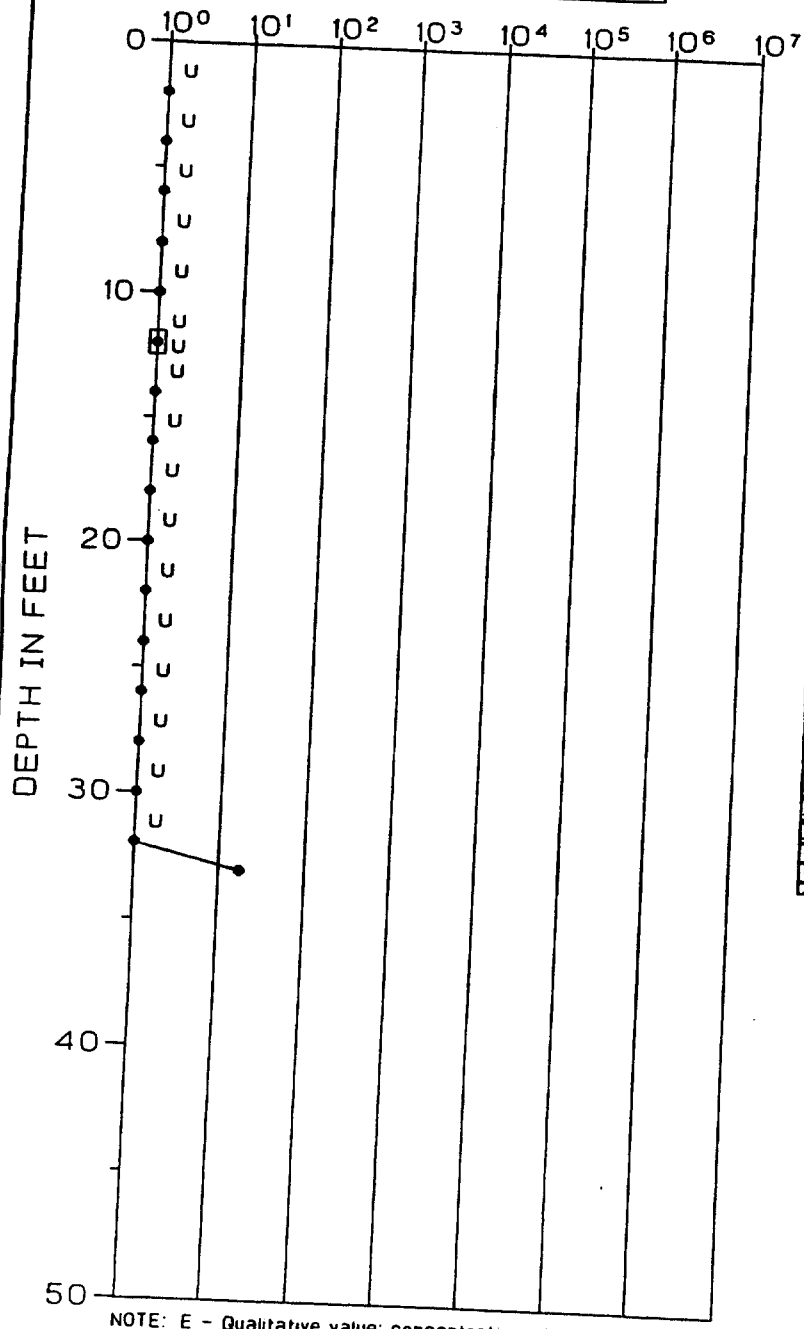
RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

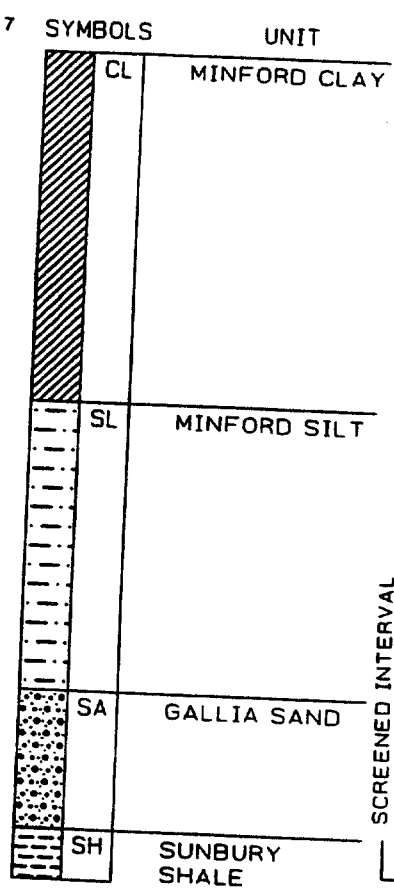
TCE CONCENTRATIONS

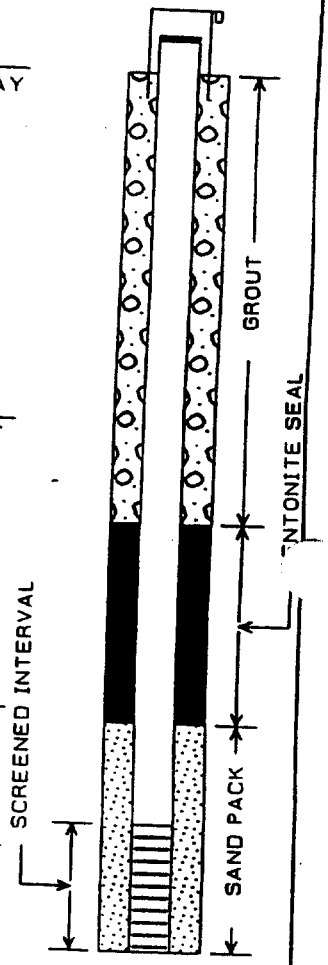
	QA CODES
• Field GC Value (ppb)	upper right
0 Lab Value (ppb)	lower right

BORING NO. X626-01G

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 4/18/91
SURFACE ELEVATION: 669.70 ft. msld
TOTAL DEPTH: 33.0 ft.







TD = 33.0 ft.

NOTE: E - Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.
J - Qualitative value; not all quality control criteria met.
M - Qualitative value; matrix problems encountered.
U - Analyte not detected
Q - Questionable peak
x - Unknown peaks

WELL LOG

Geraghty & Miller Inc.
Environmental Services

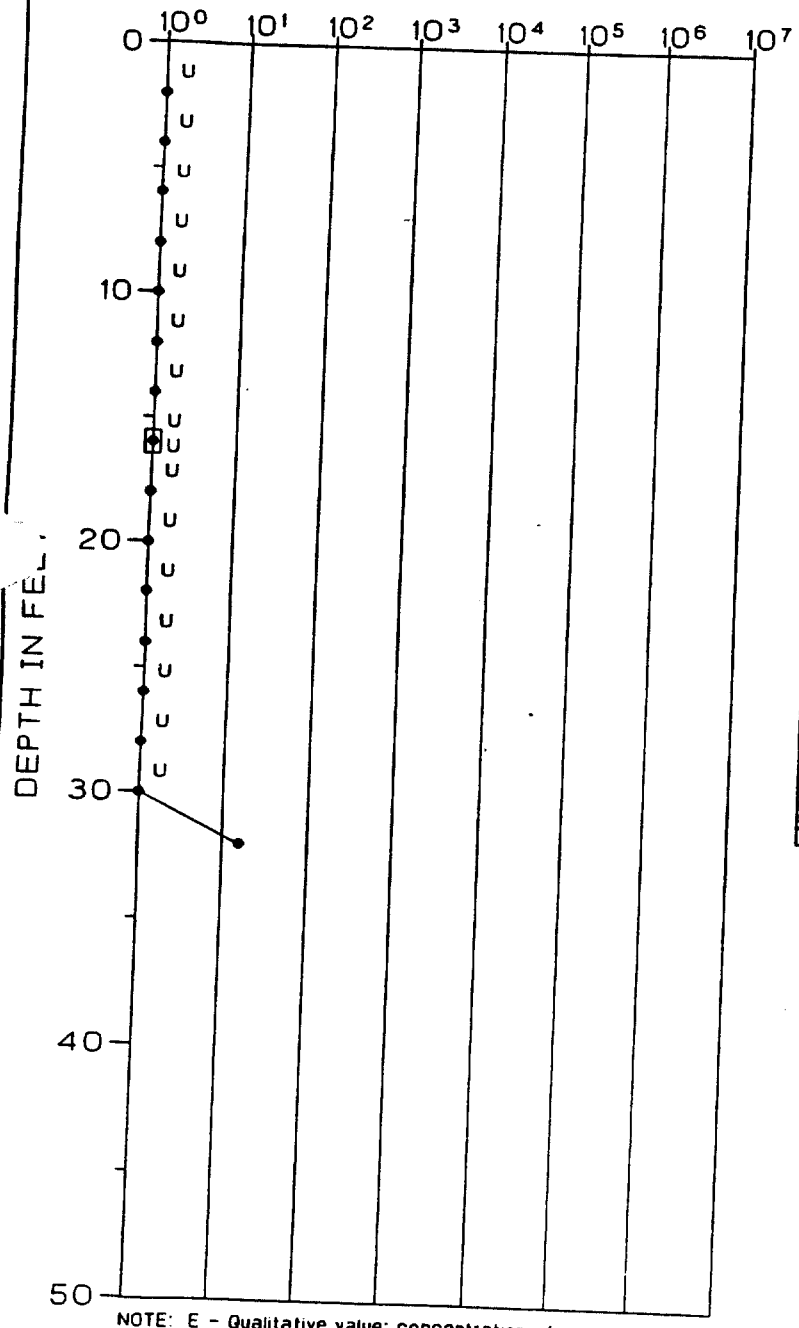
RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

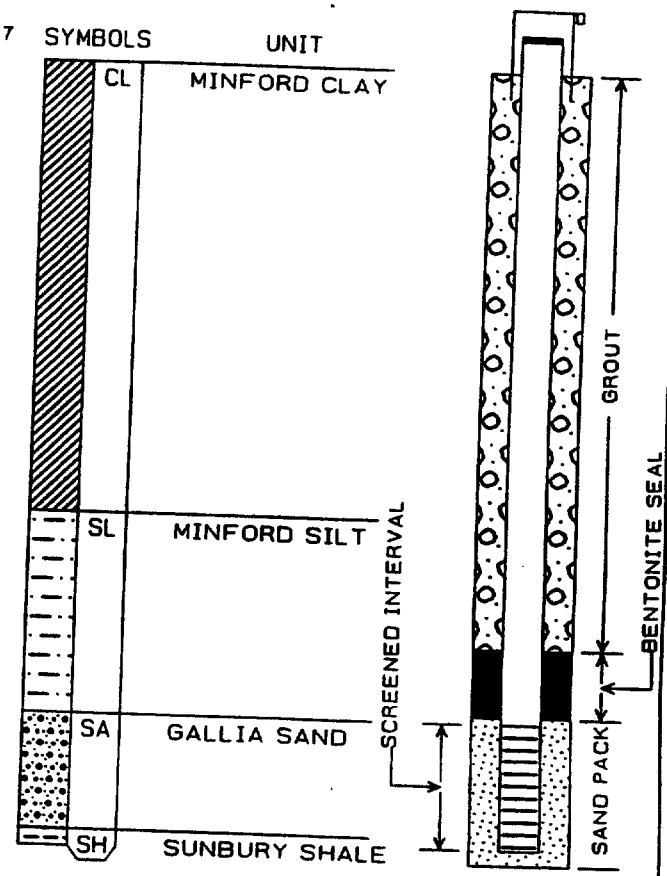
BORING NO. X626-07G

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 4/16/91
SURFACE ELEVATION: 669.70 ft. msld
TOTAL DEPTH: 31.3 ft.

TCE CONCENTRATIONS

	QA CODES
• Field GC Value (ppb)	upper right
0 Lab Value (ppb)	lower right





TD = 31.3 ft.

NOTE: E - Qualitative value; concentration of sample exceeds upper limit of gas chromatograph
J - Qualitative value; not all quality control criteria met.
M - Qualitative value; matrix problems encountered.
U - Analyte not detected
Q - Questionable peak
* - Unknown peaks

WELL LOG

Geraghty & Miller Inc.
Environmental Services

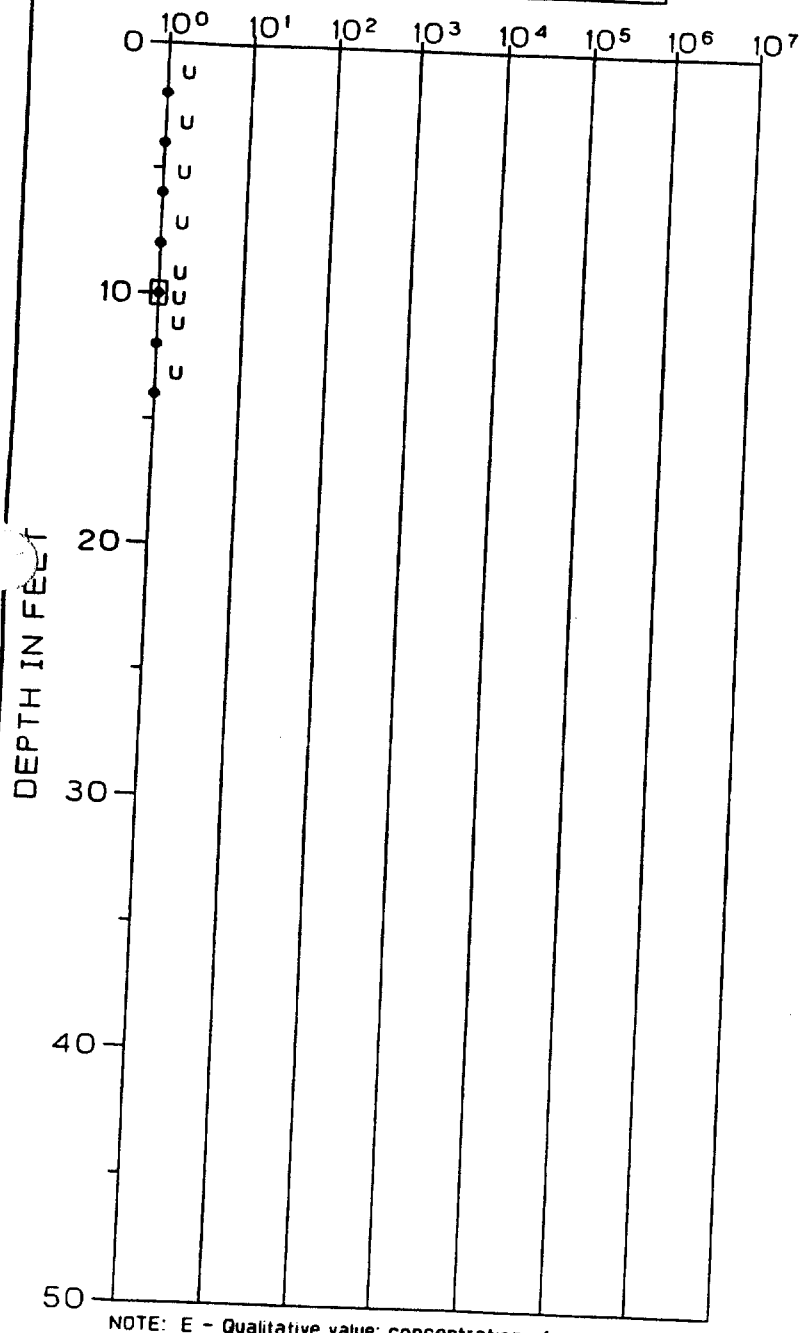
RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

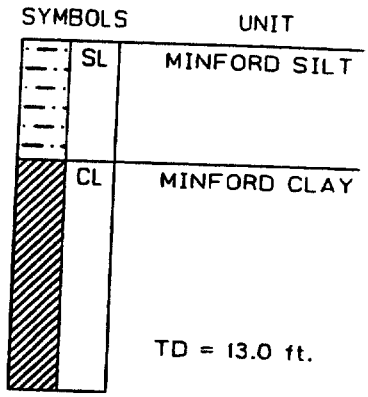
TCE CONCENTRATIONS

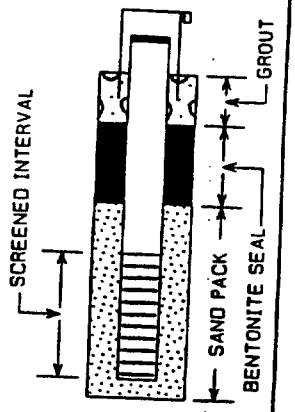
	QA CODES
• Field GC Value (ppb)	upper right
□ Lab Value (ppb)	lower right

BORING NO. X626-06M

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 5/2/91
SURFACE ELEVATION: 670.10 ft. msld
TOTAL DEPTH: 13.0 ft.







NOTE: E - Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.
J - Qualitative value; not all quality control criteria met.
M - Qualitative value; matrix problems encountered.
U - Analyte not detected
Q - Questionable peak
* - Unknown peaks

WELL LOG

Geraghty & Miller Inc.
Environmental Services

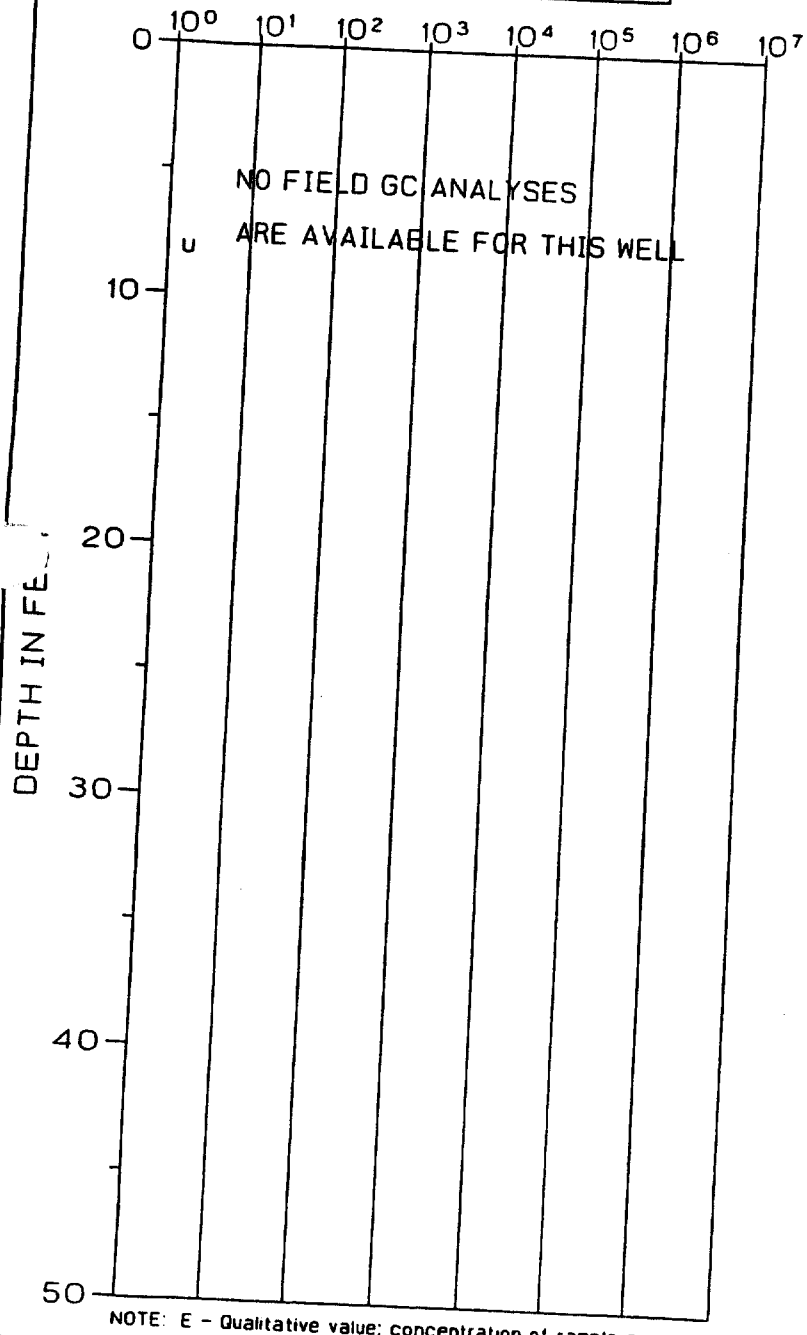
RCRA FACILITY INVESTIGATION
Log TCE Concentration vs. Depth

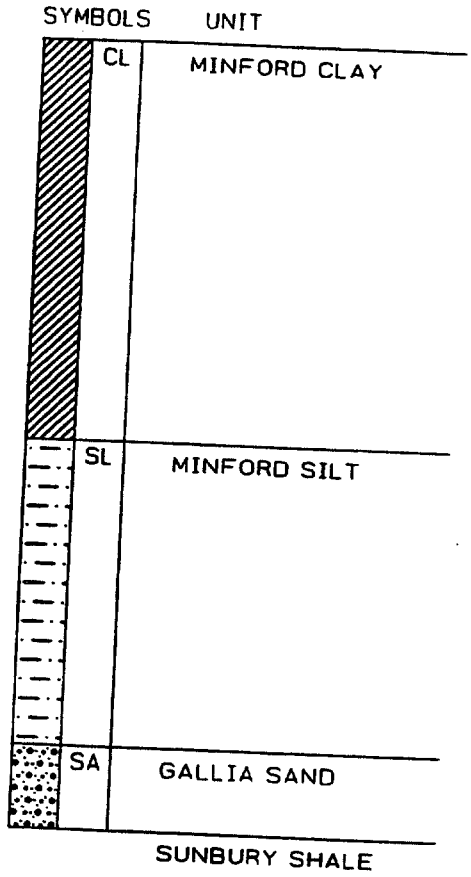
BORING NO. RCW-SB105

PORTS RFI
PIKETON, OHIO
DATE DRILLED: 4/29/91
SURFACE ELEVATION: 670.10 ft. msld
TOTAL DEPTH: 31.5 ft.

TCE CONCENTRATIONS

	QA CODES
• Field GC Value (ppb)	upper right
□ Lab Value (ppb)	lower right





TD = 31.5 ft.

NOTE: E – Qualitative value; concentration of sample exceeds upper limit of gas chromatograph.
J – Qualitative value; not all quality control criteria met.
M – Qualitative value; matrix problems encountered.
U – Analyte not detected.
Q – Questionable peak
* – Unknown peaks

BORING LOG

Geraghty & Miller Inc.
Environmental Services

WELL F-19

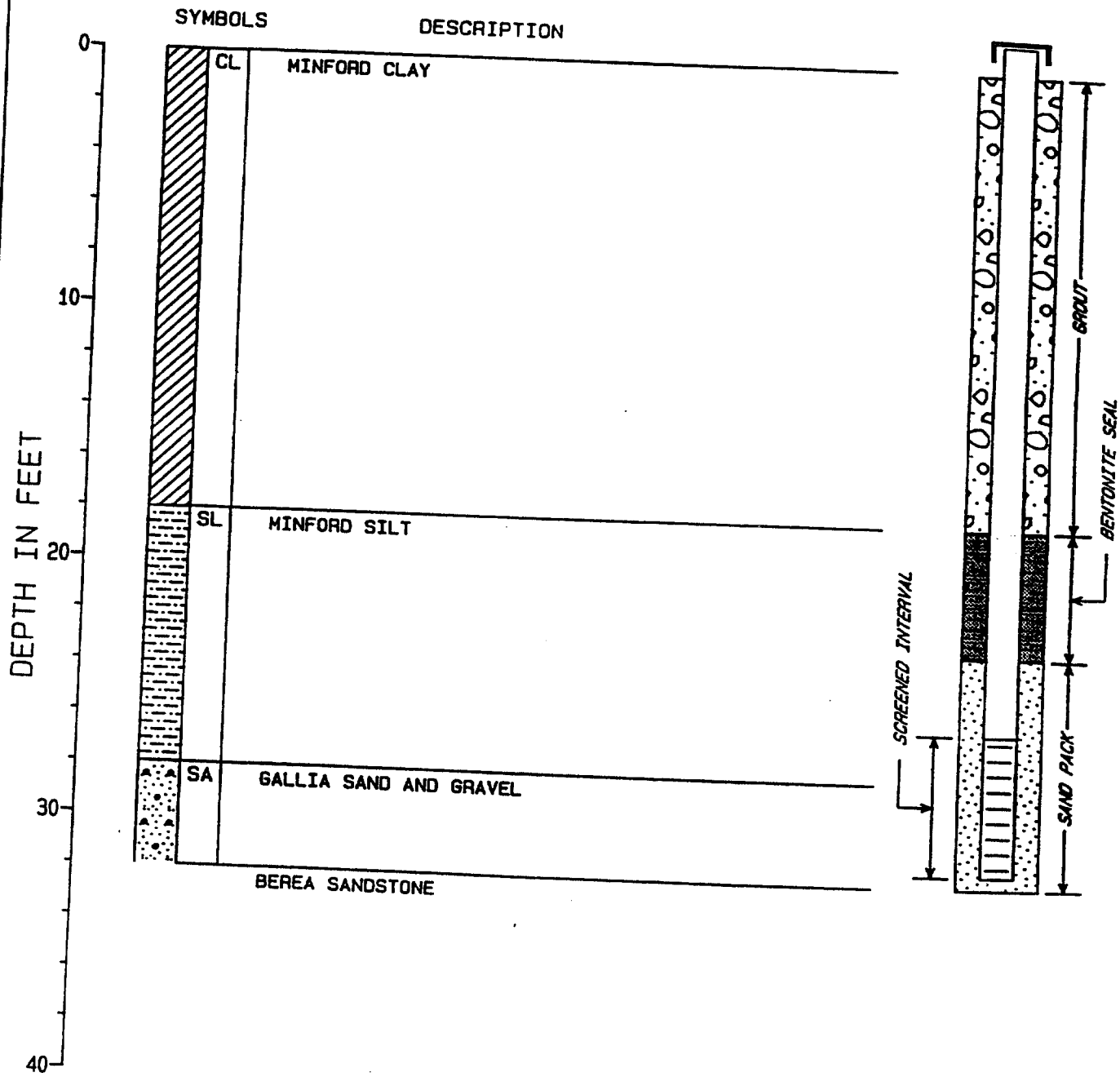
PORTS
PIKETON, OHIO

DATE DRILLED: 9/1/88

SURFACE ELEVATION: 675.82 ft. msld

TOP OF
CASING ELEVATION: 676.99 ft. msld

TOTAL DEPTH: 32.0ft. msld



WELL LOG

Geraghty & Miller Inc.

WELL F-20

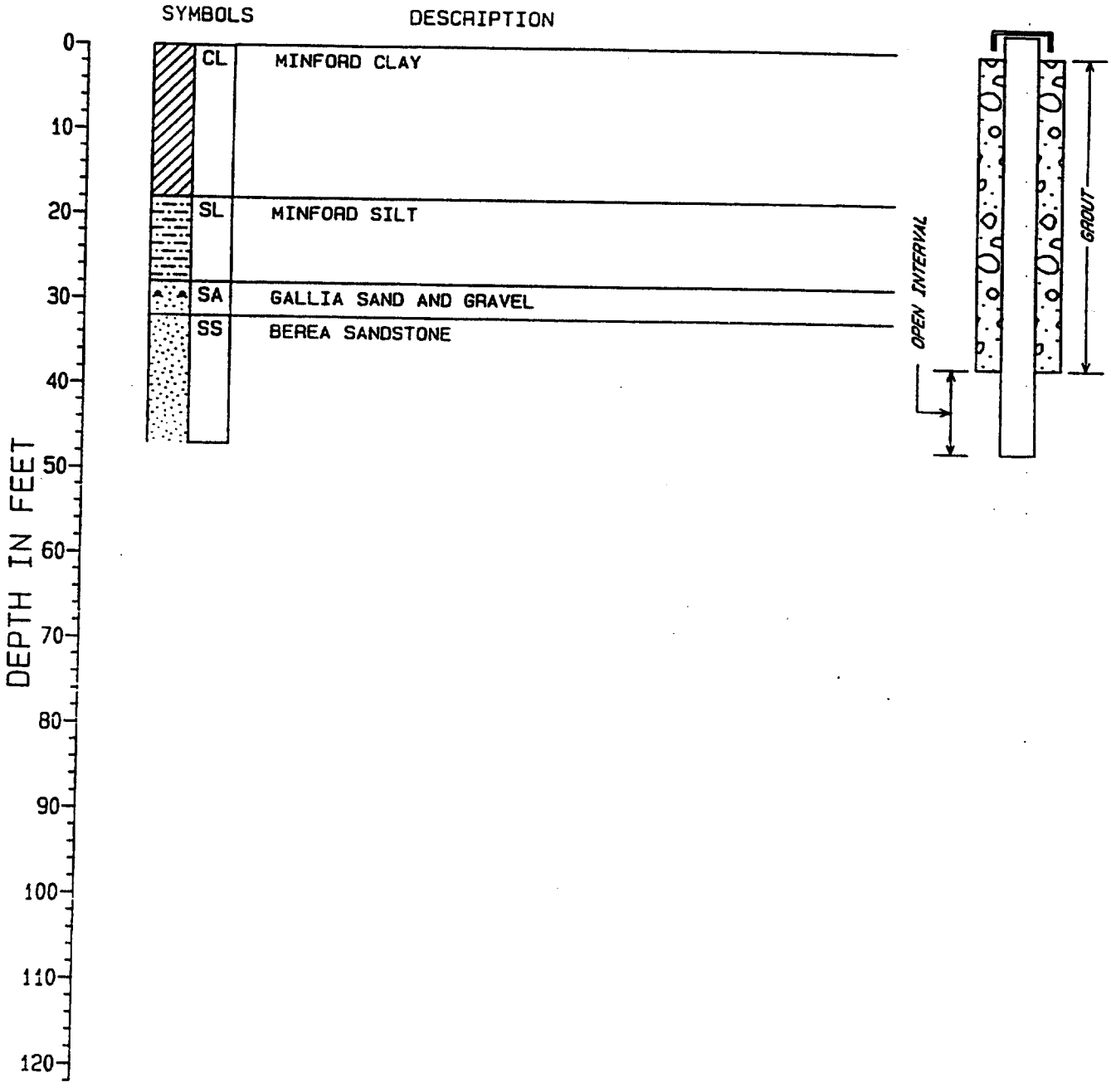
PORTS
PIKETON, OHIO

DATE DRILLED: 9/12/88

SURFACE ELEVATION: 675.72 ft. msld

TOP OF
CASING ELEVATION: 678.38 ft. msld

TOTAL DEPTH: 47.0ft. msld



WELL LOG

Geraghty & Miller Inc.

SUBMISSION DATE: February 21, 2000

APPENDIX C

X-326 Facility Closure Plan
Standard Operating Procedures

SUBMISSION DATE: February 21, 2000

SOP #1 - DECONTAMINATION OF TEFLON OR GLASS SAMPLING EQUIPMENT

EQUIPMENT:

_____ Micro solution
_____ Distilled water
_____ Log Book
_____ Brush

PROCEDURE:

1. Wash equipment thoroughly with laboratory detergent (micro solution) and distilled water using a brush to remove any particulate matter or surface film, if required.

2. Rinse equipment thoroughly with isopropanol or an appropriate solvent.

3. Rinse equipment thoroughly with distilled water and allow to air dry as long as possible.

4. Wrap equipment with plastic to prevent contamination during long-term storage.

5. Record date, time and details of decontamination in log book.

SUBMISSION DATE: February 21, 2000

SOP #2 - DECONTAMINATION OF STAINLESS STEEL OR METAL SAMPLING EQUIPMENT

EQUIPMENT:

_____ Distilled water
_____ Brush
_____ Log Book
_____ Micro solution

PROCEDURE:

1. Wash equipment thoroughly with laboratory detergent (micro solution) and distilled water using a brush to remove any particulate matter or surface film, if required.

2. Rinse equipment thoroughly with isopropanol or an appropriate solvent.

3. Rinse equipment thoroughly with distilled water and allow to air dry as long as possible.

4. Wrap equipment with plastic to prevent contamination during long term storage.

5. Record date, time and details of decontamination in log book.

SOP #3 - COLLECTION OF HAND-AUGERED SOIL/SEDIMENT SAMPLES

EQUIPMENT:

_____	Personal protective equipment	_____	Paperwork
_____	Plastic sheeting	_____	Pens/markers
_____	"Caution" tape and posts	_____	Sample bottles
_____	Stainless Steel Hand-Auger	_____	Waste containers
_____	Log book		

PROCEDURES:

Prior to Leaving Office:

A. Acquire necessary equipment and forms.

At Sampling Location:

1. Don appropriate PPE (See Health and Safety Plan)
2. Establish exclusion zone with barricade tape.
3. Set up monitoring equipment (PID and radiation meter)
4. Place plastic sheeting near work area.
5. Using stainless steel hand auger, collect soil or sediment samples from locations and depths prescribed in the Closure Plan.
6. Record all details of sample collection in log book.
7. Collect samples into appropriate bottles. Label each bottle with the following information: date, time of sampling, sample ID, analytical method, sampler initials and method of preservation. Print all information accurately and legibly. Complete chain-of-custody forms (see SOP #6).
8. Place samples in containers as needed, and pack with ice in coolers as soon as possible.
9. Label all waste drum(s) (see SOP #8).
10. Decontaminate the hand auger as outlined in SOP #2.

SUBMISSION DATE: February 21, 2000

SOP #4 - RINSEATE BLANK COLLECTION

EQUIPMENT:

_____ Distilled water

_____ Sample containers

_____ Log book

PROCEDURE - Re-Usable Equipment:

1. Decontaminate equipment according to SOP #1 or #2.

2. Following the final distilled water rinse, again rinse the sampling device with distilled water this time washing the rinseate into sample containers for laboratory analysis

3. All rinseate blanks must be handled and analyzed in the same manner as investigative samples. (See SOP #6 for Chain-of-Custody and Sample Shipment Procedures.) Record details of rinseate blank collection in the log book.

QA/QC REQUIREMENTS:

One rinseate blank per ten investigative samples must be collected by the sampling team.

SUBMISSION DATE: February 21, 2000

SOP #5 - DUPLICATE SAMPLE COLLECTION

EQUIPMENT:

_____ Sample containers _____ Log book

PROCEDURE:

1. Immediately following sample collection, fill a second set of sample containers using the same order of sample collection and procedures.

2. Label the sample with its duplicate sample id.

3. All duplicate samples should be handled and analyzed in the same manner as investigative samples. (See SOP #6 for Chain-of-Custody and Sample Shipment Procedures.) Record details of duplicate sample collection in the log book.

QA/QC REQUIREMENTS:

One duplicate sample per ten investigative samples must be collected by the sampling team.

SUBMISSION DATE: February 21, 2000

SOP #6 - CHAIN-OF-CUSTODY SAMPLE SHIPMENT PROCEDURE

PROCEDURE:

A chain-of-custody record must be completed for all samples immediately upon collection. Informatio be provided on this form includes:

- Sample container volume;
- Project number and ID;
- Laboratory identification;
- Sampling personnel;
- Sample identification
- Sample container material;
- Sample preservation;
- Date and time of collection;
- Type of analysis to be performed;
- Analytical method number; and
- Shipment method and carrier

All samples should be packed in coolers with sufficient packaging to prevent damage to sample bottle during shipment. Frozen ice packs must be included in each sample cooler. Once the container is read for shipment, a Chain-of-Custody seal should be applied in such a manner so as to monitor tampering.

Upon change of possession, the record is to be signed and dated by both parties. The white (original) copy accompanies the shipment.

SUBMISSION DATE: February 21, 2000

SOP # 7- COMPLETION OF REQUEST FOR DISPOSAL (RFD) FORMS

PROCEDURE:

1. After completing work or when drum is full, fill out RFD form items 1-2.

2. Mark RFD number on drum. If more than one drum will be accounted for on each RFD, mark the drums (i.e., 1 of 3 or 2 of 3) to ensure that all drums on each RFD form are handled.

3. Deliver all completed RFD forms to the designated waste management personnel.

SUBMISSION DATE: February 21, 2000

SOP # 8 - HNU PHOTOIONIZATION DETECTOR PROCEDURE

EQUIPMENT:

_____ HNU Model P1 101 (10.2 eV lamp)

_____ Calibrant Gases (Isobutylene: 20-200 ppm and 0-20 ppm)

_____ HNU Calibration Log

_____ Flow meter _____ Paperwork

PROCEDURES:

INSTRUMENT SET-UP:

1. Prior to calibration, check the function switch on the control panel to make sure it is in the OFF position. The probe nozzle is stored inside the instrument cover. Remove cover plate by pulling up on the pins that fasten the cover plate.

2. Remove the nozzle from the cover. Assemble probe by screwing nozzle into casing.

3. Attach probe cable to instrument box inserting 12 pin interface connector of the probe cable int the connector on the instrument panel. Match the alignment keys and insert connector. Turn connector in clockwise direction until a distinct snap and lock is felt.

4. Turn the function switch to the Battery Check position. When the battery is charged, the needle should read within or above the green battery arc on the scale plate. If the needle is below the green arc or the red LED light comes on, the instrument should be recharged prior to making ar measurements.

5. Turn the function switch to the ON position. In this position, the UV light source should be on. To verify, gaze at the end of the probe for a purple glow. Do Not Look Directly at the Lamp Itse If the lamp does not come on refer to the Instruction Manual.

6. To zero the instrument, turn the function switch to the standby position and rotate the zero potentiometer until the meter reads zero. Clockwise rotation of the zero potentiometer produces upscale deflection while counter clockwise rotation yields a down scale deflection. (Note - No

zero gas is needed since this is an electronic zero adjustment.) If the span adjustment is changed during instrument calibration, the zero should be rechecked and adjusted. If necessary, wait 15 to 20 seconds to ensure that the zero reading is stable. Readjust as necessary.

INSTRUMENT DAILY CALIBRATION

1. Insert one end of T tube into probe. Insert second end of probe into calibration gas in the 20-200 p.m. range. The third end of probe should have the rotameter (bubble meter) attached.

2. Set the £unction switch in the 0-200 p.m. range. Crack the valve on the pressured calibration gas container until a slight flow is indicated on the rotameter. The instrument will draw in the volume required for detection with the rotameter indicating excess flow.

3. Adjust the span potentiometer so that the instrument is reading the exact value of the calibration gas. (Calibration gas value is labeled on the cylinder.)

4. Turn instrument switch to the standby position and check the electronic zero. Reset zero potentiometer as necessary following step 6 above.

5. Record on field-data sheet all original and readjusted settings.

6. Set the function switch to 0-20 p.m.. Remove the mid-range (20-200 p.m.) calibration gas cylinder and attach the low range (0-20 p.m.) calibration gas cylinder as described above.

7. Do not adjust the span potentiometer. The observed reading should be ±3 p.m. of the concentration specified for the low range calibration gas. If this is not the case, recalibrate the mid range scale repeating Step 1 thru 6 above. If the low range reading consistently falls outside the recommended tolerance range, the probe light source window likely needs cleaning. Clean window according to instruction manual. When the observed readings is within the required tolerances, the instrument is fully calibrated.

INSTRUMENT CALIBRATION CHECK:

1. Exit the exclusion zone and turn meter to "ON" position. Check that the meter is reading a value of zero.

2. Insert one end of T-tube into probe and other end into calibration gas. The third end of the T-tu should be attached to a flow meter

3. Crack the valve on the calibration gas and read the value shown by the instrument. Record the value and calibrant gas concentration and a field-data sheet.

4. If the value shown by the instrument is greater than ±20% of the calibrant gas concentration, ta meter outside of exclusion zone and recalibrate as outlined above.

SAMPLE MEASUREMENT:

1. Place function switch in 0-20 p.m. range for field monitoring. This will allow for most sensitiv quick response in detecting airborne contaminants.

2. Before entering a contaminated area, determine background concentration. This concentration should be used as a reference to readings made in the contaminated area. Under no circumstan should one attempt to adjust the zero or span adjustments while the instrument is being operate in the field.

3. Take measurements in contaminated area, recording readings and locations. Should readings exceed the 0-20 scale, switch the function switch to the 0-200 or 0-2,000 range as appropriate receive a direct reading. Return the instrument switch to the 0-20 range when readings are reduced to that level. Record measurements on field-data sheet.

Note: The instrument will not function properly in high humidity or when the window to the light housing is dirty. If the instrument response is erratic or lower than expected, recalibrate or obta a different meter and calibrate as outlined above.

4. When finished, reverse Steps 1 thru 6 in Instrument Setup section to shut down the instrument

QA/QC Requirements:

The instrument must undergo a 2-point calibration as described above every morning before commencement of field work. In addition, a calibration check must be performed every hour during use of the instrument. The readings from the HNU will only be used in selection of proper PPE during field work and in selecting initial field-GC analytical parameters for sample analysis in the field.

REFERENCE: Modified from TSAI, U.S.EPA Region V, QAS.

SUBMISSION DATE: February 21, 2000

SOP #9 - COMBUSTIBLE GAS INDICATOR (MSA EXPLOSIMETERS - MODEL 2A)

EQUIPMENT:

_____ Calibrant Gasses - 40% LEL (Methane 2%)
- 50% LEL (Methane 2.5%)

PROCEDURES:

INSTRUMENT SET-UP:

The MSA Explosimeter is set in its proper operating condition by the adjustment of a single control. This control is a rheostat regulating the current to the Explosimeter measuring circuit. The rheostat knob is held in the OFF" position by a locking bar. This bar must be lifted before the knob can be turned from "OFF
position.

1. Lift the end of the rheostat knob "On-OFF" bar and turn the rheostat knob one quarter turn clockwise.

This operation closes the battery circuit (there will be an initial deflection of the meter pointer). The meter pointer may move rapidly upscale and then return to a point below ZERO, or drop directly below ZERO.

2. Flush fresh air through the instrument.

The circuit of the instrument must be balanced with air free of combustible gases or vapors. Five squeezes of the aspirator bulb are sufficient to flush the combustion chamber. If a sampling line is used, an additional two squeezes will be required for each ten feet of line.

3. Adjust rheostat knob until meter pointer rests at zero.

Clockwise rotation of the rheostat knob causes the meter pointer to move up scale. A clockwise rotation sufficient to move the meter pointer considerably above zero should be avoided as this subjects the detector filament to an excessive current may shorten its life.

Note:

When the meter pointer remains below zero and cannot be brought up to ZERO even when the control rheostat is turned to its extreme clockwise position, the batteries must be replaced.

If the pointer of the indicating meter moves to the extreme right side of its scale when the instrument is turned on and cannot be adjusted to ZERO, the detector filament may be burned out and should be replaced.

INSTRUMENT USAGE:

1. Readjust meter pointer to zero if necessary by turning rheostat knob.

2. Aspirate sample through instrument until highest reading is obtained .

Approximately five squeezes of the bulb are sufficient to give maximum deflection. If a sampling line is used add two squeezes for each ten feet of line. This reading indicates the concentration of combustible gases or vapors in the sample.

INSTRUMENT DAILY CALIBRATION:

1. Attach the flow control to the calibration gas tank.

2. Connect the hose to the flow control and to the instrument inlet fitting.

3. Open the flow control valve.

4. Record the meter reading after it stabilizes. NOTE: It is not necessary to operate the aspirator bulb to obtain the calibration sample. Depending on which calibration gas is used, the instrument reading should be within one of the following ranges:

   2.0% Methane: 42 to 60%
   2.5% Methane: 54 to 75%

SUBMISSION DATE: February 21, 2000

Attachments for Appendix I-1

Four oversize engineering drawing were the original attachments to this closure plan. These drawing are outdated and therefore are not included with the permit renewal application. The information provided on each drawing can be obtained in other locations as listed below:

Attachment I-1 Regional Topographic Map:	See Section B, Figure B-2
Attachment I-2 PORTS SWMU Map:	See PORTS RCRA Corrective Action Program documents
Attachment I-3 X-326 Hazardous Waste Storage Facility Floor Plan:	See Section D, Figure D-3 and Appendix D-1
Attachment I-4 X-326 Cross Sectional View:	See Section D, Appendix D-1

SUBMISSION DATE: FEBRUARY 21, 2000

APPENDIX I-2

CLOSURE PLAN FOR THE X-7725 UNIT

Closure Plan for the X-7725 Storage Unit

Portsmouth Gaseous Diffusion Plant

Date Issued — February 21, 2000

Prepared for the
U.S. Department of Energy
Office of Environmental Restoration and Waste Management

BECHTEL JACOBS COMPANY LLC
managing the
Environmental Management Activities at the
Portsmouth Gaseous Diffusion Plant

Bechtel Jacobs Company LLC
P.O. Box 900
Piketon, Ohio 45661

under contract DE-AC05-98OR22700
for the
U.S. DEPARTMENT OF ENERGY

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ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
ALARA	As low as reasonably achievable
ANSI	American National Standards Institute
CFR	Code of Federal Regulations
COC	Chain-of-Custody
CPR	Cardiovascular Pulmonary Resuscitation
DAC	Derived Air Concentration
DBA	Decibel
dm	Decimeter
DOE	United States Department of Energy
DOT	United States Department of Transportation
dpm	Disintegrations per minute
EPA	United States Environmental Protection Agency
ESH	Environmental, Safety and Health
GCEP	Gas Centrifuge Enrichment Plant
HASP	Health and Safety Plan
HWP	Hazardous Work Permit
ID	Identification
IDLH	Immediately Dangerous to Life and Health
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MMES	Martin Marietta Energy Systems, Inc.
MPH	Miles per hour
mrem/hr	Millirem/hour
MSDS	Materials Safety Data Sheet
MSHA	Mine Safety and Health Administration
NCS	Nuclear Criticality Safety
NEPA	National Environmental Policy Act
NIOSH	National Institute for Occupational Safety and Health
NPDES	National Pollutant Discharge Elimination System
OAC	Ohio Administrative Code
Ohio EPA	Ohio Environmental Protection Agency
OSHA	Occupational Safety and Health Administration
PAL	Plant Allowable Limit
PCB	Polychlorinated biphenyl
PED	Plant Emergency Director
PELs	Permissible Exposure Limits
PID	Photo-ionization detector
PORTS	Portsmouth Gaseous Diffusion Plant
PPE	Personal Protective Equipment
ppm	Parts per million
PVC	Polyvinyl chloride
QA/QC	Quality Assurance/Quality Control
QAS	Quality Assurance Standard

RCRA	Resource Conservation and Recovery Act
rem	Units of radiation
RFD	Request For Disposal
RFI	RCRA Facility Investigation
SCBA	Self Contained Breathing Apparatus
SOPs	Standard Operating Procedures
SSHO	Site Safety and Health Officer
SW-846	Publication of the U.S. EPA - Solid Waste Office
TLV	Threshold Limit Values
TSCA	Toxic Substances Control Act
U	Uranium
µCi/mL	Micro-Curie per milliliter
U.S.EPA	United States Environmental Protection Agency
UL	Underwriters' Laboratory
USCG	United States Coast Guard
U.S. GPO	United States Government Printing Office
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
°F	Degrees Fahrenheit
"	inch
'	foot

CLOSURE PLAN FOR THE X-7725 STORAGE UNIT

1. FACILITY DESCRIPTION

1.1 General Description

The Portsmouth Gaseous Diffusion Plant (PORTS) is owned by DOE and is contractor managed by Bechtel Jacobs Company LLC. For the purposes of this permit application, DOE and Bechtel Jacobs Company LLC are Co-Operators of the X-326 and X-7725 Hazardous Waste Storage Units.

PORTS is located at 39°00'30" N latitude and 83°00'28" W longitude on a 3,714-acre federally owned reservation in Pike County, Ohio. Pike County, one of the state's lesser populated counties, encompasses an area of approximately 444 square miles. The site is located approximately equidistant between Chillicothe and Portsmouth, Ohio. The plant site is approximately 4 miles southeast of Piketon, Ohio, 1.5 miles east of U.S. Route 23, 2 miles east of the Scioto River, and 70 miles south of Columbus, Ohio (see Figure 1).

PORTS has operated since 1954, enriching uranium for national defense and commercial nuclear reactors. That enrichment is accomplished by the gaseous diffusion process. As of 1993, all uranium enrichment operations at PORTS are conducted by the United States Enrichment Corporation, formed as a government-owned corporation by the Energy Policy Act of 1992, that became private in July 1998. As such, DOE's mission at the PORTS site has changed to environmental restoration, waste management, removal of highly enriched uranium, and operation of nonleased facilities.

As a result of historical and current enrichment operations, and as is typical of large industrial plants, a wide variety of hazardous wastes are generated. These include analytical laboratory wastes, spent solvents, electroplating wastes, paint wastes, sludges, corrosive wastes, and environmental restoration generated wastes. Table 1 provides a listing of solid waste management units at PORTS.

The X-7725 Building was originally designed for Gaseous Centrifuge Enrichment (GCEP) activities. However, after GCEP was canceled in 1985, the X-7725 Building was selected as the site for hazardous waste container storage because it has a large area of floor space kept under climate-controlled conditions. The building consists of five floors with 20 acres of total floor space under roof. Approximately 9 acres of floor space are used for hazardous waste container storage activities. The building is divided into a number of rooms, staging areas, open bays, and offices (Fig. B-4).

The X-7725 Building has built-up roofing over rigid insulation and metal decking. Room and bay ceiling heights range from 11 feet to 75 feet. Each level of the roof is designed to direct rainwater drainage to metal downspouts, which discharge to a storm sewer. The flooring is constructed of reinforced concrete slabs varying from 6 to 17 inches thick. The entire building is climate-controlled. Heat is provided by recirculating heating water and cooling by chilled water systems.

Wastes that may be stored in the X-7725 Building hazardous waste storage areas include any of the waste codes listed in Part A of this application.

All hazardous waste storage areas in the X-7725 Building have berms to provide for a secondary containment capacity of 10% of the total waste volume of hazardous waste stored and 25% of the total waste volume where RCRA/TSCA wastes are stored. The floor of the X-7725 Building is free of cracks and gaps and is sealed with a chemically resistant sealant.

1.1.1 Topographic Map

The U.S. Geological Survey (USGS) topographic map for the facility is shown on Attachment I-1. Topographic details of the X-7725 Storage Unit area are shown on Figure 3.

1.1.2 Solid Waste Management Units

All Solid Waste Management Units (SWMUs) at the PORTS facility are noted as such on Table 1 and the units are shown on Attachment I-2. A detailed description and list of the wastes managed and/or disposed at these units is found in the PORTS RFI Description of Current Conditions (DOCC) for Quadrants I-IV. Section 6 of the Quadrant III DOCC provides detailed information for the X-7725 facility. Appendix A of this closure plan contains the title page and table of contents for the Quadrant III DOCC.

1.2 Hydrogeologic Information

1.2.1 Geologic and Hydrologic Settings

The PORTS facility lies near the western margin of the Appalachian Highlands within the Appalachian Plateau Province. The physiography of this area is typified by rugged, irregularly dissected hills and ridges separated by generally mature drainage systems. The topographic highs are erosional remnants of the more competent units of the Paleozoic bedrock which underlie the area.

The facility lies to the south of the terminus of Pleistocene glaciation, however, two distinct physiographic features of glacial origin are present in the area. The most prominent of these features are large flat expanses of glacio-lacustrine deposits which fill preglacial topographic depressions. Deeply incised stream valleys which formed during periods of high flow resulting from glacial meltwater are also present locally.

Most of these valleys are partially filled with alluvial material and many are occupied by streams which are orders of magnitude smaller than the ones which originally formed the valleys.

The PORTS facility is situated on one of the glacio-lacustrine deposits formed when drainage of the preglacial Teays River was obstructed and prehistoric Lake Tight was impounded. Lake Tight occupied both the main Teays River valley and many of its tributary valleys, including the Portsmouth and Newark River valleys. Fine-grained sediments accumulated within Lake Tight, forming lacustrine deposits of silt and clay up to 50 feet thick. Figure 4 exhibits regional

stratigraphic information at the PORTS facility.

Bedrock in the area consists of sedimentary strata of marine origin which were deposited during the Paleozoic Era. The formations which comprise the bedrock beneath the PORTS facility belong to the Waverly Group, and they are described below from the youngest to the oldest.

The Cuyahoga Formation is comprised of sandstone, conglomerate, and shale. Locally the Cuyahoga is predominantly composed of gray shale, and it is present on both the east and west side of the facility where it outcrops on the hills. The Cuyahoga formation is 250 to 300 feet thick.

The Sunbury shale is described as a hard, "bony", fissile shale. It is typically highly carbonaceous and black in color. The unit averages 20 feet in thickness throughout its known range, and it has been reported to have a maximum thickness of about 30 feet. However, the formation is highly variable, and in the vicinity of the PORTS facility the Sunbury averages only 8 to 10 feet in thickness. The Sunbury may have been removed from some areas due to erosion either before the deposition of the Lake Tight sediments (Teays formation) or in relatively recent times.

The Beret sandstone is comprised of a fine-grained sandstone interspersed with thin shale beds and laminae. The unit is gray to brown in color and 25 to 40 feet thick in the subject area. The sandstone beds range in thickness from 6 inches to 2 feet and are described as weather resistant, with regular jointing at right angles to bedding surfaces. In Pike County the uppermost 6 to 10 feet of the unit is massive with few bedding planes or shale laminae. Below this upper unit a 20 to 35 foot thick blue and gray sandstone interbedded with shale is present. This unit is reported to increase in shale content downsection so that it exhibits a gradational contact with the underlying Bedford shale.

The Bedford shale is a thinly bedded, calcareous shale interfingered with thin, fine-grained argillaceous sandstones. The unit ranges from 90 to 100 feet in thickness and has a blue-gray to red colored, clay-like shale comprising the upper zone. The lower portion of the unit is similar physically to the upper zone but is red in color.

The Paleozoic strata are inclined (dip) very slightly to the east, so that subsequent erosion, before the formation of Lake Tight, exposed the Sunbury shale in the eastern part of the area and the underlying Beret sandstone to the west. These formations thus comprise the bedrock in their former outcrop areas, now buried beneath the sediments of Lake Tight.

An assemblage of unconsolidated sediments, the Teays formation, covers the bedrock over much of the area of the PORTS facility. The Teays is comprised mainly of two members: the Gallia sand and the Minford clay. The Gallia sand is the basal unit, consisting largely of sand and gravel deposits of fluvial origin. Muscovite and feldspar are present as accessory minerals, and local bedrock fragments are common to the base of the unit in some areas. The Gallia is normally 5 to 10 feet in thickness, and it interfaces sharply with underlying bedrock. The Minford clay, overlying the Gallia member, consists of up to 40 feet of mostly lacustrine silty clay. The Teays formation represents the glacio-lacustrine sedimentary environment of the prehistoric Lake Tight. The thickness of the Teays formation is controlled by the topography of the erosional surface of the bedrock; it is thickest in low areas on the bedrock surface and may be absent on bedrock highs.

Two types of aquifers with differing hydrogeologic characteristics exist in the area of the facility: a bedrock aquifer and a complex alluvial aquifer. These water-bearing systems generally behave as two distinct and hydraulically separate aquifers; however, at some locations at the PORTS facility the two systems have been demonstrated to be interconnected.

The uppermost aquifer system in the area is the Teays formation which consists of unconsolidated Pleistocene valley fill comprised variously of clay, sand, silt, and gravel of both fluvial and lacustrine origins. This unit ranges in thickness from 0 to 50 feet primarily as a result of the underlying erosion surface. The aquifer system on the Piketon Reservation becomes more complex within the Big Run and Little Beaver Creek channels. These units are thin fluvial deposits, typically being only a few feet in thickness.

The alluvial aquifers are generally comprised of two separate units: a basal sand and gravel, and an overlying finer grained lacustrine deposit. The basal unit is the Gallia sand member. The Gallia sand grades upward from a coarse sand or gravel to a fine sand, and is composed primarily of subangular to subrounded quartz. The Minford clay (or Minford silt) member overlies the Gallia sand and consists of silt and laminated clays. This unit is generally 15 to 25 feet thick at the site but reportedly exhibits a maximum thickness of 80 feet in nearby locations.

Permeability in these alluvial aquifers is primarily a function of the intergranular pore space, and consequently it varies according to the nature of the sediments. The hydraulic conductivities of the various materials present ranges from 2×10^{-7} cm/sec for the lacustrine silts and clays to as high as 1×10^{-3} cm/sec for the sand and gravel.

The bedrock aquifer includes both sandstones and shales. Permeability in both rock types is mainly attributed to secondary porosity, resulting from fractures and fissures. No significant differences appear to exist in the permeabilities of the different rock types near the surface of the bedrock which are probably controlled by fractures. However, as the degree of weathering decreases and overburden pressure increases with depth, the aperture of the fractures that compose the secondary porosity system may decrease. Therefore, the components of the primary porosity system, grain size, grain shape and packing arrangement, may exert a greater influence over hydraulic conductivity as the distance from the surface of the bedrock becomes greater. Packer tests indicate that the Beret sandstone is more permeable than the Bedford shale. The Bedford shale has an average hydraulic conductivity of 2.66×10^{-5} cm/sec in the vicinity of the site. Hydraulic conductivities on the order of 10^{-4} cm/sec have been reported for the Beret sandstone in this area.

The Sunbury shale is present beneath the X-7725 building along the eastern margin of Quadrant III. However, to the west of the building the Sunbury is not present. Beneath the Gallia, the Sunbury shale where present, acts as a barrier to the vertical flow of groundwater thereby inhibiting the contamination of the Beret. The lower vertical boundary is the Bedford shale which lies beneath the Beret. The unit is composed primarily of shale and also limits the downward flow of groundwater. This is true for all quadrants.

Near the X-7725 facility, the Minford clay is approximately 12 to 32 feet thick and the Minford Silt is approximately 10 to 16 feet thick. Both the clay and silt thin to the westnorthwest. The Gallia formation is estimated to be approximately 3 to 7 feet thick. The Sunbury Shale forms the upper

bedrock surface at an average depth of 20 feet.

The ground water flow directions in the area of X-7725 in the Gallia and the Beret aquifers were analyzed using water levels measured on December 12, 1988. The flow directions in both units are consistent with a general northwestern hydraulic gradient. Stratigraphic and construction logs of the wells are included in Appendix B.

1.3 X-7725 Storage Unit Description

1.3.1 Waste Managed

The waste that may be stored in the X-7725 building are the following: product and process wastes, RCRA characteristic wastes, low level radioactive wastes (contaminated primarily with uranium and/or technetium), TSCA wastes containing PCBs or asbestos, and combinations of the above wastes. The majority of these wastes are liquid containing arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, and benzene, spent halogenated and non-halogenated solvents, and/or radioactive wastes generated from laboratories wastes, decontamination solutions, and a variety of plant processes and clean-up operations.

During the operational life of the X-7725 Storage Unit, documented mixed waste containing RCRA constituents included aqueous laboratory solutions, spent laboratory solvents, and decontamination solutions from several other buildings on the plantsite. All of the laboratory solutions, aqueous and organic, result from the chemical analysis of uranium bearing mixtures/compounds. These wastes may be characteristically ignitable or corrosive, hazardous by the toxicity characteristic, or listed as hazardous.

Wastes stored in the X-7725 Storage Unit may include:

D001 Ignitables
D002 Corrosive (acid and alkaline)
D003-D043 TC Characteristic
F001
F002
F003
F005
F007
Various P and U Wastes
Radioactive RCRA Wastes
TSCA/RCRA Mixed Wastes*
Radioactive TSCA/RCRA Mixed Wastes~

* Note - Storage area will store PCB waste if waste is RCRA hazardous.

Table 2 lists the maximum number of containers for each waste type. The wastes are stored in either DOT approved 55 gallon 17C or 17E drums, 5 inch diameter/10 Liter polyethylene bottle, 4'x4'x6' boxes or various other containers as delineated in Table 2. The drums are stored on wooden pallets

of poly-pallets, which prevent contact with potentially inadvertent standing liquid introduced into the area.

1.3.2 X-7725 Storage Unit Description

The X-7725 building was originally constructed to house the recycle and assembly operations for the Gas Centrifuge Enrichment Plant (GCEP), which was canceled by DOE in 1985. The building consists of five floors with 20 acres of total floor space, approximately 9 acres of which is suitable for waste storage. There are areas for receiving and storing materials, testing and inspection of parts, and manufacturing/assembly of machines. Consequently the building is divided into a number of rooms, staging areas, open bays, and offices.

The X-7725 building had been selected to store RCRA hazardous wastes since it has a large area of floor space kept under climate-controlled conditions and can meet applicable Part 264 RCRA standards. The area immediately surrounding the building has been graded to prevent run-on of rainwater. The X-7725 building has built-up roofing over rigid insulation and metal decking. Room and bay ceiling heights range from 20 feet to 75 feet. Each level of the roof is designed to direct rainwater drainage to metal down-spouts, which discharge to a storm sewer. The flooring is constructed of reinforced concrete slabs varying from 6 to 17 inches thick. The entire building is climate-controlled. Heat is provided by recirculating heating water, and cooling by chilled water systems.

Twenty-two areas located on the first and fourth floor of Building X-7725 (see Attachment 1-3 and 1-4) have been modified to accommodate mixed waste storage. A summary of the floor area for each storage area is provided in Table 5.

All storage areas of the X-7725 building have dikes to ensure an adequate containment capacity of 10% of the total waste volume stored. The floors of the X-7725 building are free of cracks and gaps. Rough or spalled areas of the floor are repaired with a polymer-modified Portland cement. Cracks in the floor are sealed with a modified-methacrylate crack healer/penetrating sealer, or an epoxy injection adhesive as appropriate for the number and size of the cracks. Expansion joint gaps are filled with a polyurethane elastomeric sealant. Control joint gaps are filled with a flexible epoxy control joint sealer/adhesive. To further ensure the base is capable of containing any liquids which may accumulate, the floors in all storage areas are sealed with a chemically resistant sealant.

All containers are elevated to prevent contact with any liquids which may accumulate in the containment areas. The containers are elevated on wooden pallets or poly-pallets. The poly-pallets, polyethylene spill containment pallets are for the storage of all liquid wastes when available.

Small spills or leaks of liquid waste are removed by adsorbents. The contaminated adsorbent is then placed in a suitable container and handled as hazardous waste. Larger spills will be pumped into a new container and residual liquid will be adsorbed and the adsorbent placed into suitable container.

1.4 References to Other Environmental Permits

The PORTS facility operates in conformance with requirements established by a number of federal

and state statutes and regulations, Ohio EPA Directors Findings and Orders, Executive Orders, DOE Orders, permits and/or submitted applications criteria, and compliance and settlements agreements. The PORTS facility maintains compliance status with regard to major environmental statutes under the following: Ohio EPA air permits and registered air emission sources; National Pollutant Discharge Elimination System (NPDES) permit 0IO00000; a Part B Permit; TSCA regulated storage areas; and Ohio State Fire Marshal Underground Storage Unit (UST) Registrations.

1.5 Anticipated Waivers or Exemptions

No waivers or exemptions are anticipated to be requested or required for the closure of this facility. The PORTS facility, including the X-7725 Storage Unit, is owned by the U.S. Department of Energy, a Federal Agency.

1.6 Closure and Post-Closure Cost Estimates

In accordance with Ohio Administrative Code (OAC) 3745-55-40(C), closure and postclosure cost estimates are not required for this Federal Facility.

1.7 Financial Assurance

In accordance with OAC 3745-55-40(C), financial assurance is not required for this Federal Facility.

1.8 Liability Coverage

In accordance with OAC 3745-55-40(C), liability coverage is not required for this Federal Facility.

2. CLOSURE PROCEDURES

The closure described in this plan is intended to minimize the need for further maintenance. It eliminates -- to the extent necessary to protect human health and the environment -- post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off or hazardous waste decomposition products to the ground or surface waters or to the atmosphere. Closure will be accomplished by the removal of waste and decontamination of the X-7725 Storage Unit floors, curbing and associated surfaces.

2.1 Estimate of the Quantity of Inventory to be Removed

The maximum capacity of the X-7725 Storage is summarized in Table 3. Waste stored in the X-7725 Storage Unit are discussed in Section 1.3.1.

2.2 Procedures for Handling Removed Inventory

All wastes at the facility will either undergo on-site treatment to render wastes nonhazardous and remain on-site, or be disposed at a facility permitted to receive waste (e.g., RCRA TSDF, TSCA incinerator). All wastes will be disposed in strict compliance with all applicable environmental regulations. Any wastes removed from the facility for disposal will be removed in an acceptable manner to transportation vehicles appropriate for waste transport. All transportation will take place via hazardous waste transporters registered with the Public Utilities Commission of Ohio and U.S. EPA and possessing a registration number from each of these entities. All waste disposed will be manifested using the uniform hazardous waste manifest (U.S. EPA form 8700-22 and 8700-22A) in accordance with Ohio Administrative Code 3745-52-20 before transportation off-site.

2.3 Procedures for Decontamination and Disposal

2.3.1 Surface Decontamination

The X-7725 Storage Unit storage area surfaces consist of urethane painted/coated concrete surfaces and associated diking. The urethane material is extremely resistant to chipping and cracking. Structural joints are filled with a caulking which is also extremely resistant to cracking.

Each of the twenty-two storage areas of the X-7725 Storage Unit will be decontaminated as discussed. Initially, those areas where PCB and PCB-contaminated waste were stored will be sampled for PCBs to determine if PCB contamination exists. Standard 100 cm^2 wipe samples will be randomly collected in accordance with 40 CER 761.125 (PCB Spill Cleanup Policy). Additional samples will be collected from areas that appear stained as identified by a certified professional engineer. Any areas exhibiting PCB contamination above 10 $\mu g/100\ cm^2$ (the clean level for PCBs under 40 CFR 761.125) will be decontaminated according to procedures specified in 40 CFR 761.125 before undergoing RCRA decontamination. Upon completion of these procedures, the areas will undergo additional RCRA decontamination procedures.

Prior to decontamination of a storage area, the area will be divided into zones for decontamination verification. Before decontamination procedures begin, a certified professional engineer will

determine the perimeter of the zones based upon visual inspection. Areas of apparent surface staining, contamination or structural faults will be noted for special evaluation in zone and/or sampling consideration. The inner surfaces of the diked outer periphery of the storage areas will be decontaminated. Materials such as sorbent sausages and/or pads will also be placed in areas being decontaminated on the top of the dike, outer surface and outer flooring to protect these areas from splashing that might potentially occur during the decontamination process. To decontaminate the X-7725 Storage Unit, personnel will use a brush, mops, and/or a high pressure hot water spray to wash down the floor. All decontamination procedures will strictly adhere to the health and safety requirements outlined in the X-7725 Storage Unit HASP (Section 4.0). Minimal detergent solutions will be used to facilitate the proposed treatment of any generated liquid waste. As the floor is cleaned, the liquid spray will be collected and placed into containers. The areas where the contaminated material and liquid wastes are transferred to containers will be curbed and overlain with Visqueen plastic or equivalent sheeting to provide spill containment.

Chemical analysis of the final rinseate will be used to determine if sufficient decontamination of the surfaces has taken place. A final rinseate sample for analysis will be collected from each of the divided zones. The liquid rinseate will be analyzed for the parameters listed in Table 4. The X-7725 Storage Unit surfaces will be considered clean when concentrations of liquid hazardous waste or hazardous waste constituents fall below:

a) Fifteen times the public drinking water maximum contaminant level (MCL) for hazardous waste constituents as listed in 40 CFR 141.11 and OAC 3745-81-11 for inorganics and 40 CFR 141.12 and OAC 3745-81-12 for organics;

b) If an MCL is not available for a particular contaminant, then fifteen times the maximum contaminant level goal (MCLG) as listed in 40 CFR 141.50 shall be used as the clean standard: and

c) If the product of fifteen times the MCL or MCLG exceeds 1 mg/l or if neither an MCL nor an MCLG is available for a particular contaminant, 1 mg/l shall be used as the clean standard.

After the surface decontamination is completed, floor joints, if any, will be visually inspected for their integrity and tested for contamination under the supervision of a certified professional engineer. Those joint areas that exhibit the poorest integrity and visual contamination will be randomly sampled to verify no contamination. A total of five rinseate samples will be randomly collected and analyzed for those constituents in Table 4.

If the analysis indicates contamination still exists at the joints, any joint sealer will be removed and containerized and the joint inspected for visible contamination. If visible contamination is identified, the contaminated areas will possibly be removed by chipping, scabbling or a similar procedure. If contamination is exhibited beneath the depth of the slab, a soil core sample will be collected beneath the contaminated area. If chipping, scabbling or a similar procedure and core sampling is necessary, steps to minimize or eliminate fugitive dust air emissions, such as wetting with a fine water mist or construction of plastic sheeting enclosures, will be taken if necessary. Air sampling and monitoring will occur in areas and will adhere to procedure specified in section 4.4

of the HASP contained in this document. All debris removed will be placed into 55-gallon DOT 17C open top drums or other structurally competent approved containers and disposed as discussed in section 2.3.2.

If any jointed areas exhibit contamination and integrity breaks after decontamination, they will be inspected and investigated as outlined above.

If the analysis indicates contamination still exists on the floor, the decontamination procedure will be duplicated. If analysis indicates contamination still exists, the contaminated floor areas will be subjected to scabbling or a similar procedure to remove the contamination. If scabbling or a similar procedure is necessary, steps to minimize or eliminate fugitive dust air emissions as discussed previously will be taken. Debris removed will be placed into 55-gallon DOT 17C open top drums or other structurally competent approved containers and disposed as discussed in section 2.3.2.

A maximum volume of 8,000 gallons of rinseate/waste water is estimated to be generated by the above processes.

All workers involved in decontamination of the X-7725 Storage Unit surfaces will comply with the health and safety procedures outlined in the X-7725 Storage Unit Closure HASP contained in Section 4.0.

2.3.2 Solid Treatment or Disposal

At completion of closure for the X-7725 Storage Unit, all non-disposable equipment including power tools, hand tools, hoses and other miscellaneous equipment will be decontaminated in a previously constructed decontamination area that is curbed and overlain with Visqueen plastic sheeting to provide containment following the procedures outlined in Appendix C.

Disposable equipment and supplies generated during the X-7725 Storage Unit closure will not be decontaminated but will be placed into 55-gallon DOT 17C open top drums or other structurally competent approved containers on a daily basis. At project completion, all containers with disposable equipment/supplies will be disposed at an offsite facility in accordance with all applicable disposal regulations (e.g., RCRA, TSCA, NRC). Any additional solids removed such as concrete, paint chips or sealant pieces will be subjected to laboratory waste characterization and disposed as hazardous waste or as low-level radioactive waste, depending on the radioactivity of the material. It is estimated a total of 2,000 pounds of wastes will be generated in the above processes.

2.3.3 Rinseate Treatment or Disposal

All liquid wastes generated during the X-7725 Storage Unit closure will be managed initially as hazardous waste. Each drum of rinseate/waste water generated during decontamination will be tested for parameters listed in Table 4 to document the extent of contamination and insure levels are acceptable for treatment described herein. Rinseates will then be managed as a waste water and treated through one of the facility's NPDES permitted treatment systems. Rinseate will be managed in strict compliance with the Clean Water Act. It is estimated a maximum of 8,000 gallons of liquid waste will be treated in this manner.

Rinseate may also be managed as a radioactive waste and not discharged to an NPDES treatment system depending on the radioactivity, if any, of the rinseate.

2.3.4 Soil Sampling and Analysis Program

Because the X-7725 Storage Unit storage floor surface areas consist of a layer of concrete 6 to 7 inches thick, it is extremely unlikely that a crack could develop that would allow migration of wastes to soils below. To further ensure that the floors are capable of containing liquids, they have been sealed with a chemically resistant sealant. Therefore, no soil sampling will be conducted as part of this closure. If sampling procedures discussed in Section 2.3.1 indicate unexpected contamination, PORTS will immediately contact the Ohio EPA to discuss amending the closure plan.

2.4 Description of Security System

PORTS is a controlled access facility with fencing, gates, and numerous other features that contribute to the safety and security of the facility. Security is maintained by a staff of trained security guards 24-hours a day. Routine patrols of areas outside the main complex are conducted at a minimum of once every eight hours. All security guards are equipped with two way radios and have direct communication with other protection personnel (i.e. fire department, shift superintendents, and the plant communications center). Employees are required to show identification badges when entering all main complex gates. Visitors and contractors entering the main complex must sign a log sheet and/or obtain proper passes.

2.5 Closure Certification

Within sixty (60) days of final closure, the owner/operator and an Independent Certified Professional Engineer will submit a certification of closure to the Ohio EPA Director by registered mail, assuring that the closure has been performed and is in accordance with the approved closure plan.

2.5.1 Activities to be Conducted

The performance standards to be used in evaluating activities proposed in Section 2.2 and 2.3 are the detection limits of the individual hazardous chemicals. Samples will be collected from decontamination rinseate.

2.5.2 Testing and Analysis to be Performed

The sampling and analysis protocol for activities proposed in Section 2.2 and 2.3 will generally follow the requirements of SW-846 and the SOPs in Appendix C. All laboratory sample analytical methods will follow a specific quality assurance and quality control plan.

2.5.3 Criteria for Evaluating Adequacy

The activities proposed in Section 2.2 and 2.3 will be evaluated by an Independent Certified

Professional Engineer. The Independent Certified Professional Engineer will be required to submit a report of findings and recommendations.

2.5.4 Schedule of Inspections

The areas where the activities proposed in Section 2.2 and 2.3 are to be conducted will be inspected by the independent engineer routinely. Upon the beginning of closure operations, the independent engineer will notify the Ohio EPA (District and Central Office) five days prior to any critical activity and will inspect all closure activities on a daily basis. All observation and inspection activities will be recorded in the engineer's log book. This schedule will continue until the activity has been completed, all hazardous waste has been removed, any contaminated soil or rinsewaters have been removed, and the sampling protocol has been completed. In addition to the closure performance inspection, PORTS health and safety, and building custodian personnel will be inspecting the X-7725 building closure area.

2.5.5 Types of Documentation

Documentation which will be included in the closure certification report will include the sample analysis information, volume of waste generated during closure, waste shipping records, spill/leak reports, all sample and decontamination procedures documentation (Chain-of-Custody (COCs), sampling logs, etc.), routine and special inspection records, photography, the approved closure plan and other related documents. In addition, the closure certifications report will contain any correspondence with outside agencies and independent evaluations which relate to the closure activity.

3. CLOSURE SCHEDULE

3.1 Expected Year of Closure

The X-7725 Storage Unit is expected to undergo closure in the year 2041 upon notification of intent to close according to the schedule outlined in Table 6.

3.2 Frequency of Partial Closure

There will be no partial closure for the X-7725 Storage Unit.

3.3 Waste Removal

The X-7725 stored hazardous waste will be shipped to a permitted Treatment, Storage, and Disposal (TSD) Facility on a routine basis and will be completed at 90 days after receipt of final volume of hazardous waste, assuming all wastes are characterized and the containers are adequate for shipping. Organic waste will be disposed in accordance with applicable treatment techniques. Aqueous inorganic mixed waste may be treated on-site to allow low-level radioactive waste disposal. Any remaining waste at the time of closure will be removed accordingly. The schedule for waste removal is illustrated in Table 6. Waste removal will begin in the year 2041 and will be completed 90 days after the start of removal.

3.4 Closure Completion

Closure is expected to be completed within 180 days of beginning closure under an Ohio EPA approved plan. Although no time extension requests are anticipated, if one should become necessary, it will be requested in accordance with demonstration requirements specified in OAC 3745-66-13.

3.5 Certification of Closure

Within 60 days of successful completion of the prescribed closure, the Department of Energy will submit to the Director of the Ohio EPA, by registered mail, a certification that the X-7725 unit has been closed in accordance with the specifications in the approved closure plan. In addition, the Regional Administrator, U.S. EPA Region V will be sent a copy. The certification statement will include the exact wording found in OAC 3745-50-42(D). The certification will be signed by the owner and by the Independent Certified Professional Engineer responsible for closure oversite, registered in the State of Ohio.

3.6 Survey Plat

Since the closure of the X-7725 Storage Unit is expected to be "clean," filing a survey plat is not expected to be required. Should it be determined that a clean closure cannot be accomplished, the Department of Energy will immediately contact the Ohio EPA to discuss amending the closure plan. If it becomes necessary, a survey plat will be submitted to the Pike County Recorder's Office and the Director of the Ohio EPA, which indicates the location and dimensions of the unit with respect

to permanently surveyed benchmarks. The plat would be prepared and certified by a professional land surveyor. The plat would contain a note, prominently displayed, which states the owners obligation to restrict disturbance of the hazardous waste unit.

3.7 Request for Extension to Deadlines for Handling Inventory or Completing Closure

There are no extensions needed at this time.

3.8 Milestones

Table 6 exhibits the time required for each phase of the X-7725 Storage Unit closure.

4. HEALTH AND SAFETY PLAN

A general Health and Safety Plan (HASP) has been developed for closure of the X-7725 Storage Unit at PORTS. The HASP presents the procedures to be followed which will achieve compliance with applicable federal, state and local regulations.

Prior to commencement of any closure field activities, a detailed and site specific HASP will be required to be submitted by the contractor selected to perform these closure activities. The site specific HASP will include but is not limited to the following general requirements.

- DOE orders (e.g., 5480.4, 5480.10 and 5480.11)
- Code of Federal Regulations (e.g., OSHA 29 CFR, EPA 40 CFR, and DOT 49 CFR)
- ACGIH threshold limit values (TLVs), latest edition
- Standard practice procedures for health and safety

This HASP will be available at PORTS for inspection by employees, their designated representatives, DOE, EPA and other authorized personnel. Specific safety and health hazards of each phase of site investigation operations and the requirements and procedures for employee protection will be provided in the site safety and health plan. The site safety and health plan complies with 29 CFR 1910.120 and must be developed and approved prior to hazardous waste operations. As a minimum, the site safety and health plan addresses the following items:

- Names of key personnel and alternates responsible for site safety and health and appointment of a site safety and health officer;
- Site characterization and analysis;
- A safety and health risk analysis of each site task and operation;
- Employee training;
- Selected engineering controls, administrative controls and work practices to be implemented;
- Personal protective equipment to be used by employees for each of the site tasks and operations being conducted;
- Medical surveillance requirements;
- Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used. Methods of maintenance and calibration of monitoring and sampling equipment used;
- Site control measures;
- Decontamination procedures;

- Site's standard operating procedures;
- A contingency plan meeting the requirements of paragraph (1) of 29 CFR 1910.120 for safe and effective responses to emergencies including the necessary personal protective equipment and other equipment; and
- Confined space entry procedures.

4.1 Objectives

This general HASP contains the requirements for protection of on-site personnel and the public during closure of the X-7725 Storage Unit at PORTS.

The protection of individuals and the environment are major concerns during any project involving potentially hazardous substances. The objective of this HASP is to assure that safe working conditions exist at the site during the field activities. Adopted safety measures and procedures have been based on an analysis of potential hazards at PORTS.

This HASP has been developed based upon a review of the requirements and guidelines described in the EPA Standard Operating Safety Guide, U.S. Department of Labor OSHA Standards 29 CFR Part 1910 (especially, 29 CFR 1910.120 covering hazardous waste operations), NIOSH/OSHA/USCG/EPA Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (U.S. Department of Health and Human Services Publication No. 85-115). Subcontractors will be given copies of this general HASP and will be required to follow the procedures and protocols specified herein for development and implementation of specific site safety and health plans.

Requirements of this general HASP and associated site safety and health plans may be modified, in writing, in response to review of changing site conditions upon approval by PORTS Environmental, Safety and Health (ESH) and the Site Safety and Health Officer.

4.2 Responsibilities

All closure operations which might expose personnel to site contamination are subject to this HASP. Avoiding adverse health effects and injuries to the site workers and preventing environmental insult are dependent on the contribution of all project participants.

4.2.1 Site Safety and Health Officer (SSHO)

The Site Safety and Health Officer (SSHO) will be responsible for providing technical coordination of the health and safety program. The officer will review documentation on medical programs and training requirements to be certain that personnel fulfill OSHA requirements. After review of the site safety and health plan's hazard assessment, the health and safety officer will select appropriate air monitoring engineering controls, work practices and personal protective equipment for particular work areas. Daily activities and site access are monitored to assure that all applicable procedures are followed. Representatives of PORTS ESH and the EPA will oversee issues relating to health and

safety. The officer provides authorized personnel with the HASP-related documentation which must be available at all work sites. This documentation includes the following:

- A copy of the physician's written opinion for each employee;
- A copy of training records, which document that each employee has completed the necessary training to accomplish the job to satisfy applicable 29 CFR and 40 CFR requirements, and is trained in the use of respiratory protection equipment;
- Documentation of the fit-testing program for respiratory protection equipment (meeting the requirements of OSHA 1910.134 and the American National Standards Institute (ANSI) Z88.2-1980);
- Job-specific (e.g., drilling, drumming waste, etc.) air monitoring records;
- A copy of this HASP and appropriate site safety and health plans; and
- Assurance that operators possess current licenses/certificates to operate motorized equipment.

The SSHO will communicate the specified safety-related requirements to all personnel during the daily safety meeting. Pre-entry briefings are held prior to initiating any site activity and at other times as necessary to ensure that employees are informed of and follow the site safety and health plan.

4.2.2 PORTS ESH

PORTS ESH is ultimately responsible for ensuring that all project participants abide by the requirements set forth in this plan. Approval of each site safety and health plan must be granted by PORTS ESH prior to initiating site operations. No individual may enter a hazardous waste site unless authorized by PORTS ESH to have site access. Such access is dependent upon presentation of satisfactory documentation including a physician's written opinion and necessary training.

PORTS ESH performs periodic audits to assure field implementation of the general HASP and site safety and health plans and reviews air and personal exposure monitoring results.

Disputes over health and safety issues will be resolved by PORTS ESH and the SSHO prior to submitting a modified HASP to Ohio EPA and U.S. EPA for review. The Ohio EPA and U.S. EPA shall also be kept informed of all changes made to the HASP.

4.2.3 Field Personnel

Field personnel must be properly trained in health and safety regulations associated with handling hazardous materials and are responsible for adherence to the safety procedures during performance of the work. In no case may work be performed in a manner that conflicts either with the intent of these procedures or with the inherent safety and environmental cautions expressed. After due

warnings, any personnel who violate safety procedures will be dismissed from the site.

4.3 Hazard Evaluation

Site-specific hazard evaluations of substances known or suspected in the X-7725 Storage Unit will be included in the site specific safety and health plan and reviewed prior to initiation of field activities. Appropriate personal protection levels, specific safety measures, and other pertinent information to be employed for the X-7725 Storage Unit closure will also be presented in the site specific health and safety plan.

4.3.1 Radiological Hazards

Radioactive materials emit one or more of four types of potentially harmful radiation: (alpha, beta, gamma and neutron). Alpha radiation has limited penetrating ability and is usually stopped by clothing and outer layers of the skin. Alpha radiation poses little threat outside the body, but can be hazardous if materials that emit alpha radiation are inhaled or ingested. Beta radiation can cause harmful "beta burns" to the skin and change the subsurface blood system. Beta radiation is also hazardous if materials that emit beta radiation are inhaled or ingested. Use of protective clothing, coupled with scrupulous personal hygiene and decontamination, afford good protection against alpha and beta radiation. In addition, use of respiratory and other protective equipment can help keep radiation-emitting materials from entering the body by inhalation, ingestion, injection, or skin absorption.

Gamma and neutron radiation easily pass through clothing and human tissue and can also cause serious permanent damage to the body. Chemical-protective clothing affords no protection against these types of radiation.

A PORTS health physicist will be consulted prior to work. At dosage-rate levels greater than 2 millirem per hour (mrem/hr) (whole body gamma radiation), all site activities shall cease until the situation has been assessed and appropriate health and safety measures have been implemented.

All workers will submit baseline and exit bioassay urine samples for total uranium, gross alpha and technetium-99. The urine specimen will represent at least a full 24-hour period. The minimum acceptable volume is 1.0 liter. Monthly specimens for the routine bioassay program will be collected on Friday or the last day of the workshift. Additional uranium bioassay samples will be collected whenever an intake above plant allowable limits may have occurred.

The purposes of the bioassay program are to confirm the results of the air sampling program and confirm the effectiveness of the respiratory protection program.

4.3.2 Chemical Hazards

Material Safety Data Sheets will be available at the job site for those chemicals utilized during closure. The SSHO will assist in identifying technical chemical hazard issues that are not addressed or are unclear on the Material Safety Data Sheets.

4.3.3 Physical Hazards

Physical hazards on the site include electric shock, tripping, falling, noise, and heat stress. To ensure a safe work place, the SSHO will conduct and document daily safety meetings and inspections. The SSHO must be familiar with OSHA construction industry and general industry standards. The SSHO shall ensure that all workers are informed of any physical hazards related to the site.

4.3.3.1 Heavy Equipment

Some general safety concerns include:

- Follow established procedures;
- Get help whenever you are in doubt about a material's weight. Use the buddy system;
- Be sure that any gas cylinders are secured properly to heavy mobile equipment;
- Hard hats and safety glasses are to be worn at all times around heavy equipment. Additional protective gear will be worn as needed;
- Establish hand signal communication when verbal communication is difficult. Determine one person per work group to give hand signals to equipment operators;
- Only qualified/licensed people are to operate heavy equipment;
- Use chains, hoists, straps, and other safety equipment to aid in moving heavy materials consistent with hoisting and rigging standards;
- Never walk directly in back of or to the side of heavy equipment without the operators knowledge; and
- Be sure that no underground or overhead power lines, sewer lines, gas lines, or telephone lines will present a hazard in the work area.

4.3.3.2 Trenching

Not applicable.

4.3.3.3 Electrical

All electrical wiring used during the X-7725 Storage Unit closure activities will satisfy the requirements of 29 CFR 1926, Subpart K, and any applicable local electric codes. Some specific electrical safety requirements follow:

- All electrical work will follow established procedures;

- All wiring will be done by a licensed electrician;
- All extension cords must have functional grounding conductors;
- All equipment that is not "double insulated" must have a functional grounding conductor;
- All electrical cords must be in good condition;
- In lieu of a documented "assured equipment grounding conductor program," ground fault protected circuits can be utilized; and
- Electrical cords and power tools will be inspected by the SSHO prior to use on the X7725 Storage Unit closure. Workers will inspect their power tools and cords.

4.3.3.4 Tripping and Falling

Workers will be apprised of any potential trip hazards through daily tool box health and safety meetings.

Whenever possible, trip and fall hazards will be eliminated or clearly identified with yellow "caution" tape. Impalement hazards to workers will be corrected as soon as they are identified.

4.3.3.5 Utilities and Powerlines

Not applicable.

4.3.3.6 Noise

Workers will be protected from excessive noise exposure through equipment maintenance, noise monitoring, and hearing conservation programs which comply with 29 CFR 1910.95. The daily equipment inspection will include the exhaust system; perforated exhaust pipes and mufflers will be replaced as they are discovered. Noise level surveys in work areas and around equipment will be performed regularly and documented.

Hearing protective equipment will be required whenever continuous noise levels equal or exceed 85 DBA (slow meter response) and/or impulse/impact noise exceeds current ACGIH TLVs or OSHA 1910.95.

4.3.3.7 Heat Stress

Wearing Personal Protective Equipment (PPE) puts a hazardous waste worker at risk of developing heat stress. This can result in health effects ranging from transient heat fatigue to serious illness or death. Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker. Because heat stress is probably one of the most common (and potentially serious) illnesses at hazardous waste sites, regular monitoring and other precautions are vital.

Heat stress may be of concern especially when the dry-bulb air temperature exceeds 70 °F. One or more of the following control measures can be used to help control heat stress if ambient temperatures above 70 °F are expected:

- Provision of adequate liquids to replace lost body fluids. Employees must replace water and salt lost from sweating. Employees must be encouraged to drink more than the amount required to satisfy thirst. Thirst satisfaction is not an accurate indicator of adequate salt and fluid replacement;

- Replacement fluids can be a 0.1 percent salt water solution, commercial mixes such as Gatorade or Quick Kick, or a combination of these and fresh water;

- Establishment of a work regimen that will provide adequate rest periods for cooling down. This may require additional shifts for workers or earlier/later work schedules;

- Cooling devices such as vortex tubes or cooling vests can be worn beneath protective garments;

- All breaks are to be taken in a shaded rest area;

- Employees will remove impermeable protective garments during rest periods;

- Employees will not be assigned other tasks during rest periods; and

- To prevent heat stress, all employees will be informed of the importance of adequate rest, acclimatization, proper diet, health hazards, recognition of heat illness, and first aid.

Because the incident of heat stress depends on a variety of factors, all workers, even those not wearing protective equipment, should be monitored.

- For workers wearing permeable clothing (e.g., standard cotton or synthetic work (clothes), follow recommendations for monitoring requirements and suggested work/rest schedules in the current American Conference of Govermnental Industrial Hygienists' (ACGIH) threshold limit values for heat stress. If the actual clothing worn differs from the ACGIH standard ensemble in insulation value and/or wind and vapor permeability, change the monitoring requirements and work/rest schedules accordingly.

- For workers wearing semipermeable or impermeable encapsulating ensembles, the ACGIH standard cannot be used. For these situations, workers should be monitored when the temperature in the work area is above 70 °F.

To monitor the worker, measure:

- Heart rate. Count the radial pulse during a 30-second period as early as possible in the rest period. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.

If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third; or,

- Oral temperature. Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).

  If oral temperature exceeds 99.6°F, shorten the next work cycle by one-third without changing the rest period.

  If oral temperature still exceeds 99.6 ° F at the beginning of the next rest period, shorten the following work cycle by one-third.

  Do not permit a worker to wear a semipermeable or impermeable garment when his/her oral temperature exceeds 100.6°F.

To monitor body water loss, measure weight on a scale accurate to +0.25 lb. at the beginning and end of each work day to see if enough fluids are being taken to prevent dehydration. Weights should be taken while the employee wears similar clothing or, ideally, is nude. The body water loss should not exceed 1.5 percent total body weight loss in a work day.

Initially, the frequency of physiological monitoring depends on the air temperature adjusted for solar radiation and level of physical work. The length of work cycle will be governed by frequency of the required physiological monitoring.

4.3.3.8 Cold Stress

Cold stress may be of concern, especially when a wind-chill-adjusted temperature of 10 ° F or less is expected. To control cold stress:

- Persons working outdoors in temperatures at or below freezing may be frostbitten. Extreme cold for a short time may cause severe injury to the surface of the body or result in profound generalized cooling, causing death. Areas of the body which have high surface-area-to-volume ratios such as fingers, toes, and ears, are the most susceptible;

- Two factors influence the development of cold injury: ambient temperature and the velocity of the wind. Wind chill is used to describe the chilling effect of moving air in combination with low temperature. For instance, 10 ° F with a wind of 15 miles per hour (MPH) is equivalent in chilling effect to still air at -18°F;

- As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 mph increases to 10 mph. Additionally, water conducts heat 240 times faster than air. Thus, the body cools suddenly when chemical-protective equipment is removed if the clothing underneath is perspiration soaked;

- Local injury resulting from cold is included in the generic term frostbite. There are several degrees of damage. Frostbite of the extremities can be categorized into:

- Frostbite nip or initial frostbite: Characterized by sudden blanching or whitening of skin;
- Superficial frostbite: Skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient; and
- Deep frostbite: Tissues are cold, pale, and solid; this is an extremely serious injury.
- Systemic hypothermia is caused by exposure to freezing and rapidly dropping temperature. Its symptoms are visually exhibited in five stages: (1) shivering, (2) apathy, listlessness, sleepiness, and sometimes rapid cooling of the body to less than 95 °F, (3) unconsciousness, glassy stare, slow pulse, and slow respiratory rate, (4) freezing of the extremities, and finally, (5) death.
- Thermal socks, long cotton or thermal underwear, hard hat liners and other cold weather gear can aid in the prevention of hypothermia.
- Blankets, warm drinks (other than caffeinated coffee) and warm break areas are essential.

4.3.3.9 Illumination

While work is in progress, areas accessible to employees will be illuminated not less than the intensities identified on the table located on page 4-10.

4.3.3.10 Sanitation

Provision of potable water, drinking cups, non-potable water, toilet facilities, washing facilities and other sanitation requirements will be in compliance with specifications of OSHA 1910.120 (n).

4.3.3.11 Bodies of Water

Not applicable.

4.3.3.12 Confined Space Entry

All employees required to enter into confined spaces shall observe requirements specified in ANSI Z117.1-1977 (or the latest revision thereof) and PORTS SPP H-53, "Confined Space Program." Prior to entry, employees shall have satisfactorily completed a confined space training program. Depending upon risk level, atmosphere testing for oxygen deficiency, combustible gases and toxic agents may be required. High risk entries require issuance of a hazardous work permit (HWP) by the PORTS facility custodian prior to job activities.

4.3.3.13 Site Housekeeping

Construction debris shall be handled in accordance with OSHA 1926.25.

MINIMUM ILLUMINATION INTENSITIES

FOOT-CANDLES	AREAS OR OPERATIONS
5	General site areas.
3	Excavation and waste areas, accessways, active storage areas, loading platforms, refueling and field maintenance areas.
5	Indoors: warehouse, corridors, hallways, and exitways.
5	Tunnels, shafts, and general underground work areas. (Exception: minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Mine safety and health administration approved cap lights shall be acceptable for use in the tunnel heading.)
10	General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, and indoor toilets and workrooms.)
30	First aid stations, infirmaries, and offices.

* Table 120.1 of 29 CFR 1910.120 provides additional technical information on illumination intensities.

4.4 Air Monitoring

Air monitoring will be used to identify and quantify airborne levels of hazardous substances and health hazards in order to determine the appropriate level of employee protection needed at each work site. Initial air monitoring will be conducted to identify any Immediately Dangerous to Life and Health (IDLH) and other dangerous situations, such as the presence of flammable atmospheres, oxygen-deficient environments, toxic levels of airborne contaminants, and radioactive materials. Then, periodic monitoring will be conducted when

- Work begins on a different portion of the site;
- Contaminants other than those previously identified are being handled;
- A different type of operation is initiated (e.g., drum opening as opposed to exploratory well drilling); and
- Employees are handling leaking drums or containers or working in areas with obvious liquid contamination (e.g., a spill or lagoon).

4.4.1 Radioactive Materials

Radiation and radioactive contamination will be monitored using survey instruments capable of measuring low levels of activity.

Initially, at least one breathing zone air particulate sample for the employee with the highest potential exposure will be collected per work crew per work shift during activities at the site. As results are obtained, it is anticipated that the frequency of sampling during a particular activity can be reduced. The criteria for air particulate sampling and radio nuclide counting are addressed in DOE Order 5480.11.

Radioactive air particulate samples will be counted using a gas proportional counter, or alpha scintillation counter or counter with similar capabilities. As a minimum, gross alpha emitter airborne concentration and gross beta emitter airborne concentration will be determined and documented.

Preliminary samples showing activities above 25% of applicable DAC values will be composited and sent to a laboratory for identification of the isotopes present and their concentrations. In addition, whenever the time weighted average gross alpha or gross beta airborne concentration measurements indicate that airborne radio nuclide concentrations may exceed 25% of the values provided in DOE Order 5480.11, isotopic analysis will be performed. When appropriate, several filters may be submitted as a single composite sample for isotopic analysis.

4.4.2 Chemical Hazards

Air sampling and monitoring for chemical hazards will be conducted to the extent necessary to document compliance of the project with existing regulations. Monitors used will include

direct-reading instruments and sample collecting devices. Direct reading instruments to be used during the X-7725 Storage Unit closure activities may include photo ionization detectors, flame ionization detectors, colormetric tube samplers, and combustible gas/oxygen meters; sample collecting devices utilized may include filter cassettes, florisil tubes and charcoal tubes. Breathing zone samples for employees with the highest potential exposure for each contaminant will be initially taken at a minimum rate of one per work crew per shift until results obtained indicated a greater or lesser sampling frequency is warranted.

Caution must be exercised when utilizing direct-reading instruments. Since mixtures of chemicals may be encountered and direct-reading air monitoring instrument may react to the total mixture, individual concentrations of specific compounds may not be determined by these instruments. Direct-reading instruments are not to be used when negative interference is a possibility. For situations involving exclusively positive interference, it will be assumed that the mixture is made up entirely of the chemical with the lowest airborne exposure limit. This means that the composite reading obtained will be compared with lower applicable value of the ACGIH TLVs or OSHA PELs for that specific substance to determine required respiratory protection levels.

Site hazard evaluation is a dynamic and on-going process. Respiratory protection levels may change based on measured atmospheric concentrations of detected contaminants. Respiratory protection levels will be re-evaluated if chemical analytical results from samples collected during the field activities indicated that such re-evaluation is warranted; i.e., if additional compounds are detected or if airborne concentrations significantly differ from previous measurements. The results of the air monitoring will be used as on-site documentation of contaminant exposure levels and to select the appropriate level of personal protective equipment.

4.4.3 Physical Hazards

Monitoring for physical hazards will consist of on-site inspections and use of direct-reading instruments. These instruments may include sound level meters, noise dosimeters, various types of thermometers, radio frequency analyzers, illumination meters and thickness gauges.

4.4.4 Equipment Calibration and Maintenance

All monitoring equipment will be calibrated and maintained according to manufacturer's instructions.

4.5 Personal Protective Equipment

Personnel must wear protective equipment when response activities involve known or suspected atmospheric contamination, when vapors, gases, or particulates may be generated, or when direct contact with skin-affecting substances may occur. Full-face respirators protect lungs, gastrointestinal tract, and eyes against air toxicants. Chemical-resistance clothing protects the skin from contact with skin-destructive and absorbable chemical. Good personal hygiene limits or prevents ingestion of material.

Equipment to protect the body against contact with known or anticipated chemical hazards has been

divided into four categories according to the degree of protection afforded as outlined in OSHA 1910.120, Appendix B.

- Level A: Chemical-protective, totally-encapsulating suit; NIOSH-approved, full-face piece Self Contained Breathing Apparatus (SCBA) or combination SCBA/air line; chemical-resistance inner and outer gloves; chemical-resistant boots with steel toes and shanks; disposable protective suit, gloves and boots; and two-way radios. Should be worn when the highest level of respiratory, skin, and eye protection is needed.

- Level B: Chemical-resistance splash suit and coveralls (e.g., PVC saranex); NIOSH approved, full-face piece SCBA or combination SCBA/air line; chemical-resistance inner and outer boots and gloves; hard hats; and two-way radios. Should be selected when the highest level of respiratory protection is needed, but a lesser level of skin protection or when the atmosphere contains less than 19.5% oxygen.

- Level C: Chemical-resistant splash suit and coveralls; NIOSH-approved, full-face cartridge respirators; chemical-resistant inner and outer boots and gloves; hard hats; and two-way radios. Should be selected when the types of airborne substances are known, the concentrations measured, direct contact with exposed skin poses no hazard and the criteria for using air-purifying respirators are met.

- Level D: Coveralls (cloth), boots (leather or rubber) with steel toes and shanks, chemical resistant outer boots; and hard hat. This is primarily a work uniform providing minimal protection for situations when the atmosphere contains not known hazard. Optional items include face shield, safety glasses or goggles; gloves; and hearing protectors.

4.5.1 Respiratory Protection

The selection and use of respirators will be in accordance with the publications listed below:

- ANSI Z88.2 (1980) "Practices for Respiratory Protection."

- NIOSH/OSHA/USCG/EPA (1985) Occupational Health and Safety Guidance Manual on Hazardous Waste Site Activities. US GPO, Washington, D.C.

- 29 CFR 1910.134, "Respiratory Protection."

- 29 CFR 1926.58, "Asbestos."

The following requirements will be adhered to:

- As a minimum, only properly cleaned, maintained, NIOSH/MSHA-approved full-face air purifying respirators will be used on-site;

- Selection of respirator, as well as any decisions regarding upgrading or downgrading of respiratory protection, will be made by the SSHO;

- Air-purifying cartridges will be replaced on a regular basis, as determined by the SSHO;

- No employee shall be assigned to tasks requiring the use of respirators if, based upon the most recent examination, a physician determines that the employee will be unable to function normally wearing a respirator or that the safety or health of the employee or other employees will be impaired by use of a respirator. All respirator users are required to have physicals annually with the most recent physician's written opinion permitting respirator use;

- Contact lenses are not to be worn while using any type of respiratory protection;

- Air-line respirators shall be assembled according to manufacturer's specifications regarding hose length, couplings, valves, regulators, manifolds, etc. Though not anticipated, air-line respirators may need to be used on-site;

- Excessive facial hair (for example, beards) prohibits proper face fit and effectiveness of respirators. Persons required to wear full-face piece respirators of SCBAs must not have interfering facial hair. All personnel wearing full-face piece respirators of SCBAs will be required to be shaven to permit proper fit;

- Regular eyeglasses cannot be used with full-face respirators (they can break the facepiece seal). Inserts must be utilized;

- The respiratory protection program utilized on-site will be documented and in compliance with OSHA, 29 CFR 1910.134 and ANSI Z88.2-1980. This requires annual respirator-usage training and annual fit testing of the respiratory equipment (fit testing every 6 months if asbestos exposure is a possibility). Program documentation and employee records for training and fit testing must be reviewed and approved by ESH; and

- Where respirators are designated for protection against contaminants, the employee shall be permitted to change canisters or cartridges whenever an increase in breathing resistance, contaminant odor breakthrough, or other malfunction is experienced.

Based on the hazard evaluation the use of respiratory protection is anticipated to be limited for the majority of tasks involved. Level D protection (with the modifications listed in Section 4.5.2 of this HASP) has been selected for site activities unless on-site monitoring data indicates a necessity for upgrading personal protective equipment. Air monitoring will be used to identify and quantify airborne levels of hazardous substances and health hazards in order to determine the initial and ongoing job appropriate level(s) of employee protection. These monitoring procedures are discussed in Section 4.4 of this HASP (air monitoring).

4.5. Protective Clothing

Based on available health and safety information, initial protective clothing for this work shall be as follows:

- Disposable acid-resistant coveralls with hood and boot covers;
- Boots (leather or rubber) with steel toes and shanks;
- Chemical-resistant outer boots;
- Hard hat, as applicable;
- Latex inner gloves;
- Chemical-resistant outer gloves or equivalent;
- Hearing protection, as applicable;
- If not wearing a full-face piece respirator or SCBA, chemical splash goggles will be worn at all times in the work area. Contact lenses will not be permitted in the contaminated area; and
- Sleeves will be taped to gloves and cuffs taped to boots, as applicable.

Upgrading or downgrading of the selected level of protective equipment will be the decision of the SSHO based on assessment of potential hazards.

4.6 Site Control

A site control program which meets requirements specified in OSHA 1910.120(D) will be included in the site safety and health plan.

Appropriate warning signs will be posted in readily visible locations in or near contaminated work areas. Inadvertent entry by unauthorized personnel will be prevented by utilizing barricade tape to mark the boundaries of hazardous waste sites within the PORTS security fence.

Access to contaminated work areas will be restricted to persons authorized by ESH. A daily roster containing the date, the person's name, the person's signature, organization, the time of entry, and the time of exit will be kept of all persons working in such areas. Any visitors to the area must present proper identification and be authorized to be on site. Visitors must comply with all aspects of the HASP.

Each restricted access area at PORTS will be divided into three zones, an exclusion zone, a decontamination zone, and a support zone. The basic premise behind this type of procedure is to limit the transportation of contaminants to clean areas by confining and controlling activities.

4.6. Exclusion Zone

The exclusion zone includes the actual work area where contamination is likely to be the highest. This zone has the higher inhalation exposure potential and/or presents a potentially higher

probability of skin contact with cutaneous or percutaneous effecting chemicals. As its name implies, access to the exclusion zone is limited, and the exclusion zone is bounded by an access barrier. The exclusion zone is entered after donning the proper equipment and passing through the contaminant-reduction zone. The exclusion zone should be large enough to contain the working area and small enough to be easily controlled. No eating, drinking, or smoking is allowed in the exclusion zone. The hotline can be as rigid as a fence or simply signs or barrier tape. The main point is to control access into the area. Field personnel will not enter the exclusion zone alone. Entry will be in teams of at least two individuals working under the buddy system. Visitors are not permitted to enter exclusion zones.

4.6.2 Decontamination Zone

The decontamination zone includes the areas immediately surrounding the exclusion zone. This zone has the next highest inhalation hazard, but does not have a high probability of skin contact with cutaneous or percutaneous effecting chemicals. This zone is the area in which the actual decontamination of equipment and PPE takes place. As its name implies, the intent is to reduce contamination, i.e., become progressively cleaner. This means that after decontaminating auxiliary equipment, the most contaminated PPE (e.g., boots, gloves) should be doffed first, the coveralls, other PPE, and finally, the respirator. If the site is heavily contaminated, it may be necessary to have a wash station available for removing surficial contamination before starting the disrobing procedure. Visitors are not permitted to enter decontamination zones.

Personnel decontamination will be completed according to the guidance given in the Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities. Personnel and personnel protective equipment will be decontaminated using water or a mixture of detergent and water. Liquid and solid wastes generated during decontamination will be properly collected and disposed. Prior to leaving this zone, workers will be frisked for radioactive contamination.

Every attempt will be made to reduce contamination on equipment and articles to levels that are as low as reasonably practicable. Whenever possible, steam cleaning and the use of detergents and water will be used in place of solvents and chemical decontaminants. Solid and liquid wastes produced during decontamination will be collected for proper disposal.

4.6.3 Support Zone

The support zone (clean zone) covers all areas immediately outside of the decontamination zone. Adverse exposure to chemical is unlikely in this zone. This zone is usually used to store supplies and as a dressing area. Personnel or equipment which have been in the exclusion zone must be decontaminated before re-entering the support zone. Visitors may enter support zones under the following conditions:

- Visitors must be under continuing escort by personnel qualified in at least 24 hours of health and safety training for hazardous waste sites;

- Visitation occurrence is irregular or intermittent and for short-term entry only; and

- Purpose of visitation is observatory in nature or involves the performance of incidental, non-hazardous tasks.

4.7 General Work Practices

- At least one copy of this general HASP and applicable site safety and health plan will be available at each work site.

- Contaminated protective equipment, such as respirators, hoses, boots, etc., will not be removed from the exclusion zone or decontamination zone until it has been cleaned, or properly packaged and labeled.

- Food and beverages will not be permitted or consumed in the restricted-access areas. Possession or use of tobacco products and the application of cosmetics are also prohibited in these areas.

- Containers will be moved only with the proper equipment and will be secured to prevent dropping or loss of control during transport.

- During activities all personnel will be required to wash their hands and face before eating, drinking, smoking, or applying cosmetics.

- Portable eyewash stations will be located in the restricted-access areas near work activities.

- All personnel will be required to field wash (hands and face) as a minimum at the end of their shift before leaving the job site if they might have been contaminated. Hands and face will be washed during breaks.

- All personnel will avoid contact with potentially contaminated substances. Walking through puddles or mud and kneeling on the ground should be avoided whenever possible.

- Equipment will not be placed on possibly contaminated surfaces.

- Field personnel must observe each other for signs of toxic exposure and heat/cold illness. Indications of adverse effects include, but are not limited to:

  * Changes in complexion and skin discoloration
  * Changes in coordination
  * Changes in demeanor
  * Excessive salivation and pupillary response
  * Changes in speech pattern

- Field personnel are cautioned to inform each other of non-visual effects of illness such

  * Headaches
  * Dizziness

* Nausea
* Blurred vision
* Cramps
* Irritation of eyes, skin, or respiratory tract

4.8 Training and Information Programs

Training and information programs must comply with requirements specified in OSHA 1910.120(E) and (I). General site workers and the SSHO are required to have satisfactorily completed an off-site 40-hour health and safety training course for conducting work at hazardous waste sites and a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. On-site supervisors (e.g., SSHO) responsible for employees performing hazardous waste operations are required to have also completed an 8-hour specialized course on management of such operations. Workers and supervisors must receive 8 hours of refresher training each year. At least one member of each crew will have current certificates in Cardiovascular Pulmonary Resuscitation (CPR) and first aid. Employees expected to respond to hazardous emergency situations shall have been trained in how to respond to expected emergencies.

Prior to beginning the fieldwork tasks, field personnel and subcontractors will be given a training program/briefing by the SSHO and ESH. This session will include, but is not limited to, the following topics:

- Names of SSHO and designated alternates
- Site history and site control measures
- Specific hazards (including toxicological data) and location of materials safety data sheets (MSDS).
- Hazard recognition and symptoms of overexposure
- Standard operation procedures and use of PPE and engineering controls
- Decontamination (personnel and equipment)
- Emergency procedures and locations of emergency equipment
- Respirator fit test and use
- Relevant aspects of the 29 CFR 1910.120(I)(2) site safety and health plan requirements listed at the beginning of this HASP

Throughout the course of the field program, field management personnel and the SSHO will be responsible for ensuring the implementation of and adherence to the health and safety program. In addition, the following items will be discussed during briefings between the project representative and personnel on-site. It should be kept in mind that these points are not exclusive, and any other potentially hazardous situation that may be known by the parties involved in this safety briefing should be outlined at the time of the meeting.

- Hazardous substances (suspected or known contaminated media that personnel may be exposed to)

- Hazard assessment (toxic effects, reactivity, warning signs)

- Levels of personal protection to be employed in work areas

- Work area monitoring and the atmospheric concentrations which warrant changes in the level of respiratory protection

- Personnel exposure emergency procedure (skin contact, inhalation, ingestion, falls, etc.): Notify ESH (or shift superintendent at ext. 3025)

- Potential or actual fire or explosion emergency procedure: Call emergency #5555. Relate location and status of the fire or explosion and injuries to personnel. Response will be immediate

- Potential or actual ionizing radiation exposure emergency procedure: Notify Energy Systems ESH of suspected or actual exposure to ionizing radiation (e.g., ingestion of uranium particulates). ESH will respond by notifying either the shift superintendent or health physics personnel as the situation warrants

- Environmental accidents emergency procedure (spread of contamination outside existing site): Call shift superintendent at ext.3025 and relate incident. The shift superintendent or his representative will be the authority at the site of the incident

- Emergency signals and/or codes: (See Part 4.11.2 of this section for a description of emergency alarms)

- Emergency routes: (This will depend upon worksite location)

Emergency phone number: 5555

4.9 Medical Surveillance

As a minimum, the medical monitoring program will satisfy the requirements of 29 CFR 1910 including, but not necessarily limited to, those provided in 29 CFR 1920.120 (the hazardous waste operations standard) and 29 CFR 1910.134 (the respiratory protection standard).

All participating personnel must have a copy of a written opinion from the examining physician dated not more than 12 months prior to on-site operations. This opinion includes the following:

- The results of the medical examination and tests;

- The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from work in hazardous waste operations or emergency response;

- The physician's recommended limitations upon the employees assigned work with special emphasis on fitness for duty, including the ability to wear any required personal protective clothing and equipment under conditions (i.e., temperature extremes) that may be expected

at the work site; and

A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions which require further examination or treatment.

4.10 Hazardous Waste Site Emergency Procedures

The SSHO shall be notified of any on-site emergencies and be responsible for ensuring that the appropriate procedures are followed. The following standard emergency procedures will be used by on-site personnel.

4.10.1 Injury in Exclusion or Decontamination Zone

In the event of an injury in the exclusion zone, all site personnel shall exit the exclusion zone and assemble at the decontamination line. The on-site inspector will evaluate the nature of the injury and the affected person should be decontaminated to the extent practical prior to movement to the support zone. Appropriate first aid will be initiated, and an immediate request will be made for an ambulance (if necessary) and the designated medical facility notified (if required). No persons will re-enter the exclusion zone until the cause of injury or symptoms is determined.

4.10.2 Injury in the Support Zone

In the event an injury occurs in the support zone, the SSHO must be notified immediately. Appropriate first aid will be administered and, if necessary, the injured individual will be transported to the designated medical facility. If the injury does not affect the performance of site personnel, operations may continue.

4.10.3 Fire/Explosion

In the event of a fire or explosion at the site, the PORTS fire department will be alerted and all personnel should move to a safe distance from the area (See Section 4.11 for a list of emergency phone numbers).

4.10.4 Protective Equipment Failure

If any site worker experiences a failure or alteration of protective equipment that affects the protection factor, that person and designated buddy will immediately leave the exclusion zone. Re-entry to the exclusion zone will not be permitted until functionally sound equipment has been donned.

4.11 PORTS Emergency Procedures

Emergency phone numbers and directions to the nearest medical facility will be posted at conspicuous places in the support zone. The policy at PORTS is to maintain an emergency preparedness program to provide the maximum practical protection for employees, DOE and DOE contractor personnel, members of the public, and property in the event of emergencies involving

activities on the PORTS site. Because of the nature of the facility, visitors to PORTS are always accompanied by an escort. The escort will be familiar with emergency situation response, the locations of monitoring stations, etc., and can direct visitors should an emergency situation occur. The following information is provided in case of alarms or emergencies.

4.11.1 Reporting an Emergency

Any person discovering an emergency condition at a RCRA facility should immediately alert the Plant Emergency Director (PED) and the Plant Emergency Response Team by one of the following means:

- Dial 5555 on any phone. Give your name and all vital information to the answering parties. The plan emergency squad will respond;

• Actuate a red fire alarm box - if possible wait nearby to provide the emergency squad with details of the emergency;

• Use the plant radio system to notify X-300 (plant control facility); and

• Pick up a red emergency phone. X-300 will answer. Give your name and details of the emergency.

After alerting the plant emergency director and the plant emergency response team, the person discovering the emergency should do whatever can safely be done to minimize the emergency.

In all emergencies, no matter how the alarm is initiated, it is important that the PORTS cascade coordinator is on the receiving end of an initial request for the emergency response team. The only way the coordination personnel would not be included in the initial alert sent in by one of the means above would be because of a malfunction of their equipment. Any time an alarm is received by the police or fire department and cascade coordination does not respond with immediate contact of police and fire departments, it will be assumed that cascade coordination did not receive the alarm and it will be the responsibility of the fire department captain or the police console operator to pick up the red emergency phone and include the cascade coordinator in the initial alert.

4.11.2 Recognizing Emergency Alarms

The steady sounding of sirens atop the X-330 and X-7725 building is an alert signal listen for a public address announcement.

- The wailing, or intermittent sounding of these sirens is a signal to take cover or protective action. It means an attack against our country has been detected.

- Building horns - a continuous blast means leave the building immediately and go to a monitoring station or assigned assembly point.

- Gas release sirens are local alarms. They are located at X-330 Tails and Side Feed Facilities, X-7725 ERP and PW Sampling Areas, X-700 Furnace Stand, X-342, X-344, and the HF

Storage unit Farm. When you hear a continuous modulated high-frequency siren at one of these facilities, evacuate the area and seek a position upwind.

- Any signal consisting of a series of seven short tones, sounded three times, is a request for personnel accountability. Report in person or by phone to your home base as soon as possible.

- A radiation alarm is a continuous sounding of building horns and the local radiation cluster nitrogen horns. Flashing red lights outside will be on. Immediately leave the affected building and go to a monitoring station.

4.11.3 Monitoring Station Locations

- Trailer southeast of X-100
- Fire station (X-106)
- Frame building east of X-105
- Maintenance shop in X-533 switchyard
- Inside X-630 pumphouse, north end
- Cement building south of X-530 switchyard

Additional monitoring stations will be established as needed near investigated units. Any such proposed stations will be identified in the appropriate site safety and health plan.

4.12 Records and Reporting Requirements

The contractor will notify the DOE site office, PORTS safety department, the project manager, and the responsible field manager of a fatality or serious accident, as required in DOE Order 5484.1A. Fatal accidents will be investigated by the PORTS safety department and/or DOE representatives as the situation requires.

The contractor will be responsible for the recording and reporting of illnesses and injuries in accordance with PORTS and OSHA requirements. Copies of these reports will be provided to the contractor's project files and the Portsmouth facility's safety department personnel. Recordable occupational accidents and illnesses are those defined in DOE Order 5484.1A, "Environmental Protection, Safety, and Health Protection Information Reporting Requirements" and OSHA 29 CFR 1910 and 1926.

The contractor will submit a DOE form 5484.X "Individual Accident/Incident Report" for each occurrence for which reporting is required under DOE 5484.1A. Forms will be submitted to the Portsmouth facility's safety department and the cognizant DOE operations office. Additionally, the contractor should comply with all reporting requirements as identified in OSHA 29 CFR 1910 and 1926.

The contractor will maintain records of employee's exposures to radioactive or toxic materials or other harmful physical agents for a period of 30 years. In addition, a copy of all radiation exposures records will be transferred to the Portsmouth facility's health physics department upon employee

termination or completion of the contract. Reporting requirements of DOE Order 5484.1 will be adhered to by the contractor and Portsmouth facility.

All site workers are required by DOE Order 50003 to notify the PORTS Safety Department and cognizant DOE Site Office of any unusual occurrences. An "unusual occurrence" is any unusual or unplanned event having programmatic significance such that the event adversely affects or potentially affects the integrity of the site, the performance and reliability, or safety of the project. Notification of occurrences similar to the following will be required:

- Any substantial degradation of a barrier designed to contain radioactive or toxic material or any substantial release of radioactive or toxic material past this barrier (e.g., overflow of a water treatment pond, contaminant release into a stream, or contamination released beyond the site boundary);
- Accidents involving the transport of radioactive, hazardous, or toxic materials;
- Any fire or explosion which affects the integrity of the site or project;
- Any condition, resulting from natural events or manmade activities, which substantially affects or threatens performance, reliability, or safe operation (e.g., site flooding, wind damage, soil stability problems, personnel operation errors which create hazardous conditions);
- Any radiation or chemical exposure in excess of applicable limits;
- Any incidence or breach of access control by unauthorized personnel;
- Any acts of vandalism or major theft occurring at a site; and
- Any release of contamination outside the controlled area; including personnel, equipment, and roadways.

The contractor will maintain a central file of all enforcement inspections and reports along with violations and abatement actions that will be available for inspection by either the PORTS safety department or DOE's personnel. The contractor will also maintain a central file of formal employee health and safety complaints and reports of their disposition. Upon request, these will be made available for inspection by affected employees or their authorized representative.

The contractor will maintain documentation of all employee training, including the OSHA required 40 hours training, site specific training, new employee orientation, refresher courses, respirator fit test results, and respirator training in addition to other requirements specified by OSHA.

4.13 Complaints

A DOE Form 5480.2 (12/86) poster shall be posted at hazardous waste operation sites. Employees are encouraged to report to the SSHO either directly or through their authorized employee

representative any conditions or practices which they consider detrimental to their health or safety or which they believe are in violation of applicable health and safety standards. Such complaints may be made orally or in writing. The contractor will also have available in the workplace DOE Form F-5480.4, "Occupational Safety and Health Complaint Form," to be used in reporting violations.

Employees who believe that an imminent danger exists that threatens human or environmental health, death or serious physical harm, are encouraged to bring this matter to the immediate attention of the SSHO for resolution. In the event of the inadequate corrective action, the employee and/or authorized representative may also contact the local agency having jurisdiction, the contractor's project office, or ESH by telephone and set forth with reasonable particularity the basis for their request for an immediate inspection. Competent medical personnel, which may include a physician, will evaluate the symptoms of illnesses that could seriously affect a worker's health and safety.

SUBMISSION DATE: February 21, 2000

Table 1
Solid Waste Management Units

UNIT NUMBER	UNIT TITLE
X-231A	OIL BIODEGRADATION PLOT
X-231B	OIL BIODEGRADATION PLOT
X-701BP	NORTHEAST OIL BIODEGRADATION PLOT
X-614A	SEWAGE LIFT STATION
X-614B	SEWAGE LIFT STATION
X-614D	SEWAGE LIFT STATION
X-614P	SEWAGE LIFT STATION
X-615	ABANDONED SANITARY SEWAGE TREATMENT PLANT
X-616	EFFLUENT CONTROL FACILITY/FORMER CHROMIUM SLUDGE LAGOONS
X-617	pH ADJUSTMENT
X-622T	CARBON FILTRATION UNIT
X-622	SOUTH GROUNDWATER TREATMENT FACILITY
X-623	NORTH GROUNDWATER TREATMENT FACILITY
X-624	GROUNDWATER TREATMENT FACILITY
X-625	GROUNDWATER TREATMENT FACILITY
X-626	RECIRCULATING WATER PUMP HOUSE AND COOLING TOWER
X-630	COOLING TOWER BASIN
X-630-1 X-630-2 X-630-2	RECIRCULATING WATER PUMP HOUSE, COOLING TOWER, AND ACID HANDLING STATION
X-633	RECIRCULATING WATER PUMP HOUSE AND COOLING TOWER
X-701E	NEUTRALIZATION FACILITY
X-230G	RCW SYSTEM
X-6614E	SEWAGE LIFT STATION
X-6614J	SEWAGE LIFT STATION
X-6619	SEWAGE TREATMENT FACILITY
	SANITARY SEWER SYSTEM

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UNIT NUMBER	UNIT TITLE
	STORM SEWER SYSTEM
X-103	AUXILIARY OFFICE BUILDING
X-104A	INDOOR FIRING RANGE
X-114A	FIRING RANGE
X-120	OLD TRAINING FACILITY SITE
X-326	PROCESS BUILDING
X-330	PROCESS BUILDING
X-333	PROCESS BUILDING
X-343	FEED VAPORIZATION AND SAMPLING FACILITY
X-344C X-344D	HF STORAGE FACILITY AND HF NEUTRALIZATION PIT
X-600 X-600A	COAL FIRED STEAM PLANT AND COAL STORAGE YARD
X-700	CHEMICAL CLEANING FACILITY (SOILS ONLY)
X-700 X-705	PROCESS WASTE LINE SOILS
X-700T	TCE/TCA OUTSIDE STORAGE TANK (SOILS ONLY)
X-701C	NEUTRALIZATION PIT (SOILS ONLY)
X-705	DECONTAMINATION BUILDING (SOILS ONLY)
X-705A X-705B	RADIOACTIVE WASTE INCINERATION /CONTAMINATED BURNABLES STORAGE LOT (SOILS ONLY)
X-710	TECHNICAL SERVICES BUILDING AND NEUTRALIZATION PIT (SOILS ONLY)
X-720	MAINTENANCE BUILDING (SOILS ONLY)
X-736	CONSTRUCTION SPOILS AREA
X-744Y X-744G	WASTE STORAGE YARD AND BULK STORAGE BUILDING (SOILS ONLY)
X-744W	SURPLUS AND SALVAGE WAREHOUSE
X-749	CONTAMINATED MATERIALS DISPOSAL FACILITY (SOILS ONLY)
X-751	MOBILE EQUIPMENT GARAGE
X-760	PILOT INVESTIGATION BUILDING AND NEUTRALIZATION PIT (SOILS ONLY)

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UNIT NUMBER	UNIT TITLE
X-770	MECHANICAL TESTING FACILITY
X-3001	PROCESS BUILDING
X-3346	FEED AND WITHDRAWAL FACILITY
	BARREN AREA
	OLD NORTHWEST FIRING RANGE (RUBY HOLLOW)
	RAILROAD SPUR YARD STORAGE AREA
	TRANSFORMER CLEANING STORAGE PAD
X-530A X-530B X-530C X-530D X-530E X-530F X-530G	SWITCHYARD, SWITCH HOUSE, TEST AND REPAIR BUILDING, OIL HOUSE, VALVE HOUSE, AND GCEP OIL PUMPING STATION
X-533A X-533B X-533C X-533D X-533E X-533F X-533H	SWITCHYARD, SWITCH HOUSE, TEST AND REPAIR BUILDING, OIL HOUSE AND ASSOCIATED FRENCH DRAINS, VALVE HOUSES, AND GAS RECLAIMING CART GARAGE
X-747G	NORTHEAST CONTAMINATED MATERIAL STORAGE YARD (SOILS ONLY)
X-747F	MISCELLANEOUS MATERIALS STORAGE YARD
X-747H	NORTHWEST SURPLUS AND SCRAP YARD
	DON MARQUIS SUBSTATION (DRAINAGE COLLECTION PONDS) AND CONSTRUCTION SPOILS
X-326	CONTAINER STORAGE UNIT (L-CAGE)
X-326	PCB STORAGE UNIT
X-330	PCB STORAGE AREA
X-333	PCB STORAGE AREA
X-705B	CONTAMINATED BURNABLES STORAGE LOT
X-741	OIL DRUM STORAGE FACILITY
X-744G	UNRESTRICTED CONTAINER STORAGE UNIT

SUBMISSION DATE: February 21, 2000

UNIT NUMBER	UNIT TITLE
X-744G	RESTRICTED CONTAINER STORAGE UNIT
X-744P X-744N X-744Q	WAREHOUSES AND ASSOCIATED OLD CONSTRUCTION HEADQUARTERS
X-744S X-744T X-744U	WAREHOUSES
X-744RW	RETRIEVABLE WASTE STORAGE AREA
X-744Y	RAD WASTE STORAGE YARD
X-745B	ENRICHMENT PROCESS GAS YARD
X-745C	WEST CYLINDER STORAGE YARD
X-745E	NORTHWEST INTERNATIONAL PROCESS GAS YARD
X-745F	NORTH PROCESS GAS STOCKPILE YARD
X-752	HAZARDOUS WASTE STORAGE FACILITY
XT-847	WAREHOUSE
X-7725 X-7745R BFS FACILITY	RECYCLE & ASSEMBLY BUILDING, RECYCLE & ASSEMBLY STORAGE YARD, AND INITIAL CONSTRUCTION BULK FUEL STORAGE AREA (BULK FUEL STORAGE SWMU)
X-7725	CONTAINER STORAGE UNIT
X-7725	NON-HAZARDOUS WASTE CONTAINER STORAGE UNIT
X-7725R	STORAGE YARD
X-334	TRANSFORMER STORAGE AND CLEANING BUILDING
X-342A X-342B X-342C	FEED VAPORIZATION AND FLUORINE GENERATION BUILDING, FLUORINE STORAGE BUILDING, AND WASTE HF NEUTRALIZATION PIT
X-344 X-344A	URANIUM HEXAFLUORIDE SAMPLING FACILITY AND SETTLING TANK
X-344D	HF NEUTRALIZATION PIT
X-700CT	CHEMICAL AND PETROLEUM STORAGE CONTAINMENT TANKS
X-701C	NEUTRALIZATION PIT
X-701E	NEUTRALIZATION FACILITY

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UNIT NUMBER	UNIT TITLE
X-710	RADIOACTIVE WASTE PIT
X-720	NEUTRALIZATION PIT AND SOILS
X-740	WASTE OIL HANDLING FACILITY
X-750	MOBILE EQUIPMENT MAINTENANCE SHOP, FUEL STATION, AND WASTE OIL TANK
X-751	MOBILE EQUIPMENT GARAGE
X-760	NEUTRALIZATION PIT
	CHEMICAL AND PETROLEUM CONTAINMENT BASINS (EAST OF X-533A) AND EMERGENCY CONTAINMENT TANKS
	GCEP UNDERGROUND STORAGE TANKS
X-230J3	RUNOFF POND
X-230J3	WEST ENVIRONMENTAL SAMPLING BUILDING AND INTERMITTENT CONTAINMENT BASIN
X-230J5	WEST HOLDING POND AND OIL SEPARATION BASIN
X-230J6	NORTHEAST HOLDING POND, MONITORING STATION, AND SECONDARY OIL COLLECTION BASIN
X-230J7	EAST HOLDING POND AND OIL SEPARATION BASIN
X-230K	SOUTH HOLDING POND
X-611A	NORTH, MIDDLE, AND SOUTH LIME SLUDGE LAGOONS
X-611B	LIME SLUDGE LAGOON
X-621	COAL PILE RUNOFF TREATMENT FACILITY
X-701B	HOLDING POND, CONTAINMENT PONDS AND RETENTION SOILS
X-2230M	SOUTHWEST HOLDING POND, WASTE PILE AND X-617 pH ADJUSTMENT UNIT
X-2230N	WEST HOLDING POND NO. 2
X-734 X-734A X-734B	OLD SANITARY LANDFILL, CONSTRUCTION SPOILS LANDFILL, AND OLD CONSTRUCTION SPOILS LANDFILL
X-735	RCRA LANDFILL
X-735 AND X-735A	SANITARY LANDFILL AND LANDFILL UTILITY BUILDING

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UNIT NUMBER	UNIT TITLE
X-749 NORTH	HAZARDOUS WASTE LANDFILL
X-749 SOUTH	SOLID WASTE LANDFILL
X-749A	CLASSIFIED MATERIALS DISPOSAL UNIT
X-749B	PETER KIEWIT LANDFILL
	BIG RUN CREEK
	EAST DRAINAGE DITCH
	LITTLE BEAVER CREEK
	NORTH DRAINAGE DITCH, X-230L NORTH HOLDING POND, AND UNNAMED CONSTRUCTION FILL AREA
	NORTHEAST DRAINAGE DITCH
	WEST DRAINAGE DITCH
	5-UNIT GROUNDWATER PLUME
	7-UNIT GROUNDWATER AREA
	X-701B AREA GROUNDWATER AREA
	X-740 WASTE OIL HANDLING FACILITY (GROUNDWATER ONLY)
	X-749/X-120 GROUNDWATER PLUME

Table 2
Container Information

Volume	Type	Material	Dimensions[1]	Specification	Thickness
110 Gal.	Drum	Steel	30"id, 41"ih	49 cfr 178 Subpart d	16 gauge
85 Gal.	Drum	Steel	26"id, 36.375"ih	49 cfr 178 Subpart d	16 gauge
55 Gal.	Drum	Steel Steel ss[2] ple[3]	22.5", 35" ih 22.5"id, 35"ih 22.5"id, 35"ih 22.5"id, 35"ih	HM181,1A2 DOT17c,h,e DOT17c,e DOT34	16 16 & 18 gauge
1,2,13, 30 Gal.	Drum	ple	18.5"id, 29.75"oh (typical, 30 gal.)	DOT34	.1875"
30 Gal.	Drum	Steel ple	18.25"id, 29"oh 18.5"id 31.875"oh	DOT17h DOT34	.18"
20 Gal.	Drum	ple	21.25"id, 17.5"oh	49cfr 178 Subpart d	.1875"
5 Gal.	Pail	Steel ple	11.25"id, 13"oh	DOT17c,e DOT34	0.2"
10 Liter (2.64 Gal.)	Bottle	ple	5"id, 50"ih	Drawing no.: DX-761-2340-M	.195"
1.70 Gal.	Can	Tin	5"id *15"ih	Drawing No.: DX-761-2331-M	.010" Head .015" Body
83.7 Cu. Ft.	Box	Steel	4' X 4' X 6'	Drawing No.: DX-761-2265-M liner-10mil ple	12 Gauge
96 Cu. Ft.	Box	Steel	4' X 4' X 6'	49 cfr Subpart d	12 Gauge
275 Cu. Ft.	Box	Steel	6' X 6' X 8'	Drawing No.: DX-761-2286-M	12 Gauge
Various	Cylinder	Steel	Various	49 cfr 178 Subpart c	Various
Various	Bulk	Stainless Steel	Various	49 cfr 178 Subpart h	Various
Various	Bottle	Glass	Various	N/A	Various

1) id-inside diameter, od-outside diameter, ih-inside height, oh-outside (overall) height.
2) ss-stainless steel

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Table 3
Maximum Number of Containers, X-7725 Unit

Container Volume	Maximum Number
110 gallon	45,000
85 gallon	60,000
55 gallon	99,000
30 gallon	100,000
20 gallon	100,000
13 gallon	4,500
2 gallon	4,500
1 gallon	4,500
5 gallon	10,000
10 liter	10,000
1.7 gallon	10,000
83.7 cu. ft.	3,400
96 cu. ft.	3,400
275 cu. ft.	750
glass bottles	50,000
cardboard boxes	20,000
gas cylinders	1,000

Table 4
X-7725 Sampling Parameter List

Inorganics	**Organics**
arsenic	chloromethane
barium	bromomethane
cadmium	vinyl chloride
chromium	chloroethane
lead	methylene chloride
mercury	acetone
selenium	carbon disulfide
silver	1,1-dichloroethane
	1,1-dichloroethene
cyanide	1,2-dichloroethene (total)
	chloroform
	1,2-dichloroethane
	2-butanone
	1,1,1-trichloroethane
	carbon tetrachloride
	vinyl acetate
	bromodichloromethane
	1,2-dichloropropane
	cis-1,3-dichloropropene
	trichloroethene
	dibromochloromethane
	1,1,2-trichloroethane
	benzene
	trans-1,3-dichloropropene
	bromoform
	Freon 113
	4-methyl-2-pentanone
	2-hexanone
	tetrachloroethene
	toluene
	1,1,2,2-tetrachloroethane
	chlorobenzene
	ethyl benzene
	styrene
	xylenes (total)

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Table 5
Gross Floor Area of X-7725 Storage Areas

X-7725 Storage Areas	Area (ft^2)
4A	17,135
4B	8389
4C	7085
4E	5964
A	55,327
B	27,171
C	28,734
D	4212
E and F (combined)	31,403
G	1938
H	5988
J	4487
K	7180
L	5640
M1	2418
M	2831
N1	11,680
N	17,544
P1	5982
P3	2444
P	5267
Q	6942
Total	265,763

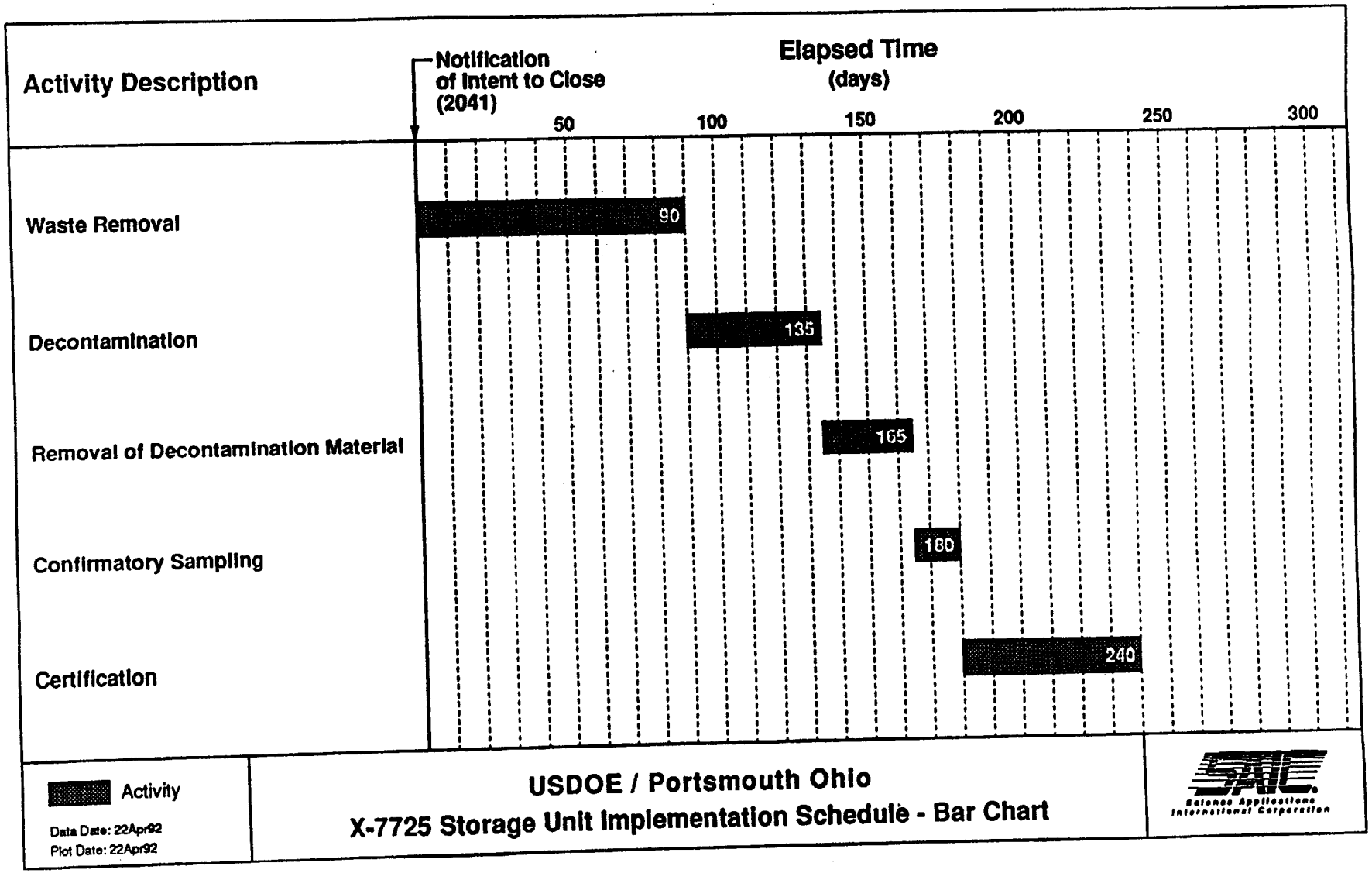

Table 6. Implementation Schedule for Closure of the X-7725 Storage Unit

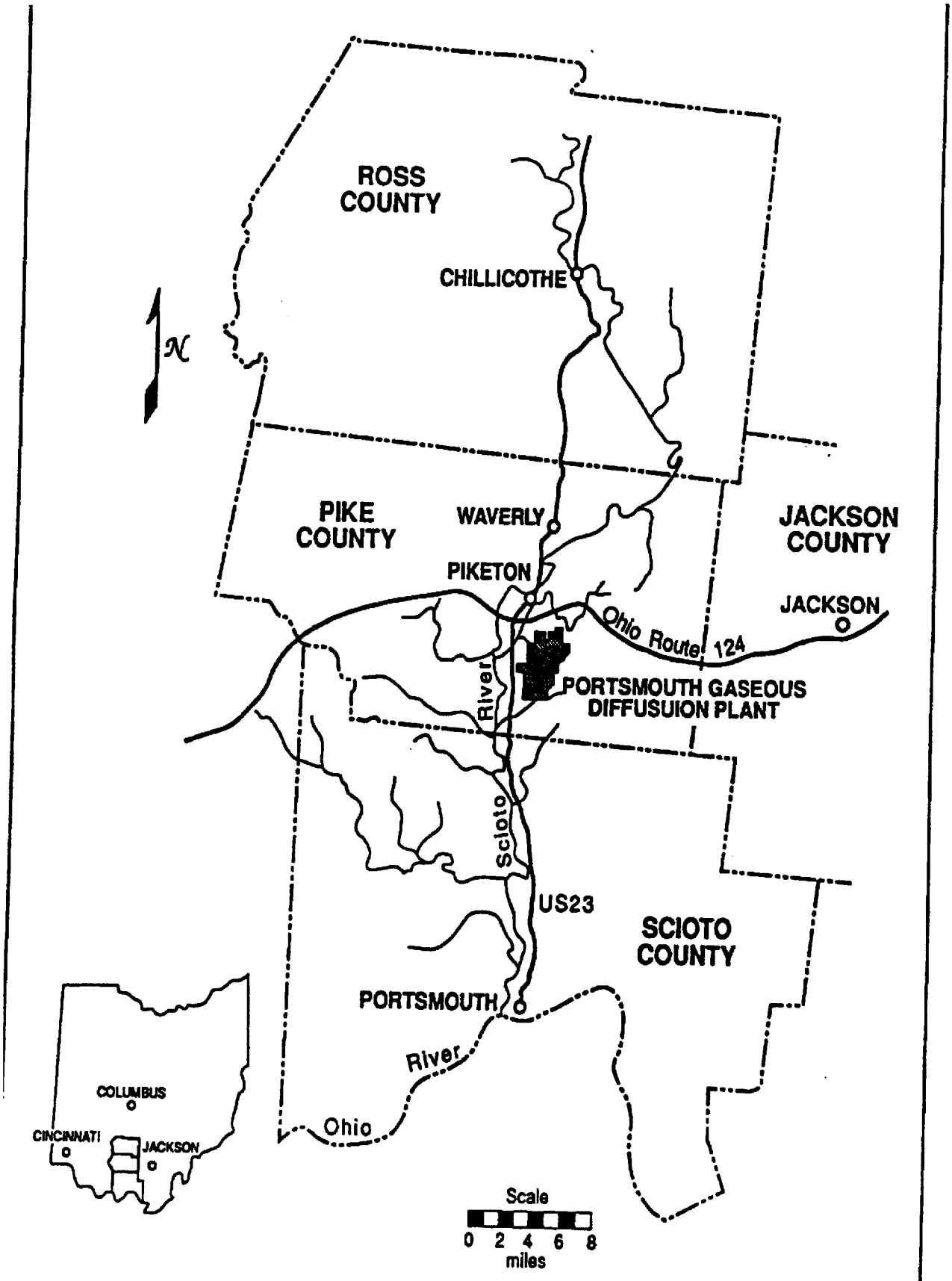

Figure 1. Location of the Portsmouth Gaseous Diffusion Plant

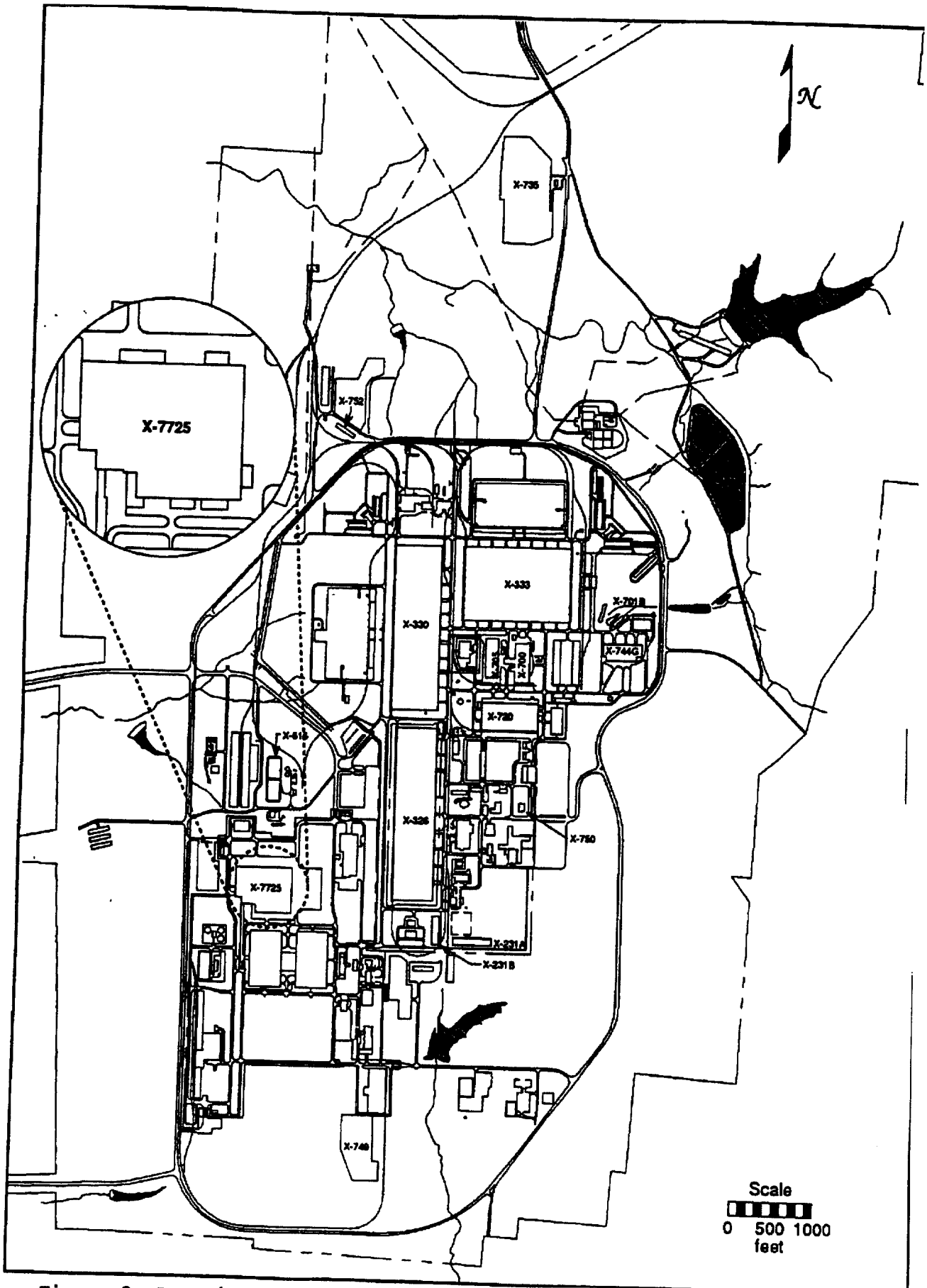

Figure 2. Location of X-7725 at the Portsmouth Gaseous Diffusion Plant

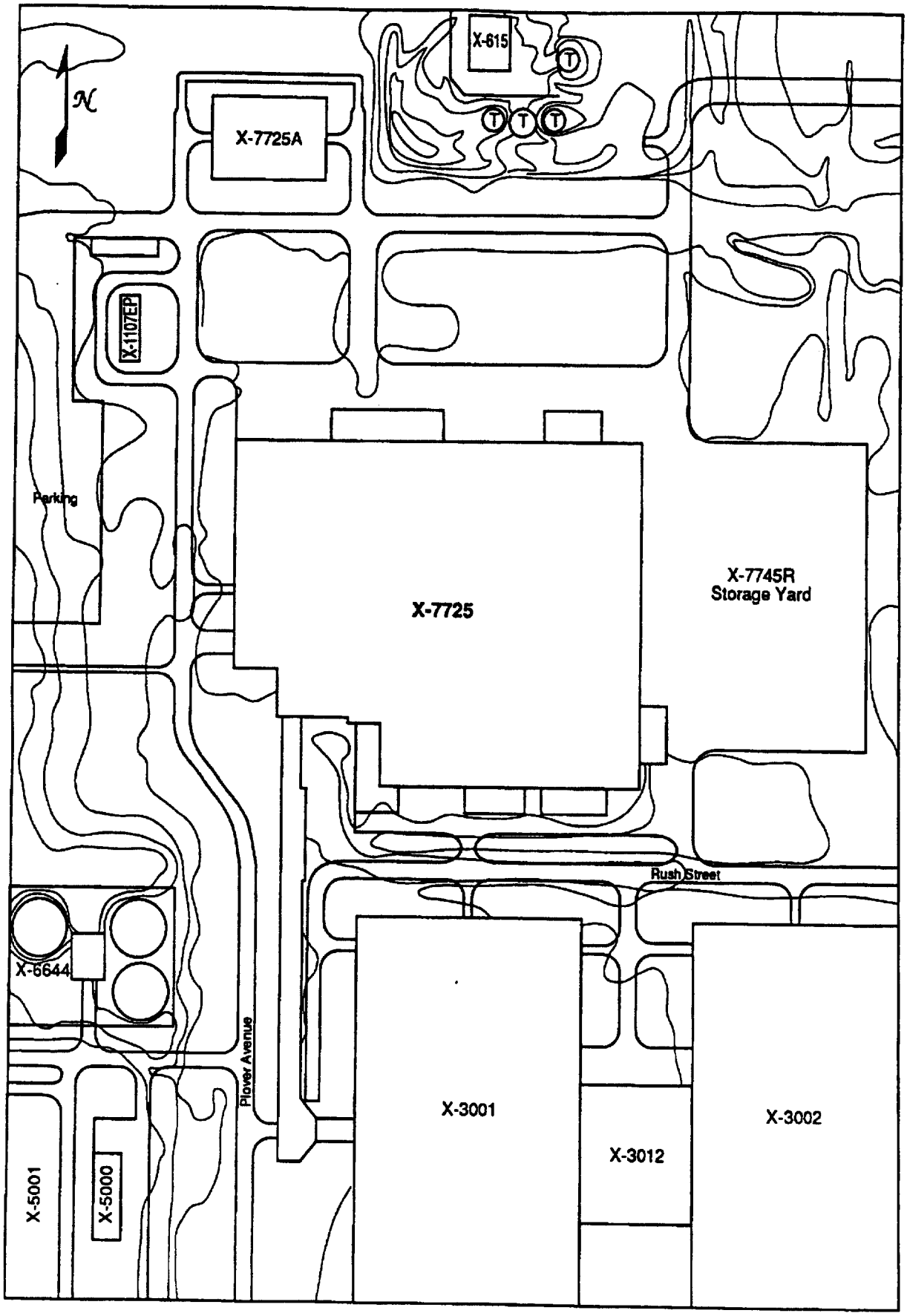

Figure 3. Topographic Details Near the X-7725 Facility

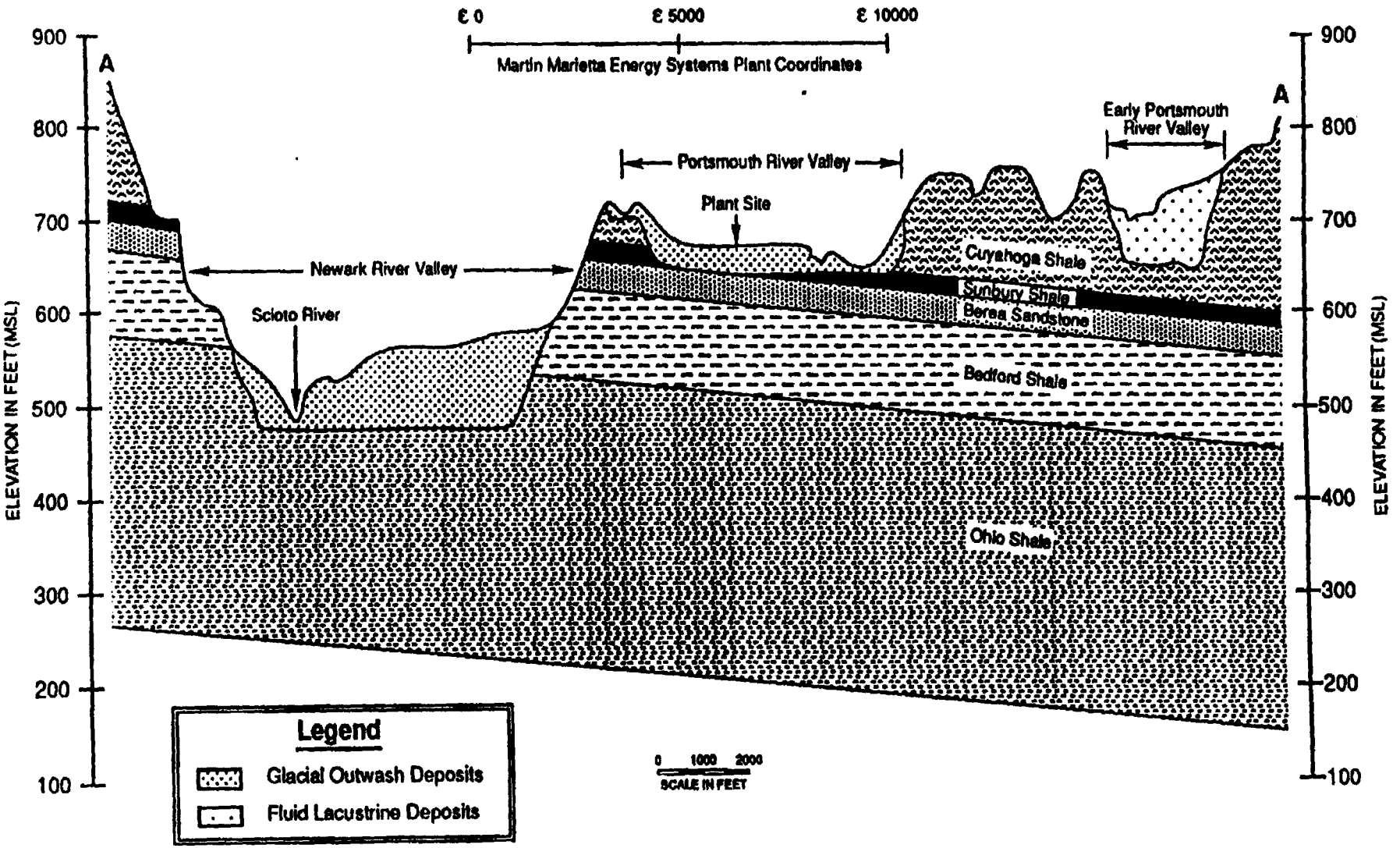

Figure 4. Regional Structral Cross Section through PORTS

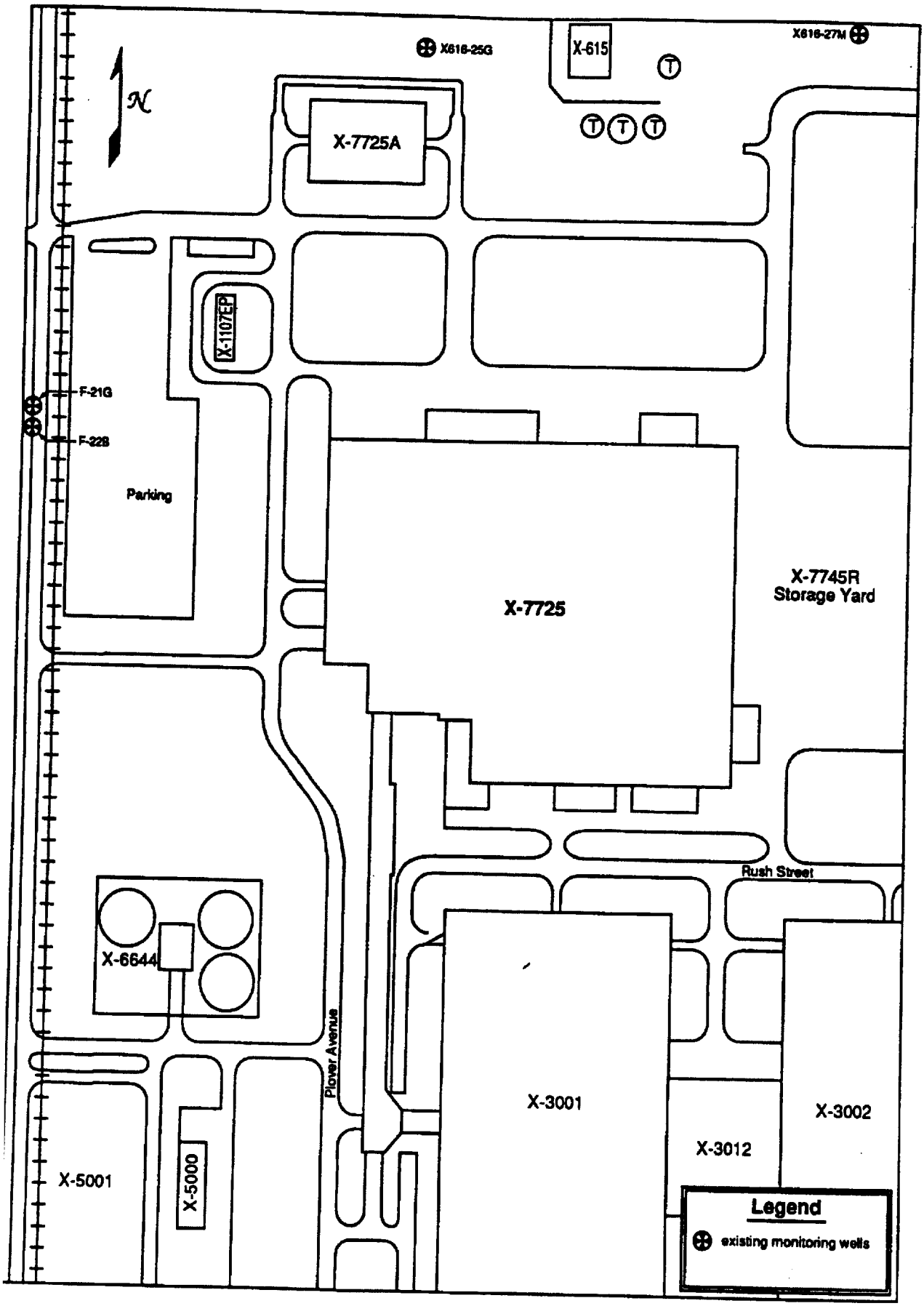

Figure 5. Well and Soil Boring Locations Near the X-7725 Storage Unit

SUBMISSION DATE: February 21, 2000

APPENDIX A

Quadrant III RFI Description of Current Conditions
Title Page and Table of Contents

SUBMISSION DATE: February 21, 2000

QUADRANT III

DESCRIPTION OF CURRENT CONDITIONS

For the

PORTSMOUTH GASEOUS DIFFUSION PLANT

PIKETON, OHIO

Operated by

MARTIN MARIETTA ENERGY SYSTEMS

For

UNITED STATES DOE

UNDER CONTRACT # DE-AC05-760R00001

Prepared By

GERAGHTY & MILLER, INC.
ENVIRONMENTAL SERVICES

6209 Riverside Dr., Suite One South
Dublin, OH 43017

May 1990

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APPENDIX B

Stratigraphic and Construction Logs of Wells and Soil Borings in the Vicinity of the X-7725 Storage Unit

WELL F-21

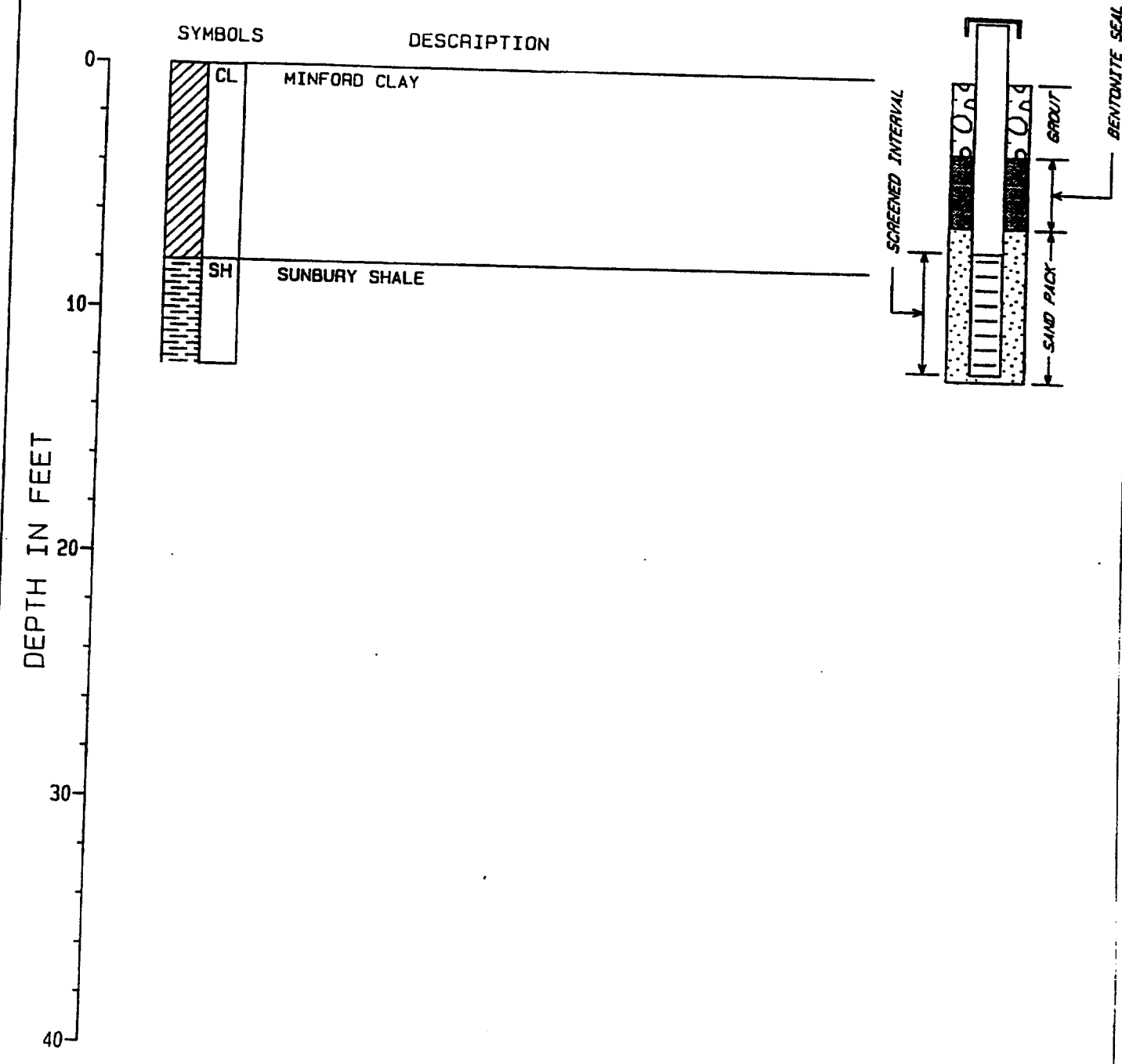
PORTS
PIKETON, OHIO

DATE DRILLED: 8/13/88

SURFACE ELEVATION: 676.93 ft. msld

TOP OF
CASING ELEVATION: 679.43 ft. msld

TOTAL DEPTH: 12.3ft. msld



WELL LOG

Geraghty & Miller Inc.

WELL SB-25 (X616-25G)

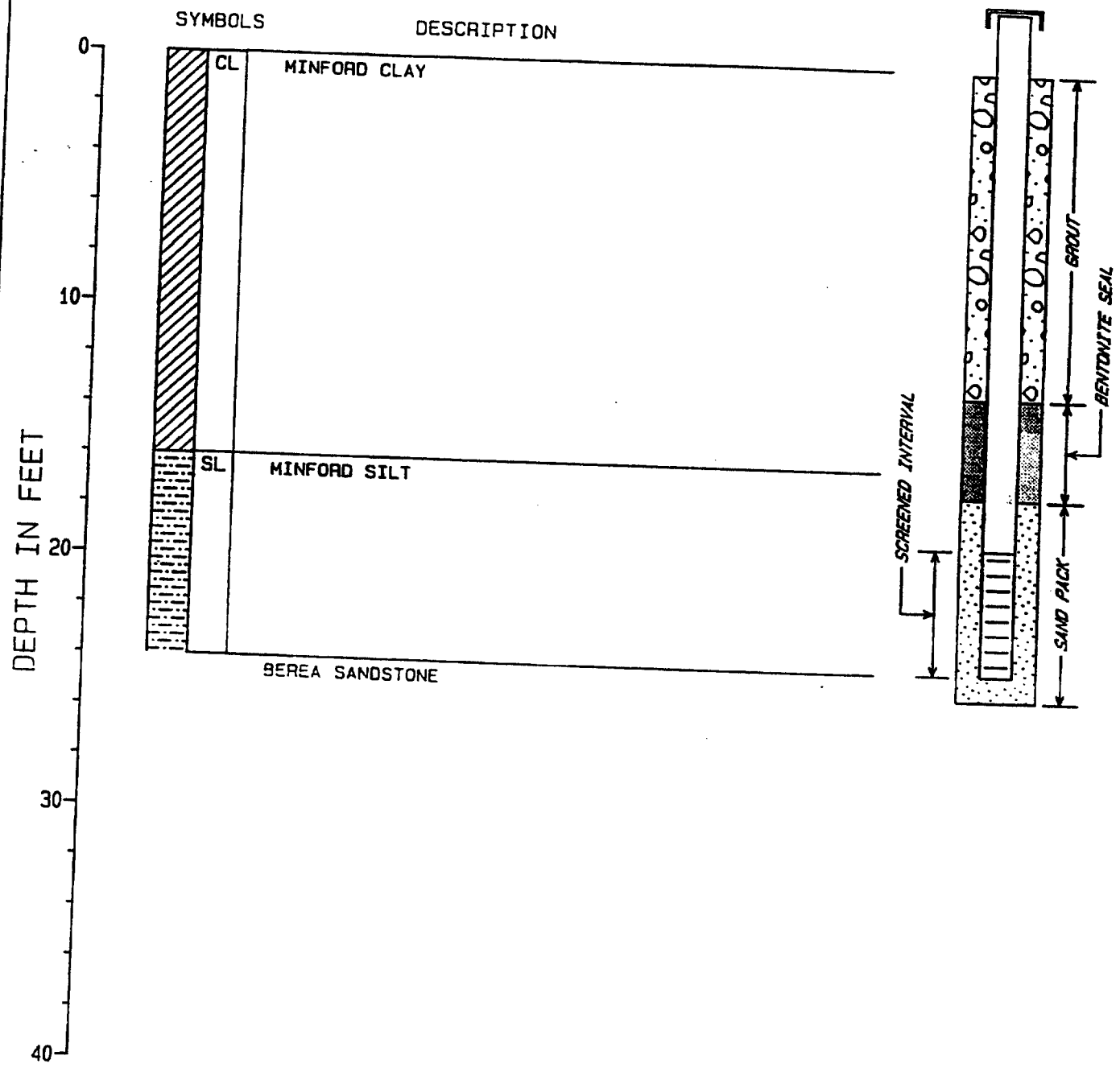
PORTS
PIKETON, OHIO

DATE DRILLED: 9/2/88

SURFACE ELEVATION: 669.68 ft. msld

TOP OF
CASING ELEVATION: 672.18 ft. msld

TOTAL DEPTH: 24.0ft. msld



WELL LOG

Geraghty & Miller Inc.

WELL F-22

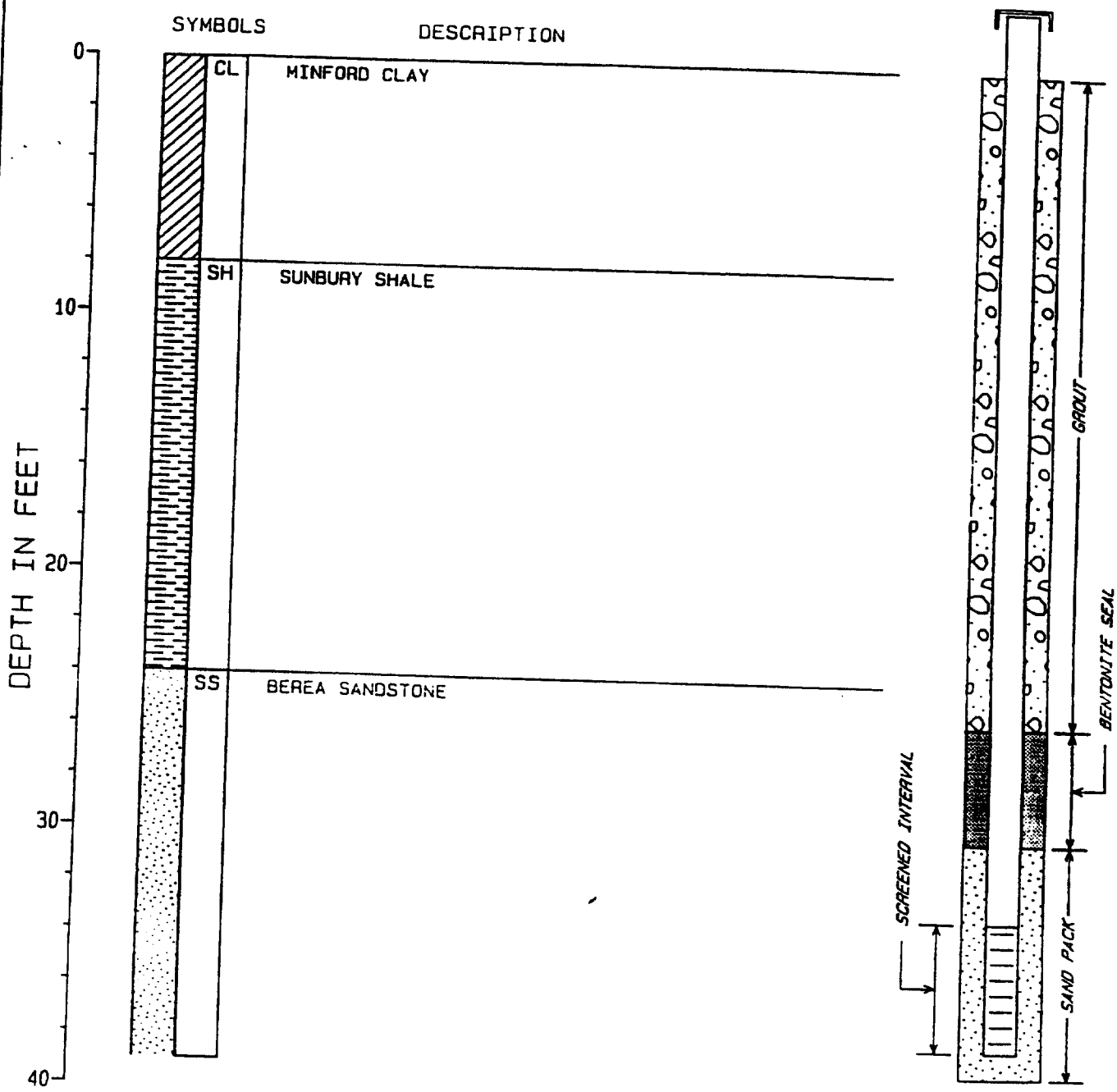
PORTS
PIKETON, OHIO

DATE DRILLED: 8/25/88

SURFACE ELEVATION: 677.68 ft. msld

TOP OF
CASING ELEVATION: 680.18 ft. msld

TOTAL DEPTH: 39.0ft. msld



WELL LOG

Geraghty & Miller Inc.

SUBMISSION DATE: 5/12/92

WELL SB-28 (X616-27M)

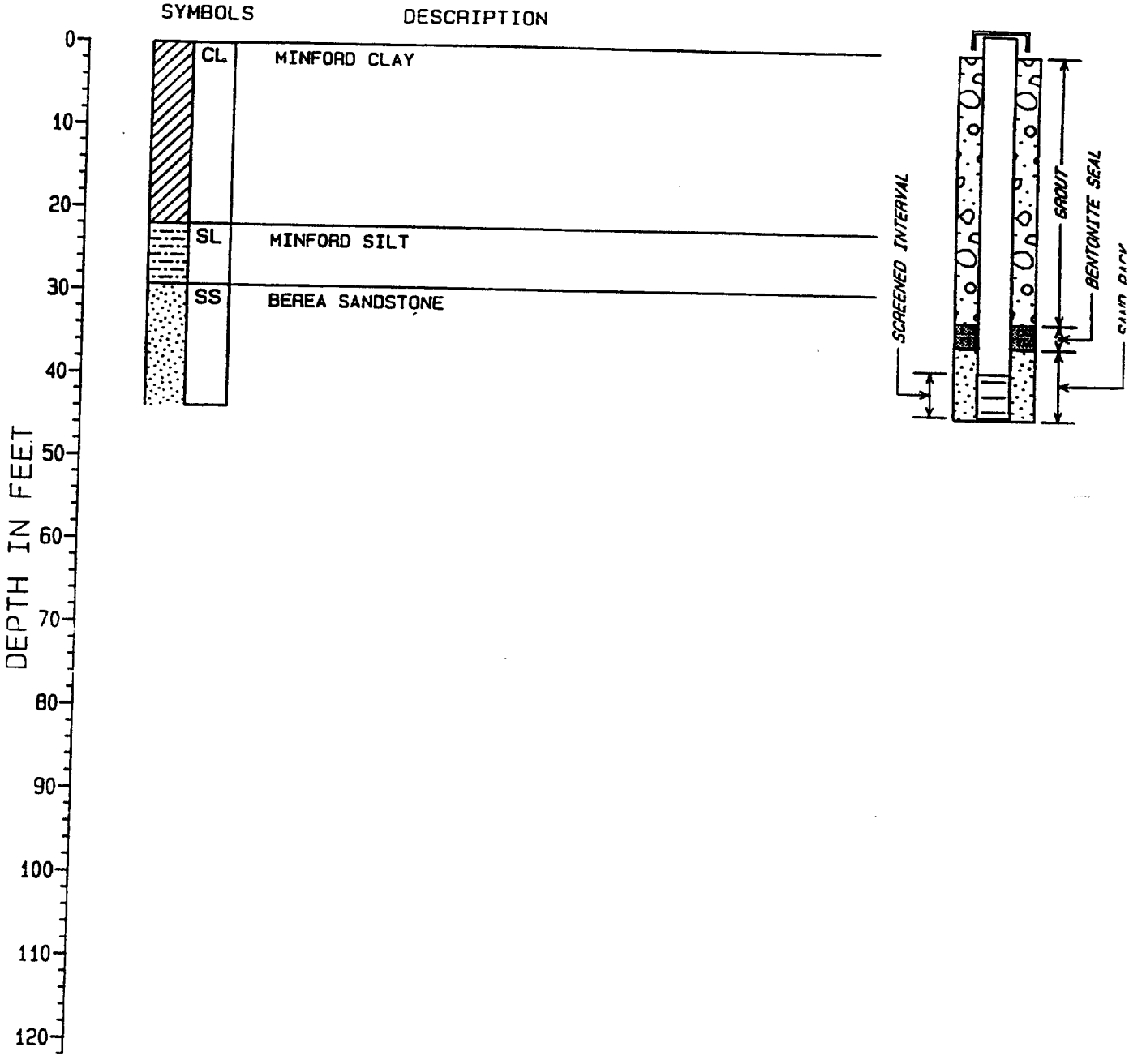
PORTS
PIKETON, OHIO

DATE DRILLED: 9/2/88

SURFACE ELEVATION: 668.97 ft. ms

TOP OF
CASING ELEVATION: 671.47 ft. msld

TOTAL DEPTH: 43.9ft. msld



WELL LOG

Geraghty & Miller Inc.

SUBMISSION DATE: February 21, 2000

APPENDIX C

X-7725 Facility Closure Plan
Standard Operating Procedures

SOP #1 - DECONTAMINATION OF TEFLON OR GLASS SAMPLING EQUIPMENT

EQUIPMENT:

_____ Micro solution
_____ Distilled water
_____ Log Book
_____ Brush

PROCEDURE:

1. Wash equipment thoroughly with laboratory detergent (micro solution) and distilled water using a brush to remove any particulate matter or surface film, if required.

2. Rinse equipment thoroughly with isopropanol or an appropriate solvent.

3. Rinse equipment thoroughly with distilled water and allow to air dry as long as possible.

4. Wrap equipment with plastic to prevent contamination during long-term storage.

5. Record date, time and details of decontamination in log book.

SUBMISSION DATE: February 21, 2000

SOP #2 - DECONTAMINATION OF STAINLESS STEEL OR METAL SAMPLING EQUIPMENT

EQUIPMENT:

_____ Distilled water
_____ Brush
_____ Log Book
_____ Micro solution

PROCEDURE:

1. Wash equipment thoroughly with laboratory detergent (micro solution) and distilled water using a brush to remove any particulate matter or surface film, if required.

2. Rinse equipment thoroughly with isopropanol or an appropriate solvent.

3. Rinse equipment thoroughly with distilled water and allow to air dry as long as possible.

4. Wrap equipment with plastic to prevent contamination during long term storage.

5. Record date, time and details of decontamination in log book.

SOP #3 - COLLECTION OF HAND-AUGERED SOIL/SEDIMENT SAMPLES

EQUIPMENT:

_____	Personal protective equipment	_____	Paperwork
_____	Plastic sheeting	_____	Pens/markers
_____	"Caution" tape and posts	_____	Sample bottles
_____	Stainless Steel Hand-Auger	_____	Waste containers
_____	Log book		

PROCEDURES:

Prior to Leaving Office:

A. Acquire necessary equipment and forms.

At Sampling Location:

1. Don appropriate PPE (See Health and Safety Plan)
2. Establish exclusion zone with barricade tape.
3. Set up monitoring equipment (PID and radiation meter)
4. Place plastic sheeting near work area.
5. Using stainless steel hand auger, collect soil or sediment samples from locations and depths prescribed in the Closure Plan.
6. Record all details of sample collection in log book.
7. Collect samples into appropriate bottles. Label each bottle with the following information: date, time of sampling, sample ID, analytical method, sampler initials and method of preservation. Print all information accurately and legibly. Complete chain-of-custody forms (see SOP #6).
8. Place samples in containers as needed, and pack with ice in coolers as soon as possible.
9. Label all waste drum(s) (see SOP #8).
10. Decontaminate the hand auger as outlined in SOP #2.

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SOP #4 - RINSEATE BLANK COLLECTION

EQUIPMENT:

_____ Distilled water

_____ Sample containers

_____ Log book

PROCEDURE - Re-Usable Equipment:

1. Decontaminate equipment according to SOP #1 or #2.

2. Following the final distilled water rinse, again rinse the sampling device with distilled water this time washing the rinseate into sample containers for laboratory analysis

3. All rinseate blanks must be handled and analyzed in the same manner as investigative samples. (See SOP #6 for Chain-of-Custody and Sample Shipment Procedures.) Record details of rinseate blank collection in the log book.

QA/QC REQUIREMENTS:

One rinseate blank per ten investigative samples must be collected by the sampling team.

SOP #5 - DUPLICATE SAMPLE COLLECTION

EQUIPMENT:

_____ Sample containers _____ Log book

PROCEDURE:

1. Immediately following sample collection, fill a second set of sample containers using the same order of sample collection and procedures.

2. Label the sample with its duplicate sample id.

3. All duplicate samples should be handled and analyzed in the same manner as investigative samples. (See SOP #6 for Chain-of-Custody and Sample Shipment Procedures.) Record details of duplicate sample collection in the log book.

QA/QC REQUIREMENTS:

One duplicate sample per ten investigative samples must be collected by the sampling team.

SUBMISSION DATE: February 21, 2000

SOP #6 - CHAIN-OF-CUSTODY SAMPLE SHIPMENT PROCEDURE

PROCEDURE:

A chain-of-custody record must be completed for all samples immediately upon collection. Information to be provided on this form includes:

- Sample container volume;
- Project number and ID;
- Laboratory identification;
- Sampling personnel;
- Sample identification
- Sample container material;
- Sample preservation;
- Date and time of collection;
- Type of analysis to be performed;
- Analytical method number; and
- Shipment method and carrier

All samples should be packed in coolers with sufficient packaging to prevent damage to sample bottles during shipment. Frozen ice packs must be included in each sample cooler. Once the container is ready for shipment, a Chain-of-Custody seal should be applied in such a manner so as to monitor tampering.

Upon change of possession, the record is to be signed and dated by both parties. The white (original) copy accompanies the shipment.

SOP # 7- COMPLETION OF REQUEST FOR DISPOSAL (RFD) FORMS

PROCEDURE:

1. After completing work or when drum is full, fill out RFD form items 1-2.

2. Mark RFD number on drum. If more than one drum will be accounted for on each RFD, mark the drums (i.e., 1 of 3 or 2 of 3) to ensure that all drums on each RFD form are handled.

3. Deliver all completed RFD forms to the designated waste management personnel.

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SOP # 8 - HNU PHOTOIONIZATION DETECTOR PROCEDURE

EQUIPMENT:

_____ HNU Model P1 101 (10.2 eV lamp)

_____ Calibrant Gases (Isobutylene: 20-200 ppm and 0-20 ppm)

_____ HNU Calibration Log

_____ Flow meter _____ Paperwork

PROCEDURES:

INSTRUMENT SET-UP:

1. Prior to calibration, check the function switch on the control panel to make sure it is in the OFF position. The probe nozzle is stored inside the instrument cover. Remove cover plate by pulling up on the pins that fasten the cover plate.

2. Remove the nozzle from the cover. Assemble probe by screwing nozzle into casing.

3. Attach probe cable to instrument box inserting 12 pin interface connector of the probe cable into the connector on the instrument panel. Match the alignment keys and insert connector. Turn connector in clockwise direction until a distinct snap and lock is felt.

4. Turn the function switch to the Battery Check position. When the battery is charged, the needle should read within or above the green battery arc on the scale plate. If the needle is below the green arc or the red LED light comes on, the instrument should be recharged prior to making any measurements.

5. Turn the function switch to the ON position. In this position, the UV light source should be on. To verify, gaze at the end of the probe for a purple glow. Do Not Look Directly at the Lamp Itself. If the lamp does not come on refer to the Instruction Manual.

6. To zero the instrument, turn the function switch to the standby position and rotate the zero potentiometer until the meter reads zero. Clockwise rotation of the zero potentiometer produces an upscale deflection while counter clockwise rotation yields a down scale deflection. (Note - No

zero gas is needed since this is an electronic zero adjustment.) If the span adjustment is changed during instrument calibration, the zero should be rechecked and adjusted. If necessary, wait 15 to 20 seconds to ensure that the zero reading is stable. Readjust as necessary.

INSTRUMENT DAILY CALIBRATION

1. Insert one end of T tube into probe. Insert second end of probe into calibration gas in the 20-200 p.m. range. The third end of probe should have the rotameter (bubble meter) attached.

2. Set the £unction switch in the 0-200 p.m. range. Crack the valve on the pressured calibration gas container until a slight flow is indicated on the rotameter. The instrument will draw in the volume required for detection with the rotameter indicating excess flow.

3. Adjust the span potentiometer so that the instrument is reading the exact value of the calibration gas. (Calibration gas value is labeled on the cylinder.)

4. Turn instrument switch to the standby position and check the electronic zero. Reset zero potentiometer as necessary following step 6 above.

5. Record on field-data sheet all original and readjusted settings.

6. Set the function switch to 0-20 p.m.. Remove the mid-range (20-200 p.m.) calibration gas cylinder and attach the low range (0-20 p.m.) calibration gas cylinder as described above.

7. Do not adjust the span potentiometer. The observed reading should be ±3 p.m. of the concentration specified for the low range calibration gas. If this is not the case, recalibrate the mid range scale repeating Step 1 thru 6 above. If the low range reading consistently falls outside the recommended tolerance range, the probe light source window likely needs cleaning. Clean window according to instruction manual. When the observed readings is within the required tolerances, the instrument is fully calibrated.

INSTRUMENT CALIBRATION CHECK:

1. Exit the exclusion zone and turn meter to "ON" position. Check that the meter is reading a value of zero.

2. Insert one end of T-tube into probe and other end into calibration gas. The third end of the T-tube should be attached to a flow meter

3. Crack the valve on the calibration gas and read the value shown by the instrument. Record the value and calibrant gas concentration and a field-data sheet.

4. If the value shown by the instrument is greater than ±20% of the calibrant gas concentration, take meter outside of exclusion zone and recalibrate as outlined above.

SAMPLE MEASUREMENT:

1. Place function switch in 0-20 p.m. range for field monitoring. This will allow for most sensitive, quick response in detecting airborne contaminants.

2. Before entering a contaminated area, determine background concentration. This concentration should be used as a reference to readings made in the contaminated area. Under no circumstance should one attempt to adjust the zero or span adjustments while the instrument is being operated in the field.

3. Take measurements in contaminated area, recording readings and locations. Should readings exceed the 0-20 scale, switch the function switch to the 0-200 or 0-2,000 range as appropriate to receive a direct reading. Return the instrument switch to the 0-20 range when readings are reduced to that level. Record measurements on field-data sheet.

Note: The instrument will not function properly in high humidity or when the window to the light housing is dirty. If the instrument response is erratic or lower than expected, recalibrate or obtain a different meter and calibrate as outlined above.

4. When finished, reverse Steps 1 thru 6 in Instrument Setup section to shut down the instrument.

QA/QC Requirements:

The instrument must undergo a 2-point calibration as described above every morning before commencement of field work. In addition, a calibration check must be performed every hour during use of the instrument. The readings from the HNU will only be used in selection of proper PPE during field work and in selecting initial field-GC analytical parameters for sample analysis in the field.

REFERENCE: Modified from TSAI, U.S.EPA Region V, QAS.

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SOP #9 - COMBUSTIBLE GAS INDICATOR (MSA EXPLOSIMETERS - MODEL 2A)

EQUIPMENT:

_____ Calibrant Gasses - 40% LEL (Methane 2%)
- 50% LEL (Methane 2.5%)

PROCEDURES:

INSTRUMENT SET-UP:

The MSA Explosimeter is set in its proper operating condition by the adjustment of a single control. This control is a rheostat regulating the current to the Explosimeter measuring circuit. The rheostat knob is held in the OFF" position by a locking bar. This bar must be lifted before the knob can be turned from "OFF
position.

1. Lift the end of the rheostat knob "On-OFF" bar and turn the rheostat knob one quarter turn clockwise.

This operation closes the battery circuit (there will be an initial deflection of the meter pointer). The meter pointer may move rapidly upscale and then return to a point below ZERO, or drop directly below ZERO.

2. Flush fresh air through the instrument.

The circuit of the instrument must be balanced with air free of combustible gases or vapors. Five squeezes of the aspirator bulb are sufficient to flush the combustion chamber. If a sampling line is used, an additional two squeezes will be required for each ten feet of line.

3. Adjust rheostat knob until meter pointer rests at zero.

Clockwise rotation of the rheostat knob causes the meter pointer to move up scale. A clockwise rotation sufficient to move the meter pointer considerably above zero should be avoided as this subjects the detector filament to an excessive current may shorten its life.

Note:

When the meter pointer remains below zero and cannot be brought up to ZERO even when the control rheostat is turned to its extreme clockwise position, the batteries must be replaced.

If the pointer of the indicating meter moves to the extreme right side of its scale when the instrument is turned on and cannot be adjusted to ZERO, the detector filament may be burned out and should be replaced.

INSTRUMENT USAGE:

1. Readjust meter pointer to zero if necessary by turning rheostat knob.

2. Aspirate sample through instrument until highest reading is obtained .

Approximately five squeezes of the bulb are sufficient to give maximum deflection. If a sampling line is used add two squeezes for each ten feet of line. This reading indicates the concentration of combustible gases or vapors in the sample.

INSTRUMENT DAILY CALIBRATION:

1. Attach the flow control to the calibration gas tank.

2. Connect the hose to the flow control and to the instrument inlet fitting.

3. Open the flow control valve.

4. Record the meter reading after it stabilizes. NOTE: It is not necessary to operate the aspirator bulb to obtain the calibration sample. Depending on which calibration gas is used, the instrument reading should be within one of the following ranges:

   2.0% Methane: 42 to 60%
   2.5% Methane: 54 to 75%

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Attachments for Appendix I-2

Four oversize engineering drawing were the original attachments to this closure plan. These drawing are outdated and therefore are not included with the permit renewal application. The information provided on each drawing can be obtained in other locations as listed below:

Attachment I-1 Regional Topographic Map:	See Section B, Figure B-2
Attachment I-2 PORTS SWMU Map:	See PORTS RCRA Corrective Action Program documents
Attachment I-3 X-7725 Hazardous Waste Storage Facility Floor Plan Level I:	See Section D, Figure D-1 and Appendix D-1
Attachment I-4 X-7725 Hazardous Waste Storage Facility Floor Plan Level IV:	See Section D, Figure D-2 and Appendix D-1