70-036

MAY 28 1997

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

May 27, 1997
EF-21-8445

Mr. T. David Taylor, Site Manager
Lockheed Martin Energy Systems
Post Office Box 628
Piketon, Ohio 45661

RECORD COPY

Dear Mr. Taylor:

RECORD OF DECISION FOR THE PETER KIEWIT LANDFILL AT THE PORTSMOUTH SITE, PIKETON, OHIO

Enclosed is the approved Decision Document by the U. S. EPA and the DOE-ORO Manager of Environmental Management. The document was signed on May 15, 1997 and May 23, 1997, respectively. The selected remedy consists of the following requirements:

- The continuation of the seep collection system currently operating along the east side of the landfill;
- The placement of an engineered cap which meets RCRA Subtitle D requirements;
- Institutional controls necessary to ensure the integrity of the remedial action;
- The installation of a subsurface vertical barrier (if necessary) to prevent the flow of groundwater into landfilled waste;
- Groundwater and surface water/sediments monitoring programs.

If you have questions or comments, call Dewintus Perkins at extension 5524.

Sincerely,

Eugene W. Gillespie
Site Manager
Portsmouth Site Office

EF-21:Perkins

Enclosure

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cc: MCMaster (4cc)

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RECORD OF DECISION / STATEMENT OF BASIS

PETER KIEWIT LANDFILL

UNITED STATES DEPARTMENT OF ENERGY
PORTSMOUTH GASEOUS DIFFUSION PLANT
PIKE COUNTY, OHIO

MAY 1997

Mr. Eugene Gillespie, Site Manager
United States Department of Energy
Portsmouth Site Office
Portsmouth Enriching Office
P.O. Box 700
Piketon, OH 45661-0770

SRF-5J

Subject: Decision Document for the Peter Kiewit Landfill Solid Waste Management Unit,
Portsmouth Gaseous Diffusion Plant, Piketon, Ohio
OH7 890 008 983

Dear Mr. Gillespie:

The Decision Document for the Peter Kiewit Landfill Solid Waste Management Unit has been signed by the United States Environmental Protection Agency (U.S. EPA) and is enclosed for your signature. Upon United States Department of Energy signature, please return the signed original to the U.S. EPA.

If you have any questions, please call me at (312) 886-4591.

Sincerely,

E Jablonowski

Gene Jablonowski
Remedial Project Manager
Federal Facilities Section
Superfund Remedial Response Branch #2

Enclosure

RECORD OF DECISION / STATEMENT OF BASIS
PETER KIEWIT LANDFILL
UNITED STATES DEPARTMENT OF ENERGY
PORTSMOUTH GASEOUS DIFFUSION PLANT
PIKE COUNTY, OHIO

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DECLARATION FOR THE RECORD OF DECISION / STATEMENT OF BASIS

SITE NAME AND LOCATION

Peter Kiewit Landfill Solid Waste Management Unit
Portsmouth Gaseous Diffusion Plant (PORTS)
United States Department of Energy (U.S. DOE), Pike County, Ohio

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Peter Kiewit Landfill site on the U.S. DOE Reservation in Pike County, Ohio. The U.S. DOE site is being cleaned up under an Administrative Order signed by U.S. DOE and United States Environmental Protection Agency, Region 5 (U.S. EPA) and a Consent Decree between U.S. DOE and the State of Ohio. Both legal agreements were signed in 1989. This decision document serves as the Statement of Basis (SB) in accordance with the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984, and the record of decision (ROD) in accordance with the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the Administrative Record for this action. The specific documents in the Administrative Record include but are not limited to the Quadrant I RCRA Facility Investigation (RFI), the Peter Kiewit Landfill Corrective Measures Study (CMS), and the Peter Kiewit Landfill Preferred Plan. Attachment A to this decision document (herein after referred to as SB/ROD) is the Administrative Record Index for this decision.

The State of Ohio concurs on the selected remedy and has issued its own decision document for selection of the response action for the Peter Kiewit Landfill. A copy of the State of Ohio decision document is presented in Attachment B to this SB/ROD.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the site, if not addressed by implementing the response action selected in this SB/ROD, may present an imminent and substantial endangerment to public health, welfare, and the environment.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy at the Peter Kiewit Landfill will address the principal threats posed by the site through containment of source materials and treatment of leachate. The major components of the selected remedial action include:

- The continuation of the seep collection system currently operating along the east side of the landfill. This system was installed in November of 1994 and collects leachate migrating from the landfill towards Big Run Creek. The leachate is then treated at the X-622 treatment plant located on the south central part of the U.S. DOE reservation (within QI).

- The placement of an engineered cap which meets RCRA Subtitle D requirements. This consists of a recompacted clay cap or equivalent. The cap material will be covered with a drainage layer

and a vegetative layer at least 30 inches in depth to prevent frost damage to the cap material.

- Institutional controls necessary to ensure the integrity of the remedial action. Site deed restrictions and fencing will be used to restrict access as necessary to prevent the disturbance of the capped area.

- The installation of a subsurface vertical barrier if necessary to prevent the flow of groundwater into landfilled waste.

- Ground water and surface water/sediments monitoring program to confirm that the containment and treatment of source materials is sufficiently protective of human health and the environment.

STATUTORY DETERMINATIONS AND REMEDY SELECTION STANDARDS

This SB/ROD complies with the statutory mandates of both CERCLA and RCRA as described below.

CERCLA statutory requirements: The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. However, because treatment of the principal threats of the Peter Kiewit Landfill was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principle element of the remedy. The wastes that comprise the principal threat from the landfill will be contained on-site in accordance with all applicable or relevant and appropriate requirements (ARAR).

Because this remedy will result in hazardous substances remaining on-site above health-based levels, a review will be conducted within five (5) years after construction of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

RCRA standards for remedy selection: The selected remedy meets RCRA standards as follows: The selected remedy is protective of human health and the environment, controls the source of releases that may pose a threat to human health and the environment, and complies with applicable standards for management of wastes. This remedy will provide long-term effectiveness, will reduce the mobility of contaminants, and is implementable.

5/15/97
Date

Wm. E. Muno
U.S. EPA

5/23/97
Date

U.S. DOE

DECLARATION FOR THE RECORD OF DECISION / STATEMENT OF BASIS

SITE NAME AND LOCATION

Peter Kiewit Landfill Solid Waste Management Unit
Portsmouth Gaseous Diffusion Plant (PORTS)
United States Department of Energy (U.S. DOE), Pike County, Ohio

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Peter Kiewit Landfill site on the U.S. DOE Reservation in Pike County, Ohio. The U.S. DOE site is being cleaned up under an Administrative Order signed by U.S. DOE and United States Environmental Protection Agency, Region 5 (U.S. EPA) and a Consent Decree between U.S. DOE and the State of Ohio. Both legal agreements were signed in 1989. This decision document serves as the Statement of Basis (SB) in accordance with the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984, and the record of decision (ROD) in accordance with the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the Administrative Record for this action. The specific documents in the Administrative Record include but are not limited to the Quadrant I RCRA Facility Investigation (RFI), the Peter Kiewit Landfill Corrective Measures Study (CMS), and the Peter Kiewit Landfill Preferred Plan. Attachment A to this decision document (herein after referred to as SB/ROD) is the Administrative Record Index for this decision.

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- The placement of an engineered cap which meets RCRA Subtitle D requirements. This consists of a recompacted clay cap or equivalent. The cap material will be covered with a drainage layer

and a vegetative layer at least 30 inches in depth to prevent frost damage to the cap material.

- Institutional controls necessary to ensure the integrity of the remedial action. Site deed restrictions and fencing will be used to restrict access as necessary to prevent the disturbance of the capped area.

- The installation of a subsurface vertical barrier if necessary to prevent the flow of groundwater into landfilled waste.

- Ground water and surface water/sediments monitoring program to confirm that the containment and treatment of source materials is sufficiently protective of human health and the environment.

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Because this remedy will result in hazardous substances remaining on-site above health-based levels, a review will be conducted within five (5) years after construction of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

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5/15/97
Date

Wm. E. Yarmo
U.S. EPA

Date

U.S. DOE

DECISION SUMMARY - PETER KIEWIT LANDFILL

1.0 SITE LOCATION AND DESCRIPTION

The Portsmouth Gaseous Diffusion Plant (PORTS) facility is located near Piketon, Ohio, in the south central portion of the state (see Figure 1, *USDOE-PORTS Site Location*). The PORTS facility was constructed between 1952 and 1956 and is owned by U.S. DOE. The active portion of the PORTS plant occupies approximately 1,000 acres of a 4,000-acre U.S. DOE reservation in south central Ohio, approximately 80 miles south of Columbus, 20 miles north of Portsmouth, and 1 mile east of U.S. Route 23, near Piketon. The principal process at the PORTS facility is the separation of uranium isotopes via gaseous diffusion.

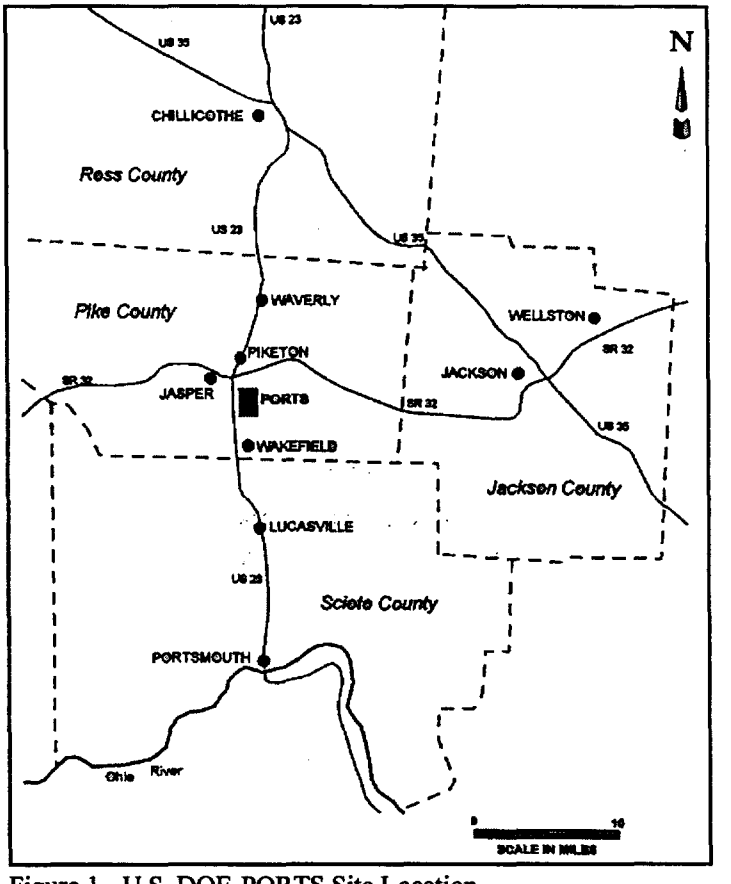

Figure 1 - U.S. DOE-PORTS Site Location

The PORTS facility has been operating since 1954 enriching uranium for use in commercial nuclear reactors and for use by the U.S. Navy in power reactors in the nuclear navy. Support operations include the feed and withdrawal of material from the primary process, water treatment for sanitary and cooling purposes, decontamination of equipment removed from the plant for maintenance or replacement, recovery of uranium from various waste materials and treatment of sewage wastes and cooling water blow down. The construction, operation and maintenance of this facility requires the use of a wide range of commercially available chemicals. Continuous operation of this facility since 1954 has resulted in the generation of inorganic, organic and low level radioactive waste materials.

The immediate region surrounding the site consists of Pike County, Scioto County, Jackson County, and Ross County. Approximately 24,250 people reside in Pike County, and scattered rural development is typical. Piketon is the nearest town, approximately 5 miles north of the facility on U.S. Route 23. Piketon had an estimated population of 1,717 in 1990. The county's largest community, Waverly, has approximately 4,500 residents and is situated 12 miles north of the facility.

Land within a 5-mile radius of PORTS is primarily undeveloped, including cropland, woodlots, pasture, and forest. This distribution includes approximately 25,000 acres of farmland and 25,000

acres of forest. There is approximately 500 acres of urban land within the same radius.

The PORTS facility occupies an upland area of southern Ohio with an average land surface elevation of 670 feet above mean sea level. The terrain surrounding the plant site consists of marginal farmland and wooded hills, generally with less than 100 feet of relief. The plant is located within a mile-wide abandoned river valley.

The geology of the PORTS plant site consists of unconsolidated material overlying bedrock formations. The unconsolidated material is known as the Teays formation. The Teays formation is composed of two members, the Minford silt and clay (Minford), and the Gallia sand and gravel (Gallia). The bedrock formations underlying the Teays formation are, in descending order, the Sunbury shale, the Berea sandstone, and the Bedford shale.

For purposes of the RCRA Facility Investigation (RFI), the PORTS facility has been separated into four quadrants (Fig. 2). Each quadrant roughly corresponds to the uppermost groundwater flow paths beneath the site. The PORTS groundwater system includes two water-bearing units, the Berea Sandstone bedrock and the unconsolidated Gallia, and two aquitards, the Sunbury Shale (Sunbury) and the unconsolidated Minford. Although the Minford silt does not transmit groundwater as readily as Gallia, the basal silt portion of the Minford is generally grouped with the Gallia as part of the uppermost water-bearing unit at the PORTS site.

The Peter Kiewit Landfill is located in the central portion of Quadrant I (QI) of the PORTS facility, just west of Big Run Creek (BRC) and approximately 200 feet east of the XT-847 GCEP construction warehouse (see Figure 2, *USDOE-PORTS Site Map*). The Peter Kiewit Landfill was used from approximately 1953 until 1968. During plant construction, the landfill was used as a salvage yard, burn pit and trash disposal area. After plant construction, the landfill was used as a sanitary landfill. It is probable that solid wastes now known to be potentially hazardous were landfilled at this site. The landfill is about 23.5 acres in size

2.0 HISTORY OF ENFORCEMENT ACTIVITIES

As a result of chemicals used to support the uranium enrichment process, and the presence of uranium and technetium, waste management units at the site have contaminated soils and groundwater. In 1986, the State of Ohio filed suit against U.S. DOE resulting in a Consent Decree (CD) between the State of Ohio and U.S. DOE which became effective in August of 1989. The CD outlines the requirements for handling hazardous waste generated at the site and for the investigation and clean-up of the site. As part of the Resource Conservation and Recovery Act (RCRA) corrective action program, U.S. EPA and U.S. DOE signed a similar agreement in September of 1989. This agreement is an administrative order negotiated between Region V of U.S. EPA and U.S. DOE. Both the Administrative Order on Consent (AOC) and the CD require that the investigation of the site proceed according to quadrant boundaries established in the agreements. A schedule is attached to each agreement that outlines when documents pertaining to the investigation or corrective measures studies are to be submitted to Ohio EPA and U.S. EPA (hereafter referred to as the "Agencies"). A separate schedule shall be submitted to the Agencies for cleanup of the individual waste management units.

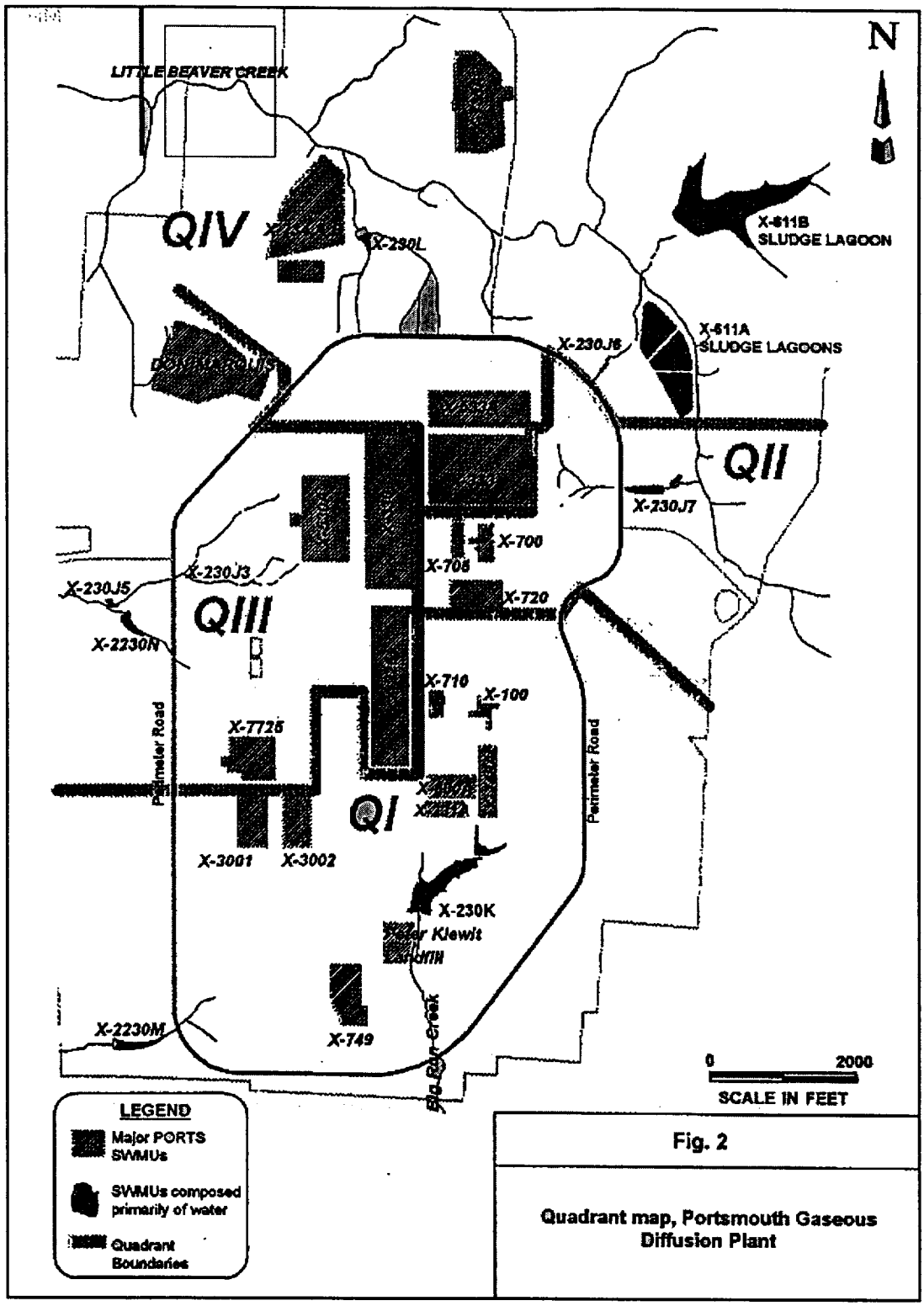

Figure 2, U.S. DOE-PORTS Site Map

3.0 COMMUNITY RELATIONS ACTIVITIES

A public meeting was held at the Vern Riffe Vocational School on April 18, 1995 to discuss the preferred plan for the Peter Kiewit Landfill. An information repository is located at U.S. DOE's Environmental Information Center located at 505 West Emmit Avenue in Waverly, Ohio. The public can also review these documents at Ohio EPA's Southeast District Office or at U.S. EPA's Region V office located in Chicago.

Details of the investigation at the Peter Kiewit Landfill can be found in the draft RCRA Facility Investigation (RFI) report located at the Information Center. The draft final Cleanup Alternatives Study/Corrective Measures Study (CAS/CMS) report and the preferred plan were discussed and presented at the April 18, 1995 public meeting. The public comment period on the proposed remedy extended from April 11, 1995 to May 17, 1995.

An announcement regarding the public comment period and the availability of the documents related to the clean-up at the site was published in the Waverly Watchman and in the Portsmouth Times newspapers. No written or verbal requests were received to extend the public comment period.

The public meeting, held on April 18, 1995 at the Vern Riffe Vocational School, was attended by approximately 25 members of the public. Representatives from U.S. EPA, and Ohio EPA answered questions regarding the preferred plan, summarized the findings of the RFI, and accepted statements from members of the public. Comments, including formal statements from four community members, were recorded by a court reporter. A transcript of the meeting is included in the Administrative Record. A total of two written submittals were received from the public during the public comment period.

Ohio EPA's written responses to comments received during the public comment period are contained in the Responsiveness Summary, which is part of this document. Ohio EPA's written responses were reviewed and approved by U.S. EPA. The public participation process was designed to be consistent with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and therefore satisfies Sections 113(k)(2)(B)(i-v) and 117 of this law. The decision for the remedial alternative is based on the administrative record. The administrative record index for the response action is presented in Appendix A of this document.

4.0 SCOPE AND ROLE OF THE RESPONSE ACTION

For purposes of the RFI the PORTS facility has been separated into four quadrants. Each quadrant roughly corresponds to a distinct groundwater flow cell within the primary water-bearing unit beneath the site and has been investigated separately. Peter Kiewit Landfill is located in Quadrant I (QI), and is one of twenty-one Solid Waste Management Units (SWMUs) in QI currently undergoing investigation or remediation.

The response action at the Peter Kiewit Landfill is intended to be a long-term action designed to address contamination and potential contamination caused by waste disposed at the site. The remedial action will address the principal threats at the facility: contaminated soils, leachate, and landfilled solid waste through treatment of the leachate and containment of wastes in order to meet all ARARs. Wastes disposed of in the landfill have been identified as the primary risk to groundwater, surface water, and sediments.

Consequently, actions to treat and/or contain contaminated soils and wastes will, in addition to minimizing concerns associated with direct contact, minimize the potential for contaminants to infiltrate to the groundwater or leach to surface water. When the selected remedy is completed, no further remedial action at the site other than groundwater and surface water monitoring and operation and maintenance (O&M) activities are envisioned. The monitoring will be conducted to assure that all leachate sources are directed toward treatment and to detect any future migration of chemicals to surface water or groundwater. Since hazardous substances will remain above health-based levels in the capped area of the site, five-year reviews of the remedial action will be necessary.

5.0 SUMMARY OF RCRA FACILITY INVESTIGATION

The QI RFI was conducted during 1991 and the initial RFI report submitted to U.S. EPA and Ohio EPA on February 19, 1992. Phase II of the investigation was conducted between October 1993 to January 1994. The Phase II RFI report was submitted to the U.S. EPA and Ohio EPA on June 20, 1994. The Peter Kiewit Landfill was investigated as part of the QI RFI.
Because a permit was not required at the time of landfill operation, the exact boundaries of the filled area and the exact nature of all of the wastes disposed at the Peter Kiewit Landfill are not known (see Figure 3, *Approximate Landfill Boundaries*, for approximate landfill boundaries based on the current topography of the Peter Kiewit area). An estimate of the western boundary location cannot be made due to the presence of the XT-847 building. Borings and monitoring wells west of XT-847 such as the PK-08G and PK-09G wells did not encounter waste during installation. However, it is possible that the southern half of the XT-847 warehouse was built over a portion of the Peter Kiewit Landfill. Together, the Peter Kiewit Landfill and the XT-847 building cover approximately 23.5 acres.

During the QI RFI, several intermittent seeps located near the base of the landfilled material were discovered along the eastern edge of the landfill. Sampling during and after the RFI field work has indicated the presence of contaminants in the seep discharge and associated seep sediments.

5.1 Nature and Extent of Contamination

As done with all four quadrants, the investigation of QI consisted of Phase I and Phase II investigations. The Phase I investigation consisted of the installation of 11 monitoring wells, 2 sediment samples near Big Run Creek and 2 samples of leachate from the Peter Kiewit Landfill.

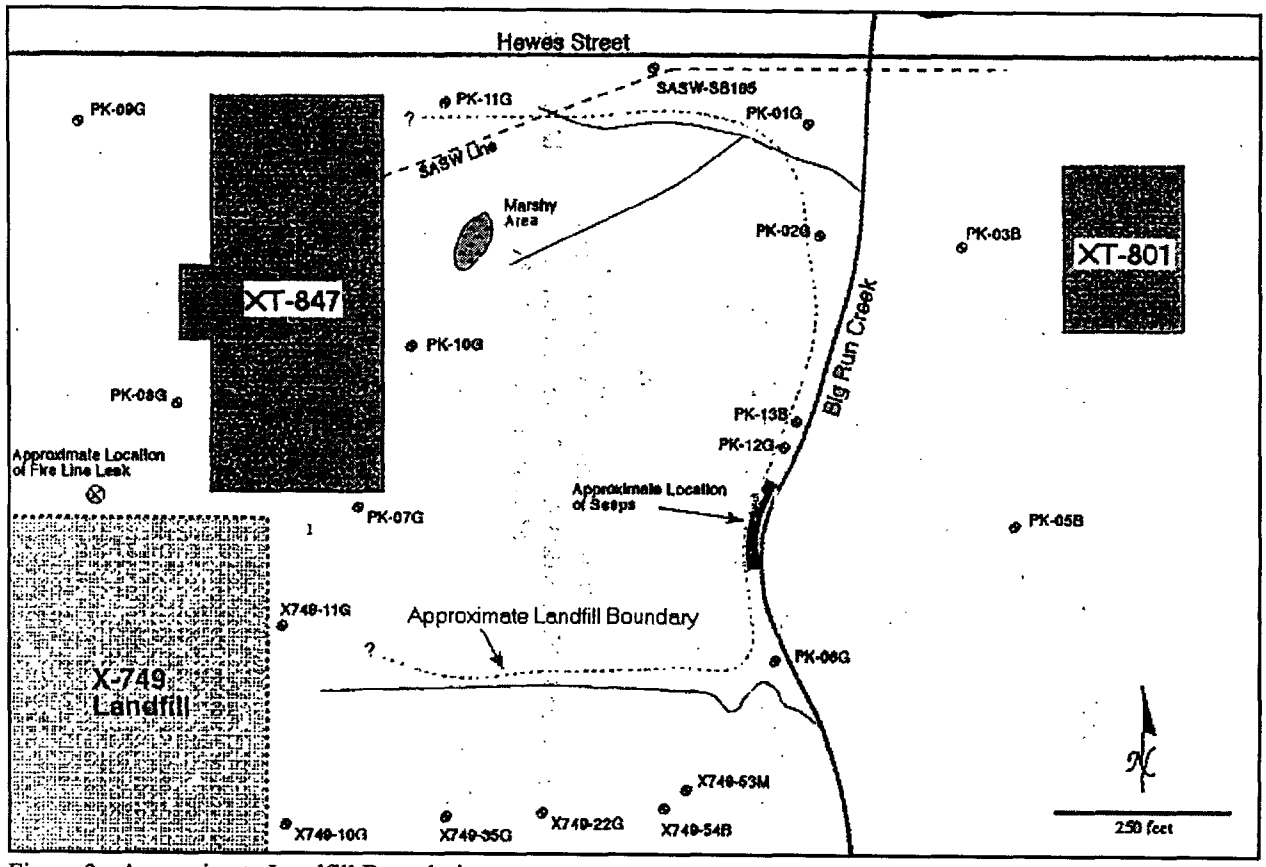

Figure 3 - Approximate Landfill Boundaries

The leachate samples were analyzed for over 200 volatile organic chemicals (VOCs) and also radiological analyses including uranium and Technetium-99, both previously detected radioactive materials at PORTS. The two sediment samples were analyzed for over 30 VOCs, over 20 metals, radiological analyses and also for freon and fluoride, both used on the plant site. The 11 monitoring wells were installed around the Peter Kiewit Landfill with 9 being drilled in the Gallia sand and gravel layer and 2 in the underlying Berea sandstone. A random soil sample was taken from each well and ground water was sampled from each well for VOCs and radiologicals.

During the Phase II investigation, eight hand auger soil samples were collected along the east side of the Peter Kiewit Landfill to provide better definition in this area. The results of the Phase I and Phase II investigations revealed that VOCs and Aroclor-1260 (PCB) were detected in surface water from the seeps located on the east side of the landfill. Gross alpha and gross beta radioactivity above preliminary background levels were also detected in these seep samples. The sediment samples taken in the area of the seeps showed levels of semi-volatile organic chemicals (SVOCs) and VOCs.

VOCs were detected in ground water at 4 wells. One well, PK-03B, showed 70 parts per billion of trichloroethylene (TCE) in one sample but the duplicate was non-detect. This well will be

resampled to resolve this discrepancy. Due to the location of the well and the direction of groundwater flow, the volatile organics detected are likely associated with the X-749/X-120 landfill ground water plume located southwest of Peter Kiewit. Migration of volatile organics from the X-749 area in an easterly direction toward Big Run Creek has been documented from past groundwater sampling.

Soil samples collected along the east side of the landfill revealed low levels of VOCs, SVOCs and elevated levels of PCBs (Aroclor-1260) in three samples. Sediment samples collected in the seep drainage disclosed numerous semi-volatile compounds, and low levels of radiologicals. All investigation samples are detailed in the revised Draft RFI. An interim action was completed in late 1994 to re-route the creek away from the landfill and collect and treat leachate from seeps located along the eastern side of the landfill.

6.0 SUMMARY OF RISK ASSESSMENT

The assessment of potential or current risks from wastes present at a SWMU such as the Peter Kiewit Landfill is based on guidance provided by the U.S. EPA, in particular the 1989 "Risk Assessment Guidance for Superfund" (RAGS) and the 1992 "Guidelines for Exposure Assessment." These guidance documents are founded on well established chemical risk assessment principles developed for the regulation of environmental contaminants. The risk assessment for contaminated sites on the U.S. DOE-PORTS site consists of a human health risk assessment and an ecological risk assessment. The human health risk assessment is conducted assuming that no institutional controls such as fencing are in place and that residential use is possible. A future residential scenario at a SWMU is considered the reasonable maximum exposure (RME) for risk assessment purposes. The initial risk assessment conducted for the site assumes that no future cleanup action is taken and is referred to as the baseline risk assessment (BRA). The baseline risk assessment consists of the following steps:

6.1 Identification of Chemicals of Concern

After data collected during the RCRA facility investigation (RFI) is evaluated, those chemicals that were detected during lab analysis were retained as Chemicals of Concern (COC). Some data not appropriate for certain exposure pathways was excluded. For example, deep soil data greater than 10 feet would not be expected to be available for possible ingestion by children or adults and is only a threat to ground water contamination. Therefore, this data was not included in the assessment of soil ingestion risks.

6.2 Exposure Assessment

This step involves the evaluation of potential human exposures to site chemicals. There are basically four separate tasks necessary in the exposure assessment. These steps are: (a) characterization of the exposure setting; (b) identification of exposure pathways; c) estimation of environmental concentrations; and (d) estimation of human intake.

6.2.1 Characterization of the Exposure Setting

This step involves modeling or simulating those exposure scenarios considered possible on the site both for current use and future use. The following scenarios were included in the baseline risk assessment:

6.2.1.1 Current Use Scenarios

- on-site worker
- off-site worker
- off-site recreational population

The on-site worker scenario describes potential exposures to outdoor media at PORTS for a worker engaged in normal day-to-day activities throughout the quadrant. Because contaminated areas on the site did not extend to off-site locations, an assessment of current-use, off-site residential scenarios was not conducted. Current-use off-site residential risk estimates for air inhalation pathways will be assessed upon completion of the Air RFI work. The recreational population scenario was developed to assess potential exposures to surface water bodies on the PORTS reservation and to fish and game eaten by local recreational anglers and hunters. In estimating exposure for both current off-site resident and recreational populations, any significant direct access to media within the quadrant being evaluated was considered unlikely. Exposures were assumed to result from contaminants that could potentially migrate off-site.

Future use scenarios were developed consistent with the reasonable maximum exposure assumption of unrestricted access to the site. Specifically, on-site residential development and an on-site recreational population were assumed as potential exposure scenarios. For the future use conditions, the following scenarios were developed:

6.2.1.2 Future Use Scenarios

- on-site resident
- on-site recreational population
- on-site worker
- off-site resident
- off-site recreational population

In addition to the on-site worker who is involved in normal day-to-day activities, another exposure scenario modeled under both current and future land use conditions is the excavation worker. This worker is assumed to be in contact with contaminated media during periodic, intrusive activities such as construction or landscaping.

6.2.2 Identification of Human Exposure Pathways

The above exposure scenarios were developed to model or simulate possible exposure situations

found at the site. It is also necessary to determine the most likely exposure pathways as well. An example of an exposure pathway is the ingestion of contaminated groundwater under both current and future site use. The following exposure pathways were evaluated:

- Exposure to groundwater via ingestion of drinking water, and dermal contact and inhalation of volatiles while showering;
- Exposure to soil via incidental ingestion and dermal contact, and via external gamma radiation from radionuclides present in soil;
- Exposure to sediment via incidental ingestion and dermal contact;
- Exposure to surface water via incidental ingestion and dermal contact;
- Exposure to air via inhalation of vapors and particulates;
- Exposure to vegetables grown and to beef and milk from cattle pastured on contaminated land;
- Exposure via ingestion of local game contaminated by grazing on land affected by plant operations; and
- Exposure via ingestion of fish.

6.2.3 Estimation of Environmental Concentrations

In this step, concentrations of chemicals and radionuclides in various environmental media from which exposure may occur are estimated via sampling results and mathematical modeling.

6.2.4 Estimation of Human Intake

This step involves calculating the amount of a substance received by an individual through exposure to chemicals and radionuclides in the various environmental media. Chemical intakes (referred to as chronic daily intakes or CDIs) are typically expressed in terms of the amount of material in contact with the body for a certain time period, and are calculated as a function of chemical concentration in the soil or water, how often the exposure occurs and how long (exposure frequency), body weight, and the portion of a lifetime that exposure occurs.

The generic equation for calculating the CDI is as follows:

$$CDI = \frac{CxCRxEFxED}{BwxAT}$$

where: CDI = Chronic daily intake, mg/kg/day

C	=	Chemical concentration in soil or water, e.g. mg/kg soil
CR	=	Contact rate, e.g., kg/soil/day
EF	=	Exposure frequency, days/year
Bw	=	Body weight, kg
AT	=	Averaging time; portion of life time over which exposure is averaged (days).

Variations of this equation are used when calculating air inhalation and radiological exposures.

6.3 Toxicological Assessment

The toxicological assessment involves the identification of adverse health effects associated with exposure to a chemical or radionuclide and the relationship between the extent of exposure and the likelihood and/or severity of adverse effects. The U.S. EPA has conducted such assessments on many frequently occurring environmental chemicals and radionuclides and has developed toxicity values based on these assessments for use in risk assessments. Further information regarding the toxicological assessment can be found in the draft RFI Reports.

6.4 Risk Characterization

This step involves calculating estimates of carcinogenic (cancer causing) and non-carcinogenic risks from chemicals of concern for different exposure pathways. Cancer risk is defined as the probability of an individual developing cancer over a lifetime as a result of exposure to a potential carcinogen in addition to the probability of cancer risks from all other causes. As a benchmark in developing clean-up goals at contaminated sites, an acceptable range of excess lifetime cancer risk (ELCR) from one in one million ($1x10^{-6}$) to one in ten thousand (1×10^{-4}) has been established. The point of departure or program goal for risk remaining after a site is cleaned up is $1x10^{-6}$ (i.e. a one in one million excess lifetime cancer risk, above and beyond risks from other unrelated causes) and is the risk goal for the U.S. DOE-PORTS site.

The "Hazard Quotient" (HQ) is used to determine the severity of non-cancerous hazards posed at a site. The HQ is determined by dividing the Chronic daily intake (CDI) by the Reference dose (RfD). The reference dose is the amount of material that is determined to cause a toxic effect. If the HQ is less than or equal to 1, then the estimated exposure to a substance represented by the CDI, is judged to be below the threshold that could result in a toxic effect. An HQ greater than 1, indicates that a toxic effect may result. To assess the cumulative effect of similar noncancerous substances, the HQ for all of the substances being assessed at a site are added, with the result being the hazard index (HI).

6.5 Conclusions

The risks estimated for substances evaluated at a solid waste management unit (SWMU) and in the quadrant, are compared to target risk levels and general conclusions regarding the potential risks associated with these substances are discussed in the baseline risk assessment.

6.6 Peter Kiewit (SWMU Specific) Risk Assessment

The SWMU specific risk assessment for the Peter Kiewit Landfill was completed using the above described principles. By using the SWMU specific data gathered during the RFI, it is possible to estimate risks associated with the landfill. The risk estimates for the scenarios assessed at the Peter Kiewit Landfill are summarized below in Table 1 and are the estimated risks assuming no clean-up action is taken at the site. Other risk estimates presented in the CAS/CMS report are for risks to construction workers during implementation of the clean-up alternative and for risk estimates after clean-up is complete. Table 1 shows that conservative estimates of future residential use of the area around (i.e. next to) the landfill and worker scenarios show unacceptable risk (i.e. HI > 1 and a cancer risk greater than 10^{-4}) if no clean-up actions are taken. The future on-site residential scenario is considered to represent the reasonable maximum exposure (RME) risk estimate for the Peter Kiewit landfill area.

6.7 Ecological Risk Assessment

The purpose of the ecological risk assessment was to estimate the potential and future risks of Peter Kiewit Landfill contaminants to ecological receptors. The primary source of potential ecological risks was determined to be the seeps located along the eastern side of the landfill. In 1994, an interim action was completed to re-route Big Run Creek away from the landfill and collect and treat leachate from the seeps. Following the completion of the interim action, potential ecological exposure to landfill wastes has been minimized. The selected remedy will appropriately address landfill wastes which have potential to cause future ecological harm.

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this SB/ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

TABLE 1[1]

Summary of Risks Associated with the Peter Kiewit Landfill		
Exposure Scenario	**Noncancer Hazard Index (HI)**	**Cancer Risk (Excess Lifetime Cancer Risk-ELCR)**
Current Use: On-site Worker	Total HI = $7x10^{-2}$	Total excess cancer risk = $1x10^{-5}$.
Future Use: On-site Resident (next to the landfill)	Total HI = 50	Total excess cancer risk > $1x10^{-2}$
On-site Recreational Population: Seep and sediment assessment[2]	Total HI = $9x10^{-1}$	Total excess cancer risk = $2x10^{-4}$
Future Use: On-site Worker	Total HI = 20	Total excess cancer risk = $2x10^{-3}$
Excavation Worker	Total HI = 30	Total excess cancer risk = $1x10^{-4}$
On-site Worker: Seep and sediment assessment[2]	Total HI = $7x10^{-1}$	Total excess cancer risk = $1x10^{-4}$

[1] From the Quadrant I Baseline Risk Assessment, RFI Report, U.S. DOE, 1994

[2] Seep and Sediment Assessment: Risks associated with exposure to seep and sediment only. This scenario assumes the seep collection system is <u>not</u> in operation.

7.0 DESCRIPTION OF ALTERNATIVES

The CAS/CMS was conducted to identify and screen technologies and cleanup alternatives for addressing the Peter Kiewit Landfill. The seep collection system installed on the east side of Big Run Creek is expected to collect contaminants released from the landfill. Under a true no action scenario, continued treatment of seeps would not occur, posing continued unacceptable risk, as demonstrated in the baseline risk assessment. The "No Further Action" scenario presented below assumes that the seep collection system will remain in operation.

Four alternatives were evaluated in detail in the CAS/CMS Report. The alternatives were compared based on the overall effectiveness in addressing the current and future site conditions. These alternatives were as follows:

- No Further Action (seep collection system would remain in operation)
- Limited Action - Fencing/Signs, Deed Restrictions and Environmental Monitoring
- Capping, Vertical Subsurface Barriers, Deed Restrictions and Environmental Monitoring
- Vertical Subsurface Barriers, Deed Restrictions and Environmental Monitoring

These alternatives are summarized below:

7.1 Alternative #1: No Further Action

Under this alternative, the seep collection system (and treatment) would remain in operation but PORTS enrichment plant processes are assumed to be shut down and no additional actions would be taken at the landfill. The No Further Action alternative assumes unrestricted access to the landfill area and no restrictions on land use. There would be no additional active measures taken to reduce the concentration levels or mobility of the contaminants in the seeps.

Cost Analysis-Alt. #1: No Further Action Alternative

There are no costs associated with this alternative in addition to the seep collection system and its operation. The total present worth cost of the seep collection system is $2,995,000.

7.2 Alternative #2: Limited Action - Fencing/Signs, Deed Restrictions and Environmental Monitoring

This Limited Action alternative includes installing a security fence around the perimeter of the Peter Kiewit Landfill. Signs prohibiting entry would be prominently placed upon the fence. Deed restrictions would be applied to this area to restrict digging, drilling, building, or any other activity that can disturb soils, and to prevent installation of drinking water wells in the contaminated area. Environmental monitoring of the ground water and surface water near the

area would occur semi-annually. An annual report would be prepared summarizing all field activities and analytical data. Evaluation of the environmental monitoring program would be conducted every five years to determine the need for remediation and/or continued monitoring. In addition, the interim action would be continued for seep collection and treatment.

Since the Limited Action Alternative primarily uses institutional controls such as fencing and no active source treatment, it does not comply with Section 300.430 of the NCP which states that institutional controls shall not substitute for active response measures as the sole remedy unless active response measures are determined not to be practicable. Alternative #2 is retained only to provide a remedial option that may be selected if other alternatives involving active source treatment prove impracticable.

Cost Analysis-Alternative #2: Fencing/Signs, Deed Restrictions, Environmental Monitoring

The total present worth cost for this alternative is $6,052,000.

7.3 Alternative #3: Capping, Continuation of Seep Collection System, Deed Restrictions, Environmental Monitoring, and Vertical Subsurface Barriers (contingency)

This alternative would be designed to include the relevant components of U.S. EPA's presumptive remedy guidance for landfills, which specifies containment technologies to isolate the contaminated seeps and wastes present in the landfill, and reduce the water source of the seeps. Infiltration would be reduced by the construction of a cap over the landfill which would extend over the previous course of Big Run Creek (the stream channel prior to installation of the seep collection system).

If necessary to prevent the flow of groundwater into the landfilled wastes, vertical subsurface barriers would be installed on the northern and western edges of the landfill (see discussion of subsurface barriers below). The primary source of seep water is believed to be from infiltration of rain water from the landfill surface and not from ground water flowing into the waste. Therefore, the installation of the vertical subsurface barriers is included in this alternative as a contingency. Determination of the need for the vertical subsurface barriers would be made during the first five year review of the remedial action, using criteria developed during the remedial design.

Seep collection and treatment would be accomplished using the seep collection system (SCS). Two options each for capping and vertical subsurface barriers were considered under this alternative and are described below. Deed restrictions would be enacted to prevent any activities that could damage the integrity of the cap.

7.3.1 Capping Options

Two different capping options were evaluated in the CAS/CMS, a RCRA Subtitle C cap and a

RCRA Subtitle D cap. Section 7.3.1.1 and 7.3.1.2 below summarize the evaluations for the two capping options.

7.3.1.1 Hazardous Waste Disposal Facilities Final Cover (RCRA Subtitle C Multimedia Cap).

This option involves constructing a multimedia cap over the landfill per RCRA Subtitle C requirements The multimedia cap would consist of a low permeability geomembrane/soil layer, a drainage layer, and a top vegetative/soil layer. In addition, the design would consist of vents for landfill gas collection and perimeter drains for capturing drainage through the drainage layer.

It is possible that the landfill material may be unstable and pose cap implementation problems, such as settling due to the use of heavy machinery causing differential settlement of the cap. If the landfill material is determined to be unstable for cap installation, measures for providing a solid foundation for the cap or other actions for stabilizing the landfill may be required. The existing landfill material can be compacted by heavy equipment traffic or by dynamic compaction. A foundation consisting of a 3-foot layer of stone overlain by a 3-foot layer of below-cap fill is another possible option for providing stability. The decision of the cap stability requirement and the measures to be taken for stabilizing the cap would be determined in the detailed design phase.

The cap would be sloped to force the runoff of any precipitation away from the landfill area. Monitoring would include regular visual inspections to ensure the integrity of the cap and leachate collection system. Noted defects in the cap will be repaired as needed.

Cost Analysis-Alternative #3: Hazardous Waste Cap Option

The total capital cost for this alternative is $17,267,000. Operation and Maintenance costs are estimated to be, Year 1: $294,000; Years 2-30: $9,925,000; The total present worth cost in 1994 dollars is $21,503,000.

7.3.1.2 Municipal Solid Waste Landfills Final Cover (RCRA Subtitle D Multimedia Cap)

This option involves constructing a multimedia cap over the landfill per RCRA Subtitle D requirements for the final closure of a municipal/sanitary landfill facility. This option would also address the applicable, relevant, and appropriate requirements for closure of a solid waste facility per Ohio regulations. The multimedia cap would consist of a compacted soil barrier layer, a granular drainage layer, and a top vegetative layer. The slope of the cover may vary from 5 percent to 25 percent or any other slope justified by adequate slope-stability analysis.

The discussion on cap stability requirement is the same as that described for the Subtitle C cap. The cap would be sloped to force the runoff of any precipitation away from the landfill area. Monitoring would include regular visual inspections to ensure the integrity of the cap and

leachate collection system. Noted defects in the cap will be repaired as needed.

Cost Analysis-Alt. #3: Solid Waste Cap Option

The solid waste cap costs are identical to the above costs with the exception of no added costs for the synthetic liner material. Therefore, this alternative's net worth is approximately $20,877,000.

7.3.2 Vertical Subsurface Barrier Options

Two vertical subsurface barrier options were evaluated in the CAS/CMS, slurry wall and sheet piling. Sections 7.3.2.1 and 7.3.2.2 below summarize the evaluations of these options.

7.3.2.1 Slurry Walls

Conventional slurry wall technology involves excavation of trenches followed by backfilling with soil bentonite slurry. However, recently developed techniques, which use simultaneous soil mixing and injection of soil-bentonite slurry, can be used for construction of slurry walls. The principal advantage of these techniques is the minimization of the volume of soil to be excavated. In this alternative, slurry walls would be constructed on the northern and western edges of the landfill. This technique utilizes a drill rig with multi-shaft augers and mixing paddles to drill into the soil. During the drilling operation a fluid slurry is injected and mixed with the soil to form a low permeability column. These columns are then overlapped to form a continuous barrier to ground water flow.

The slurry wall would extend from the ground surface into the impervious Sunbury shale layer, located at a depth of approximately 30 ft. in the landfill area. The slurry wall would divert ground water around the landfill and is intended to prevent horizontal ground water flow into the waste. Soils removed during construction of the slurry wall would be tested and disposed according to these test results.

7.3.2.2 Sheet Piling

This option involves driving steel sheets into the ground to form an interconnecting, thin, low-permeability barrier to ground water movement into the landfill area. The joints of steel sheet piles would be sealed by a bituminous sealant to further reduce permeability. The sheet piles would extend from the ground surface into the impervious Sunbury shale layer, located at a depth of approximately 30 ft. in the landfill area.

Cost Analysis-Vertical Subsurface Barrier Options

Costs associated with the Vertical Subsurface Barriers were included in the cost analyses for Alternative #3. The cost difference between the two subsurface barrier options is not expected to substantially affect the total cost of Alternative #3.

7.4 Alternative #4: Vertical Subsurface Barriers, Continuation of Seep Collection System, Deed Restrictions, and Environmental Monitoring

This alternative would continue to allow precipitation to infiltrate into the landfill to allow for natural biodegradation of organic contaminants in the landfill. Some organic compounds such as PCB's do not readily biodegrade. Biodegradation could be enhanced by spraying inorganic nutrients over the landfill surface. Leachate from the landfill is collected and either recirculated for re-infiltration into the landfill or treated prior to discharge. This alternative is similar to Alternative #3 except that landfill capping is not included. Vertical subsurface barriers would be placed upgradient of the landfill to minimize ground water movement into the landfill and minimize contamination of ground water moving into and away from the landfill. The options for vertical subsurface barriers are described in Alternative #3. The seep collection system would be continued for seep collection and treatment. Deed restrictions would be placed on the landfill area to prevent access to the landfill and to prevent any activities that may damage the integrity of the remedy.

Cost Analysis-Alt. #4: Vertical Subsurface Barrier

The total capital cost for this alternative is $4,909,000. O&M costs are estimated to be, Year 1: $283,000; Years 2-30: $9,876,000; The total present worth cost is $10,420,000.

8.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting the remedial alternative, U.S. EPA and U.S. DOE considered the following nine criteria. Although the eighth criterion, state acceptance, was not formally evaluated in the CAS/CMS, it is evaluated in this SB/ROD.

1. **Overall protection of human health and the environment** addresses whether or not a remedy provides adequate protection, and describes how risks are eliminated, reduced or controlled through treatment, engineering controls, and/or institutional controls.

2. **Compliance with all State, Federal and local laws and regulations** addresses whether or not a remedy will meet all of the relevant, appropriate and applicable State, Federal, and Local environmental statutes.

3. **Long-term effectiveness and permanence** refers to the ability of a remedy to maintain reliable protection of human health and the environment over time once clean-up goals have been met.

4. **Reduction of toxicity, mobility, or volume** is the anticipated performance of the treatment technologies to yield a permanent solution. This includes the ability of the selected alternative to reduce the toxic characteristics of the chemicals of

concern or remove the quantities of those chemicals to an acceptable risk concentration or regulatory limit and/or decrease the ability of the contaminants to migrate through the environment.

5. **Short-term effectiveness** involves the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until clean-up goals are achieved.

6. **Implementability** is the technical and administrative feasibility of a remedy, including the availability of goods and services needed to implement the chosen solution.

7. **Cost** includes capital and operation and maintenance costs.

8. **State Acceptance** involves assessing whether or not the State would find the remedial alternative acceptable.

9. **Community acceptance** is assessed in the Responsiveness Summary of this document. Public comments were received on the RFI report, the CAS/CMS, and the Preferred Plan.

The nine criteria are categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria. The first two criteria, overall protection of human health and the environment and compliance with ARARs, are the threshold criteria that must be satisfied in order for an alternative to be eligible for selection as remedial alternative. Criteria three through seven are the primary balancing criteria that are used to weigh major trade-offs among alternatives. The final two criteria, State and community acceptance are the modifying criteria that are taken into account after public comment is received on the Preferred Plan. U.S. EPA and U.S. DOE evaluated each alternative using the above nine criteria. The following discussion summarizes the compliance of the alternatives with these criteria.

8.1 Overall Protection of Human Health and the Environment

Alternatives #1 and #2 do not provide overall protection of human health and the environment due to the long-term risks associated with potential formation of additional seeps along the southern edge of the landfill, and possible exposure to uncovered waste due to eventual erosion of the current cover material. Alternatives #3 and #4 were determined to provide overall protectiveness.

Alternative #3 (cap, seep collection, vertical upgradient barrier) is expected to be the most protective of both human health and the environment because the most effective activities will be conducted to alleviate infiltration of surface water into the waste, seep water volume, and, if necessary, migration of groundwater as compared to the other alternatives. In addition to this,

the cap is expected to provide more protection against possible exposure to uncovered waste due to eventual erosion of the current cover material than will Alternative #4 (no cap, seep collection, vertical barrier) or Alternative #2 (Seep Collection, Fencing/Signs, Deed Restrictions). Alternative #1 was considered the least protective because a greater probability of additional seeps and eventual erosion of the current soil cover is anticipated as compared to the other alternatives. The potential for erosion of the current soil cover is equal for Alternatives #1, #2, and #4, however, Alternative #4 poses a lesser risk for additional leachate from seeps over Alternative #1 because some reduction in groundwater flow into the landfill is expected with a vertical barrier.

8.2 Compliance with all State, Federal and Local Laws and Regulations

Selected remedial actions on the U.S. DOE site must comply with applicable Federal, State, and Local laws and regulations. Examples of applicable laws and regulations include, but are not limited to, the Clean Air Act, Toxic Substances Control Act, the Safe Drinking Water Act, the Clean Water Act, the Resource Conservation and Recovery Act, Ohio Revised Code (ORC) 6111, ORC 3734, and Ohio Administrative Code 3745. CERCLA Section 121 requires that remedial actions meet legally applicable or relevant and appropriate requirements of other environmental laws. "Applicable requirements" means those cleanup standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a site.

"Relevant and appropriate" requirements are cleanup standards , standards of control, and other substantive environmental protection requirements, criteria or limitations promulgated under Federal or State law that, while <u>not</u> legally "applicable" to a hazardous substance, pollutant, remedial action or circumstance at a site, their use and application is well suited to the situation at a site. An example of a situation where a law would be relevant and appropriate is the treatment of waste not lawfully deemed "hazardous" but identical to chemicals currently deemed hazardous under the Resource Conservation and Recovery Act (RCRA). A list of Ohio's ARARs is provided in Appendix C. U.S. EPA and U.S. DOE have reduced the number of Ohio ARARs to reflect only those action-, chemical-, and location-specific requirements that are pertinent to the remedy selected for Peter Kiewit Landfill. Therefore, the list of state ARARs in this SB/ROD is shorter than the list of state ARARs presented in the State of Ohio's decision document.

In certain instances, a remedy may be selected which does not meet an ARAR. Six conditions have been established under which an ARAR may be waived: interim measure, greater risk to health and the environment, technical impracticability, equivalent standard of performance, inconsistent application of state requirements, and fund-balancing. No waiver of an ARAR has been sought by U.S. DOE with respect to the Peter Kiewit Landfill.

ARAR's are divided into three different categories:

- Chemical-Specific ARARs
- Action-Specific ARARs
- Location-Specific ARARs

Chemical-Specific ARARs are health or risk-based numerical values which establish the acceptable amount or concentration of a chemical that may be found in the environment. An example of chemical-specific requirements are maximum contaminant levels (MCLs) established for certain chemicals. All of the alternatives evaluated for the Peter Kiewit Landfill are expected to comply with chemical-specific ARARs because discharge levels for treated seep water are identical in each alternative. Only if operation of the seep collection system is halted (a true "No Action alternative") would there be potential violations in discharge limits for treated seep water.

Action-Specific ARARs are usually technology or activity based requirements or limitations on actions taken with respect to hazardous waste. An example of an action-specific requirement would be the requirement for treatment of hazardous waste to approved standards before it is land disposed. Alternative #3 complies with action-specific ARARs, however, the remaining alternatives do not. A "relevant and appropriate" requirement for landfills is the placement of a cap on the landfill after it is no longer in operation. Because they do not evaluate placement of a cap on the Peter Kiewit Landfill, Alternatives #1, #2, and #4 do not satisfy Action-specific ARARs. Additionally, the NCP states that a preference shall be given to alternatives that actively treat waste rather than institutional controls (Alternative #2).

Location-Specific ARARs are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because they occur in a specific location. An example of location-specific requirements are laws forbidding the placement of an incinerator near a hospital or school or the placement of waste in a wetland area. All of the alternatives will comply with these requirements because no waste disposal outside of the landfill is proposed.

According to Section 121 of CERCLA, no federal, state or local permits are required for remedial actions taken on-site.

8.3 Long-term Effectiveness and Permanence

Alternative #3 is expected to provide the greatest long-term protectiveness over the other alternatives because capping the landfill will reduce infiltration of water into the waste and the additional contingency measure of up-gradient groundwater control would also be expected to reduce horizontal groundwater flow. An alternative which would remove and treat the landfill waste would have the greatest level of long-term effectiveness. However, due to the large cost and risks of addressing unknown landfill waste and the high cost of off-site disposal, such an alternative was found impracticable and was not considered in the detailed analysis of alternatives. Alternatives #1, #2 and #4 are anticipated to have a lesser degree of permanence because eventual failure of the current soil cover which could expose wastes and additional seep generation is more likely to occur without further control of rainwater infiltration into the waste. Alternative #4 was judged to be more protective than Alternative #1 and #2 because a vertical

barrier to stop the migration of groundwater will reduce the likelihood of future seep generation.

8.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

None of the alternatives reduce the toxicity, mobility or volume of landfill wastes through treatment. No hot spots were located at the Peter Kiewit Landfill; therefore, treatment of hot spots was not considered. Treatment of the homogenous waste within the landfill was not found to be practicable. A landfill operated today similar to the Peter Kiewit Landfill would be required to be capped per solid waste regulations after operations ceased. Although the Peter Kiewit Landfill ceased operation before these State and Federal laws were enacted, capping the landfill is a relevant and appropriate requirement.

8.5 Short-Term Effectiveness

Alternatives #1 and #2 do not require soil excavation and are therefore not expected to cause short-term risk from exposure to landfilled wastes. Alternative #3 is expected to slightly increase ecological risks during cap construction due to soil run-off into Big Run Creek. Alternative #4 is expected to have the greatest short-term risk because unknowns during construction of the vertical barrier could cause exposures from buried wastes. In the westerly direction from the landfill (where the vertical barrier would be installed), the extent of buried waste is not known, increasing the possibility of excavating wastes during construction. Contingency measures to address these concerns would be addressed during remedial design.

Since the seep collection system is already in place, Alternative #1 would be completed immediately. Alternative #2 could be completed in less than six months; Alternative #4 in approximately six months; and Alternative #3 in six months to one year.

8.6 Implementability

All of the alternatives are expected to be technically implementable. Alternatives #3 and #4 would be expected to present greater difficulties than alternatives #1 and #2 due to the proposed cap construction (Alt. #3) and potential vertical barrier work (Alt. #4). Alternatives #1 and #2 would be the easiest to implement because fence construction in alternative #2 is the only construction activity necessary. No construction activities are planned in alternative #1 beyond the seep collection system which is already in place and operating.

8.7 Cost

The "No Further Action" alternative would not require additional costs beyond the installation costs already expended for the seep collection system and is the least costly alternative. However, additional costs may be necessary in the future for addressing additional seeps or failure of the current soil cover. Alternative #2 is more costly than alternative #1, followed by alternative #4 and alternative #3, which is estimated to be the most expensive due to the greatest amount of field work. Alternative #4 is substantially less costly than alternative #3 because of

the absence of capping construction costs. Recent experience with construction work at the PORTS plant has shown that contractor bids for remedial work are often times lower than estimated in the corrective measures studies.

8.8 State Acceptance

The State of Ohio has indicated its acceptance of the remedial action for Peter Kiewit Landfill by issuance of its own decision document (see Appendix B).

8.9 Community Acceptance

Comments received from the community are addressed in writing in the Responsiveness Summary to this SB/ROD. Based on the comments received, the community accepts the preferred alternative for the Peter Kiewit Landfill.

9.0 THE SELECTED REMEDY

U.S. EPA and U.S. DOE select a modified version of Alternative #3. This alternative continues the operation of the seep collection system, requires the landfill to be capped with a solid waste type cap meeting Subtitle D requirements, and stipulates the installation of a subsurface vertical barrier if monitoring shows that a barrier is needed to prevent the flow of groundwater into landfilled waste (see Figure 4, *Schematic of Alternative 3*, for a sketch of alternative components). This alternative provides the best balance of trade-offs when considering the criteria used to evaluate remedies presented in the preferred plan and in Section 8.0 above. U.S. EPA and U.S. DOE believe that this remedy will be protective of human health and the environment by containing and where practicable, treating the waste (leachate sources). This alternative meets ARAR (see Appendix C), is cost-effective, and will provide long-term effectiveness.

The major components of this alternative are:

- Continuation of the seep collection system which is currently in operation on the east side of the landfill;
- Capping the landfill to contain wastes and reduce water infiltration with a cap meeting the requirements of RCRA Subtitle D;
- The use of vertical barriers (slurry wall) as necessary to minimize lateral migration of contaminants. Future evaluation of the leachate volumes flowing to the seep collection system will determine the need for a vertical subsurface barrier. The criteria for determining the need for the vertical subsurface barrier shall be developed during the remedial design. Specific details shall be included in all subsequent design documents.

- Environmental monitoring to ensure that the final remedial action is protective.

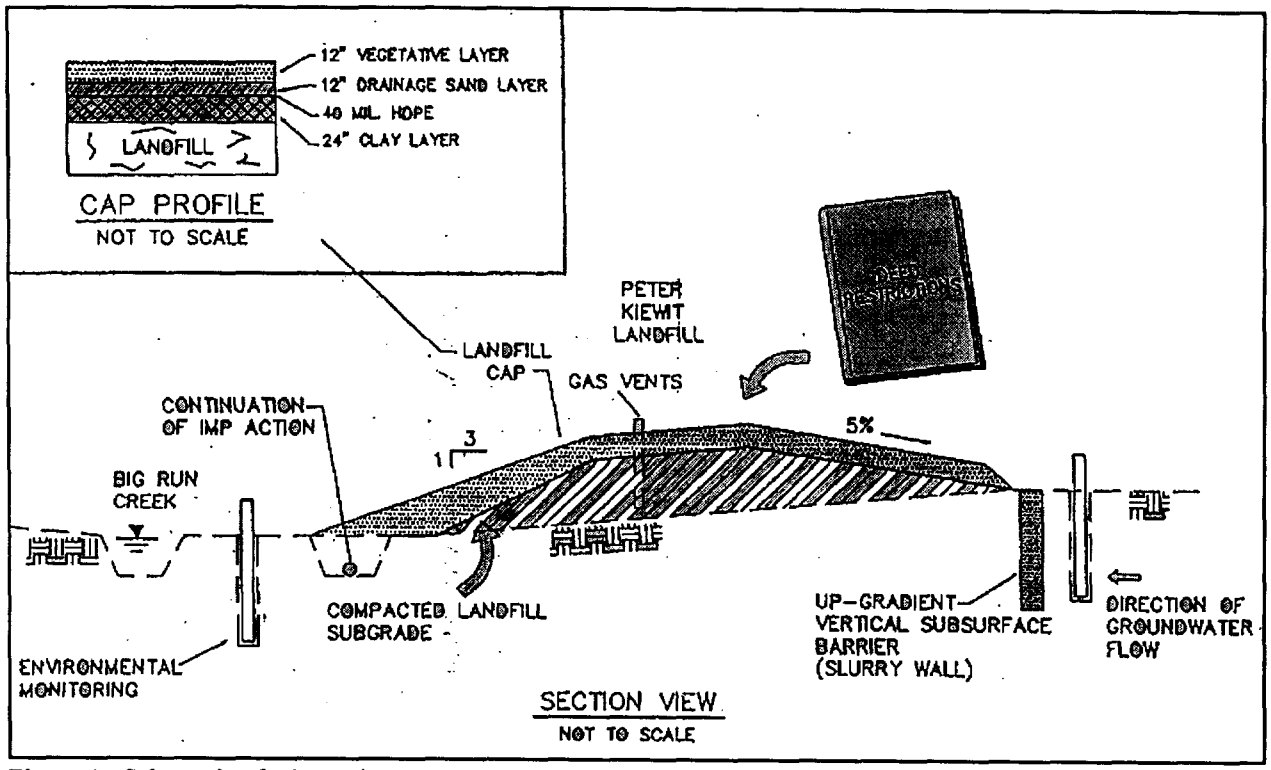

Figure 4 - Schematic of Alternative 3

The recompacted low permeability cap is the preferred cap design. This cap, commonly referred to as a solid waste cap, has been used at two other locations on the site and is expected to contain landfilled wastes and minimize the infiltration of rain water into the landfill.

A landfill operated today similar to the Peter Kiewit Landfill would be required to be capped per solid waste regulations after operations ceased. Although the Peter Kiewit Landfill ceased operation before these State and Federal laws were enacted, capping the landfill is a relevant and appropriate requirement and will comply with Federal and State law. Alternative #1 (No Further Action), Alternative #2 (Fencing and Deed Restrictions), and Alternative #4 (Vertical Subsurface Barrier) do not meet relevant and appropriate requirements.

If deemed necessary, the selected remedy will require the installation of a slurry wall to prevent the horizontal flow of groundwater into the landfill. However, based on past data showing that the Minford clays have a relatively low horizontal permeability, U.S. EPA and U.S. DOE believe that the primary source of seep water is from infiltration of rain water from the landfill surface and not from ground water flowing into the waste. The effectiveness of the landfill cap in reducing seep water volume, and the continued ability of the seep collection system will determine the need for the installation of a slurry wall. Specific criteria developed during the remedial design will be examined during the first five year review of the remedy to determine the need for the slurry wall. If a slurry wall is deemed necessary to reduce lateral migration of

contaminants, its placement and design will consider the existing structures and utilities west of the landfill area.

Excavation and subsequent disposal of the material in the Peter Kiewit Landfill was considered; however, it was determined that this alternative would not be practicable and would not provide significant advantages in risk reduction over alternative #3. As stated above, excavation is likely to cause increased exposure risks to wastes during field work and the final disposal location for this waste is undetermined. Containment of the waste in the Peter Kiewit Landfill was considered a better alternative than attempting to excavate and treat the landfilled wastes because of the variety of wastes present and the difficulty in adequately treating a mixture of contaminants such as landfill wastes.

Environmental monitoring such as ground water sampling and monitoring of the seep collection system will be conducted after the landfill is capped to ensure that the selected remedial action is effective. The seep discharges will be collected and treated as long as seep flow is present. The remedial alternative is expected to significantly reduce or eliminate the seep discharge. Immediate steps will be taken to mitigate any unacceptable risks from releases detected after remedial actions have been completed. Additional actions are not anticipated but might be necessary for unexpected events such as new seeps or previously undetected ground water contamination.

The objective of Alternative #3, the preferred alternative, is to eliminate the release of contaminants (i.e. seeps). Other alternatives are less likely to eliminate the seeps; therefore, they were deemed less effective in reducing the mobility of contaminants (via seep discharge), less effective in the protection of human health and the environment, and less permanent than Alternative #3. Capping the landfill is expected to cause no insurmountable problems during construction. However, as noted above in the discussion of implementability, the installation of a slurry wall or sheet piling, if needed, may present some construction difficulties.

10.0 STATUTORY DETERMINATIONS

In accordance with the statutory requirements of Section 121 of CERCLA, remedial actions must be protective of human health and the environment, comply with all ARARs established under federal and state environmental laws, be cost effective, utilize permanent solutions and alternative technologies or recovery technologies to the maximum extent practicable, and, to the extent practicable, use treatment to reduce the toxicity, mobility, or volume as a principle element. In addition to the CERCLA statutory mandates, the RCRA standards for remedial actions must be met. Under RCRA, remedial actions must: protect human health and the environment, attain media cleanup standards set by the implementing agency, control the source of releases, and comply with any applicable standards for management of wastes.

10.1 Protection of Human Health and the Environment

The selected remedy protects human health and the environment by preventing potential human and ecological exposure to landfill wastes and seep water. The area will be capped, preventing infiltration of precipitation into the wastes and reducing seep water volume. The cap will also provide protection against possible exposure to uncovered waste due to the eventual erosion of the current cover material. If necessary to further control seep water, a vertical subsurface barrier will be installed to prevent migration of groundwater into the landfill wastes.

10.2 Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedy will comply with all ARARs established under federal and state environmental laws. ARARs specific to the Peter Kiewit Landfill are presented in Appendix C.

10.3 Cost-Effectiveness

The selected remedy is cost-effective because it has been determined to provide overall effectiveness proportional to its costs, the net present worth being $20,877,000. Removal and subsequent on- or off-site disposal was not developed as an alternative, because the high cost, excessive waste volume, and unknown waste composition made such an alternative impracticable. Although Alternative #3 is the next to most costly of the four considered alternatives (construction of a RCRA Subtitle C Multimedia Cap would be more costly, with a present worth cost of $21,503,000), its protectiveness, compliance with ARARs, and long-term effectiveness make it the most cost-effective.

10.4 Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

U.S. EPA and U.S. DOE have determined that the selected remedy for the Peter Kiewit Landfill represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a cost-effective manner. Of those alternatives that are protective of human health and the environment and comply with ARARs, this selected remedy provides the best balance of tradeoffs among the alternatives in terms of long-term effectiveness and permanence, reduction in toxicity, mobility, and volume through treatment, short-term effectiveness, implementability, and cost, also considering community acceptance.

10.5 Preference for Treatment as a Principal Element

The selected remedy does not satisfy the statutory preference for treatment as a principal element of the remedy because treatment of the principal threat of the site was not found to be practicable.

10.6 Source Control

The selected remedy will effectively control the source of releases by containing the landfill wastes. Source control will be accomplished by the landfill cap, seep collection system, and, if

necessary, the installation of a vertical subsurface barrier.

11.0 DOCUMENTATION OF SIGNIFICANT CHANGES

The preferred plan for the Peter Kiewit Landfill was released for public comment in April, 1995. The preferred plan identified a modified version of Alternative #3: continuation of the seep collection system; capping the landfill to contain wastes and reduce water infiltration; the use of vertical barriers as necessary to minimize lateral migration of contaminates; and environmental monitoring to ensure that the final remedial action is protective. U.S. EPA and Ohio EPA reviewed all written and verbal comments submitted during the comment period. Upon review of these comments, it was determined that no significant changes to the remedy, as it was originally identified in the preferred plan, were necessary.

RESPONSIVENESS SUMMARY
PETER KIEWIT LANDFILL

1.0 SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD

This section provides an overview of the purpose and organization of the Responsiveness Summary and summarizes significant comments received during the public comment period. The Ohio EPA responded to the comments received. For the purpose of this SB/ROD, U.S. EPA reviewed, approves, and adopts all the responses written by Ohio EPA.

1.1 Overview

This responsiveness summary has been prepared to respond to each of the significant comments, criticisms, and new data submitted in written or oral presentations on the preferred plan for the Peter Kiewit landfill and is intended to be consistent with Sections 113(k) (2) (B) (iv) and 117(B) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). This section requires that the United States Environmental Protection Agency (U.S. EPA) respond "... to each of the significant comments, criticisms, and new data submitted in written or oral presentations" on the preferred plan. Numerous comments were made during the public comment period that do not pertain to the proposed remedial action at the Peter Kiewit Landfill. These comments were not addressed in this responsiveness summary. Attempts will be made to address all comments and concerns not specific to the Peter Kiewit Landfill by communicating with the public in future public informational/update meetings and during site visits where Ohio EPA and/or U.S. EPA representatives are present.

The administrative record index for the U.S. DOE site which includes the RCRA Facility Investigation (RFI), the Cleanup Alternatives Study/Corrective Measures Study (CAS/CMS) and the Preferred Plan is available to the public at the Environmental Information Center located in Waverly, Ohio. The first draft of the RFI was submitted to Ohio EPA and U.S. EPA on February 19, 1992. The CAS/CMS was submitted on June 2, 1994, and a public notice alerting the public of their opportunity to comment on the preferred plan was placed in the ***Waverly Watchman*** and the ***Portsmouth Times*** on April 11, 1995. The public comment period closed on May 12, 1995. A public meeting to discuss the preferred plans was held on April 18,1995 at the Vern Riffe Vocational School near the U.S. DOE plant.

1.2 Summary of Significant Comments

The public comments regarding the U.S. DOE site are organized into the following categories:

(1) Summary of comments and Agency responses to citizens regarding the preferred plan;

(2) Summary of comments from U.S. DOE and Agency responses.

2.0 COMMENTS FROM THE COMMUNITY

1. A commenter expressed concern regarding the short time period Ohio EPA and U.S. EPA had given between notification of the public meeting and the meeting date on April 18th.

   Ohio EPA's Response: The purpose of the meeting was to present the remediation alternatives being considered to the public and to accept oral comments. Written comment were accepted throughout the comment period. Holding the meeting earlier in the public comment period, gave citizens more time to consider the information presented prior to the end of the comment period. By holding the meeting sooner, rather than later in the comment period, citizens had a greater opportunity to provide comments once the alternatives were presented. The length of the comment period was consistent with federal and state regulations and no request for a comment period extension was requested.

2. This same commenter also pointed out that EPA does not have the authority to regulate radioactive constituents in drinking water and therefore it was not accurate to say that the preferred remedy complied with all laws and regulations.

   Ohio EPA's Response: The authority of EPA to regulate radioactive material has some restrictions and does not apply to all radioactive material. However, many radioactive materials from U.S. DOE facilities and the PORTS site in particular are subject to regulation by Ohio EPA and/or U.S. EPA. Designated levels for some radioactive materials in the Safe Drinking Water Act (SDWA) such as gross alpha, gross beta, radium and radon do apply to U.S. DOE facilities and CERCLA also covers radioactive materials not otherwise exempted by the Atomic Energy Act of 1954. Thus, U.S. EPA and Ohio EPA have authority over certain radioactive materials in drinking water. Public water supplies in the State are required to conduct the above listed radioactive analyte list.

   During evaluation of alternatives, a primary criterion is protection of human health and the environment. Ohio EPA and U.S. EPA evaluate all alternatives to determine their ability to protect human health. Leaching of radioactive material to groundwater, ingestion exposures to both soils and waters, dust inhalation and dermal contact are all considered during alternative evaluation and selection.

3. This commenter also asked what decisions were being made as to the extent of cleanup, if there is a cleanup goal and if some plant conversion was anticipated (such as a commercial nuclear waste treatment facility) and also recommended that a "budget plan" be put in place for restoration costs.

Ohio EPA's Response: Throughout the RFI and CAS/CMS process, Ohio EPA and U.S. EPA have required that the risk assessments evaluate unrestricted future use with the reasonable maximum exposure (RME) being residential use of the property. The one in a million excess cancer rate level (1×10^{-6}) has been identified as a remediation goal. At this time, future commercial and unrestricted future residential use has been evaluated for the PORTS site by Ohio EPA or U.S. EPA. Clean-up goals will be protective of the future use designated for the site. In regards to budget considerations, all of the alternatives are evaluated with respect to cost but it is not considered a primary screening criteria.

4. This commenter ended by requesting that the agencies consider human health more than cost when determining remedies for waste units.

Ohio EPA's Response: Ohio EPA agrees with this request. As discussed above, remedial action decisions place primary emphasis on the protection of human health and the environment. Cost is always considered, but is done so after remediation goals are established for the protection of human health and the environment. The remedial alternative that is protective, complies with ARARs, and is cost-effective is selected. Cost-effectiveness, as stated in the NCP, is determined by evaluating the overall effectiveness of an alternative and then assessing the cost of the alternative to ensure that the cost is proportional to the overall effectiveness.

5. Another commenter expressed that the area of the landfill was greater than stated during the public meeting. An additional concern noted by this commenter was the burn area that was in operation at the landfill area. Also mentioned was the disposal of "85,000 pounds of metal hydraulic sludge from the X-705", and also waste oils and solvents.

Ohio EPA's Response: Ohio EPA stated in the public meeting that the acreage of the landfill was not exactly known and the acreage was estimated by scaling dimensions from maps included in investigation documents from U.S. DOE. It was not intended to be a precise value and was used by Ohio EPA and U.S. EPA to provide a description of the landfill. During the investigation work at the Peter Kiewit landfill, monitoring wells and soil borings were taken around the perimeter of the known disposal area. This investigation work served to identify the approximate area where wastes were placed. Because the approximate dimensions of the landfill are known, the chosen remedy for the landfill will not be affected if a precise acreage for the landfill is not available. It is common when addressing old landfills to encounter incomplete information because accurate records were not usually kept. However, cleanup actions will be designed to address all known and suspect areas of waste disposal. Environmental monitoring of groundwater and surface water will be conducted on a routine basis to evaluate the selected remedy's effectiveness.

Ohio EPA believes that the commenter was referring to the X-749 landfill and not the Peter Kiewit landfill when commenting about the sludge from the X-705 building. The

X-749 landfill did receive 85,000 pounds of hydroxide sludge between August, 1984 and June, 1985 (QI RFI, 1994). A cap was placed on this landfill and a leachate collection system was installed in 1991.

Existing plant engineering drawings indicate that a burn pit was operated at the landfill by the construction contractor to dispose of construction waste. There are not records that characterize the material that was burned, nor are there records of the quantities or characterization of wastes disposed in the Peter Kiewit landfill during it's operation.

3.0 COMMENTS FROM THE U.S. DOE

The U.S. DOE identified the following concerns in the Preferred Plan and presented these concerns in written correspondence to Ohio EPA and U.S. EPA during the public comment period.

1. Page 8, Line 14 of the Preferred Plan:

U.S. DOE Comment: "Geologic data do not indicate that the Sunbury Shale is absent beneath the landfill..."

Ohio EPA's Response: During development of the preferred plan document for public review, Ohio EPA and U.S. EPA referenced past documents such as the RFI and the CAS/CMS to assemble information for presentation in the plan. In this specific case, Section 6.1.2.1 of the CAS/CMS document was used in part as a reference for geologic information. Section 6.1.2.1 of the CAS/CMS discusses the absence of the Sunbury Shale in the southeast portion of the landfill and also where the Sunbury and Berea have been eroded in the drainage ravine south of the landfill. The inference that the Sunbury Shale was likely absent from the landfill area was drawn from these statements. Ohio EPA agrees that this statement is a generalization and should have been more specific to the areas specifically identified in the RFI and CAS/CMS. However, this statement was merely intended to provide a description of the geology in the vicinity of the Peter Kiewit Landfill and should not be construed as a statement made with the intention of supporting the Agencies preferred remedy for the Peter Kiewit Landfill.

2. Page 9, Line 2:

U.S. DOE Comment: "Construction of the seep collection system is complete and all data indicate that the system is effective in preventing discharge of contaminants to Big Run Creek."

Ohio EPA's Response: Ohio EPA agrees with U.S. DOE's comment. The Agency's evaluation of all of the alternatives assumed that the seep collection was operating and would continue operating as long as necessary.

3. **Page 27, Line 6:**

U.S. DOE Comment: "While it is true that Alternative #3 has the most extensive construction activities associated with it, it is not clear that this alternative is more protective...."

Ohio EPA's Response: During evaluation of the alternatives for the Peter Kiewit Landfill, the Agencies ranked each alternative according to it's performance (identifying the most effective to the least effective alternative) in each of the eight criteria. This was done for all eight criteria, even though some of the differences between alternatives may be small. In the case of "Overall Protection of Human Health and the Environment", under the current use (i.e. short term), the differences between the alternatives may be small. However, the Agencies believe that the differences between alternatives are more pronounced when evaluating an alternative's ability to be protective over the long term.

4. **Page 27, Line 10:**

U.S. DOE Comment: "The landfill is covered, vegetated, and maintained to prevent erosion. There has been little erosion to the cover since 1968, and as part of the IRM, low spots have been filled and revegetated to prevent ponding of surface water."

Ohio EPA's Response: As stated in the previous response, the objective of evaluation was to rank the alternatives according to their effectiveness for each of the eight criteria. The Agencies believe that the placement of an engineered solid waste cap or liner material will provide a greater level of protection than will the current condition at the landfill. While the IRM may have eliminated the current erosion on the east side of the landfill, erosion over time did occur in the sloped area adjacent to Big Run Creek , exposing landfilled wastes. The likelihood of this re-occurring in the same location or elsewhere on the site is greater without an engineered cover over the waste.

5. **Page 28, Line 30**

U.S. DOE Comment: "As stated in the Preferred Plan, relevant and appropriate requirements are generally not applicable and should be considered based on the specific site situation...."

Ohio EPA's Response: Ohio EPA disagrees with U.S. DOE's interpretation of the discussion of ARAR's in the Preferred Plan. Relevant and appropriate requirements apply to the Peter Kiewit landfill. The discussion here was not intended to point out that "relevant and appropriate" requirements are generally not applicable to a cleanup situation as stated in U.S. DOE's comment, but rather was intended to outline the difference between an applicable law versus a relevant and appropriate application of a law or rule to a cleanup situation (e.g. a landfill such as the Peter Kiewit Landfill that was

closed prior to the enactment of Ohio's closure rules for solid waste landfills). The applicability of the closure rule to currently operated solid waste landfills is not dependent upon the observation of occurrences such as infiltration of water, exposed waste, etc. The intent of capping upon closure is to prevent as much as possible the future occurrence of infiltration, erosion, etc. that eventually could result in migration of wastes and subsequently higher maintenance costs and necessary corrective measures. When the analysis results in a determination that a requirement is both relevant and appropriate, such a requirement must be complied with to the same degree as if it were applicable, unless waived.

6. **Page 29, Line 5**

U.S. DOE Comment: "Capping of the landfill is not considered containment nor active treatment under the National Contingency Plan" .....

Ohio EPA's Response: The statement regarding the preference for active treatment in the NCP was added to emphasize this when comparing Alternative #2 to other alternatives and was intended to be similar to language in the CAS/CMS documents regarding Alternative #2. It was not the intent of the Agencies to imply that other alternatives for the Peter Kiewit Landfill provided greater treatment than Alternative #2.

7. **Page 29, Line 22**

U.S. DOE Comment: "Surveillance, maintenance and scheduled improvements will reduce or eliminate these concerns".

Ohio EPA's Response: Ohio EPA agrees that surveillance, maintenance and scheduled improvements will reduce the concerns regarding exposed wastes and additional seep generation. However, a preference is given to the permanence of an alternative and the minimization of operation and maintenance. The Agencies believe that the preferred remedy will result in reduced maintenance costs in the future compared to the "no further action" alternative, and will meet ARARs.

8. **Page 30, Line 20**

U.S. DOE Comment: "Because interim remedial measures have mitigated potential risk to human health and the environment, it is difficult to justify additional large-scale construction and 12 million dollars in costs to implement Alternative #3."

Ohio EPA's Response: The response to comment #7 above also applies to this comment. The permanence of an alternative is expected to result in reduced future maintenance costs and a reduced probability of future releases of waste to soils and groundwater/surface water.

9. **Page 31, Line 25**

U.S. DOE Comment: "A waiver could be obtained for the relevant and appropriate requirement that is not met. The existing cover prevents direct contact and reduces infiltration. This requirement should not be viewed as a deciding factor".

Ohio EPA's Response: The attainment of ARAR's was not the only criteria used to identify the preferred alternative. Issues of long term effectiveness and permanence also affected the decision to select Alternative #3 as the preferred alternative. However, the placement of a cap over the Peter Kiewit Landfill was determined to be a "relevant and appropriate" requirement based on the analysis required by Section 300.400 (g) (2) of the NCP. The capping requirement is "relevant and appropriate" because, (a): the actions or activities regulated by the requirement and the remedial action contemplated at the CERCLA site are sufficiently similar; and, (b): the requirement is well suited to the site.

Six conditions have been established under which an ARAR may be waived: Interim Measure; Greater Risk to Health and the Environment; Technical Impracticability; Equivalent Standard of Performance; Inconsistent Application of State Requirements; and Fund-Balancing. With regard to the capping of the Peter Kiewit Landfill, only the Equivalent Standard of Performance condition potentially applies.

According to the preamble of the March 8, 1990 NCP, the criteria for evaluating whether an alternative method is equivalent to or better than the method required by the ARAR are degree of protection; level of performance; reliability into the future; and time required for results. Alternatives #1, #2, and #4 do not meet these criteria because of the uncertainty of the long term effectiveness of the current cover, the lack of reduction of seep water volume, the essentially unlimited period of time required to achieve remedial objectives, and the unknown wastes disposed in the landfill.

10. **Page 32, Line 24**

U.S. DOE Comment: Installation and operation of the collection system have eliminated the possibility of contaminants leaving the site. Alternative #3 should be viewed as less, not more permanent than Alternative #1, #2, and #4; because Alternative #3 requires perpetual operation and maintenance. Under Alternatives #1, #2, and #4, however, contaminated leachate will eventually cease being generated, significantly reducing operation and maintenance requirements".

Ohio EPA's Response: The Agencies disagree that Alternative #3 (capping) should be viewed as less permanent than alternatives #1 (no action), #2 (institutional controls) and #4 (vertical barrier), and disagree that these alternatives will have less operation and maintenance compared to alternative #3. The time frame under which leachate will cease being generated is not known, but is expected to be a long period of time because organic

industrial wastes were likely disposed in the Peter Kiewit Landfill and the attenuation of these wastes commonly requires decades or more. The erosion of the landfill cover material over time will require at least as much or more routine maintenance than will an engineered cap.

11. **U.S. DOE Comment**: "The No further Action alternative provides the most efficient and effective solution to mitigating risks to human health and the environment posed by Peter Kiewit Landfill. As stated in the preferred plan "The seep collection system installed west of Big Run Creek is expected to address much of the estimated risk to humans and to Big Run Creek by collecting contaminants released from the landfill". The seep collection system effectively eliminates short-term risk to the environment, therefore, the goal of the remedial alternative implemented through the CAS/CMS should be to reduce the long-term risk to the environment. The No Further Action alternative accomplishes this by reducing the toxicity of material in the landfill over a relatively short period of time (approximately ten years). It is expected that concentration of contaminants in seep water will eventually be reduced below PQLs allowing the collection system to cease operation. Implementation of the No Further Action alternative will require very little additional capital cost and will mitigate the need for perpetual operation and maintenance costs and large-scale construction at this unit".

Ohio EPA's Response: While the seep collection system is expected to effectively capture contaminants from the landfill, an important issue is the long-term effectiveness of the no-action alternative. This alternative is expected to require more maintenance in the future than alternatives that reduce infiltration of water into the waste. Because it is not known what quantities of containerized liquids or other organic waste may be present in the landfill, the agencies are not necessarily in agreement that the reduction of contaminants will be accomplished in approximately ten years as stated in U.S. DOE's comment. Unexpected future releases from the landfill are considered more likely with the no-action alternative than with alternative #3, therefore, Ohio EPA does not agree that the no-action alternative is the most effective alternative.

APPENDIX A

ADMINISTRATIVE RECORD INDEX

AR Doc. No. Catalog No.	Internal Doc. No. Revision	Document Title	Date Pages	Originator From	Recipient To	Location Document Type
1-20-28/00.001 763		Requirement for Interim Remedial Plan U.S. DOE - Portsmouth OH7 890 008 983	10/18/93 2	USEPA Boyle	USDOE Gillespie	PORTS AR Letter
1-20-28/00.002 875		Remedial Action at the Peter Kiewit Landfill	10/25/93 1	OEPA Rochotte	USDOE Gillespie	PORTS AR Letter
1-20-28/05.001 800	0	Interim Measures Plan: Peter Kiewit Landfill	11/18/93 83	USDOE Gillespie	USEPA, OEPA Bianchin, Rochotte, Welch	PORTS AR Plan
1-20-28/81.001 1006		Disapproval of Interim Measures Plan for the Peter Kiewit Landfill U.S. DOE Portsmouth Gaseous Diffusion Plant OH7 890 008 983	1/31/94 14	USEPA Boyle	USDOE Gillespie	PORTS AR Disapproval/Comments
1-20-28/81.002 1039	EO-23-5885	USEPA Required Revisions to Interim Measures Plan - Request for Extension of Time to Submit	3/2/94 1	USDOE Gillespie	USEPA Averill	PORTS AR Letter
1-20-28/81.003 1077		Ohio EPA Comments on the Peter Kiewit Landfill Interim Measures Plan	3/15/94 2	OEPA Rochotte	USDOE Gillespie	PORTS AR Comments
1-20-28/81.004 1055	EO-23-5950	Revisions to Interim Measures Plan - Peter Kiewit Landfill	3/28/94 2	USDOE Gillespie	USDOE Averill	PORTS AR Letter
1-20-28/81.005 1161		Approval of Revision to Interim Measures Plan for Peter Kiewit Landfill Department of Energy OH7 890 983	3/30/94 1	USEPA Averill	USDOE Gillespie	PORTS AR Approval Letter
1-20-28/81.006 1088	EO-23-6007	Revised Interim Measures Plan - Peter Kiewit Landfill	4/14/94 15	USDOE Gillespie	USEPA, OEPA Averill, Rochotte, Welch	PORTS AR Responses
1-20-28/05.002 1089	DOE/OR/11-1262&D2 1	Interim Measures Plan for the Peter Kiewit Landfill at the Portsmouth Gaseous Diffusion Plant	4/15/94 116	MMES Gillespie	USEPA, OEPA Averill, Rochotte, Welch	PORTS AR IMP
1-20-28/00.003 1167	EO-23-6060	Peter Kiewit (PK) Landfill Interim Remedial Measure Project	5/11/94 2	USDOE Gillespie	US Army Corps. Engineers Adamo	PORTS AR Letter
1-20-28/81.007 1169		Ohio EPA Comments on the Peter Kiewit Landfill Interim Remedial Measures Plan	5/13/94 2	OEPA Rochotte	USDOE Gillespie	PORTS AR Comments
1-20-28/81.008 1175		Disapproval of the Interim Measures Plan: Peter Kiewit Landfill for the Portsmouth	6/1/94 3	USEPA Averill	USDOE Gillespie	PORTS AR Disapproval/Comments

AR Doc. No. Catalog No.	Internal Doc. No. Revision	Document Title	Date Pages	Originator From	Recipient To	Location Document Type
		Gaseous Diffusion Plant (PORTS) OH7 890 008 983				
1-20-28/00.004 1177		Description: Peter Kiewit (PK) Landfill Interim Remedial Measure Project Proposal	6/2/94 32	US Dept. of the Army Richmond	USDOE Gillespie	PORTS AR Letter
1-20-28/05.003 1200	DOE/OR/11-1262&D3 2	Interim Measures Plan for the Peter Kiewit Landfill at the Portsmouth Gaseous Diffusion Plant Piketon, Ohio	6/30/94 120	MMES Gillespie	USEPA, OEPA Averill, Rochotte, Welch	PORTS AR IMP
1-20-28/81.009 1201	EO-23-6171	Description: Response to USEPA and OEPA Comments on the Peter Kiewit Landfill Interim Measures Plan	7/1/94 27	MMES Gillespie	USEPA, OEPA Averill, Rochotte, Welch	PORTS AR Responses
1-20-28/81.010 1223		Ohio EPA Approval of the Peter Kiewit Interim Measures Plan	7/25/94 2	OEPA Rochotte	USDOE Gillespie	PORTS AR Approval/Comments
1-20-28/81.011 1232		Approval with Conditions of the Interim Measures Plan: Peter Kiewit Landfill for the Portsmouth Gaseous Diffusion Plant (PORTS) OH7 890 008 983	7/26/94 1	USEPA Averill	USDOE Gillespie	PORTS AR Approval Letter
1-20-05/15.001 1236	DOE/OR/12-1295&D1 0	Peter Kiewit Landfill Draft Cleanup Alternatives Study/Corrective Measures Study Report for the Portsmouth Gaseous Diffusion Plant	7/29/94 283	SAIC Gillespie	USEPA,OEPA Averill, Rochotte, Welch	PORTS AR Report
1-20-28/05.003A 1254	DOE/OR/11-1262&D4 3	Interim Measures Plan for the Peter Kiewit Landfill at the Portsmouth Gaseous Diffusion Plant Piketon, Ohio	8/23/94 28	MMES Gillespie	USEPA, OEPA Averill, Rochotte, Welch	PORTS AR Revised Pages
1-20-28/81.012 1255	EF-21-6268	Description: Response to USEPA and OEPA Comments on the Peter Kiewit Landfill Interim Measures Plan	8/23/94 5	MMES Gillespie	USEPA, OEPA Averill, Rochotte, Welch	PORTS AR Response
1-20-05/15.002 1257		Modeling Results - Draft Addendum to the Peter Kiewit Landfill Draft Cleanup Alternatives Study/Corrective Measures Study Report for the Portsmouth Gaseous Diffusion Plant Piketon, Ohio	8/29/94 22	SAIC Gillespie	USEPA, OEPA Averill, Rochotte, Welch	PORTS AR Addendum

AR Doc. No. Catalog No.	Internal Doc. No. Revision	Document Title	Date Pages	Originator From	Recipient To	Location Document Type
1-20-05/81.001 1377		Description: Ohio EPA Comments on the Peter Kiewit Landfill CAS/CMS Report	10/20/94 3	OEPA Rochotte	USDOE Gillespie	PORTS AR Comments
1-20-28/55.001 1383	EF-21-6385	Notice of Intent Form (NOI) for Stormwater General Permit - Department of Energy (DOE) - Portsmouth Gaseous Diffusion Plant (PORTS) - Peter Kiewit Landfill Interim Remedial Measures (IRM) Project	10/26/94 3	USDOE Gillespie	OEPA General NPDES Permits	PORTS AR NOI
1-20-05/81.002 1387		"Peter Kiewit Landfill Draft Cleanup Alternatives" Technical Review Comments Portsmouth Gaseous Diffusion Plant Piketon, Ohio OH7 890 008 983	11/1/94 6	USEPA Averill	USDOE Gillespie	PORTS AR Comments
1-20-05/81.003 1405	EF-21-6431	Response to OEPA Comments on the Draft Peter Kiewit CAS/CMS Report	11/21/94 4	USDOE Gillespie	USEPA, OEPA Averill, Rochotte	PORTS AR Responses
1-20-28/00.005 1418	EF-21-6446	Completion of Construction at Peter Kiewit Landfill IRM	11/30/94 2	USDOE Gillespie	USEPA, OEPA Averill, Rochotte, Welch	PORTS AR Letter
1-20-05/81.004 1420	EF-21-6456	Responses to USEPA Comments Regarding Peter Kiewit Landfill CMS/CAS Report	12/5/94 11	USDOE Gillespie	USEPA, OEPA Averill, Rochotte	PORTS AR Responses
1-20-05/15.003 1500	DOE/OR/12-1295&D2	Peter Kiewit Landfill Draft Cleanup Alternatives Study/Corrective Measures Study Report for the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio	2/10/95 221	SAIC Gillespie	USEPA, OEPA Averill, Rochotte, Welch	PORTS AR Report
1-20-05/81.005 1531		Ohio EPA Approval of the X-705A/B CAS/CMS and Peter Kiewit Landfill CAS/CMS Reports	3/22/95 1	OEPA Rochotte	USDOE Gillespie	PORTS AR Approval
1-20-15/73.001 1558		Description: Public Notice: Portsmouth DOE Public Hearing on Preferred Plan for Peter Kiewit Landfill	4/11/95 1	OEPA	Public	PORTS AR Public Notice
1-20-15/60.001 1548		The Ohio EPA's and the U.S. EPA's Preferred Plan for the Peter Kiewit Landfill U.S. DOE - PORTS Site	4/13/95 72	OEPA Rochotte	Env. Information Center Childers	PORTS AR Preferred Plan

AR Doc. No. Catalog No.	Internal Doc. No. Revision	Document Title	Date Pages	Originator From	Recipient To	Location Document Type
1-20-15/75.001 1586		Description: Ohio EPA's and U.S. EPA's Meeting Regarding Preferred Plans for DOE PORTS Peter Kiewit Landfill	4/18/95 10	OEPA	Public	PORTS AR Public Meeting
1-20-15/81.001 1566	EF-21-6802	Comments Regarding the USEPA and OEPA Preferred Plan Remediation of Contamination at the Peter Kiewit Landfill	5/10/95 5	USDOE Gillespie	USEPA, OEPA Averill, Rochotte	PORTS AR Comments
1-20-28/72.001 1573	PORTS/ER/CR0018	Peter Kiewit Landfill Interim Remedial Measures	5/18/95 2	SAIC	Public	PORTS AR Fact Sheet
1-20-28/00.006 1617	EF-21-6855	Maintenance Requirements for the Peter Kiewit Landfill Interim Remedial Measure	5/31/95 3	USDOE Gillespie	OEPA Rochotte	PORTS AR Letter
1-20-28/81.013 1720		Ohio EPA Approval of the Maintenance Construction Plan at the Peter Kiewit Landfill	7/13/95 1	OEPA Rochotte	USDOE Gillespie	PORTS AR Approval
1-20-05/81.006 1785		Ohio EPA Approval of the X-705 and Peter Kiewit Landfill Corrective Measures Study Reports	8/8/95 1	OEPA Rochotte	USDOE Gillespie	PORTS AR Approval
1-20-05/81.007 1823		Description: USEPA Approval of Revised Peter Kiewit Landfill CAS/CMS Report	9/14/95 1	USEPA Averill	USDOE Gillespie	PORTS AR Approval

APPENDIX B

STATE OF OHIO DECISION DOCUMENT

Major Differences Between the U.S. EPA Decision Document and the Ohio EPA Decision Document for the Peter Kiewit Landfill at the Portsmouth Gaseous Diffusion Plant Piketon, Ohio

U.S. EPA and Ohio EPA have issued two separate decision documents for selection of the remedy for the Peter Kiewit Landfil at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio. Ohio EPA issued its decision document in May 1996. U.S. EPA delayed issuance of its decision document in order to address issues relating to radioactive waste disposal at Peter Kiewit Landfill. To ensure as much consistency between the two decision documents as possible, U.S. EPA based its decision document on the Ohio EPA decision document with several changes. The major differences between the U.S. EPA and Ohio EPA decision documents that resulted from the changes are listed below. Other editorial changes that were made are not listed.

1. The U.S. EPA decision document is referred to as a Statement of Basis/Record of Decision (SB/ROD) to indicate it complies with both RCRA and CERCLA.

2. The text of the declaration was changed to indicate that the SB/ROD is based on the Administrative Record Index for the response action.

3. A short paragraph describing the Peter Kiewit Landfill was moved from Section 5.0 to Section 1.0.

4. A standard paragraph required by EPA's ROD guidance was added to the end of Section 6.0. The paragraph states that the risks from the site, if not addressed by the response action, pose an imminent and substantial threat to human health and the environment.

5. The state acceptance evaluation criteria was added to Section 8.0 and evaluated in a new Section 8.8. A new section 8.9 was also added for the evaluation of the community acceptance criterion.

6. The text was revised to indicate that U.S. EPA reviewed and approved of the responses written by Ohio EPA in the Responsiveness Summary.

7. The four figures were added into the text of the document instead of being placed in an Appendix at the end of the document.

8. The Administrative Record Index was moved to Appendix A and the most recent version of the Q1 RFI report was added to the index.

9. The Federal ARARs pertaining to preparing and transporting hazardous waste off-site and RCRA land disposal restrictions were removed because the remedy does not involve hazardous waste management. In addition, RCRA Subtitle D landfill capping requirements were added to the list of Federal ARARs.

10. State ARARs that do not pertain to the remedy, such as air pollution limitations for incineration and regulations for hazardous waste management, were deleted from the State ARAR list. This results in a significantly shorter list of State ARARs in the U.S. EPA and U.S. DOE SB/ROD than in the Ohio EPA decision document.

DECISION DOCUMENT
PETER KIEWIT LANDFILL

U.S. DOE PORTSMOUTH

PIKE COUNTY, OHIO

MAY 1996

DECISION DOCUMENT
PETER KIEWIT LANDFILL
U. S. DOE PORTSMOUTH SITE
PIKE COUNTY, OHIO

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DECLARATION FOR THE DECISION DOCUMENT

SITE NAME AND LOCATION

United States Department of Energy, Pike County, Ohio
The Peter Kiewit Landfill Solid Waste Management Unit

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Peter Kiewit Landfill site on the U. S. DOE Reservation in Pike County, Ohio. The U. S. DOE site is being cleaned up under a Consent Decree between U. S. DOE and the State of Ohio and an Administrative Order signed by U. S. DOE and U. S. EPA. Both legal agreements were signed in 1989. This decision has been developed in accordance with the Resource Conservation and Recovery Act (RCRA) of 1976, the Comprehensive Environmental Response Compensation and Liability Act of 1980 as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and with the Hazardous and Solid Waste Amendments (HSWA) of 1984. The documentation for the selection of a remedial action is part of the administrative record located in the Environmental Information Center in Waverly, Ohio. The specific documents include but are not limited to the Quadrant I RCRA Facility Investigation (RFI), the Peter Kiewit Landfill Corrective Measures Study (CMS), and the Peter Kiewit Landfill Preferred Plan. The most current administrative record index is attached to this Decision Document.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the site, if not addressed by implementing the response action selected in this Decision Document, may present a future risk to the environment, and/or human health.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy at the Peter Kiewit Landfill will address the principal threats posed by the site through containment of source materials and treatment of leachate. The major components of the selected remedial action include:

- The continuation of the seep collection system currently operating along the east side of the landfill. This system was installed in November of 1994 and collects leachate migrating from the landfill towards Big Run Creek. The leachate is then treated at the X-622 treatment plant located on the south central part of the DOE reservation (within QI).

- The placement of an engineered cap which meets RCRA Subtitle D requirements. This consists of a recompacted clay cap or equivalent. The cap material will be

covered with a drainage layer and a vegetative layer at least 30 inches in depth to prevent frost damage to the cap material.

- Institutional controls necessary to ensure the integrity of the remedial action. Site deed restrictions and fencing will be used to restrict access as necessary to prevent the disturbance of the capped area.

- The installation of a subsurface vertical barrier if necessary to prevent the flow of groundwater into landfilled waste.

- Ground water and surface water/sediments monitoring program to confirm that the containment and treatment of source materials is sufficiently protective of human health and the environment

STATUTORY DETERMINATIONS AND REMEDY SELECTION STANDARDS

CERCLA statutory requirements: The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. However, because treatment of the principal threats of the Peter Kiewit Landfill was not found to be practicable, this remedy does not satisfy the statutory preference for treatment as a principle element of the remedy. The wastes that comprise the principal threat from the landfill will be contained on-site in accordance with all Applicable or Relevant and Appropriate Requirements (ARAR's).

Because this remedy will result in hazardous substances remaining on-site above health-based levels, a review will be conducted within five (5) years after construction of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

RCRA standards for remedy selection: The selected remedy meets RCRA standards as follows: The selected remedy is protective of human health and the environment, controls the source of releases that may pose a threat to human health and the environment, and complies with applicable standards for management of wastes. This remedy will provide long-term effectiveness, will reduce the mobility of contaminants, and is implementable.

5/02/90
Date

Jan Carlson
Chief, Division of Emergency
and Remedial Response

DECISION SUMMARY
PETER KIEWIT LANDFILL

1.0 SITE LOCATION AND DESCRIPTION

The PORTS facility is located near Piketon, Ohio, in the south central portion of the state (see Figure 1, *USDOE-PORTS Site Location*). The plant-site encompasses approximately 1000 acres of the 4000 acre U.S. DOE reservation. The principal process at the PORTS facility is the separation of uranium isotopes via gaseous diffusion. The PORTS facility has been operating since 1954 enriching uranium for use in commercial nuclear reactors and for use by the U.S. Navy in power reactors in the nuclear navy. Support operations include the feed and withdrawal of material from the primary process, water treatment for sanitary and cooling purposes, decontamination of equipment removed from the plant for maintenance or replacement, recovery of uranium from various waste materials and treatment of sewage wastes and cooling water blow down. The construction, operation and maintenance of this facility requires the use of a wide range of commercially available chemicals. Continuous operation of this facility since 1954 has resulted in the generation of inorganic, organic and low level radioactive waste materials.

2.0 HISTORY OF ENFORCEMENT ACTIVITIES

As a result of chemicals used to support the uranium enrichment process, and the presence of uranium and technetium, waste management units at the site have contaminated soils and groundwater. In 1986, the State of Ohio filed suit against U. S. DOE resulting in a Consent Decree (CD) between the State of Ohio and U. S. DOE which became effective in August of 1989. The CD outlines the requirements for handling hazardous waste generated at the site and for the investigation and clean-up of the site. U. S. EPA and U. S. DOE signed a similar agreement in September of 1989. This agreement is an administrative order negotiated between Region V of U. S. EPA and U. S. DOE. Both the Administrative Order on Consent (AOC) and the CD require that the investigation of the site proceed according to quadrant boundaries established in the agreements. A schedule is attached to each agreement that outlines when documents pertaining to the investigation or corrective measures studies are to be submitted to Ohio EPA and U. S. EPA (hereafter referred to as the "Agencies"). A separate schedule shall be submitted to the Agencies for cleanup of the individual waste management units.

3.0 COMMUNITY RELATIONS ACTIVITIES

A public meeting was held at the Vern Riffe Vocational School on April 18, 1995 to discuss the preferred plan for the Peter Kiewit Landfill. An information repository is located at U. S. DOE's Environmental Information Center located at 505 West Emmit Avenue in Waverly, Ohio. The

public can also review these documents at Ohio EPA's Southeast District Office or at U. S. EPA's Region V office located in Chicago.

Details of the investigation at the Peter Kiewit Landfill can be found in the draft RCRA Facility Investigation (RFI) report located at the Information Center. The draft final Cleanup Alternatives Study/Corrective Measures Study (CAS/CMS) report and the preferred plan were discussed and presented at the April 18, 1995 public meeting. The public comment period on the proposed remedy extended from April 11, 1995 to May 17, 1995.

An announcement regarding the public comment period and the availability of the documents related to the clean-up at the site was published in the Waverly Watchman and in the Portsmouth Times newspapers. No written or verbal requests were received to extend the public comment period.

The public meeting, held on April 18, 1995 at the Vern Riffe Vocational School, was attended by approximately 25 members of the public. Representatives from U. S. EPA, and Ohio EPA answered questions regarding the preferred plan, summarized the findings of the RFI, and accepted statements from members of the public. Comments, including formal statements from four community members, were recorded by a court reporter. A transcript of the meeting is included in the Administrative Record. A total of two written submittals were received from the public during the public comment period.

Ohio EPA's responses to comments received during the public comment period are contained in the Responsiveness Summary, which is part of this document. The public participation process was designed to be consistent with the Comprehensive Environmental Compensation and Liability Act (CERCLA) and therefore satisfies Sections 113(k)(2)(B)(i-v) and 117 of this law. The decision for the remedial alternative is based on the administrative record. The administrative record index for the response action is attached to this document in Appendix B.

4.0 SCOPE AND ROLE OF THE RESPONSE ACTION

For purposes of the RFI the PORTS facility has been separated into four quadrants. Each quadrant roughly corresponds to a distinct groundwater flow cell within the primary water-bearing unit beneath the site and has been investigated separately. Peter Kiewit Landfill is located in Quadrant I (QI), and is one of twenty-one Solid Waste Management Units (SWMUs) in QI currently undergoing investigation or remediation.

The response action at the Peter Kiewit Landfill is intended to be a long-term action designed to address contamination and potential contamination caused by waste disposed at the site. The remedial action will address the principal threats at the facility: contaminated soils, leachate, and landfilled solid waste through treatment of the leachate and containment of wastes in order to

meet all Applicable or Relevant and Appropriate Requirements (ARARs). Wastes disposed of in the landfill have been identified as the primary risk to groundwater, surface water, and sediments. Consequently, actions to treat and/or contain contaminated soils and wastes will, in addition to minimizing concerns associated with direct contact, minimize the potential for contaminants to infiltrate to the groundwater or leach to surface water. When the selected remedy is completed, no further remedial action at the site other than groundwater and surface water monitoring and operation and maintenance (O&M) activities are envisioned. The monitoring will be conducted to assure that all leachate sources are directed toward treatment and to detect any future migration of chemicals to surface water or groundwater. Since hazardous substances will remain above health-based levels in the capped area of the site, five-year reviews of the remedial action will be necessary.

5.0 SUMMARY OF RCRA FACILITY INVESTIGATION

The QI RFI was conducted during 1991 and the initial RFI report submitted to Ohio EPA and U.S. EPA on February 19, 1992. Phase II of the investigation was conducted between October 1993 to January 1994. The Phase II RFI report was submitted to the Ohio EPA and U.S. EPA on June 20, 1994.

The Peter Kiewit Landfill is located in the central portion of QI, just west of Big Run Creek (BRC) and approximately 200 feet east of the XT-847 GCEP construction warehouse (see Figure 2, *USDOE-PORTS Site Map*). The Peter Kiewit Landfill was used from approximately 1953 until 1968. During plant construction, the landfill was used as a salvage yard, burn pit and trash disposal area. After plant construction, the landfill was used as a sanitary landfill. It is probable that solid wastes now known to be potentially hazardous were landfilled at this site.

Because a permit was not required at the time of landfill operation, the exact boundaries of the filled area and the exact nature of all of the wastes disposed at the Peter Kiewit Landfill are not known (see Figure 3, *Approximate Landfill Boundaries*, for approximate landfill boundaries based on the current topography of the Peter Kiewit area). An estimate of the western boundary location cannot be made due to the presence of the XT-847 building. Borings and monitoring wells west of XT-847 such as the PK-08G and PK-09G wells did not encounter waste during installation. However, it is possible that the southern half of the XT-847 warehouse was built over a portion of the Peter Kiewit Landfill. Together, the Peter Kiewit Landfill and the XT-847 building cover approximately 23.5 acres.

During the QI RFI (DOE 1994), several intermittent seeps located near the base of the landfilled material were discovered along the eastern edge of the landfill. Sampling during and after the RFI field work has indicated the presence of contaminants in the seep discharge and associated seep sediments.

5.1 Nature and Extent of Contamination

As done with all four quadrants, the investigation of Quadrant I which includes the Peter Kiewit Landfill consisted of Phase I and Phase II investigations. The Phase I investigation consisted of the installation of 11 monitoring wells, 2 sediment samples near Big Run Creek and 2 samples of leachate from the Peter Kiewit Landfill. The leachate samples were analyzed for over 200 volatile organic chemicals (VOCs) and also radiological analyses including uranium and Technetium-99, both previously detected radioactive materials at PORTS. The two sediment samples were analyzed for over 30 VOCs, over 20 metals, radiological analyses and also for freon and fluoride, both used on the plant site. The 11 monitoring wells were installed around the Peter Kiewit Landfill with 9 being drilled in the Gallia sand and gravel layer and 2 in the underlying Berea sandstone. A random soil sample was taken from each well and ground water was sampled from each well for VOCs and radiologicals.

During the Phase II investigation, eight hand auger soil samples were collected along the east side of the Peter Kiewit Landfill to provide better definition in this area. The results of the Phase I and Phase II investigations revealed that VOCs and Aroclor-1260 (PCB) were detected in surface water from the seeps located on the east side of the landfill. Gross alpha and gross beta radioactivity above preliminary background levels were also detected in these seep samples. The sediment samples taken in the area of the seeps showed levels of semi-volatile organic chemicals (SVOCs) and VOCs.

VOCs were detected in ground water at 4 wells. One well, PK-03B, showed 70 parts per billion of trichloroethylene (TCE) in one sample but the duplicate was non-detect. This well will be resampled to resolve this discrepancy. Due to the location of the well and the direction of groundwater flow, the volatile organics detected are likely associated with the X-749/X-120 landfill ground water plume located southwest of Peter Kiewit. Migration of volatile organics from the X-749 area in an easterly direction toward Big Run Creek has been documented from past groundwater sampling.

Soil samples collected along the east side of the landfill revealed low levels of VOCs, SVOCs and elevated levels of PCBs (Aroclor-1260) in three samples. Sediment samples collected in the seep drainage disclosed numerous semi-volatile compounds, and low levels of radiologicals. All investigation samples are detailed in the revised Draft RFI. An interim action was completed in late 1994 to re-route the creek away from the landfill and collect and treat leachate from seeps located along the eastern side of the landfill.

6.0 SUMMARY OF RISK ASSESSMENT

The assessment of potential or current risks from wastes present at a SWMU such as the Peter Kiewit Landfill is based on guidance provided by the U. S. EPA, in particular the "Risk Assessment Guidance for Superfund" (RAGS), (U.S. EPA, 1989a) and Guidelines for Exposure Assessment (U.S. EPA, 1992a). These guidance documents are founded on well established chemical risk assessment principles developed for the regulation of environmental contaminants. The risk assessment for contaminated sites on the DOE-PORTS site consists of a human health risk assessment and an ecological risk assessment. The human health risk assessment is conducted assuming that no institutional controls such as fencing are in place and that residential use is possible. A future residential scenario at a SWMU is considered the reasonable maximum exposure (RME) for risk assessment purposes. The initial risk assessment conducted for the site assumes that no future cleanup action is taken and is referred to as the baseline risk assessment (BRA). The baseline risk assessment consists of the following steps:

6.1 Identification of Chemicals of Concern

After data collected during the RCRA facility investigation (RFI) is evaluated, those chemicals that were detected during lab analysis were retained as Chemicals of Concern (COC). Some data not appropriate for certain exposure pathways was excluded. For example, deep soil data greater than 10 feet would not be expected to be available for possible ingestion by children or adults and is only a threat to ground water contamination. Therefore, this data was not included in the assessment of soil ingestion risks.

6.2 Exposure Assessment

This step involves the evaluation of potential human exposures to site chemicals. There are basically four separate tasks necessary in the exposure assessment. These steps are: (a) characterization of the exposure setting; (b) identification of exposure pathways; (c) estimation of environmental concentrations; and (d) estimation of human intake.

6.2.1 Characterization of the Exposure Setting

This step involves modeling or simulating those exposure scenarios considered possible on the site both for current use and future use. The following scenarios were included in the baseline risk assessment:

6.2.1.1 Current Use Scenarios

- on-site worker
- off-site worker
- off-site recreational population

The on-site worker scenario describes potential exposures to outdoor media at PORTS for a worker engaged in normal day-to-day activities throughout the quadrant. Because contaminated areas on the site did not extend to off-site locations, an assessment of current-use, off-site residential scenarios was not conducted. Current-use off-site residential risk estimates for air inhalation pathways will be assessed upon completion of the Air RFI work. The recreational population scenario was developed to assess potential exposures to surface water bodies on the PORTS reservation and to fish and game eaten by local recreational anglers and hunters. In estimating exposure for both current off-site resident and recreational populations, any significant direct access to media <u>within</u> the quadrant being evaluated was considered unlikely. Exposures were assumed to result from contaminants that could potentially migrate off-site.

Future use scenarios were developed consistent with the reasonable maximum exposure assumption of unrestricted access to the site. Specifically, on-site residential development and an on-site recreational population were assumed as potential exposure scenarios. For the future use conditions, the following scenarios were developed:

6.2.1.2 Future Use Scenarios

- **On-site resident**
- **On-site recreational population**
- **On-site worker**
- **Off-site resident**
- **Off-site recreational population.**

In addition to the on-site worker who is involved in normal day-to-day activities, another exposure scenario modeled under both current and future land use conditions is the excavation worker. This worker is assumed to be in contact with contaminated media during periodic, intrusive activities such as construction or landscaping.

6.2.2 Identification of Human Exposure Pathways

The above exposure scenarios were developed to model or simulate possible exposure situations found at the site. It is also necessary to determine the most likely exposure pathways as well. An

example of an exposure pathway is the ingestion of contaminated groundwater under both current and future site use. The following exposure pathways were evaluated:

- **Exposure to groundwater via ingestion of drinking water, and dermal contact and inhalation of volatiles while showering;**
- **Exposure to soil via incidental ingestion and dermal contact, and via external gamma radiation from radionuclides present in soil;**
- **Exposure to sediment via incidental ingestion and dermal contact;**
- **Exposure to surface water via incidental ingestion and dermal contact;**
- **Exposure to air via inhalation of vapors and particulates;**
- **Exposure to vegetables grown and to beef and milk from cattle pastured on contaminated land;**
- **Exposure via ingestion of local game contaminated by grazing on land affected by plant operations;**
- **Exposure via ingestion of fish.**

6.2.3 Estimation of Environmental Concentrations

In this step, concentrations of chemicals and radionuclides in various environmental media from which exposure may occur are estimated via sampling results and mathematical modeling.

6.2.4 Estimation of Human Intake

This step involves calculating the amount of a substance received by an individual through exposure to chemicals and radionuclides in the various environmental media. Chemical intakes (referred to as chronic daily intakes or CDIs) are typically expressed in terms of the amount of material in contact with the body for a certain time period, and are calculated as a function of chemical concentration in the soil or water, how often the exposure occurs and how long (exposure frequency), body weight, and the portion of a lifetime that exposure occurs.

The generic equation for calculating the CDI is as follows:

$$\mathbf{CDI} = \frac{\mathbf{C \times CR \times EF \times ED}}{\mathbf{BW \times AT}}$$

where:

CDI	=	Chronic daily intake, mg/kg/day
C	=	Chemical concentration in soil or water, e.g. mg/kg soil
CR	=	Contact rate, e.g., kg/soil/day
EF	=	Exposure frequency, days/year
BW	=	Body weight, kg
AT	=	Averaging time; portion of life time over which exposure is averaged (days).

Variations of this equation are used when calculating air inhalation and radiological exposures.

6.3 Toxicological Assessment

The toxicological assessment involves the identification of adverse health effects associated with exposure to a chemical or radionuclide and the relationship between the extent of exposure and the likelihood and/or severity of adverse effects. The U.S. EPA has conducted such assessments on many frequently occurring environmental chemicals and radionuclides and has developed toxicity values based on these assessments for use in risk assessments. Further information regarding the toxicological assessment can be found in the draft RFI Reports.

6.4 Risk Characterization

This step involves calculating estimates of carcinogenic (cancer causing) and non-carcinogenic risks from chemicals of concern for different exposure pathways. Cancer risk is defined as the probability of an individual developing cancer over a lifetime as a result of exposure to a potential carcinogen <u>in addition</u> to the probability of cancer risks from all other causes. As a benchmark in developing clean-up goals at contaminated sites, an acceptable range of excess lifetime cancer risk (ELCR) from one in one million (1×10^{-6}) to one in ten thousand (1×10^{-4}) has been established. The point of departure or program goal for risk remaining after a site is cleaned up is 1×10^{-6} (i.e. a one in one million excess lifetime cancer risk, above and beyond risks from other unrelated causes) and is the risk goal for the U. S. DOE-PORTS site.

The "Hazard Quotient" (HQ) is used to determine the severity of <u>non-cancerous</u> hazards posed at a site. The HQ is determined by dividing the Chronic daily intake (CDI) by the Reference dose (RfD). The reference dose is the amount of material that is determined to cause a toxic effect. If

the HQ is less than or equal to 1, then the estimated exposure to a substance represented by the CDI, is judged to be below the threshold that could result in a toxic effect. An HQ greater than 1, indicates that a toxic effect may result. To assess the cumulative effect of similar noncancerous substances, the HQ for all of the substances being assessed at a site are added, with the result being the hazard index (HI).

6.5 Conclusions

The risks estimated for substances evaluated at a solid waste management unit (SWMU) and in the quadrant, are compared to target risk levels and general conclusions regarding the potential risks associated with these substances are discussed in the baseline risk assessment.

6.6 Peter Kiewit (SWMU Specific) Risk Assessment

The SWMU specific risk assessment for the Peter Kiewit Landfill was completed using the above described principles. By using the SWMU specific data gathered during the RFI, it is possible to estimate risks associated with the landfill. The risk estimates for the scenarios assessed at the Peter Kiewit Landfill are summarized below in Table 1 and are the estimated risks <u>assuming no clean-up action is taken at the site</u>. Other risk estimates presented in the CAS/CMS report are for risks to construction workers during implementation of the clean-up alternative and for risk estimates after clean-up is complete. Table 1 shows that conservative estimates of future residential use of the area around (i.e. next to) the landfill and worker scenarios show unacceptable risk (i.e. HI > 1 and a cancer risk greater than 10^{-4}) if no clean-up actions are taken. The future on-site residential scenario is considered to represent the reasonable maximum exposure (RME) risk estimate for the Peter Kiewit landfill area.

278 **TABLE 1**[1]

Summary of Risks Associated with the Peter Kiewit Landfill		
Exposure Scenario	**Noncancer Hazard Index (HI)**	**Cancer Risk (Excess Lifetime Cancer Risk-ELCR)**
Current Use: On-site Worker	**Total HI = $7x10^{-2}$**	**Total excess cancer risk = $1x10^{-5}$.**
Future Use: On-site Resident (next to the landfill)	**Total HI = 50**	**Total excess cancer risk > 10^{-2}**
On-site Recreational Population: Seep and sediment assessment[2]	**Total HI = $9x10^{-1}$**	**Total excess cancer risk = $2x10^{-4}$**
Future Use: On-site Worker	**Total HI = 20**	**Total excess cancer risk = $2x10^{-3}$**
Excavation Worker	**Total HI = 30**	**Total excess cancer risk = $1x10^{-4}$**
On-site Worker: Seep and sediment assessment[2]	**Total HI = $7x10^{-1}$**	**Total excess cancer risk = $1x10^{-4}$**

[1] From the Quadrant I Baseline Risk Assessment, RFI Report, U.S. DOE, 1994

[2] Seep and Sediment Assessment: Risks associated with exposure to seep and sediment only. This scenario assumes the seep collection system is not in operation.

6.7 Ecological Risk Assessment

The purpose of the ecological risk assessment was to estimate the potential and future risks of Peter Kiewit Landfill contaminants to ecological receptors. The primary source of potential ecological risks was determined to be the seeps located along the eastern side of the landfill. In 1994, an interim action was completed to re-route Big Run Creek away from the landfill and collect and treat leachate from the seeps. Following the completion of the interim action, potential ecological exposure to landfill wastes has been minimized. The selected remedy will appropriately address landfill wastes which have potential to cause future ecological harm.

7.0 DESCRIPTION OF ALTERNATIVES

The CAS/CMS was conducted to identify and screen technologies and cleanup alternatives for addressing the Peter Kiewit Landfill. The seep collection system installed on the east side of Big Run Creek is expected to collect contaminants released from the landfill. Under a true no action scenario, continued treatment of seeps would not occur, posing continued unacceptable risk, as demonstrated in the baseline risk assessment. The "No Further Action" scenario presented below assumes that the seep collection system will remain in operation.

Four alternatives were evaluated in detail in the CAS/CMS Report. The alternatives were compared based on the overall effectiveness in addressing the current and future site conditions. These alternatives were as follows:

- **No Further Action (seep collection system would remain in operation)**
- **Limited Action - Fencing/Signs, Deed Restrictions and Environmental Monitoring**
- **Capping, Vertical Subsurface Barriers, Deed Restrictions and Environmental Monitoring**
- **Vertical Subsurface Barriers, Deed Restrictions and Environmental Monitoring**

These alternatives are summarized below:

7.1 Alternative #1: No Further Action

Under this alternative, the seep collection system (and treatment) would remain in operation but PORTS enrichment plant processes are assumed to be shut down and no additional actions would be taken at the landfill. The No Further Action alternative assumes unrestricted access to the landfill area and no restrictions on land use. There would be no additional active measures taken to reduce the concentration levels or mobility of the contaminants in the seeps.

Cost Analysis-Alt. #1: No Further Action Alternative

There are no costs associated with this alternative in addition to the seep collection system and its operation. The total present worth cost of the seep collection system is $2,995,000.

7.2 Alternative #2: Limited Action - Fencing/Signs, Deed Restrictions and Environmental Monitoring

This Limited Action alternative includes installing a security fence around the perimeter of the Peter Kiewit Landfill. Signs prohibiting entry would be prominently placed upon the fence. Deed restrictions would be applied to this area to restrict digging, drilling, building, or any other activity that can disturb soils, and to prevent installation of drinking water wells in the contaminated area. Environmental monitoring of the ground water and surface water near the area would occur semi-annually. An annual report would be prepared summarizing all field activities and analytical data. Evaluation of the environmental monitoring program would be conducted every five years to determine the need for remediation and/or continued monitoring. In addition, the interim action would be continued for seep collection and treatment.

Since the Limited Action Alternative primarily uses institutional controls such as fencing and no active source treatment, it does not comply with the National Contingency Plan (NCP) requirements (40 CFR 300.430) which state that institutional controls shall not substitute for active response measures as the sole remedy unless active response measures are determined not to be practicable. Alternative #2 is retained only to provide a remedial option that may be selected if other alternatives involving active source treatment prove impracticable.

Cost Analysis-Alternative #2: Fencing/Signs, Deed Restrictions, Environmental Monitoring

The total present worth cost for this alternative is $6,052,000.

7.3 Alternative #3: Capping, Continuation of Seep Collection System, Deed Restrictions, Environmental Monitoring, and Vertical Subsurface Barriers (contingency)

This alternative would be designed to include the relevant components of U.S. EPA's presumptive remedy guidance for landfills, which specifies containment technologies to isolate the contaminated seeps and wastes present in the landfill, and reduce the water source of the seeps. Infiltration would be reduced by the construction of a cap over the landfill which would extend over the previous course of Big Run Creek (the stream channel prior to installation of the seep collection system).

If necessary to prevent the flow of groundwater into the landfilled wastes, vertical subsurface barriers would be installed on the northern and western edges of the landfill (see discussion of subsurface barriers below). The primary source of seep water is believed to be from infiltration of rain water from the landfill surface and not from ground water flowing into the waste. Therefore, the installation of the vertical subsurface barriers is included in this alternative as a contingency. Determination of the need for the vertical subsurface barriers would be made during the first five year review of the remedial action, using criteria developed during the remedial design.

Seep collection and treatment would be accomplished using the seep collection system (SCS). Two options each for capping and vertical subsurface barriers were considered under this alternative and are described below. Deed restrictions would be enacted to prevent any activities that could damage the integrity of the cap.

7.3.1 Capping Options

7.3.1.1 Hazardous Waste Disposal Facilities Final Cover (RCRA Subtitle C Multimedia Cap).

This option involves constructing a multimedia cap over the landfill per RCRA Subtitle C requirements (U.S. EPA 1991). The multimedia cap would consist of a low permeability geomembrane/soil layer, a drainage layer, and a top vegetative/soil layer. In addition, the design would consist of vents for landfill gas collection and perimeter drains for capturing drainage through the drainage layer.

It is possible that the landfill material may be unstable and pose cap implementation problems, such as settling due to the use of heavy machinery causing differential settlement of the cap. If the landfill material is determined to be unstable for cap installation, measures for providing a solid foundation for the cap or other actions for stabilizing the landfill may be required. The existing landfill material can be compacted by heavy equipment traffic or by dynamic compaction. A foundation consisting of a 3-foot layer of stone overlain by a 3-foot layer of below-cap fill is another possible option for providing stability. The decision of the cap stability requirement and the measures to be taken for stabilizing the cap would be determined in the detailed design phase.

The cap would be sloped to force the runoff of any precipitation away from the landfill area. Monitoring would include regular visual inspections to ensure the integrity of the cap and leachate collection system. Noted defects in the cap will be repaired as needed.

Cost Analysis-Alternative #3: Hazardous Waste Cap Option

The total capital cost for this alternative is $17,267,000. Operation and Maintenance costs are estimated to be, Year 1: $294,000; Years 2-30: $9,925,000; The total present worth cost in 1994 dollars is $21,503,000.

7.3.1.2 Municipal Solid Waste Landfills Final Cover (RCRA Subtitle D Multimedia Cap)

This option involves constructing a multimedia cap over the landfill per RCRA Subtitle D requirements for the final closure of a municipal/sanitary landfill facility (U.S. EPA 1991). This option would also address the applicable, relevant, and appropriate requirements for closure of a solid waste facility per Ohio regulations. The multimedia cap would consist of a compacted soil barrier layer, a granular drainage layer, and a top vegetative layer. The slope of the cover may vary from 5 percent to 25 percent or any other slope justified by adequate slope-stability analysis.

The discussion on cap stability requirement is the same as that described for the Subtitle C cap. The cap would be sloped to force the runoff of any precipitation away from the landfill area. Monitoring would include regular visual inspections to ensure the integrity of the cap and leachate collection system. Noted defects in the cap will be repaired as needed.

Cost Analysis-Alt. #3: Solid Waste Cap Option

The solid waste cap costs are identical to the above costs with the exception of no added costs for the synthetic liner material. Therefore, this alternative's net worth is approximately $20,877,000.

7.3.2 Vertical Subsurface Barrier Options

7.3.2.1 Slurry Walls

Conventional slurry wall technology involves excavation of trenches followed by backfilling with soil bentonite slurry. However, recently developed techniques, which use simultaneous soil mixing and injection of soil-bentonite slurry, can be used for construction of slurry walls. The principal advantage of these techniques is the minimization of the volume of soil to be excavated. In this alternative, slurry walls would be constructed on the northern and western edges of the landfill. This technique utilizes a drill rig with multi-shaft augers and mixing paddles to drill into the soil. During the drilling operation a fluid slurry is injected and mixed with the soil to form a low permeability column. These columns are then overlapped to form a continuous barrier to ground water flow.

The slurry wall would extend from the ground surface into the impervious Sunbury shale layer, located at a depth of approximately 30 ft. in the landfill area. The slurry wall would divert ground water around the landfill and is intended to prevent horizontal ground water flow into the waste. Soils removed during construction of the slurry wall would be tested and disposed according to these test results.

7.3.2.2 Sheet Piling

This option involves driving steel sheets into the ground to form an interconnecting, thin, low-permeability barrier to ground water movement into the landfill area. The joints of steel sheet piles would be sealed by a bituminous sealant to further reduce permeability. The sheet piles would extend from the ground surface into the impervious Sunbury shale layer, located at a depth of approximately 30 ft. in the landfill area.

Cost Analysis-Vertical Subsurface Barrier Options

Costs associated with the Vertical Subsurface Barriers were included in the cost analyses for Alternative #3. The cost difference between the two subsurface barrier options is not expected to substantially affect the total cost of Alternative #3.

7.4 Alternative #4: Vertical Subsurface Barriers, Continuation of Seep Collection System, Deed Restrictions, and Environmental Monitoring

This alternative would continue to allow precipitation to infiltrate into the landfill to allow for natural biodegradation of organic contaminants in the landfill. Some organic compounds such as PCB's do not readily biodegrade. Biodegradation could be enhanced by spraying inorganic nutrients over the landfill surface. Leachate from the landfill is collected and either recirculated for re-infiltration into the landfill or treated prior to discharge. This alternative is similar to Alternative #3 except that landfill capping is not included. Vertical subsurface barriers would be placed upgradient of the landfill to minimize ground water movement into the landfill and minimize contamination of ground water moving into and away from the landfill. The options for vertical subsurface barriers are described in Alternative #3. The seep collection system would be continued for seep collection and treatment. Deed restrictions would be placed on the landfill area to prevent access to the landfill and to prevent any activities that may damage the integrity of the cap.

Cost Analysis-Alt. #4: Vertical Subsurface Barrier

The total capital cost for this alternative is $4,909,000. O&M costs are estimated to be, Year 1: $283,000; Years 2-30: $9,876,000; The total present worth cost is $10,420,000.

8.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting the remedial alternative, Ohio EPA and U.S. EPA considered the following eight criteria.

1. **Overall protection of human health and the environment** addresses whether or not a remedy provides adequate protection, and describes how risks are eliminated, reduced or controlled through treatment, engineering controls, and/or institutional controls.

2. **Compliance with all State, Federal and local laws and regulations** addresses whether or not a remedy will meet all of the relevant, appropriate and applicable State, Federal, and Local environmental statutes.

3. **Long-term effectiveness and permanence** refers to the ability of a remedy to maintain reliable protection of human health and the environment over time once clean-up goals have been met.

4. **Reduction of toxicity, mobility, or volume** is the anticipated performance of the treatment technologies to yield a permanent solution. This includes the ability of the selected alternative to reduce the toxic characteristics of the chemicals of concern or remove the quantities of those chemicals to an acceptable risk concentration or regulatory limit and/or decrease the ability of the contaminants to migrate through the environment.

5. **Short-term effectiveness** involves the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until clean-up goals are achieved.

6. **Implementability** is the technical and administrative feasibility of a remedy, including the availability of goods and services needed to implement the chosen solution.

7. **Cost** includes capital and operation and maintenance costs.

8. **Community acceptance** was assessed in the Responsiveness Summary of this document. Public comments were received on the RFI report, the CAS/CMS, and the Preferred Plan.

The eight criteria are categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria. The first two criteria, overall protection of human health and the environment and compliance with ARARs, are the threshold criteria that must be satisfied in order for an alternative to be eligible for selection as the preferred remedial alternative. Criteria three through seven are the primary balancing criteria that are used to weigh major trade-offs among alternatives. Community acceptance is the modifying criterion that is taken into account after public comment is received on the Preferred Plan. Ohio EPA and U. S. EPA evaluated each alternative using the above eight criteria. The following discussion summarizes the compliance of the alternatives with these criteria.

8.1 Overall Protection of Human Health and the Environment

Alternatives #1 and #2 do not provide overall protection of human health and the environment due to the long-term risks associated with potential formation of additional seeps along the southern edge of the landfill, and possible exposure to uncovered waste due to eventual erosion of the current cover material. Alternatives #3 and #4 were determined to provide overall protectiveness.

Alternative #3 (cap, seep collection, vertical upgradient barrier) is expected to be the most protective of both human health and the environment because the most effective activities will be conducted to alleviate infiltration of surface water into the waste, seep water volume, and, if necessary, migration of groundwater as compared to the other alternatives. In addition to this, the cap is expected to provide more protection against possible exposure to uncovered waste due to eventual erosion of the current cover material than will Alternative #4 (no cap, seep collection, vertical barrier) or Alternative #2 (Seep Collection, Fencing/Signs, Deed Restrictions). Alternative #1 was considered the least protective because a greater probability of additional seeps and eventual erosion of the current soil cover is anticipated as compared to the other alternatives. The potential for erosion of the current soil cover is equal for Alternatives #1, #2, and #4, however, Alternative #4 poses a lesser risk for additional leachate from seeps over Alternative #1 because some reduction in groundwater flow into the landfill is expected with a vertical barrier.

8.2 Compliance with all State, Federal and Local Laws and Regulations

Selected remedial actions on the U. S. DOE site must comply with applicable Federal, State, and Local laws and regulations. Examples of applicable laws and regulations include, but are not limited to, the Clean Air Act, Toxic Substances Control Act, the Safe Drinking Water Act, the Clean Water Act, the Resource Conservation and Recovery Act, Ohio Revised Code (ORC) 6111, ORC 3734, and Ohio Administrative Code 3745. CERCLA Section 121 requires that remedial actions meet legally applicable or relevant and appropriate requirements of other environmental laws. "Applicable requirements" means those cleanup standards of control, and

other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a site.

"Relevant and appropriate" requirements are cleanup standards , standards of control, and other substantive environmental protection requirements, criteria or limitations promulgated under Federal or State law that, while not legally "applicable" to a hazardous substance, pollutant, remedial action or circumstance at a site, their use and application is well suited to the situation at a site. An example of a situation where a law would be relevant and appropriate is the treatment of waste not lawfully deemed "hazardous" but identical to chemicals currently deemed hazardous under the Resource Conservation and Recovery Act (RCRA). A list of Ohio's ARAR's is provided in Appendix C.

In certain instances, a remedy may be selected which does not meet an ARAR. Six conditions have been established under which an ARAR may be waived: interim measure, greater risk to health and the environment, technical impracticability, equivalent standard of performance, inconsistent application of state requirements, and fund-balancing. No waiver of an ARAR has been sought by U.S. DOE with respect to the Peter Kiewit Landfill.

ARAR's are divided into three different categories:

- **Chemical-Specific ARARs**
- **Action-Specific ARARs**
- **Location-Specific ARARs**

Chemical-Specific ARARs are health or risk-based numerical values which establish the acceptable amount or concentration of a chemical that may be found in the environment. An example of chemical-specific requirements are maximum contaminant levels (MCLs) established for certain chemicals. All of the alternatives evaluated for the Peter Kiewit Landfill are expected to comply with chemical-specific ARARs because discharge levels for treated seep water are identical in each alternative. Only if operation of the seep collection system is halted (a true "No Action alternative") would there be potential violations in discharge limits for treated seep water.

Action-Specific ARARs are usually technology or activity based requirements or limitations on actions taken with respect to hazardous waste. An example of an action-specific requirement would be the requirement for treatment of hazardous waste to approved standards before it is land disposed. Alternative #3 complies with action-specific ARARs, however, the remaining alternatives do not. A "relevant and appropriate" requirement for landfills is the placement of a cap on the landfill after it is no longer in operation. Because they do not evaluate placement of a cap on the Peter Kiewit Landfill, Alternatives #1, #2, and #4 do not satisfy Action-specific ARARs. Additionally, the National Contingency Plan states that a preference shall be given to

alternatives that actively treat waste rather than institutional controls (Alternative #2).

Location-Specific ARARs are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because they occur in a specific location. An example of location-specific requirements are laws forbidding the placement of an incinerator near a hospital or school or the placement of waste in a wetland area. All of the alternatives will comply with these requirements because no waste disposal outside of the landfill is proposed.

According to Section 121 of CERCLA, no federal, state or local permits are required for remedial actions taken on-site.

8.3 Long-term Effectiveness and Permanence

Alternative #3 is expected to provide the greatest long-term protectiveness over the other alternatives because capping the landfill will reduce infiltration of water into the waste and the additional contingency measure of up-gradient groundwater control would also be expected to reduce horizontal groundwater flow. An alternative which would remove and treat the landfill waste would have the greatest level of long-term effectiveness. However, due to the large cost and risks of addressing unknown landfill waste and the high cost of off-site disposal, such an alternative was found impracticable and was not considered in the detailed analysis of alternatives. Alternatives #1, #2 and #4 are anticipated to have a lesser degree of permanence because eventual failure of the current soil cover which could expose wastes and additional seep generation is more likely to occur without further control of rainwater infiltration into the waste. Alternative #4 was judged to be more protective than Alternative #1 and #2 because a vertical barrier to stop the migration of groundwater will reduce the likelihood of future seep generation.

8.4 Reduction of Toxicity, Mobility, or Volume Through Treatment

None of the alternatives reduce the toxicity, mobility or volume of landfill wastes through treatment. No hot spots were located at the Peter Kiewit Landfill; therefore, treatment of hot spots was not considered. Treatment of the homogenous waste within the landfill was not found to be practicable.

8.5 Short-Term Effectiveness

Alternatives #1 and #2 do not require soil excavation and are therefore not expected to cause short-term risk from exposure to landfilled wastes. Alternative #3 is expected to slightly increase ecological risks during cap construction due to soil run-off into Big Run Creek. Alternative #4 is expected to have the greatest short-term risk because unknowns during construction of the vertical barrier could cause exposures from buried wastes. In the westerly direction from the landfill (where the vertical barrier would be installed), the extent of buried waste is not known,

increasing the possibility of excavating wastes during construction. Contingency measures to address these concerns would be addressed during remedial design.

Since the seep collection system is already in place, Alternative #1 would be completed immediately. Alternative #2 could be completed in less than six months; Alternative #4 in approximately six months; and Alternative #3 in six months to one year.

8.6 Implementability

All of the alternatives are expected to be technically implementable. Alternatives #3 and #4 would be expected to present greater difficulties than alternatives #1 and #2 due to the proposed cap construction (Alt. #3) and potential vertical barrier work (Alt. #4). Alternatives #1 and #2 would be the easiest to implement because fence construction in alternative #2 is the only construction activity necessary. No construction activities are planned in alternative #1 beyond the seep collection system which is already in place and operating.

8.7 Cost

The "No Further Action" alternative would not require additional costs beyond the installation costs already expended for the seep collection system and is the least costly alternative. However, additional costs may be necessary in the future for addressing additional seeps or failure of the current soil cover. Alternative #2 is more costly than alternative #1, followed by alternative #4 and alternative #3, which is estimated to be the most expensive due to the greatest amount of field work. Alternative #4 is substantially less costly than alternative #3 because of the absence of capping construction costs. Recent experience with construction work at the PORTS plant has shown that contractor bids for remedial work are often times lower than estimated in the corrective measures studies.

9.0 THE SELECTED REMEDY

Ohio EPA selects a modified version of Alternative #3. This alternative continues the operation of the seep collection system, requires the landfill to be capped with a solid waste type cap meeting Subtitle D requirements, and stipulates the installation of a subsurface vertical barrier if monitoring shows that a barrier is needed to prevent the flow of groundwater into landfilled waste (see Figure 4, *Schematic of Alternative 3*, for a sketch of alternative components). This alternative provides the best balance of trade-offs when considering the criteria used to evaluate remedies presented in the preferred plan and in Section 8.0 above. The Agency also believes that this remedy will be protective of human health and the environment by containing and where practicable, treating the waste (leachate sources). This alternative meets ARAR's (see Appendix C), is cost-effective, and will provide long-term effectiveness.

The major components of this alternative are:

- Continuation of the seep collection system which is currently in operation on the east side of the landfill;

- Capping the landfill to contain wastes and reduce water infiltration with a cap meeting the requirements of RCRA, Subtitle D;

- The use of vertical barriers (slurry wall) as necessary to minimize lateral migration of contaminants. Future evaluation of the leachate volumes flowing to the seep collection system will determine the need for a vertical subsurface barrier. The criteria for determining the need for the vertical subsurface barrier shall be developed during the remedial design. Specific details shall be included in all subsequent design documents.

- Environmental monitoring to ensure that the final remedial action is protective.

The recompacted low permeability cap is the preferred cap design. This cap, commonly referred to as a solid waste cap, has been used at two other locations on the site and is expected to contain landfilled wastes and minimize the infiltration of rain water into the landfill.

A landfill operated today similar to the Peter Kiewit Landfill would be required to be capped per solid waste regulations after operations ceased. Although the Peter Kiewit Landfill ceased operation before these State and Federal laws were enacted, capping the landfill is a relevant and appropriate requirement and will comply with Federal and State law. Alternative #1 (No Further Action), Alternative #2 (Fencing and Deed Restrictions), and Alternative #4 (Vertical Subsurface Barrier) do not meet Relevant and Appropriate Requirements.

If deemed necessary, the preferred alternative would require the installation of a slurry wall to prevent the horizontal flow of groundwater into the landfill. However, based on past data showing that the Minford clays have a relatively low horizontal permeability, Ohio EPA believes that the primary source of seep water is from infiltration of rain water from the landfill surface and not from ground water flowing into the waste. The effectiveness of the landfill cap in reducing seep water volume, and the continued ability of the seep collection system will determine the need for the installation of a slurry wall. Specific criteria developed during the remedial design will be examined during the first five year review of the remedy to determine the need for the slurry wall. If a slurry wall is deemed necessary to reduce lateral migration of contaminants, its placement and design will consider the existing structures and utilities west of the landfill area.

Excavation and subsequent disposal of the material in the Peter Kiewit Landfill was considered; however, it was determined that this alternative would not be practicable and would not provide

significant advantages in risk reduction over alternative #3. As stated above, excavation is likely to cause increased exposure risks to wastes during field work and the final disposal location for this waste is undetermined. Containment of the waste in the Peter Kiewit Landfill was considered a better alternative than attempting to excavate and treat the landfilled wastes because of the variety of wastes present and the difficulty in adequately treating a mixture of contaminants such as landfill wastes.

Environmental monitoring such as ground water sampling and monitoring of the seep collection system will be conducted after the landfill is capped to ensure that the selected remedial action is effective. The seep discharges will be collected and treated as long as seep flow is present. The remedial alternative is expected to significantly reduce or eliminate the seep discharge. Immediate steps will be taken to mitigate any unacceptable risks from releases detected after remedial actions have been completed. Additional actions are not anticipated but might be necessary for unexpected events such as new seeps or previously undetected ground water contamination.

The objective of Alternative #3, the preferred alternative, is to eliminate the release of contaminants (i.e. seeps). Other alternatives are less likely to eliminate the seeps; therefore, they were deemed less effective in reducing the mobility of contaminants (via seep discharge), less effective in the protection of human health and the environment, and less permanent than Alternative #3. Capping the landfill is expected to cause no insurmountable problems during construction. However, as noted above in the discussion of implementability, the installation of a slurry wall or sheet piling, if needed, may present some construction difficulties.

10.0 STATUTORY DETERMINATIONS

In accordance with the statutory requirements of Section 121 of CERCLA, remedial actions must be protective of human health and the environment, comply with all ARARs established under federal and state environmental laws, be cost effective, utilize permanent solutions and alternative technologies or recovery technologies to the maximum extent practicable, and, to the extent practicable, use treatment to reduce the toxicity, mobility, or volume as a principle element. In addition to the CERCLA statutory mandates, the RCRA standards for remedial actions must be met. Under RCRA, remedial actions must: protect human health and the environment, attain media cleanup standards set by the implementing agency, control the source of releases, and comply with any applicable standards for management of wastes.

10.1 Protection of Human Health and the Environment

The selected remedy protects human health and the environment by preventing potential human and ecological exposure to landfill wastes and seep water. The area will be capped, preventing infiltration of precipitation into the wastes and reducing seep water volume. The cap will also provide protection against possible exposure to uncovered waste due to the eventual erosion of the current cover material. If necessary to further control seep water, a vertical subsurface barrier will be installed to prevent migration of groundwater into the landfill wastes.

10.2 Compliance with Applicable or Relevant and Appropriate Requirements

The selected remedy will comply with all ARARs established under federal and state environmental laws. ARARs specific to the Peter Kiewit Landfill are presented in Appendix C.

10.3 Cost-Effectiveness

The selected remedy is cost-effective because it has been determined to provide overall effectiveness proportional to its costs, the net present worth being $20,877,000. Removal and subsequent on- or off-site disposal was not developed as an alternative, because the high cost, excessive waste volume, and unknown waste composition made such an alternative impracticable. Although Alternative #3 is the next to most costly of the four considered alternatives (construction of a RCRA Subtitle C Multimedia Cap would be more costly, with a present worth cost of $21,503,000), its protectiveness, compliance with ARARs, and long-term effectiveness make it the most cost-effective.

10.4 Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

Ohio EPA has determined that the selected remedy for the Peter Kiewit Landfill represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a cost-effective manner. Of those alternatives that are protective of human health and the environment and comply with ARARs, this selected remedy provides the best balance of tradeoffs among the alternatives in terms of long-term effectiveness and permanence, reduction in toxicity, mobility, and volume through treatment, short-term effectiveness, implementability, and cost, also considering community acceptance.

10.5 Preference for Treatment as a Principal Element

The selected remedy does not satisfy the statutory preference for treatment as a principal element of the remedy because treatment of the principal threat of the site was not found to be practicable.

10.6 Source Control

The selected remedy will effectively control the source of releases by containing the landfill wastes. Source control will be accomplished by the landfill cap, seep collection system, and, if necessary, the installation of a vertical subsurface barrier.

11.0 DOCUMENTATION OF SIGNIFICANT CHANGES

The preferred plan for the Peter Kiewit Landfill was released for public comment in April, 1995. The preferred plan identified a modified version of Alternative #3: continuation of the seep collection system; capping the landfill to contain wastes and reduce water infiltration; the use of vertical barriers as necessary to minimize lateral migration of contaminates; and environmental monitoring to ensure that the final remedial action is protective. Ohio EPA and U.S. EPA reviewed all written and verbal comments submitted during the comment period. Upon review of these comments, it was determined that no significant changes to the remedy, as it was originally identified in the preferred plan, were necessary.

RESPONSIVENESS SUMMARY
PETER KIEWIT LANDFILL

1.0 SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD

1.1 Overview

This responsiveness summary has been prepared to respond to each of the significant comments, criticisms, and new data submitted in written or oral presentations on the preferred plan for the Peter Kiewit landfill and is intended to be consistent with Sections 113(k) (2) (B) (iv) and 117(B) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). This section requires that the United States Environmental Protection Agency (U.S. EPA) respond "... to each of the significant comments, criticisms, and new data submitted in written or oral presentations" on the preferred plan. Numerous comments were made during the public comment period that do not pertain to the proposed remedial action at the Peter Kiewit Landfill. These comments were not addressed in this responsiveness summary. Attempts will be made to address all comments and concerns not specific to the Peter Kiewit Landfill by communicating with the public in future public informational/update meetings and during site visits where Ohio EPA and/or U. S. EPA representatives are present.

The administrative record index for the DOE site which includes the RCRA Facility Investigation (RFI), the Cleanup Alternatives Study/Corrective Measures Study (CAS/CMS) and the Preferred Plan is available to the public at the Environmental Information Center located in Waverly, Ohio. The first draft of the RFI was submitted to Ohio EPA and U. S. EPA on February 19, 1992. The CAS/CMS was submitted on June 2, 1994, and a public notice alerting the public of their opportunity to comment on the preferred plan was placed in the ***Waverly Watchman*** and the ***Portsmouth Times*** on April 11, 1995. The public comment period closed on May 12, 1995. A public meeting to discuss the preferred plans was held on April 18,1995 at the Vern Riffe Vocational School near the U. S. DOE plant.

1.2 Summary of Significant Comments

The public comments regarding the U. S. DOE site are organized into the following categories:

(1) Summary of comments and Agency responses to citizens regarding the preferred plan;

(2) Summary of comments from U. S. DOE and Agency responses.

2.0 COMMENTS FROM THE COMMUNITY

1. A commenter expressed concern regarding the short time period Ohio EPA and U.S. EPA had given between notification of the public meeting and the meeting date on April 18th.

Ohio EPA's Response: The purpose of the meeting was to present the remediation alternatives being considered to the public and to accept oral comments. Written comment were accepted throughout the comment period. Holding the meeting earlier in the public comment period, gave citizens more time to consider the information presented prior to the end of the comment period. By holding the meeting sooner, rather than later in the comment period, citizens had a greater opportunity to provide comments once the alternatives were presented. The length of the comment period was consistent with federal and state regulations and no request for a comment period extension was requested.

2. This same commenter also pointed out that U. S. EPA does not have the authority to regulate radioactive constituents in drinking water and therefore it was not accurate to say that the preferred remedy complied with all laws and regulations.

Ohio EPA's Response: The authority of U. S. EPA to regulate radioactive material has some restrictions and does not apply to all radioactive material. However, many radioactive materials from U. S. DOE facilities and the PORTS site in particular are subject to regulation by Ohio EPA and/or U. S. EPA. Designated levels for some radioactive materials in the Safe Drinking Water Act (SDWA) such as gross alpha, gross beta, radium and radon do apply to U. S. DOE facilities and CERCLA also covers radioactive materials not otherwise exempted by the Atomic Energy Act of 1954. Thus, U. S. EPA and Ohio EPA have authority over certain radioactive materials in drinking water. Public water supplies in the State are required to conduct the above listed radioactive analyte list.

During evaluation of alternatives, a primary criterion is protection of human health and the environment. Ohio EPA and U. S. EPA evaluate all alternatives to determine their ability to protect human health. Leaching of radioactive material to groundwater, ingestion exposures to both soils and waters, dust inhalation and dermal contact are all considered during alternative evaluation and selection.

3. This commenter also asked what decisions were being made as to the extent of cleanup, if there is a cleanup goal and if some plant conversion was anticipated (such as a commercial nuclear waste treatment facility) and also recommended that a "budget plan" be put in place for restoration costs.

Ohio EPA's Response: Throughout the RFI and CAS/CMS process, Ohio EPA and U. S. EPA have required that the risk assessments evaluate unrestricted future use with the reasonable maximum exposure (RME) being residential use of the property. The one in a million excess cancer rate level (1×10^{-6}) has been identified as a remediation goal. At this time, future commercial and unrestricted future residential use has been evaluated for the PORTS site by Ohio EPA or U. S. EPA. Clean-up goals will be protective of the future use designated for the site. In regards to budget considerations, all of the alternatives are evaluated with respect to cost but it is not considered a primary screening criteria.

4. This commenter ended by requesting that the agencies consider human health more than cost when determining remedies for waste units.

Ohio EPA's Response: Ohio EPA agrees with this request. As discussed above, remedial action decisions place primary emphasis on the protection of human health and the environment. Cost is always considered, but is done so after remediation goals are established for the protection of human health and the environment. The remedial alternative that is protective, complies with ARARs, and is cost-effective is selected. Cost-effectiveness, as stated in the NCP, is determined by evaluating the overall effectiveness of an alternative and then assessing the cost of the alternative to ensure that the cost is proportional to the overall effectiveness.

5. Another commenter expressed that the area of the landfill was greater than stated during the public meeting. An additional concern noted by this commenter was the burn area that was in operation at the landfill area. Also mentioned was the disposal of "85,000 pounds of metal hydraulic sludge from the X-705", and also waste oils and solvents.

Ohio EPA's Response: Ohio EPA stated in the public meeting that the acreage of the landfill was not exactly known and the acreage was estimated by scaling dimensions from maps included in investigation documents from U. S. DOE. It was not intended to be a precise value and was used by Ohio EPA and U. S. EPA to provide a description of the landfill. During the investigation work at the Peter Kiewit landfill, monitoring wells and soil borings were taken around the perimeter of the known disposal area. This investigation work served to identify the approximate area where wastes were placed. Because the approximate dimensions of the landfill are known, the chosen remedy for the landfill will not be affected if a precise acreage for the landfill is not available. It is common when addressing old landfills to encounter incomplete information because accurate records were not usually kept. However, cleanup actions will be designed to address all known and suspect areas of waste disposal. Environmental monitoring of groundwater and surface water will be conducted on a routine basis to evaluate the selected remedy's effectiveness.

Ohio EPA believes that the commenter was referring to the X-749 landfill and not the Peter Kiewit landfill when commenting about the sludge from the X-705 building. The X-749 landfill

did receive 85,000 pounds of hydroxide sludge between August, 1984 and June, 1985 (QI RFI, 1994). A cap was placed on this landfill and a leachate collection system was installed in 1991.

Existing plant engineering drawings indicate that a burn pit was operated at the landfill by the construction contractor to dispose of construction waste. There are not records that characterize the material that was burned, nor are there records of the quantities or characterization of wastes disposed in the Peter Kiewit landfill during it's operation.

3.0 COMMENTS FROM THE U. S. DOE

The U. S. DOE identified the following concerns in the Preferred Plan and presented these concerns in written correspondence to Ohio EPA and U. S. EPA during the public comment period.

1. Page 8, Line 14 of the Preferred Plan:

U. S. DOE Comment: "Geologic data do not indicate that the Sunbury Shale is absent beneath the landfill..."

Ohio EPA's Response: During development of the preferred plan document for public review, Ohio EPA and U.S. EPA referenced past documents such as the RFI and the CAS/CMS to assemble information for presentation in the plan. In this specific case, Section 6.1.2.1 of the CAS/CMS document was used in part as a reference for geologic information. Section 6.1.2.1 of the CAS/CMS discusses the absence of the Sunbury Shale in the southeast portion of the landfill and also where the Sunbury and Berea have been eroded in the drainage ravine south of the landfill. The inference that the Sunbury Shale was likely absent from the landfill area was drawn from these statements. Ohio EPA agrees that this statement is a generalization and should have been more specific to the areas specifically identified in the RFI and CAS/CMS. However, this statement was merely intended to provide a description of the geology in the vicinity of the Peter Kiewit Landfill and should not be construed as a statement made with the intention of supporting the Agencies preferred remedy for the Peter Kiewit Landfill.

2. Page 9, Line 2:

U. S. DOE Comment: "Construction of the seep collection system is complete and all data indicate that the system is effective in preventing discharge of contaminants to Big Run Creek."

Ohio EPA's Response: Ohio EPA agrees with U. S. DOE's comment. The Agency's evaluation of all of the alternatives assumed that the seep collection was operating and would continue operating as long as necessary.

3. Page 27, Line 6:

U. S. DOE Comment: "While it is true that Alternative #3 has the most extensive construction activities associated with it, it is not clear that this alternative is more protective...."

Ohio EPA's Response: During evaluation of the alternatives for the Peter Kiewit Landfill, the Agencies ranked each alternative according to it's performance (identifying the most effective to the least effective alternative) in each of the eight criteria. This was done for all eight criteria, even though some of the differences between alternatives may be small. In the case of "Overall Protection of Human Health and the Environment", under the current use (i.e. short term), the differences between the alternatives may be small. However, the Agencies believe that the differences between alternatives are more pronounced when evaluating an alternative's ability to be protective over the long term.

4. Page 27, Line 10:

U. S. DOE Comment: "The landfill is covered, vegetated, and maintained to prevent erosion. There has been little erosion to the cover since 1968, and as part of the IRM, low spots have been filled and revegetated to prevent ponding of surface water."

Ohio EPA's Response: As stated in the previous response, the objective of evaluation was to rank the alternatives according to their effectiveness for each of the eight criteria. The Agencies believe that the placement of an engineered solid waste cap or liner material will provide a greater level of protection than will the current condition at the landfill. While the IRM may have eliminated the current erosion on the east side of the landfill, erosion over time did occur in the sloped area adjacent to Big Run Creek , exposing landfilled wastes. The likelihood of this re-occurring in the same location or elsewhere on the site is greater without an engineered cover over the waste.

5. Page 28, Line 30

U. S. DOE Comment: "As stated in the Preferred Plan, relevant and appropriate requirements are generally not applicable and should be considered based on the specific site situation...."

Ohio EPA's Response: Ohio EPA disagrees with U. S. DOE's interpretation of the discussion of ARAR's in the Preferred Plan. Relevant and appropriate requirements apply to the Peter Kiewit landfill. The discussion here was not intended to point out that "relevant and appropriate" requirements are generally not applicable to a cleanup situation as stated in U. S. DOE's comment, but rather was intended to outline the difference between an applicable law versus a relevant and appropriate application of a law or rule to a cleanup situation (e.g. a landfill such as the Peter Kiewit Landfill that was closed prior to the enactment of Ohio's closure rules for solid

waste landfills). The applicability of the closure rule to currently operated solid waste landfills is not dependent upon the observation of occurrences such as infiltration of water, exposed waste, etc. The intent of capping upon closure is to prevent as much as possible the future occurrence of infiltration, erosion, etc. that eventually could result in migration of wastes and subsequently higher maintenance costs and necessary corrective measures.
When the analysis results in a determination that a requirement is both relevant and appropriate, such a requirement must be complied with to the same degree as if it were applicable, unless waived.

6. Page 29, Line 5

U. S. DOE Comment: "Capping of the landfill is not considered containment nor active treatment under the National Contingency Plan" .....

Ohio EPA's Response: The statement regarding the preference for active treatment in the NCP was added to emphasize this when comparing Alternative #2 to other alternatives and was intended to be similar to language in the CAS/CMS documents regarding Alternative #2. It was not the intent of the Agencies to imply that other alternatives for the Peter Kiewit Landfill provided greater treatment than Alternative #2.

7. Page 29, Line 22

U. S. DOE Comment: "Surveillance, maintenance and scheduled improvements will reduce or eliminate these concerns".

Ohio EPA's Response: Ohio EPA agrees that surveillance, maintenance and scheduled improvements will reduce the concerns regarding exposed wastes and additional seep generation. However, a preference is given to the permanence of an alternative and the minimization of operation and maintenance. The Agencies believe that the preferred remedy will result in reduced maintenance costs in the future compared to the "no further action" alternative, and will meet ARARs.

8. Page 30, Line 20

U. S. DOE Comment: "Because interim remedial measures have mitigated potential risk to human health and the environment, it is difficult to justify additional large-scale construction and 12 million dollars in costs to implement Alternative #3."

Ohio EPA's Response: The response to comment #7 above also applies to this comment. The permanence of an alternative is expected to result in reduced future maintenance costs and a

reduced probability of future releases of waste to soils and groundwater/surface water.

9. Page 31, Line 25

U. S. DOE Comment: "A waiver could be obtained for the relevant and appropriate requirement that is not met. The existing cover prevents direct contact and reduces infiltration. This requirement should not be viewed as a deciding factor".

Ohio EPA's Response: The attainment of ARAR's was not the only criteria used to identify the preferred alternative. Issues of long term effectiveness and permanence also affected the decision to select Alternative #3 as the preferred alternative. However, the placement of a cap over the Peter Kiewit Landfill was determined to be a "relevant and appropriate" requirement based on the analysis required by Section 300.400 (g) (2) of the NCP. The capping requirement is "relevant and appropriate" because, (a): the actions or activities regulated by the requirement and the remedial action contemplated at the CERCLA site are sufficiently similar; and, (b): the requirement is well suited to the site.

Six conditions have been established under which an ARAR may be waived: Interim Measure; Greater Risk to Health and the Environment; Technical Impracticability; Equivalent Standard of Performance; Inconsistent Application of State Requirements; and Fund-Balancing. With regard to the capping of the Peter Kiewit Landfill, only the Equivalent Standard of Performance condition potentially applies.

According to the preamble of the March 8, 1990 NCP, the criteria for evaluating whether an alternative method is equivalent to or better than the method required by the ARAR are degree of protection; level of performance; reliability into the future; and time required for results. Alternatives #1, #2, and #4 do not meet these criteria because of the uncertainty of the long term effectiveness of the current cover, the lack of reduction of seep water volume, the essentially unlimited period of time required to achieve remedial objectives, and the unknown wastes disposed in the landfill.

10. Page 32, Line 24

U. S. DOE Comment: Installation and operation of the collection system have eliminated the possibility of contaminants leaving the site. Alternative #3 should be viewed as less, not more permanent than Alternative #1, #2, and #4; because Alternative #3 requires perpetual operation and maintenance. Under Alternatives #1, #2, and #4, however, contaminated leachate will eventually cease being generated, significantly reducing operation and maintenance requirements".

Ohio EPA's Response: The Agencies disagree that Alternative #3 (capping) should be viewed as less permanent than alternatives #1 (no action), #2 (institutional controls) and #4 (vertical

barrier), and disagree that these alternatives will have less operation and maintenance compared to alternative #3. The time frame under which leachate will cease being generated is not known, but is expected to be a long period of time because organic industrial wastes were likely disposed in the Peter Kiewit Landfill and the attenuation of these wastes commonly requires decades or more. The erosion of the landfill cover material over time will require at least as much or more routine maintenance than will an engineered cap.

11. **U. S. DOE Comment:** "The No further Action alternative provides the most efficient and effective solution to mitigating risks to human health and the environment posed by Peter Kiewit Landfill. As stated in the preferred plan "The seep collection system installed west of Big Run Creek is expected to address much of the estimated risk to humans and to Big Run Creek by collecting contaminants released from the landfill". The seep collection system effectively eliminates short-term risk to the environment, therefore, the goal of the remedial alternative implemented through the CAS/CMS should be to reduce the long-term risk to the environment. The No Further Action alternative accomplishes this by reducing the toxicity of material in the landfill over a relatively short period of time (approximately ten years). It is expected that concentration of contaminants in seep water will eventually be reduced below PQLs allowing the collection system to cease operation. Implementation of the No Further Action alternative will require very little additional capital cost and will mitigate the need for perpetual operation and maintenance costs and large-scale construction at this unit".

Ohio EPA's Response: While the seep collection system is expected to effectively capture contaminants from the landfill, an important issue is the long-term effectiveness of the no-action alternative. This alternative is expected to require more maintenance in the future than alternatives that reduce infiltration of water into the waste. Because it is not known what quantities of containerized liquids or other organic waste may be present in the landfill, the agencies are not necessarily in agreement that the reduction of contaminants will be accomplished in approximately ten years as stated in U. S. DOE's comment. Unexpected future releases from the landfill are considered more likely with the no-action alternative than with alternative #3, therefore, Ohio EPA does not agree that the no-action alternative is the most effective alternative.

APPENDIX A

FIGURES

FIGURE 1

USDOE-PORTS SITE LOCATION

DECISION SUMMARY
PETER KIEWIT LANDFILL

1.0 SITE LOCATION AND DESCRIPTION

The Portsmouth Gaseous Diffusion Plant (PORTS) facility is located near Piketon, Ohio, in the south central portion of the state (see Figure 1, *USDOE-PORTS Site Location*). The plant-site encompasses approximately 1000 acres of the 4000 acre U.S. DOE reservation. The principal process at the PORTS facility is the separation of uranium isotopes via gaseous diffusion. The PORTS facility has been operating since 1954 enriching uranium for use in commercial nuclear reactors and for use by the U.S. Navy in power reactors in the nuclear navy. Support operations include the feed and withdrawal of material from the primary process, water treatment for sanitary and cooling purposes, decontamination of equipment removed from the plant for maintenance or replacement, recovery of uranium from various waste materials and treatment of sewage wastes and cooling water blow down. The construction, operation and maintenance of this facility requires the use of a wide range of commercially available chemicals. Continuous operation of this facility since 1954 has resulted in the generation of inorganic, organic and low level radioactive waste materials.

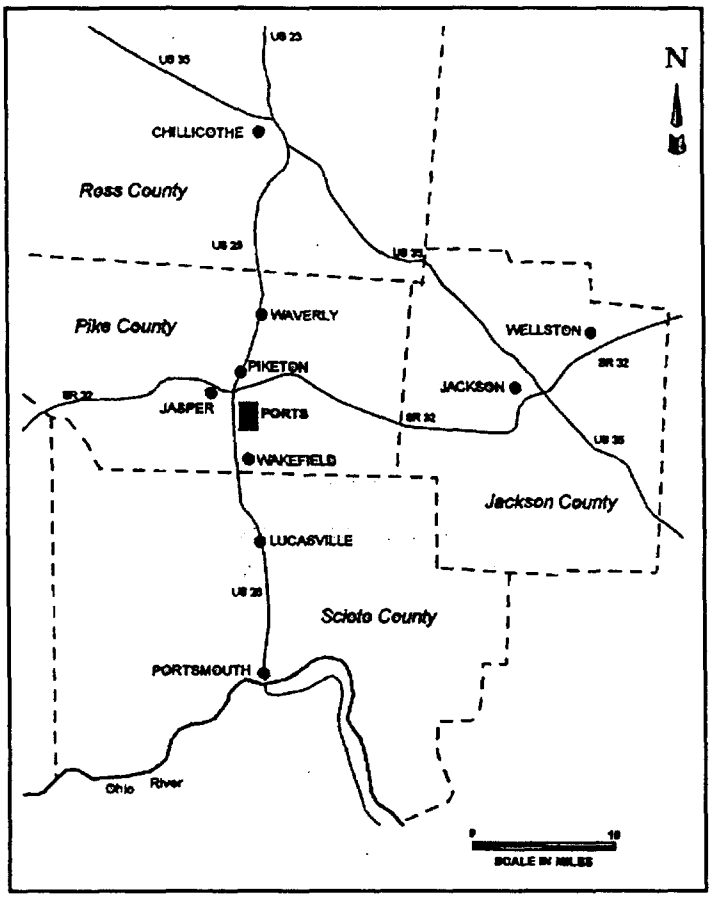

Figure 1 - U.S. DOE-PORTS Site Location

The Peter Kiewit Landfill is located in the central portion of Quadrant I (QI) of the PORTS facility, just west of Big Run Creek (BRC) and approximately 200 feet east of the XT-847 GCEP construction warehouse (see Figure 2, *USDOE-PORTS Site Map*). The Peter Kiewit Landfill was used from approximately 1953 until 1968. During plant construction, the landfill was used as a salvage yard, burn pit and trash disposal area. After plant construction, the landfill was used as a sanitary landfill. It is probable that solid wastes now known to be potentially hazardous were landfilled at this site. The landfill is about 23.5 acres in size.

2.0 HISTORY OF ENFORCEMENT ACTIVITIES

As a result of chemicals used to support the uranium enrichment process, and the presence of uranium

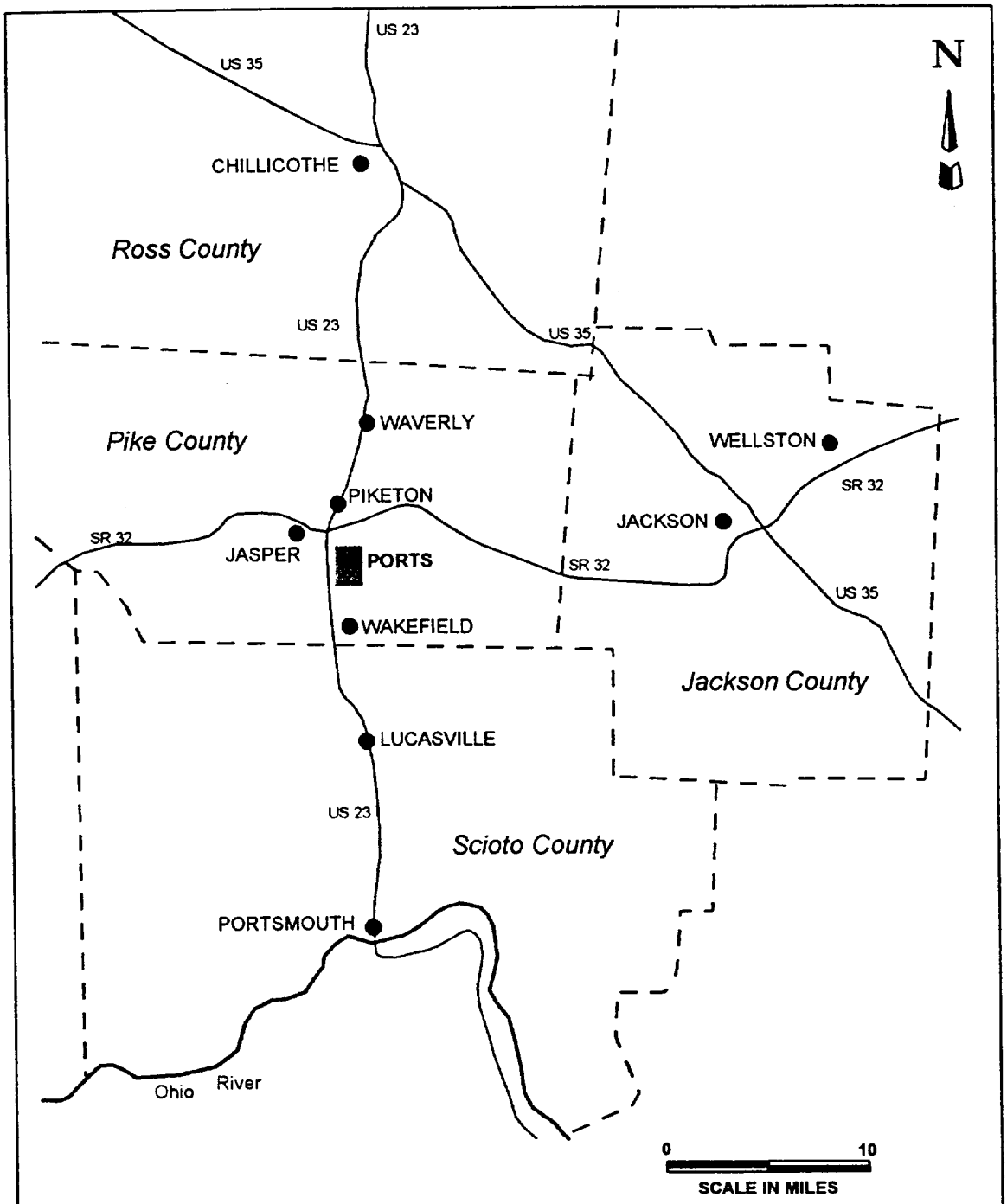

Fig. 1

Counties surrounding PORTS

FIGURE 2

USDOE-PORTS SITE MAP

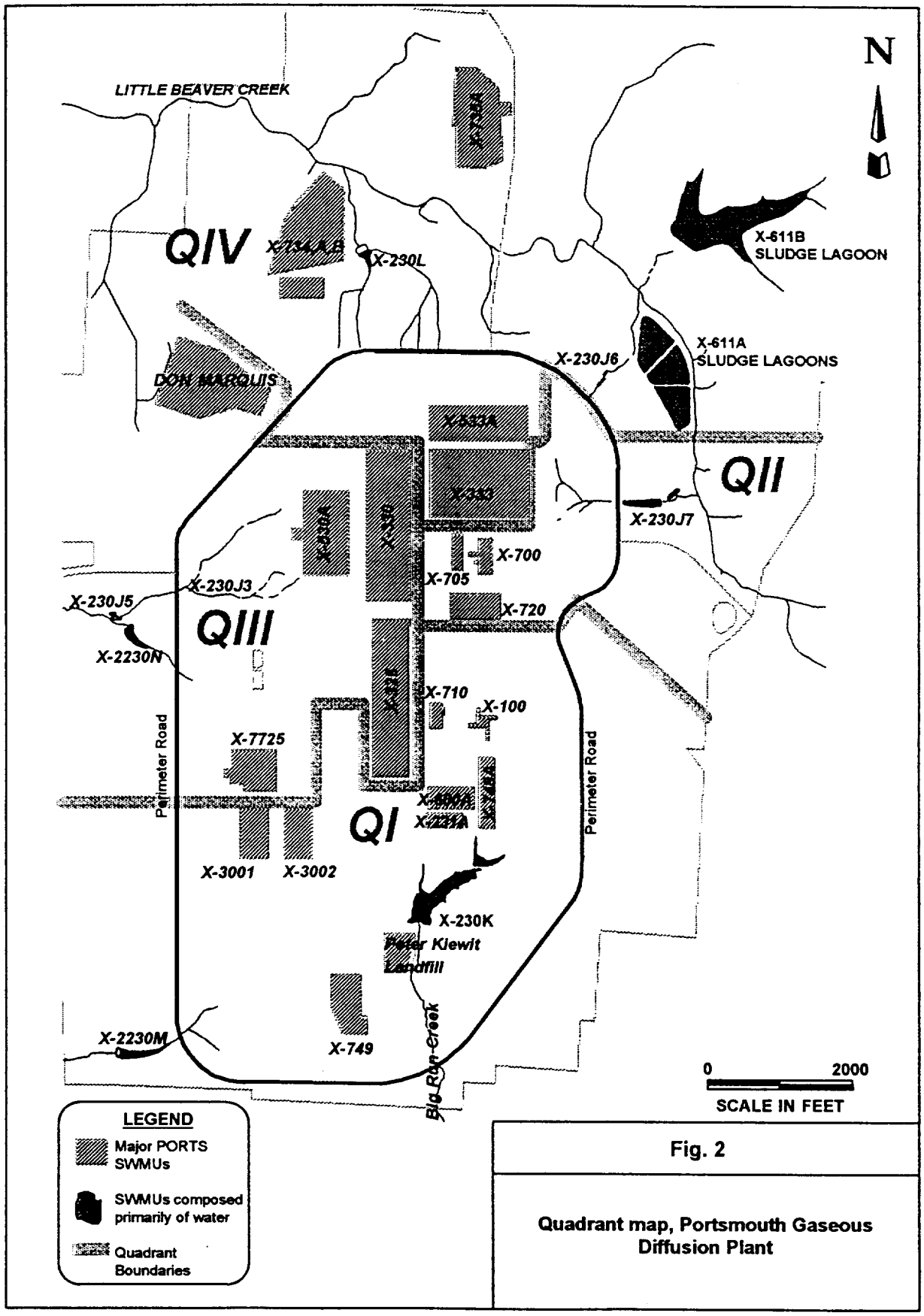

Fig. 2

Quadrant map, Portsmouth Gaseous Diffusion Plant

FIGURE 3

APPROXIMATE LANDFILL BOUNDARIES
PETER KIEWIT LANDFILL
(FROM PETER KIEWIT LANDFILL DRAFT CAS/CMS REPORT, FIGURE 6.1, PAGE 6-7)

FIGURE 4

SCHEMATIC OF ALTERNATIVE 3
(FROM PETER KIEWIT LANDFILL DRAFT CAS/CMS REPORT, FIGURE 6.10, PAGE 6-86)

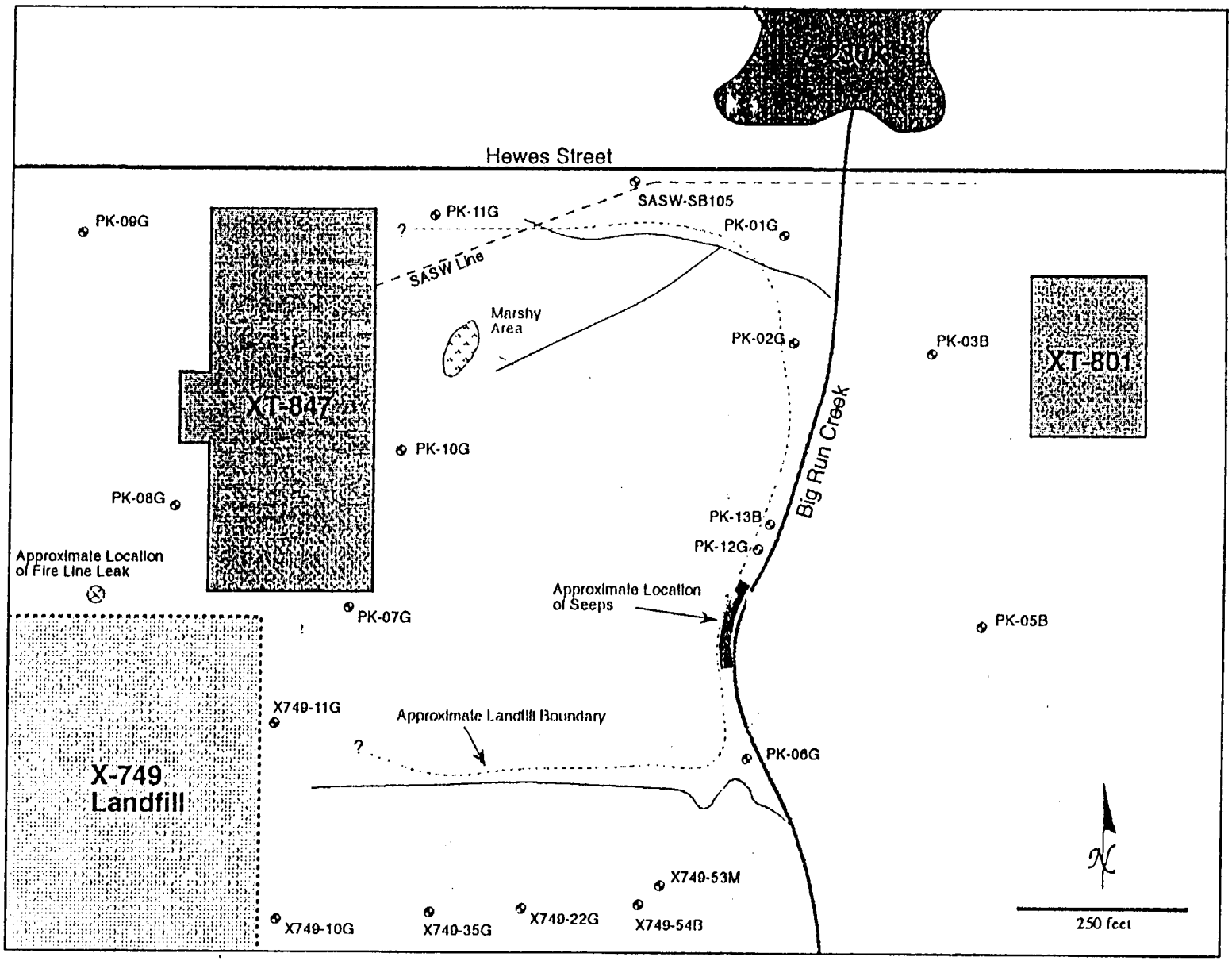

Figure 6.1. Peter Klewit Landfill: General Location Map

ADMINIS. CODE SECTION	PERTINENT PARAGRAPH	TITLE OR SUBJECT OF REGULATION	DESCRIPTION OF REGULATION	APPLICATION OF REGULATION	ARAR TYPE
			ESTABLISHES THE SUBSTANTIVE HAZARDOUS WASTE PERMIT REQUIREMENTS NECESSARY FOR OHIO EPA TO DETERMINE FACILITY COMPLIANCE. INCLUDES INFORMATION SUCH AS FACILITY DESCRIPTION, WASTE CHARACTERISTICS, EQUIPMENT DESCRIPTIONS, CONTINGENCY PLAN, FACILITY LOCATION, TOPOGRAPHIC MAP, ETC.	PERTAINS TO ANY SITE WHICH WILL HAVE TREATMENT, STORAGE OR DISPOSAL OF HAZARDOUS WASTE OCCURRING ON-SITE OR HAS EXISTING AREAS OF HAZARDOUS WASTE CONTAMINATION ON-SITE THAT WILL BE CAPPED IN-PLACE. THIS, ALONG WITH OTHER PARAGRAPHS OF THIS RULE, ESTABLISHES THE MINIMUM INFORMATION REQUIRED DURING THE REMEDIAL DESIGN STAGE.	
3745-50-44	B	PERMIT INFO REQ FOR ALL HAZ WASTE LAND DISP FACILITIES	ESTABLISHES THE SUBSTANTIVE HAZARDOUS WASTE LAND DISPOSAL PERMIT REQUIREMENTS NECESSARY FOR OHIO EPA TO DETERMINE ADEQUATE PROTECTION OF THE GROUND WATER. INCLUDES INFORMATION SUCH AS GROUND WATER MONITORING DATA, INFORMATION ON INTERCONNECTED AQUIFERS, PLUME(S) OF CONTAMINATION, PLANS AND REPORTS ON GROUND WATER MONITORING PROGRAM, ETC.	PERTAINS TO ANY FACILITY/SITE WHICH WILL HAVE HAZARDOUS WASTE DISPOSED OF ON-SITE OR HAS EXISTING AREAS OF HAZARDOUS WASTE CONTAMINATION ON-SITE THAT WILL BE CAPPED IN-PLACE. THIS, ALONG WITH OTHER PARAGRAPHS OF THIS RULE, ESTABLISHES THE MINIMUM INFORMATION REQUIRED DURING THE REMEDIAL DESIGN STAGE.	ACTION
3745-50-44	C1	ADD'L PERMIT INFO: HAZ WASTE STORAGE IN CONTAINERS	ESTABLISHES THE SUBSTANTIVE HAZARDOUS WASTE PERMIT REQUIREMENTS NECESSARY FOR OHIO EPA TO DETERMINE ADEQUACY OF CONTAINER STORAGE. INCLUDES INFORMATION SUCH AS DESCRIPTION OF CONTAINMENT SYSTEM, DETAILED DRAWINGS, ETC. SEE OAC 3745-55-70 THROUGH 3745-55-78 FOR ADDITIONAL CONTAINER REQUIREMENTS.	PERTAINS TO ANY SITE AT WHICH STORAGE OF HAZARDOUS WASTE ON-SITE WILL OCCUR IN CONTAINERS. CONSIDER FOR WASTES AND CONTAMINATED SOILS THAT ARE STORED PRIOR TO TREATMENT OR DISPOSAL. THIS, ALONG WITH OTHER PARAGRAPHS OF THIS RULE AND OAC 3745-55-70 THROUGH 3745-55-78, ESTABLISHES THE MINIMUM INFORMATION REQUIRED DURING THE REMEDIAL DESIGN STAGE.	ACTION
3745-50-44	C2	ADD'L PERMIT INFO: HAZ WASTE STORAGE/ TREAT IN TANKS	ESTABLISHES SUBSTANTIVE HAZARDOUS WASTE PERMIT REQUIREMENTS NECESSARY FOR OHIO EPA TO DETERMINE ADEQUACY OF TANK TREATMENT AND STORAGE UNITS. INCLUDES INFORMATION SUCH AS ASSESSMENT OF STRUCTURAL INTEGRITY, DETAILED PLANS OF TANK SYSTEM(S), DESCRIPTION OF SECONDARY CONTAINMENT SYSTEM, ETC. SEE OAC 3745-55-90 THROUGH 3745-55-99 FOR ADDITIONAL REQUIREMENTS.	PERTAINS TO ANY SITE AT WHICH STORAGE OR TREATMENT OF HAZARDOUS WASTE IN TANKS WILL OCCUR ON-SITE. THIS, ALONG WITH OTHER PARAGRAPHS OF THIS RULE AND OAC 3745-55-90 THROUGH 3745-55-99, ESTABLISHES THE MINIMUM INFORMATION REQUIRED DURING THE REMEDIAL DESIGN STAGE.	ACTION
3745-50-44	C4	ADD'L PERMIT INFO: HAZ WASTE STOR/TREAT IN WASTE PILES	ESTABLISHES SUBSTANTIVE HAZARDOUS WASTE PERMIT REQUIREMENTS NECESSARY FOR OHIO EPA TO DETERMINE ADEQUACY OF SURFACE IMPOUNDMENTS USED TO TREAT OR STORE HAZARDOUS WASTE. INCLUDES INFORMATION SUCH AS WASTE CHARACTERISTICS, DETAILED DESIGN PLANS AND REPORTS, CONTROL OF RUN-ON AND RUN-OFF, CLOSURE INFORMATION, ETC. SEE OAC 3745-56-20 THROUGH 3745-56-33 FOR ADDITIONAL SURFACE IMPOUNDMENT REQUIREMENTS.	PERTAINS TO SITE AT WHICH HAZARDOUS WASTE WILL BE STORED OR TREATED IN SURFACE IMPOUNDMENTS. THIS, ALONG WITH OTHER PARAGRAPHS OF THIS RULE AND OAC 3745-56-20 THROUGH 3745-56-33, ESTABLISHES THE MINIMUM INFORMATION REQUIRED DURING THE REMEDIAL DESIGN STAGE.	ACTION
3745-50-44	C6	ADD'L PERMIT INFO: ENVIRONMENTAL PERFORMANCE STANDARDS	ESTABLISHES SUBSTANTIVE HAZARDOUS WASTE PERMIT REQUIREMENTS NECESSARY FOR OHIO EPA TO DETERMINE ADEQUACY OF SURFACE IMPOUNDMENTS, WASTE PILES, LAND TREATMENT UNITS, LANDFILLS, AND UNDERGROUND INJECTION WELLS USED TO TREAT, STORE OR DISPOSE OF HAZARDOUS WASTE. INCLUDES INFORMATION SUCH AS WASTE CHARACTERISTICS, DETAILED DESIGN PLANS AND REPORTS, CONTROL OF RUN-ON AND RUN-OFF, CLOSURE INFORMATION, ETC. SEE OAC 3745-57-01 ADDITIONAL REQUIREMENTS.	PERTAINS TO SITE AT WHICH HAZARDOUS WASTE WILL BE OR HAS BEEN STORED, TREATED OR DISPOSED OF IN SURFACE IMPOUNDMENTS, WASTE PILES, LAND TREATMENT UNITS, LANDFILLS OR UNDERGROUND INJECTION WELLS . THIS, ALONG WITH OTHER PARAGRAPHS OF THIS RULE AND OAC 3745-57-01 ESTABLISHES THE MINIMUM INFORMATION REQUIRED DURING THE REMEDIAL DESIGN STAGE.	ACTION
745-50-44	C7	ADD'L PERMIT INFO: HAZ WASTE DISPOSAL IN LANDFILLS	ESTABLISHES SUBSTANTIVE HAZARDOUS WASTE PERMIT REQUIREMENTS NECESSARY FOR OHIO EPA TO DETERMINE ADEQUACY OF LANDFILLS USED FOR DISPOSAL OF HAZARDOUS WASTE. INCLUDES INFORMATION SUCH AS WASTE CHARACTERISTICS, DETAILED DESIGN PLANS AND REPORTS, CONTROL OF RUN-ON AND RUN-OFF, CLOSURE INFORMATION, ETC.. SEE OA 57-02 THROUGH 3745-57-18 FOR ADDITIONAL LANDFILL REQU.	PERTAINS TO SITE AT WHICH HAZARDOUS WASTE WILL BE OR HAS BEEN DISPOSED OF IN LANDFILLS. THIS, ALONG WITH OTHER PARAGRAPHS OF THIS RULE AND OAC 3745-57-02 THROUGH 3745-57-18, ESTABLISHES THE MINIMUM INFORMATION REQUIRED DURING THE REMEDIAL DESIGN STAGE.	ACTION

ADMINIS. CODE SECTION	PERTINENT PARAGRAPH	TITLE OR SUBJECT OF REGULATION	DESCRIPTION OF REGULATION	APPLICATION OF REGULATION	ARAR TYPE
			PUBLIC AND THE ENVIRONMENT.		
745-27-14	A	POST-CLOSURE CARE OF SANITARY LANDFILL FACILITIES	SPECIFIES THE REQUIRED POST-CLOSURE CARE FOR SOLID WASTE FACILITIES. INCLUDES CONTINUING OPERATION OF LEACHATE AND SURFACE WATER MANAGEMENT SYSTEMS, MAINTENANCE OF THE CAP SYSTEM AND GROUND WATER MONITORING.	SUBSTANTIVE REQUIREMENTS PERTAIN TO ANY NEWLY CREATED SOLID WASTE LANDFILLS ON-SITE, ANY EXPANSIONS OF EXISTING SOLID WASTE LANDFILLS ON-SITE AND ANY EXISTING AREAS OF CONTAMINATION THAT ARE CAPPED PER THE SOLID WASTE RULES.	ACTION
745-27-19	E	SANITARY LANDFILL GENERAL OPERATIONAL REQUIREMENTS	SPECIFIES GENERAL OPERATIONAL REQUIREMENTS FOR SOLID WASTE LANDFILLS. INCLUDES REQUIREMENTS FOR: PREPARATIONS FOR OPERATING DURING INCLEMENT WEATHER; MANAGEMENT TO MINIMIZE NOISE , DUST AND ODORS; VECTOR CONTROL; ADEQUATE FIRE CONTROL EQUIPMENT; NOT CAUSING A NUISANCE OR HEALTH HAZARD OR WATER POLLUTION; MINIMIZATION OF DISTURBED AREA; CHEMICAL COMPATABILITY TESTING, IF NECESSARY. SPECIFIES THAT BULK LIQUIDS, HAZARDOUS WASTE , PCBs AND INFECTIOUS WASTE MAY NOT BE ACCEPTED FOR DISPOSAL.	PERTAINS TO NEW SOLID WASTE DISPOSAL FACILITIES TO BE CREATED ON-SITE AND EXISTING LANDFILLS THAT WILL BE EXPANDED DURING REMEDIATION. PORTIONS ALSO MAY PERTAIN TO EXISTING AREAS OF CONTAMINATION THAT WILL BE CAPPED IN-PLACE PER SOLID WASTE RULES.	ACTION
745-27-19	D(2)	SANITARY LANDFILL OPERATIONS - CONSTRUCTION COMPLIANCE	REQUIRES THE OWNER/OPERATOR TO IMPLEMENT MEASURES TO ATTAIN COMPLIANCE WITH REQUIREMENTS OF THESE RULES IN THE EVENT THAT TESTING INDICATES THAT A COMPONENT OR PORTION OF THE LANDFILL HAVE NOT BEEN CONSTRUCTED IN ACCORDANCE WITH THOSE RULES.	PERTAINS TO "NEW" SOLID WASTE DISPOSAL FACILITIES TO BE CREATED ON-SITE AND EXISTING LANDFILLS THAT WILL BE EXPANDED DURING REMEDIATION. ALSO PERTAINS TO CONSTRUCTION OF FINAL COVER SYSTEMS.	ACTION
745-27-19	H	SANITARY LANDFILL OPERATIONS - FINAL COVER	INCLUDES REQUIREMENTS FOR THE FINAL CAP SYSTEM FOR AREAS AT FINAL ELEVATIONS.	PERTAINS TO NEW SOLID WASTE DISPOSAL FACILITIES TO BE CREATED ON-SITE AND EXISTING LANDFILLS THAT WILL BE EXPANDED DURING REMEDIATION. PORTIONS ALSO MAY PERTAIN TO EXISTING AREAS OF CONTAMINATION THAT WILL BE CAPPED IN-PLACE PER SOLID WASTE RULES.	ACTION
45-27-19	J	SANITARY LANDFILL OPERATIONS - SURFACE WATER MGMNT.	SURFACE WATER MUST BE DIVERTED FROM AREAS WHERE SOLID WASTE IS BEING, OR HAS BEEN, DEPOSITED. ALSO REQUIRES RUN-ON AND RUN-OFF TO BE CONTROLLED TO MINIMIZE INFILTRATION THROUGH THE COVER MATERIALS AND TO MINIMIZE EROSION OF THE CAP SYSTEM.	PERTAINS TO NEW SOLID WASTE DISPOSAL FACILITIES TO BE CREATED ON-SITE AND EXISTING LANDFILLS THAT WILL BE EXPANDED DURING REMEDIATION. PORTIONS ALSO MAY PERTAIN TO EXISTING AREAS OF CONTAMINATION THAT WILL BE CAPPED IN-PLACE PER SOLID WASTE RULES.	ACTION
45-27-19	K	SANITARY LANDFILL OPERATIONS - LEACHATE MANAGEMENT	REQUIRES REPAIR OF LEACHATE OUTBREAKS; COLLECTION AND TREATMENT OF LEACHATE ON THE SURFACE OF THE LANDFILL; AND ACTIONS TO MINIMIZE, CONTROL OR ELIMINATE CONDITIONS CAUSING LEACHATE OUTBREAKS.	PERTAINS TO NEW SOLID WASTE DISPOSAL FACILITIES TO BE CREATED ON-SITE AND EXISTING LANDFILLS THAT WILL BE EXPANDED DURING REMEDIATION. PORTIONS ALSO MAY PERTAIN TO EXISTING AREAS OF CONTAMINATION THAT WILL BE CAPPED IN-PLACE PER SOLID WASTE RULES.	ACTION
45-27-20		SANITARY LANDFILLS - PROHIBITIONS AND CLOSURE	SPECIFIES CERTAIN OPERATIONAL AND LOCATION STANDARDS FOR LANDFILLS ACCEPTING WASTE AFTER JUNE 1, 1994. ALSO REQUIRES CLOSURE OF EXISTING UNITS WHICH DO NOT MEET THOSE STANDARDS BY OCTOBER 6, 1996.	PERTAINS TO NEW SOLID WASTE DISPOSAL FACILITIES TO BE CREATED ON-SITE AND EXISTING LANDFILLS THAT WILL BE EXPANDED DURING REMEDIATION. PORTIONS	ACTION
15-31-05		WATER/AIR PERMIT CRITERIA FOR DECISION BY THE DIRECTOR	A PERMIT TO INSTALL (PTI) OR PLANS MUST DEMONSTRATE BEST AVAILABLE TECHNOLOGY (BAT) AND SHALL NOT INTERFER WITH OR PREVENT THE ATTAINMENT OR MAINTENANCE OF APPLICABLE AMBIENT AIR QUALITY STANDARDS.	PERTAINS TO ANY SITE THAT WILL DISHARGE TO ON-SITE SURFACE WATER OR WILL EMIT CONTAMINANTS INTO THE AIR.	ACTION
15-32-05		WATER QUALITY CRITERIA FOR DECISION BY THE DIRECTOR	SPECIFIES SUBSTANTIVE CRITERIA FOR SECTION 401 WATER QUALITY CRITERIA FOR DREDGING, FILLING, OBSTRUCTIONG OR ALTERING WATERS OF THE STATE.	PERTAINS TO ANY SITE THAT HAS OR WILL AFFECT WATERS OF THE STATE.	ACTION

ADMINIS. CODE SECTION	PERTINENT PARAGRAPH	TITLE OR SUBJECT OF REGULATION	DESCRIPTION OF REGULATION	APPLICATION OF REGULATION	ARAR TYPE
			CALCULATIONS, PLAN DRAWINGS.	EXISTING AREAS OF CONTAMINATION THAT ARE CAPPED PER SOLID WASTE RULES . THIS RULE ESTABLISHES THE MINIMUM INFORMATION REQUIRED DURING THE REMEDIAL DESIGN STAGE.	
45-27-07	A,B	LOCATION CRITERIA FOR SOLID WASTE DISPOSAL PERMIT	SPECIFIES LOCATIONS IN WHICH SOLID WASTE LANDFILLS ARE NOT TO BE SITED. INCLUDES FLOODPLAINS, SAND OR GRAVEL PITS, LIMESTONE OR SANDSTONE QUARRIES, AREAS ABOVE SOLE SOURCE AQUIFERS, WETLANDS, ETC.	THIS RULE PREVENTS THE ESTABLISHMENT OF NEW SOLID WASTE LANDFILLS AND EXPANSIONS OF EXISTING SOLID WASTE LANDFILLS IN CERTAIN UNFAVORABLE LOCATIONS. ALSO MAY PROHIBIT THE LEAVING OF WASTE IN-PLACE IN CERTAIN UNFAVORABLE LOCATIONS.	LOCATION
45-27-07	D,F,G,H	ADDITIONAL CRITERIA FOR SANITARY LANDFILL APPROVAL	ADDITIONAL SITING REQUIREMTNS WITH RESPECT TO GEOLOGY, WATER SUPPLIES, OCCUPIED PROPERTIES, PARKLANDS AND MINE SUBSIDENCE AREAS. GOVERNS EXPANSION OF EXISTING SITES	PERTAINS TO NEW SANITARY LANDFILLS FOR SOLID WASTE DISPOSAL AND EXPANSIONS OF EXISTING FACILITIES	LOCATION ACTION
45-27-08	C,D-H	CONSTRUCTION SPECIFICATIONS FOR SANITARY LANDFILLS	SPECIFIES THE MINIMUM REQUIREMENTS FOR THE SOIL/CLAY LAYERS, GRANULAR DRAINAGE LAYER, GEOSYNTHETICS, LEACHATE MANAGEMENT SYSTEM, GAS MONITORING SYSTEM, ETC. ALSO ESTABLISHES CONSTRUCTION REQUIREMENTS FOR FACILITIES TO BE LOCATED IN GEOLOGICALLY UNFAVORABLE AREAS.	PERTAINS TO ANY NEW SOLID WASTE DISPOSAL FACILITY CREATED ON-SITE AND ANY EXPANSIONS TO EXISTING SOLID WASTE LANDFILLS. PORTIONS ALSO PERTAIN TO AREAS OF CONTAMINATION THAT ARE CAPPED PER SOLID WASTE RULES. MAY SERVE AS SITING CRITERIA.	ACTION
45-27-10	B,C,D	SANITARY LANDFILL - GROUND WATER MONITORING	GROUND WATER MONITORING PROGRAM MUST BE ESTABLISHED FOR ALL SANITARY LANDFILL FACILITIES. THE SYSTEM MUST CONSIST OF A SUFFICIENT NUMBER OF WELLS THAT ARE LOCATED SO THAT SAMPLES INDICATE BOTH UPGRADIENT (BACKGROUND) AND DOWNGRADIENT WATER SAMPLES. THE SYSTEM MUST BE DESIGNED PER THE MINIMUM REQUIREMENTS SPECIFIED IN THIS RULE. THE SAMPLING AND ANALYSIS PROCEDURES USED MUST COMPLY WITH THIS RULE.	PERTAINS TO ANY NEW SOLID WASTE FACILITY AND ANY EXPANSIONS OF EXISTING SOLID WASTE LANDFILLS ON-SITE. ALSO MAY PERTAIN TO EXISTING AREAS OF CONTAMINATION THAT ARE CAPPED IN-PLACE PER THE SOLID WASTE RULES.	ACTION
45-27-11	B,G	FINAL CLOSURE OF SANITARY LANDFILL FACILITIES	REQUIRES CLOSURE OF A LANDFILL IN A MANNER WHICH MINIMIZES THE NEED FOR POST-CLOSURE MAINTENANCE AND MINIMIZES POST-CLOSURE FORMATION AND RELEASE OF LEACHATE AND EXPLOSIVE GASES TO AIR, SOIL GROUND WATER OR SURFACE WATER. SPECIFIES ACCEPTABLE CAP DESIGN; SOIL BARRIER LAYER, GRANULAR DRAINAGE LAYER, SOIL AND VEGETATIVE LAYER. PROVIDES FOR USE OF COMPARABLE MATERIALS TO THOSE SPECIFIED WITH APPROVAL OF DIRECTOR.	SUBSTANTIVE REQUIREMENTS PERTAIN TO ANY NEW SOLID WASTE LANDFILLS CREATED ON-SITE, ANY EXPANSIONS OF EXISTING SOLID WASTE LANDFILLS ON-SITE AND ANY EXISTING AREAS OF CONTAMINATION THAT ARE CAPPED IN-PLACE PER THE SOLID WASTE RULES.	ACTION
45-27-12	A,B,D,E,MN	SANITARY LANDFILL - EXPLOSIVE GAS MONITORING	ESTABLISHES WHEN AN EXPLOSIVE GAS MONITORING PLAN IS REQUIRED FOR SOLID WASTE LANDFILLS. SPECIFIES THE MINIMUM INFORMATION REQUIRED IN SUCH A PLAN, INCLUDING DETAILED ENGINEERING PLANS, SPECIFICATIONS, INFORMATION ON GAS GENERATION POTENTIAL, SAMPLING AND MONITORING PROCEDURES, ETC. MANDATES WHEN REPAIRS MUST BE MADE TO AN EXPLOSIVE GAS MONITORING SYSTEM. THIS RULE ONLY APPLIES TO LADFILLS WHICH RECEIVED "PUTRESCIBLE" SOLID WASTES.	PERTAINS TO ANY SITE WHICH HAS HAD OR WILL HAVE PUTRESCIBLE SOLID WASTES PLACED ON-SITE AND WHICH HAS A RESIDENCE OR OTHER OCCUPIED STRUCTURE LOCATED WITHIN 1000 FEET OF THE EMPLACED SOLID WASTE.	ACTION LOCATION
45-27-12	I, J	EXPLOSIVE GAS MONITORING FOR SANITARY LANDFILLS	IDENTIFIES PARAMETERS AND SCHEDULE FOR EXPLOSIVE GAS MONITORING	PERTAINS TO ANY DISPOSAL SITE WHERE EXPLOSIVE GAS GENERATION AND MIGRATION MAY BE A THREAT.	ACTION CHEMICAL
45-27-13	C	DISTURBANCES WHERE HAZ OR SOLID WASTE FAC WAS OPERATED	REQUIRES THAT A DETAILED PLAN BE PROVIDED TO DESCRIBE HOW ANY PROPOSED FILLING, GRADING, EXCAVATING, BUILDING, DRILLING OR MINING ON LAND WHERE A HAZARDOUS WASTE FACILITY OR SOLID WASTE FACILITY WAS OPERATED WILL BE ACCOMPLISHED. THIS INFORMATION MUST DEMONSTRATE THAT THE PROPOSED ACTIVITIES WILL NOT CREATE A NUISANCE OR ADVERSELY AFFECT THE PUBLIC HEALTH OR THE ENVIRONMENT L TERMS TO CONDUCT SUCH ACTIVITIES MAY BE IMPOSED L RECTOR TO PROTECT THE	PERTAINS TO ANY SITE AT WHICH HAZARDOUS OR SOLID WASTE HAS BEEN MANAGED, EITHER INTENTIONALLY OR OTHERWISE. DOES NOT PERTAIN TO AREAS THAT HAVE HAD ONE-TIME LEAKS OR SPILLS.	ACTION LOCATION

SITE NAME COUNTY NAME

ADMINIS. CODE SECTION	PERTINENT PARAGRAPH	TITLE OR SUBJECT OF REGULATION	DESCRIPTION OF REGULATION	APPLICATION OF REGULATION	ARAR TYPE
1746-17-02	A,B,C	PARTICULATE AMBIENT AIR QUALITY STANDARDS	ESTABLISHES SPECIFIC STANDARDS FOR TOTAL SUSPENDED PARTICULATES.	PERTAINS TO ANY SITE THAT MAY EMIT MEASURABLE QUANTITIES OF PARTICULATE MATTER (BOTH STACK AND FUGITIVE). CONSIDER FOR SITES THAT WILL UNDERGO EXCAVATION, DEMOLITION, CAP INSTALLATION, CLEARING AND GRUBBING, INCINERATION AND WASTE FUEL RECOVERY.	CHEMICAL
1746-17-05		PARTICULATE NON-DEGRADATION POLICY	DEGRADATION OF AIR QUALITY IN ANY AREA WHERE AIR QUALITY IS BETTER THAN REQUIRED BY 3746-17-02 IS PROHIBITED	PERTAINS TO SITES IN CERTAIN LOCATIONS THAT MAY EMIT OR ALLOW THE ESCAPE OF PARTICULATES (BOTH STACK AND FUGITIVE). CONSIDER FOR SITES THAT WILL UNDERGO EXCAVATION, DEMOLITION, CAP INSTALLATION, CLEARING AND GRUBBING, INCINERATION.	CHEMICAL LOCATION
746-17-07	A-D	VISIBLE PARTICULATE EMISSION CONTROL	SPECIFIES THE ALLOWABLE OPACITY FOR PARTICULATE EMISSIONS; PROVIDES EXCEPTIONS FOR UNCOMBINED WATER, START-UP/SHUTDOWN OF FUEL BURNING EQUIPMENT, MALFUNCTIONS.	PERTAINS TO ANY EMISSION OF PARTICULATE FROM A STACK. CONSIDER FOR INCINERATION AND FUEL BURNING.	CHEMICAL
746-17-08	A1,A2,B,D	EMISSION RESTRICTIONS FOR FUGITIVE DUST	ALL EMISSIONS OF FUGITIVE DUST SHALL BE CONTROLLED.	PERTAINS TO SITES WHICH MAY HAVE FUGITIVE EMISSIONS (NON-STACK) OF DUST. CONSIDER FOR SITES THAT WILL UNDERGO GRADING, LOADING OPERATIONS, DEMOLITION, CLEARING AND GRUBBING AND CONSTRUCTION.	ACTION
746-21-02	A,B,C	AMBIENT AIR QUALITY STANDARDS AND GUIDELINES	ESTABLISHES SPECIFIC AIR QUALITY STANDARDS FOR CARBON MONOXIDE, OZONE AND AND NON-METHANE HYDROCARBONS	PERTAINS TO ANY SITE WHICH WILL EMIT CARBON OXIDES, OZONE OR NON-METHANE HYDROCARBONS. CONSIDER FOR SITES THAT WILL UNDERGO WATER TREATMENT, INCINERATION AND FUEL BURNING (WASTE FUEL RECOVERY)	CHEMICAL ACTION
746-21-03	B,C,D	METHODS OF AMBIENT AIR QUALITY MEASUREMENT	SPECIFIES MEASUREMENT METHODS TO DETERMINE AMBIENT AIR QUALITY FOR THE FOLLOWING CONSTITUENTS: CARBON MONOXIDE, OZONE AND NON-METHANE HYDROCARBONS.	PERTAINS TO ANY SITE WHICH WILL EMIT CARBON MONOXIDE, OZONE OR NON-METHANE HYDROCARBONS. CONSIDER FOR FOR SITES WHERE TREATMENT SYSTEMS WILL RESULT IN AIR EMISSIONS.	CHEMICAL ACTION
746-21-05		NON-DEGRADATION POLICY	PROHIBITS SIGNIFICANT AND AVOIDABLE DETERIORATION OF AIR QUALITY.	PERTAINS TO ANY SITE WHICH WILL EMIT CARBON OXIDES, CARBON OXIDES, AND NON-METHANE HYDROCARBONS. CONSIDER FOR SITES THAT WILL UNDERGO WATER TREATMENT, INCINERATION AND FUEL BURNING (WASTE FUEL RECOVERY).	ACTION
746-21-07	A,B,G,I,J	ORGANIC MATERIALS EMISSION CONTROL: STATIONARY SOURCES	REQUIRES CONTROL OF EMISSIONS OF ORGANIC MATERIALS FROM STATIONARY SOURCES. REQUIRES BEST AVAILABLE TECHNOLOGY.	PERTAINS TO ANY SITE WHICH IS EMITTING OR WILL EMIT ORGANIC MATERIAL. CONSIDER FOR SITES THAT WILL UNDERGO WATER TREATMENT (AIR STRIPPING), INCINERATION AND FUEL BURNING (WASTE FUEL RECOVERY).	ACTION CHEMICAL
746-21-09		VOC EMISSIONS CONTROL: STATIONARY SOURCES	ESTABLISHES LIMITATIONS FOR EMISSIONS OF VOLATILE ORGANIC COMPOUNDS FROM STATIONARY SOURCES.		ACTION
46-26-03		EMISSION CONTROL ACTION PROGRAMS	REQUIRES PREPARATION FOR AIR POLLUTION ALERTS, WARNINGS AND EMERGENCIES.	PERTAINS TO ANY SITE WHICH IS EMITTING OR MAY EMIT AIR CONTAMINANTS.	ACTION
46-27-05	A,B,C	AUTHORIZED, LIMITED & PROHIBITED SOLID WASTE DISPOSAL	ESTABLISHES ALLOWABLE METHODS OF SOLID WASTE DISPOSAL; SANITARY LANDFILL, INCINERATION, COMPOSTING. PROHIBITS MANAGEMENT BY OPEN BURNING AND OPEN DUMPING.	PERTAINS TO ANY SITE AT WHICH SOLID WASTES WILL BE MANAGED. PROHIBITS MANAGEMENT BY OPEN BURNING AND OPEN DUMPING.	ACTION
46-27-06	B,C	REQUIRED TECHNICAL INFORMATION FOR SANITARY LANDFILLS	SPECIFIES THE MINIMUM TECHNICAL INFORMATION REQUIRED OF A SOLID WASTE PERMIT TO INSTALL. INCLUDED ARE A HYDROGEOLOGIC INVESTIGATION REPORT, LEACHATE PRODUCTION AND MIGRATION INFORMATION, SURFACE WATER DISCHARGE INFORMATION, DESIGN	THIS PARAGRAPH PRESENTS SUBSTANTIVE REQUIREMENTS OF A SOLID WASTE PERMIT TO INSTALL. PERTAINS TO ANY NEW SOLID WASTE DISPOSAL FACILITY CREATED ON-SITE AND EXPANSIONS OF EXISTING SOLID WASTE LANDFILLS . ALSO PERTAINS TO	ACTION

SITE NAME COUNTY NAME

REVISED FK LANDFILL

ADMINIS. CODE SECTION	PERTINENT PARAGRAPH	TITLE OR SUBJECT OF REGULATION	DESCRIPTION OF REGULATION	APPLICATION OF REGULATION	ARAR TYPE
1501-18-1	03, A	LIST OF ENDANGERED PLANT SPECIES	PLANT SPECIES CONSIDERED ENDANGERED IN OHIO	May apply at remediation sites where chemical release threatens listed species. Should also be considered where remediation activities may disrupt habitats.	
1501:31-23-	01, A-B	LIST OF ENDANGERED ANIMAL SPECIES	List of Ohio animal species considered endangered.	May apply to remdiation sites where listed species are threatened by chemical releases. May also apply at sites where remediation could disturb existing habitiats.	
3745-1-03		ANALYTICAL AND COLLECTION PROCEDURES	SPECIFIES ANALYTICAL METHODS AND COLLECTION PROCEDURES FOR SURFACE WATER DISCHARGES.	PERTAINS TO BOTH DISCHARGES TO SURFACE WATERS AS A RESULT OF REMEDIATION AND ANY ON-SITE SURFACE WATERS AFFECTED BY SITE CONDITIONS.	ACTION
3745-1-04	A,,B,C,D,E	THE "FIVE FREEDOMS" FOR SURFACE WATER	ALL SURFACE WATERS OF THE STATE SHALL BE FREE FROM: A) OBJECTIONAL SUSPENDED SOLIDS. B)FLOATING DEBRIS, OIL AND SCUM. C) MATERIALS THAT CREATE A NUISANCE. D) TOXIC, HARMFUL OR LETHAL SUBSTANCES. E) NUTRIENTS THAT CREATE NUISANCE GROWTH	PERTAINS TO BOTH DISCHARGES TO SURFACE WATERS AS A RESULT OF REMEDIATION AND ANY ON-SITE SURFACE WATERS AFFECTED BY SITE CONDITIONS.	CHEMICAL
3745-1-05	A,B,C	ANTIDEGRADATION POLICY FOR SURFACE WATER	PREVENTS DEGRADATION OF SURFACE WATER QUALITY BELOW DESIGNATED USE OR EXISTING WATER QUALITY. EXISTING INSTREAM USES SHALL BE MAINTAINED AND PROTECTED. THE MOST STRINGENT CONTROLS FOR TREATMENT SHALL BE REQUIRED BY THE DIRECTOR TO BE EMPLOYED FOR ALL NEW AND EXISTING POINT SOURCE DISCHARGES. PREVENTS ANY DEGRADATION OF "STATE RESOURCE WATERS".	REQUIRES THAT BEST AVAILABLE TECHNOLOGY (BAT) BE USED TO TREAT SURFACE WATER DISHARGES. DWQPA USES THIS RULE TO SET STANDARDS WHEN EXISTING WATER QUALITY IS BETTER THAN THE DESIGNATED USE.	CHEMICAL
3745-1-06	A,B	MIXING ZONES FOR SURFACE WATER	(A) PRESENTS THE CRITERIA FOR ESTABLISHING NON-THERMAL MIXING ZONES FOR POINT SOURCE DISCHARGES (B) PRESENTS THE CRITERIA FOR ESTABLISHING THERMAL MIXING ZONES FOR POINT SOURCE DISCHARGES	APPLIED AS A TERM OF DISCHARGE PERMIT TO INSTALL (PTI). WOULD PERTAIN TO AN ALTERNATIVE WHICH RESULTED IN A POINT SOURCE DISCHARGE.	CHEMICAL
3745-1-07	C	WATER QUALITY CRITERIA	ESTABLISHES WATER QUALITY CRITERIA FOR POLLUTANTS WHICH DO NOT HAVE SPECIFIC NUMERICAL OR NARRATIVE CRITERIA IDENTIFIED IN TABLES 7-1 THROUGH 7-15 OF THIS RULE.	PERTAINS TO BOTH DISCHARGES TO SURFACE WATERS AS A RESULT OF REMEDIAL ACTION AND ANY SURFACE WATERS AFFECTED BY SITE CONDITIONS.	CHEMICAL ACTION
3745-1-09		WATER USE DES FOR SCIOTO RIVER	ESTABLISHES WATER USE DESIGNATIONS FOR STREAM SEGMENTS WITHIN THE SCIOTO RIVER BASIN. SEEP COLLECTION SYSTEM DISCHARGE IS GOVERNED BY NPDES PERMIT NO. 01000000*ED (OUTFALL 010000006B), WHICH HAS THE FOLLOWING DISCHARGE LIMITATIONS: ZINC, TOTAL: MONITOR FLOW RATE: MONITOR pH: MONITOR 1,2-TRANS-DICHLOROETHYLENE: 26 MICROGRAMS / L (30 DAY) 66 MICROGRAMS / L (DAILY)	PERTINENT IF STREAM OR STREAM SEGMENT IS ON-SITE AND IS EITHER AFFECTED BY SITE CONDITIONS OF IF REMEDY INCLUDES DIRECT DISCHARGE. USED BY DWQPA TO ESTABLISH WASTE LOAD ALLOCATIONS.	ACTION LOCATION
3745-15-07	A	AIR POLLUTION NUISANCES PROHIBITED	DEFINES AIR POLLUTION NUISANCE AS AS THE EMISSION OR ESCAPE INTO THE AIR FROM ANY SOURCE(S) OF SMOKE, ASHES, DUST, DIRT, GRIME, ACIDS, FUMES, GASES, VAPORS, ODORS AND COMBINATIONS OF THE ABOVE THAT ENDANGER HEALTH, SAFETY OR WELFARE OF THE PUBLIC OR CAUSE PERSONAL INJURY OR PROPERTY DAMAGE. SUCH NUISANCES ARE PROHIBITED.	PERTAINS TO ANY SITE WHICH CAUSES, OR MAY REASONABLY CAUSE, AIR POLLUTION NUISANCES. CONSIDER FOR SITES THAT WILL UNDERGO EXCAVATION, DEMOLISION, CAP INSTALLATION, METHANE PRODUCTION, CLEARING AND GRUBBING, WATER TREATMENT, INCINERATION AND WASTE FUEL RECOVERY.	ACTION

Federal ARARs and TBCs for Peter Kiewet Landfill at PORTS			
Citation	**Requirement**	**Applicable (A) or Relevant and Appropriate (RA) or To Be Considered (TBC) Designation**	**Rationale**
RCRA Corrective Action Plan OSWER Directive No. 9902.3-2A	Guidance from EPA on conducting RCRA corrective actions.	TBC	The RCRA Corrective Action Plan guidance is to be considered for the Peter Kiewet Landfill remedial action.

Federal ARARs and TBCs for Peter Kiewet Landfill at PORTS			
Citation	**Requirement**	**Applicable (A) or Relevant and Appropriate (RA) or To Be Considered (TBC) Designation**	**Rationale**
Noise Control Act, as amended 42 U.S.C. 4901, et seq. Noise Pollution and Abatement Act 42 U.S.C. 7641	The public must be protected from noises that jeopardize health and welfare.	A	Because equipment and vehicles would be involved in certain aspects of the remedial action at Peter Kiewet Landfill, all substantive requirements of the act are applicable.
RCRA Corrective Actions under Sections 3004(u), 3005(c)(3), 3008(h), and 7003	Federal statutory requirements for RCRA corrective actions.	RA	RCRA corrective action provisions are relevant and appropriate to CERCLA actions involving RCRA sites.
DOE Order 5400.5	DOE orders relating to radiation dose limit, as low as reasonably achievable policy, control of residual radioactive material, management and control of radioactive materials in liquid discharges, radiation protection of public and the environment, and derived concentration guides for radionuclides contain criteria and guidelines to be considered for the management of radioactive materials.	TBC	Management of any materials at the Peter Kiewet Landfill that are contaminated with radioactive compounds should consider the criteria and guidelines established in this DOE order.
Management of Low Level Radioactive Waste DOE Order 5828.2A	DOE order relating to the management of low level radioactive waste.	TBC	Management of any materials that may be considered low level radioactive waste should consider the criteria and guidelines established in this DOE order.
RCRA Corrective Action Proposed Regulations 40 CFR 264 Subpart S	Proposed regulations for implementing RCRA corrective actions.	TBC	The proposed Subpart S regulations pertaining to RCRA corrective actions are to be considered for the Peter Kiewet Landfill remedial action.

Federal ARARs and TBCs for Peter Kiewet Landfill at PORTS			
Citation	**Requirement**	**Applicable (A) or Relevant and Appropriate (RA) or To Be Considered (TBC) Designation**	**Rationale**
DOE Compliance with Floodplain/Wetlands Environmental Review Requirements 10 CFR 1022.3(a), (b)(1), (2), (3), (5), (6), (c), (d), (e), 1022.5(b), (h), and 1022.11(a), (b), ©	DOE shall exercise leadership and take action in regard to floodplains/wetlands to avoid adverse impacts, incorporate floodplain management goals and wetland protection consideration into its planning, regulatory, and decision -making process, take appropriate steps to make floodplain determinations.	A	DOE must consider floodplain and wetland areas located within or affected by the Peter Kiewet Landfill remedial action.
Preparing and Transporting Hazardous Waste Off-site RCRA 40 CFR 262.20 through .23, .30 and .33 Subparts B and C	General Requirements for transporting hazardous waste for off-site disposal require a manifest. Pre-transporting requirements include appropriate packaging, labeling, marking, and placarding.	A	Any residues determined to be a RCRA hazardous waste destined for off-site disposal are subject to manifest requirements.
Land Disposal Restrictions RCRA 40 CFR 268.40 through .44 Subpart D	Restricted hazardous waste follow land disposal restriction regulations before being disposed of on land.	A	This requirement is applicable to disposal, on-site or off-site, of restricted RCRA hazardous waste.
Best Management Practices Program (BMP) Clean Water Act 40 CFR 125.104 Subpart K	BMP programs shall be developed in accordance with good engineering practices and (1) be documented in a narrative form, including necessary plot plans, drawings, and maps (2) establish specific objectives for the control of toxic and hazardous pollutants, and (3) establish specific best management practices to meet the specific objectives for control of toxic and hazardous pollutants to the waters of the United States.	A	The substantive portions of this regulation apply to the remedial action to be taken at Peter Kiewet Landfill.

Federal ARARs and TBCs for Peter Kiewet Landfill at PORTS			
Citation	**Requirement**	**Applicable (A) or Relevant and Appropriate (RA) or To Be Considered (TBC) Designation**	**Rationale**
National Historic Preservation Act 16 U.S.C. 470C Consideration of Historic Properties 36 CFR Part 800	DOE must take into account the effect of an undertaking on Historic Properties and accord the Advisory Council on Historic Preservation a reasonable opportunity to comment. Historic properties are defined as any prehistoric or historic district, building, site, structure, or object included in or eligible for inclusion in, the National Register of Historic Places. This term includes artifacts, records, and persons released to and located within such properties. Historic properties that are to be substantially altered or demolished must be recorded for future use and reference.	A	DOE has conducted appropriate consultation with the SHPO.
Archaeological and Historic Preservation Act 16 U.S.C. 469, 470	Upon discovery that a project may cause the irreparable loss, destruction, significant scientific finding, prehistorical finding, or loss of historical or archeological data, DOE must notify the Department of Interior in writing and provide appropriate information concerning the project. DOE must, with possible assistance from SHPO, undertake recovery, protection, and preservation of the data.	A	DOE has and will continue to consult, as appropriate, with the SHPO.
Procedure for Implementing NEPA 40 CFR 6.302(a) Executive Order 11990	Federal Agencies conducting certain activities must avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands when a practicable alternative exists.	A	DOE must consider and protect wetlands associated with the area near the Peter Landfill.
Procedures for Implementing NEPA 40 CFR 6.302(b) Executive Order 11988	Federal agencies must evaluate the potential effects of actions they may take in a floodplain to avoid, to the extent possible, adverse effects with direct or indirect development of a floodplain.	A	DOE must consider floodplain areas located within or affected by the Peter Kiewet Landfill remedial action.

APPENDIX C

LIST OF FEDERAL AND STATE ARARs

AR Doc. No. Catalog No.	Internal Doc. No. Revision	Document Title	Date Pages	Originator From	Recipient To	Location Document Type
1-20-05/81.001 1377		Description: Ohio EPA Comments on the Peter Kiewit Landfill CAS/CMS Report	10/20/94 3	OEPA Rochotte	USDOE Gillespie	PORTS AR Comments
1-20-28/55.001 1383	EF-21-6385	Notice of Intent Form (NOI) for Stormwater General Permit - Department of Energy (DOE) - Portsmouth Gaseous Diffusion Plant (PORTS) - Peter Kiewit Landfill Interim Remedial Measures (IRM) Project	10/26/94 3	USDOE Gillespie	OEPA General NPDES Permits	PORTS AR NOI
1-20-05/81.002 1387		"Peter Kiewit Landfill Draft Cleanup Alternatives" Technical Review Comments Portsmouth Gaseous Diffusion Plant Piketon, Ohio OH7 890 008 983	11/1/94 6	USEPA Averill	USDOE Gillespie	PORTS AR Comments
1-20-05/81.003 1405	EF-21-6431	Response to OEPA Comments on the Draft Peter Kiewit CAS/CMS Report	11/21/94 4	USDOE Gillespie	USEPA, OEPA Averill, Rochotte	PORTS AR Responses
1-20-28/00.005 1418	EF-21-6446	Completion of Construction at Peter Kiewit Landfill IRM	11/30/94 2	USDOE Gillespie	USEPA, OEPA Averill, Rochotte, Welch	PORTS AR Letter
1-20-05/81.004 1420	EF-21-6456	Responses to USEPA Comments Regarding Peter Kiewit Landfill CMS/CAS Report	12/5/94 11	USDOE Gillespie	USEPA, OEPA Averill, Rochotte	PORTS AR Responses
1-20-05/15.003 1500	DOE/OR/12-1295&D2	Peter Kiewit Landfill Draft Cleanup Alternatives Study/Corrective Measures Study Report for the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio	2/10/95 221	SAIC Gillespie	USEPA, OEPA Averill, Rochotte, Welch	PORTS AR Report
1-20-05/81.005 1531		Ohio EPA Approval of the X-705A/B CAS/CMS and Peter Kiewit Landfill CAS/CMS Reports	3/22/95 1	OEPA Rochotte	USDOE Gillespie	PORTS AR Approval
1-20-15/73.001 1558		Description: Public Notice: Portsmouth DOE Public Hearing on Preferred Plan for Peter Kiewit Landfill	4/11/95 1	OEPA	Public	PORTS AR Public Notice
1-20-15/60.001 1548		The Ohio EPA's and the U.S. EPA's Preferred Plan for the Peter Kiewit Landfill U.S. DOE - PORTS Site	4/13/95 72	OEPA Rochotte	Env. Information Center Childers	PORTS AR Preferred Plan

AR Doc. No. Catalog No.	Internal Doc. No. Revision	Document Title	Date Pages	Originator From	Recipient To	Location Document Type
1-20-28/00.001 763		Requirement for Interim Remedial Plan U.S. DOE - Portsmouth OH7 890 008 983	10/18/93 2	USEPA Boyle	USDOE Gillespie	PORTS AR Letter
1-20-28/00.002 875		Remedial Action at the Peter Klewit Landfill	10/25/93 1	OEPA Rochotte	USDOE Gillespie	PORTS AR Letter
1-20-28/05.001 800	0	Interim Measures Plan: Peter Klewit Landfill	11/18/93 83	USDOE Gillespie	USEPA, OEPA Bianchin, Rochotte, Welch	PORTS AR Plan
1-20-28/81.001 1006		Disapproval of Interim Measures Plan for the Peter Klewit Landfill U.S. DOE Portsmouth Gaseous Diffusion Plant OH7 890 008 983	1/31/94 14	USEPA Boyle	USDOE Gillespie	PORTS AR Disapproval/Comments
1-20-28/81.002 1039	EO-23-5885	USEPA Required Revisions to Interim Measures Plan - Request for Extension of Time to Submit	3/2/94 1	USDOE Gillespie	USEPA Averill	PORTS AR Letter
1-20-28/81.003 1077		Ohio EPA Comments on the Peter Klewit Landfill Interim Measures Plan	3/15/94 2	OEPA Rochotte	USDOE Gillespie	PORTS AR Comments
1-20-28/81.004 1055	EO-23-5950	Revisions to Interim Measures Plan - Peter Klewit Landfill	3/28/94 2	USDOE Gillespie	USDOE Averill	PORTS AR Letter
1-20-28/81.005 1161		Approval of Revision to Interim Measures Plan for Peter Klewit Landfill Department of Energy OH7 890 983	3/30/94 1	USEPA Averill	USDOE Gillespie	PORTS AR Approval Letter
1-20-28/81.006 1088	EO-23-6007	Revised Interim Measures Plan - Peter Klewit Landfill	4/14/94 15	USDOE Gillespie	USEPA, OEPA Averill, Rochotte, Welch	PORTS AR Responses
1-20-28/05.002 1089	DOE/OR/11-1262&D2 1	Interim Measures Plan for the Peter Klewit Landfill at the Portsmouth Gaseous Diffusion Plant	4/15/94 116	MMES Gillespie	USEPA, OEPA Averill, Rochotte, Welch	PORTS AR IMP
1-20-28/00.003 1167	EO-23-6060	Peter Klewit (PK) Landfill Interim Remedial Measure Project	5/11/94 2	USDOE Gillespie	US Army Corps. Engineers Adamo	PORTS AR Letter
1-20-28/81.007 1169		Ohio EPA Comments on the Peter Klewit Landfill Interim Remedial Measures Plan	5/13/94 2	OEPA Rochotte	USDOE Gillespie	PORTS AR Comments
1-20-28/81.008 1175		Disapproval of the Interim Measures Plan: Peter Klewit Landfill for the Portsmouth	6/1/94 3	USEPA Averill	USDOE Gillespie	PORTS AR Disapproval/Comments

AR Doc. No. Catalog No.	Internal Doc. No. Revision	Document Title	Date Pages	Originator From	Recipient To	Location Document Type
1-20-05/81.001 1377		Description: Ohio EPA Comments on the Peter Kiewit Landfill CAS/CMS Report	10/20/94 3	OEPA Rochotte	USDOE Gillespie	PORTS AR Comments
1-20-28/55.001 1383	EF-21-6385	Notice of Intent Form (NOI) for Stormwater General Permit - Department of Energy (DOE) - Portsmouth Gaseous Diffusion Plant (PORTS) - Peter Kiewit Landfill Interim Remedial Measures (IRM) Project	10/26/94 3	USDOE Gillespie	OEPA General NPDES Permits	PORTS AR NOI
1-20-05/81.002 1387		"Peter Kiewit Landfill Draft Cleanup Alternatives" Technical Review Comments Portsmouth Gaseous Diffusion Plant Piketon, Ohio OH7 890 008 983	11/1/94 6	USEPA Averill	USDOE Gillespie	PORTS AR Comments
1-20-05/81.003 1405	EF-21-6431	Response to OEPA Comments on the Draft Peter Kiewit CAS/CMS Report	11/21/94 4	USDOE Gillespie	USEPA, OEPA Averill, Rochotte	PORTS AR Responses
1-20-28/00.005 1418	EF-21-6446	Completion of Construction at Peter Kiewit Landfill IRM	11/30/94 2	USDOE Gillespie	USEPA, OEPA Averill, Rochotte, Welch	PORTS AR Letter
1-20-05/81.004 1420	EF-21-6456	Responses to USEPA Comments Regarding Peter Kiewit Landfill CMS/CAS Report	12/5/94 11	USDOE Gillespie	USEPA, OEPA Averill, Rochotte	PORTS AR Responses
1-20-05/15.003 1500	DOE/OR/12-1295&D2	Peter Kiewit Landfill Draft Cleanup Alternatives Study/Corrective Measures Study Report for the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio	2/10/95 221	SAIC Gillespie	USEPA, OEPA Averill, Rochotte, Welch	PORTS AR Report
1-20-05/81.005 1531		Ohio EPA Approval of the X-705A/B CAS/CMS and Peter Kiewit Landfill CAS/CMS Reports	3/22/95 1	OEPA Rochotte	USDOE Gillespie	PORTS AR Approval
1-20-15/73.001 1558		Description: Public Notice: Portsmouth DOE Public Hearing on Preferred Plan for Peter Kiewit Landfill	4/11/95 1	OEPA	Public	PORTS AR Public Notice
1-20-15/60.001 1548		The Ohio EPA's and the U.S. EPA's Preferred Plan for the Peter Kiewit Landfill U.S. DOE - PORTS Site	4/13/95 72	OEPA Rochotte	Env. Information Center Childers	PORTS AR Preferred Plan

AR Doc. No: Catalog No.	Internal Doc. No. Revision	Document Title	Date Pages	Originator From	Recipient To	Location Document Type
1-20-15/75.001 1586		Description: Ohio EPA's and U.S. EPA's Meeting Regarding Preferred Plans for DOE PORTS Peter Kiewit Landfill	4/18/95 10	OEPA	Public	PORTS AR Public Meeting
1-20-15/81.001 1566	EF-21-6802	Comments Regarding the USEPA and OEPA Preferred Plan Remediation of Contamination at the Peter Kiewit Landfill	5/10/95 5	USDOE Gillespie	USEPA, OEPA Averill, Rochotte	PORTS AR Comments
1-20-28/72.001 1573	PORTS/ER/CR0018	Peter Kiewit Landfill Interim Remedial Measures	5/18/95 2	SAIC	Public	PORTS AR Fact Sheet
1-20-28/00.006 1617	EF-21-6855	Maintenance Requirements for the Peter Kiewit Landfill Interim Remedial Measure	5/31/95 3	USDOE Gillespie	OEPA Rochotte	PORTS AR Letter
1-20-28/81.013 1720		Ohio EPA Approval of the Maintenance Construction Plan at the Peter Kiewit Landfill	7/13/95 1	OEPA Rochotte	USDOE Gillespie	PORTS AR Approval
1-20-05/81.006 1785		Ohio EPA Approval of the X-705 and Peter Kiewit Landfill Corrective Measures Study Reports	8/8/95 1	OEPA Rochotte	USDOE Gillespie	PORTS AR Approval
1-20-05/81.007 1823		Description: USEPA Approval of Revised Peter Kiewit Landfill CAS/CMS Report	9/14/95 1	USEPA Averill	USDOE Gillespie	PORTS AR Approval

Federal ARARs and TBCs for Peter Kiewet Landfill at PORTS			
Citation	**Requirement**	**Applicable (A) or Relevant and Appropriate (RA) or To Be Considered (TBC) Designation**	**Rationale**
National Historic Preservation Act 16 U.S.C. 470C Consideration of Historic Properties 36 CFR Part 800	DOE must take into account the effect of an undertaking on Historic Properties and accord the Advisory Council on Historic Preservation a reasonable opportunity to comment. Historic properties are defined as any prehistoric or historic district, building, site, structure, or object included in or eligible for inclusion in, the National Register of Historic Places. This term includes artifacts, records, and persons released to and located within such properties. Historic properties that are to be substantially altered or demolished must be recorded for future use and reference.	A	DOE has conducted appropriate consultation with the SHPO.
Archaeological and Historic Preservation Act 16 U.S.C. 469, 470	Upon discovery that a project may cause the irreparable loss, destruction, significant scientific finding, prehistorical finding, or loss of historical or archeological data, DOE must notify the Department of Interior in writing and provide appropriate information concerning the project. DOE must, with possible assistance from SHPO, undertake recovery, protection, and preservation of the data.	A	DOE has and will continue to consult, as appropriate, with the SHPO.
Procedure for Implementing NEPA 40 CFR 6.302(a) Executive Order 11990	Federal Agencies conducting certain activities must avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands when a practicable alternative exists.	A	DOE must consider and protect wetlands associated with the area near the Peter Landfill.
Procedures for Implementing NEPA 40 CFR 6.302(b) Executive Order 11988	Federal agencies must evaluate the potential effects of actions they may take in a floodplain to avoid, to the extent possible, adverse effects with direct or indirect development of a floodplain.	A	DOE must consider floodplain areas located within or affected by the Peter Kiewet Landfill remedial action.

Federal ARARs and TBCs for Peter Kiewet Landfill at PORTS			
Citation	**Requirement**	**Applicable (A) or Relevant and Appropriate (RA) or To Be Considered (TBC) Designation**	**Rationale**
Chemicals in Drinking Water (Solid Waste Disposal Facility) 40 CFR 257.4	A solid waste disposal facility shall not contaminate an underground drinking water source beyond the solid waste boundary (outermost perimeter of the waste). The concentration of chemicals shall not exceed background levels or listed maximum contaminant levels (MCLs), whichever is higher.	RA	Relevant and appropriate because Peter Kiewet Landfill contains several of the chemicals listed in the regulation.
Classification of Solid Waste Disposal Facilities and Practices 40 CFR 257.3-2	Solid waste disposal facilities or practices shall not cause or contribute to the taking of any endangered or threatened species of plants, fish, or wildlife. Solid waste disposal facilities or practices shall not result in the destruction or adverse modification of the critical habitat of endangered or threatened species identified in 50 CFR Part 17.	A	No threatened or endangered species have been identified at PORTS.
Endangered Species Act 16 U.S.C. 1531, et. seq. Endangered and Threatened Wildlife and Plants 50 CFR 17.21, 17.31, 17.61, 17.71, and 17.94 Interagency Cooperation-Endangered Species Act 50 CFR 402.01	All Federal agencies must ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of the constituent elements essential to the conservation of a listed species within a defined critical habitat. Additional requirements apply if it is determined that proposed activity could adversely affect these species or their habitat.	A	No threatened or endangered species have been identified at PORTS.
Archeological Resources Protection Act 16 U.S.C. 47099 Protection of Archaeological Resources 43 CFR 7.4(a)	No person may excavate, remove, damage, or otherwise alter or deface or attempt to excavate, remove, damage, or otherwise alter or deface any archaeological resource located on public lands unless such activity is pursuant to a permit.	A	DOE has conducted appropriate consultation with the State Historical Preservation Officer (SHPO).

APPENDIX C

LIST OF FEDERAL AND STATE ARARs

Figure 4

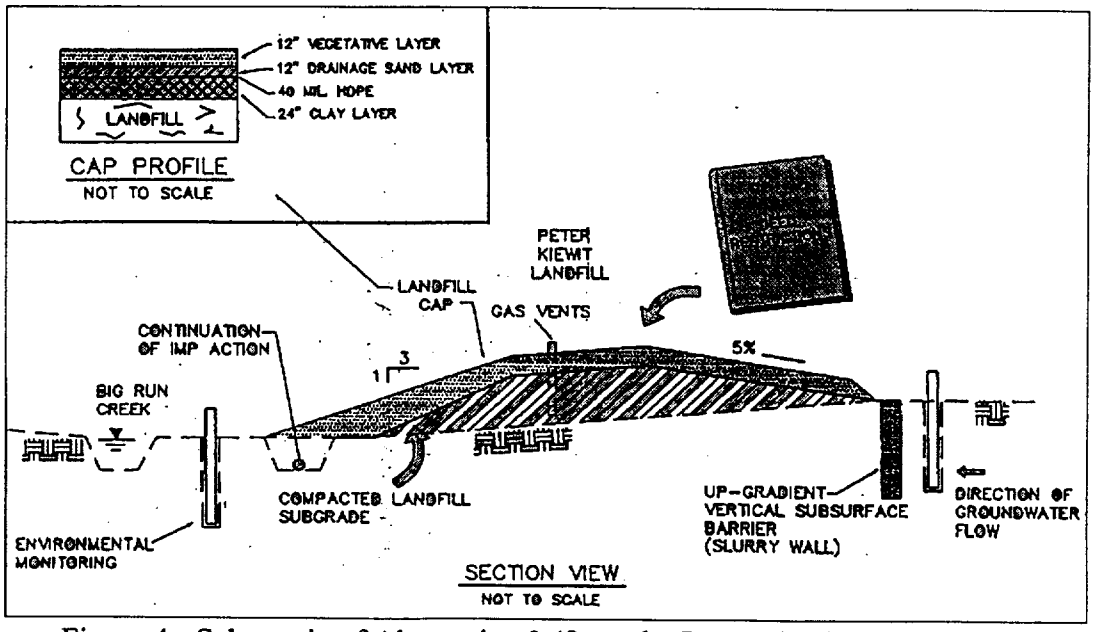

Figure 4 - Schematic of Alternative 3 (from the Peter Kiewit Landfill Draft CAS/CMS Report, Figure 6.10, Page 6-86)

ADMINIS. CODE SECTION	PERTINENT PARAGRAPH	TITLE OR SUBJECT OF REGULATION	DESCRIPTION OF REGULATION	APPLICATION OF REGULATION	ARAR TYPE
3745-50-44	C9	ADD'L PERMIT INFO: HAZ WASTE T/S/D IN MISC UNITS	ESTABLISHES SUBSTANTIVE HAZARDOUS WASTE PERMIT REQUIREMENTS NECESSARY FOR OHIO EPA TO DETERMINE ADEQUACY OF MISCELLANEOUS UNITS USED TO TREAT OR STORE HAZARDOUS WASTE. INCLUDES INFORMATION SUCH AS WASTE CHARACTERISTICS, DETAILED DESIGN PLANS AND REPORTS, CONTROL OF RUN-ON AND RUN-OFF, CLOSURE INFORMATION, ETC.. SEE OAC 3745-57-90 THROUGH 3745-57-93 FOR ADDITIONAL REQUIREMENTS FOR MISCELLANEOUS UNITS.	PERTAINS TO FACILITY/SITE AT WHICH HAZARDOUS WASTE WILL BE STORED, TREATED OR DISPOSED OF IN MISCELLANEOUS UNITS. THIS, ALONG WITH OTHER PARAGRAPHS OF THIS RULE AND OAC 3745-57-90 THROUGH 3745-57-93, ESTABLISHES THE MINIMUM INFORMATION REQUIRED DURING THE REMEDIAL DESIGN STAGE.	ACTION
3745-50-58	E,I,J	HAZARDOUS WASTE FACILITY PERMIT CONDITIONS	ESTABLISHES GENERAL PERMIT CONDITIONS APPLIED TO ALL HAZARDOUS WASTE FACILITIES IN OHIO. INCLUDES CONDITIONS SUCH AS OPERATION AND MAINTENANCE, SITE ACCESS, MONITORING, ETC.	PERTAINS TO ALL ALTERNATIVES THAT WILL INCORPORATE TREATMENT, STORAGE OR DISPOSAL OF HAZARDOUS WASTE.	ACTION
3745-51-07	A,B	RESIDUES OF HAZ WASTES IN EMPTY CONTAINERS	EXEMPTS THE RESIDUES OF HAZARDOUS WASTES FROM EMPTY CONTAINERS FROM THE HAZARDOUS WASTE REGULATIONS. PROVIDES SPECIFIC DEFINITIONS FOR THESE RESIDUES.	PERTAINS TO ANY ALTERNATIVE THAT INCORPORATES STORAGE OF HAZARDOUS WASTE ON-SITE IN CONTAINERS.	ACTION
3745-52-11	A-D	EVALUATION OF WASTES	ANY PERSON GENERATING A WASTE MUST DETERMINE IF THAT WASTE IS A HAZARDOUS WASTE (EITHER THROUGH LISTING OR BY CHARACTERISTIC).	PERTAINS TO SITES AT WHICH WASTES OF ANY TYPE (BOTH SOLID AND HAZARDOUS) ARE LOCATED.	CHEMICAL ACTION
3745-52-34		ACCUMULATION TIME OF HAZARDOUS WASTE	IDENTIFIES MAXIMUM TIME PERIODS THAT A GENERATOR MAY ACCUMULATE A HAZARDOUS WASTE WITHOUT BEING CONSIDERED AN OPERATOR OF A STORAGE FACILITY. ALSO ESTABLISHES STANDARDS FOR MANAGEMENT OF HAZARDOUS WASTES BY GENERATORS.	PERTAINS TO A SITE WHERE HAZARDOUS WASTE WILL BE GENERATED AS A RESULT OF THE REMEDIAL ACTIVITIES.	CHEMICAL ACTION
3745-54-13	A	GENERAL ANALYSIS OF HAZARDOUS WASTE	PRIOR TO ANY TREATMENT, STORAGE OR DISPOSAL OF HAZARDOUS WASTES, A REPRESENTATIVE SAMPLE OF THE WASTE MUST BE CHEMICALLY AND PHYSICALLY ANAYZED.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF).	CHEMICAL
3745-54-14	A,B,C	SECURITY FOR HAZARDOUS WASTE FACILITIES	HAZARDOUS WASTE FACILITIES MUST BE SECURED SO THAT UNAUTHORIZED AND UNKNOWING ENTRY ARE MINIMIZED OR PROHIBITED.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF).	ACTION
3745-54-15	A,C	INSPECTION REQUIREMENTS FOR HAZARDOUS WASTE FACILITIES	HAZARDOUS WASTE FACILITIES MUST BE INSPECTED REGULARLY TO DETECT MALFUNCTIONS, DETERIORATIONS, OPERATIONAL ERRORS AND DISCHARGES. ANY MALFUNCTIONS OR DETERIORATIONS DETECTED SHALL BE REMEDIED EXPEDITIOUSLY.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF).	ACTION
3745-54-17	A,B,C	REQ FOR IGNITABLE,REACTIVE OR INCOMPATABLE HAZ WASTES	PRESENTS GENERAL PRECAUTIONS TO BE TAKEN TO PREVENT ACCIDENTAL IGNITION OR REACTION OF IGNITABLE, REACTIVE OR INCOMPATIBLE WASTES.	PERTAINS TO ANY SITE AT WHICH POTENTIALLY REACTIVE, IGNITABLE OR INCOMPATIBLE WASTES ARE PRESENT.	ACTION LOCATION
3745-54-18	A,B,C	LOCATION STANDARDS FOR HAZARDOUS WASTE T/S/D FACILITIES	RESTRICTS THE SITING OF HAZARDOUS WASTE FACILITIES IN AREAS OF SEISMIC ACTIVITY OR FLOODPLAINS.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF).	LOCATION
3745-54-31		DESIGN & OPERATION OF HAZARDOUS WASTE FACILITIES	HAZARDOUS WASTE FACILITIES MUST BE DESIGNED, CONSTRUCTED, MAINTAINED AND OPERATED TO MINIMIZE THE POSSIBILITY OF FIRE, EXPLOSION OR UNPLANNED RELEASE OF HAZARDOUS WASTE OR HAZARDOUS CONSTITUENTS TO THE AIR, SOIL OR SURFACE WATER WHICH COULD THREATEN HUMAN HEALTH OR THE ENVIRONMENT.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF).	ACTION

SITE NAME COUNTY NAME

ADMINIS. CODE SECTION	PERTINENT PARAGRAPH	TITLE OR SUBJECT OF REGULATION	DESCRIPTION OF REGULATION	APPLICATION OF REGULATION	ARAR TYPE
			ALL HAZARDOUS WASTE FACILITIES MUST BE EQUIPPED WITH EMERGENCY EQUIPMENT, SUCH AS AN ALARM SYSTEM, FIRE CONTROL EQUIPMENT AND A TELEPHONE OR RADIO.		
3745-54-33		TESTING & MAINTENANCE OF EQUIPMENT; HAZ WASTE FACILTIES	ALL HAZARDOUS WASTE FACILITIES MUST TEST AND MAINTAIN EMERGENCY EQUIPMENT TO ASSURE PROPER OPERATION.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF).	ACTION
3745-54-34		ACCESS TO COMMUNICATIONS OR ALARM SYSTEM; HAZ WASTE FAC	WHENEVER HAZARDOUS WASTE IS BEING HANDLED, ALL PERSONNEL INVOLVED SHALL HAVE IMMEDIATE ACCESS TO AN INTERNAL ALARM OR EMERGENCY COMMUNICATION DEVICE.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF).	ACTION
3745-54-37	A,B	ARRANGEMENTS/ AGREEMENTS WITH LOCAL AUTHORITIES	ARRANGEMENTS OR AGREEMENTS WITH LOCAL AUTHORITIES, SUCH AS POLICE, FIRE DEPARTMENT AND EMERGENCY RESPONSE TEAMS MUST BE MADE. IF LOCAL AUTHORITIES WILL NOT COOPERATE, DOCUMENTATION OF THAT NON-COOPERATION SHOULD BE PROVIDED.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF).	ACTION
3745-54-52	A-F	CONTENT OF CONTINGENCY PLAN; HAZ WASTE FACILITIES	HAZARDOUS WASTE FACILITIES MUST HAVE A CONTINGENCY PLAN THAT ADDRESSES ANY UNPLANNED RELEASE OF HAZARDOUS WASTES OR HAZARDOUS CONSTIUENTS INTO THE AIR, SOIL OR SURFACE WATER. THIS RULE ESTABLISHES THE MINIMUM REQUIRED INFORMATION OF SUCH A PLAN.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF).	ACTION
3745-54-53	A,B	COPIES OF CONTINGENCY PLAN; HAZARDOUS WASTE FACILITIES	COPIES OF THE CONTINGENCY PLAN REQUIRED BY 3745-54-50 MUST BE MAINTAINED AT THE FACILITY AND SUBMITTED TO ALL LOCAL POLICE DEPARTMENTS, FIRE DEPARTMENTS, HOSPITALS LOCAL EMERGENCY RESPONSE TEAMS AND THE OHIO EPA.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF)	ACTION
3745-54-54	A	AMENDMENT OF CONTINGENCY PLAN; HAZ WASTE FACILITIES	THE CONTINGENCY PLAN MUST BE AMENDED IF IT FAILS IN AN EMERGENCY, THE FACILITY CHANGES (IN ITS DESIGN, CONSTRUCTION, MAINTENANCE OR OPERATION), THE LIST OF EMERGENCY COORDINATORS CHANGE OR THE LIST OF EMERGENCY EQUIPMENT.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF).	ACTION
3745-54-55		EMERGENCY COORDINATOR; HAZARDOUS WASTE FACILITIES	AT ALL TIMES THERE SHOULD BE AT LEAST ONE EMPLOYEE EITHER ON THE PREMISES OR ON CALL TO COORDINATE ALL EMERGENCY REPSONSE MEASURES.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF).	ACTION
3745-54-56	A-I	EMERGENCY PROCEDURES; HAZARDOUS WASTE FACILITIES	SPECIFIES THE PROCEDURES TO BE FOLLOWED IN THE EVENT OF AN EMERGENCY.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN DISPOSED OF)..	ACTION
3745-54-90		GROUND WATER PROTECTION; APPLICABILITY	ESTABLISHES CIRCUMSTANCES UNDER WHICH AN OPERATOR OF A HAZARDOUS WASTE FACILITY MUST IMPLEMENT A GROUND WATER PROTECTION PROGRAM OR A CORRECTIVE ACTION PROGRAM.	PERTAINS TO ALL SITES WITH LAND-BASED HAZARDOUS WASTE UNITS (SURFACE IMPOUNDMENTS, WASTE PILES, LAND TREATMENT UNITS, LANDFILLS). THIS INCLUDES EXISTING LAND-BASED AREAS OF CONTAMINATION.	LOCATION ACTION
3745-54-91	A	REQ GROUND WATER PROGRAMS FOR HAZ WASTE FACILITIES	PRESENTS THE GROUND WATER MONITORING AND RESPONSE PROGRAMS REQUIRED FOR HAZARDOUS WASTE LAND-BASED UNITS.	PERTAINS TO ALL SITES WITH LAND-BASED HAZARDOUS WASTE UNITS (SURFACE IMPOUNDMENTS, WASTE PILES, LAND TREATMENT UNITS, LANDFILLS). THIS INCLUDES EXISTING LAND-BASED AREAS OF CONTAMINATION.	ACTION
3745-54-92		GROUND WATER PROTECTION STANDARD; HAZ WASTE FACILITIES	COMPLIANCE MUST BE ATTAINED WITH THE CONDITIONS SPECIFIED IN THE PERMIT TO ENSURE THAT HAZARDOUS CONSTIUENTS (SEE 3745-54-93) DO NOT EXCEED THE PROMULGATED LIMITS (SEE 3745-54-94).	PERTAINS TO ALL SITES WITH LAND-BASED HAZARDOUS WASTE UNITS (SURFACE IMPOUNDMENTS, WASTE PILES, LAND TREATMENT UNITS, LANDFILLS). THIS INCLUDES EXISTING LAND-BASED AREAS OF CONTAMINATION.	ACTION CHEMICAL

ADMINIS. CODE SECTION	PERTINENT PARAGRAPH	TITLE OR SUBJECT OF REGULATION	DESCRIPTION OF REGULATION	APPLICATION OF REGULATION	ARAR TYPE
			REQUIRES THAT PERMIT SPECIFY HAZARDOUS CONSITIUENTS TO WHICH THE GROUND WATER PROTECTION STANDARD OF 3745-54-92 APPLIES. HAZARDOUS CONSTITUENTS ARE CONSTITUENTS IDENTIFIED IN THE APPENDIX OF THIS RULE THAT HAVE BEEN DETECTED IN GROUND WATER IN THE UPPERMOST AQUIFER UNDERLYING THE UNIT(S) AND ARE REASONABLY EXPECTED TO BE IN OR DERIVED FROM WASTE CONTAINED IN THE UNIT(S).	PERTAINS TO ALL SITES WITH LAND-BASED HAZARDOUS WASTE UNITS (SURFACE IMPOUNDMENTS, WASTE PILES, LAND TREATMENT UNITS, LANDFILLS). THIS INCLUDES EXISTING LAND-BASED AREAS OF CONTAMINATION.	
3745-54-94	A,B	CONCENTRATION LIMITS FOR GROUND WATER; HAZ WASTE FAC	PRESENTS THE METHODOLOGY FOR DETERMINING CONCENTRATION LIMITS AND ALTERNATIVE CONCENTRATION LIMITS.	PERTAINS TO ALL SITES WITH LAND-BASED HAZARDOUS WASTE UNITS (SURFACE IMPOUNDMENTS, WASTE PILES, LAND TREATMENT UNITS, LANDFILLS). THIS INCLUDES EXISTING LAND-BASED AREAS OF CONTAMINATION.	CHEMICAL
3745-54-95	A,B	POINT OF COMPLIANCE FOR GROUND WATER; HAZ WASTE FACIL	ESTABLISHES POINT OF COMPILANCE AT VERTICAL SURFACE LOCATED AT THE HYDRAULICALLY DOWNGRADIENT LIMIT OF THE WASTE MANAGEMENT AREA THAT EXTENDS DOWN INTO THE UPPERMOST AQUIFER UNDERLYING THE UNIT(S).	PERTAINS TO ALL SITES WITH LAND-BASED HAZARDOUS WASTE UNITS (SURFACE IMPOUNDMENTS, WASTE PILES, LAND TREATMENT UNITS, LANDFILLS). THIS INCLUDES EXISTING LAND-BASED AREAS OF CONTAMINATION.	ACTION CHEMICAL
3745-54-96	A,B,C	COMPLIANCE PERIOD FOR GROUND WATER; HAZ WASTE FACIL	A COMPLIANCE PERIOD DURING WHICH THE GROUND WATER PROTECTION STANDARDS APPLY WILL BE SPECIFIED IN THE PERMIT. RULE REQUIRES THAT THE COMPLIANCE PERIOD FOR A FACILITY UNDERGOING A CORRECTIVE ACTION PROGRAM WILL EXTEND UNTIL IT CAN BE DEMONSTRATED THAT THE GROUND WATER PROTECTION STANDARD OF OAC 3745-54-92 HAS NOT BEEN EXCEEDED FOR A PERIOD OF THREE CONSECUTIVE YEARS.	PERTAINS TO ALL SITES WITH LAND-BASED HAZARDOUS WASTE UNITS (SURFACE IMPOUNDMENTS, WASTE PILES, LAND TREATMENT UNITS, LANDFILLS). THIS INCLUDES EXISTING LAND-BASED AREAS OF CONTAMINATION.	ACTION CHEMICAL
3745-54-97	A-H	GEN GROUND WATER MONITORING REQUIREMENTS; HAZ WASTE FAC	PRESENTS GENERAL GROUND WATER MONITORING PROGRAM REQUIREMENTS. INCLUDES NUMBER, LOCATION AND DEPTH OF WELLS, CASING REQUIREMENTS, SAMPLING AND ANALYSIS PROCEDURES, ETC.	PERTAINS TO ALL SITES WITH LAND-BASED HAZARDOUS WASTE UNITS (SURFACE IMPOUNDMENTS, WASTE PILES, LAND TREATMENT UNITS, LANDFILLS). THIS INCLUDES EXISTING LAND-BASED AREAS OF CONTAMINATION.	ACTION CHEMICAL
3745-54-98	A-I	GROUND WATER DETECTION MONITORING PROG; HAZ WASTE FAC	PRESENTS REQUIREMENTS OF GROUND WATER DETECTION PROGRAM.	PERTAINS TO ALL SITES WITH LAND-BASED HAZARDOUS WASTE UNITS (SURFACE IMPOUNDMENTS, WASTE PILES, LAND TREATMENT UNITS, LANDFILLS) AT WHICH HAZARDOUS CONSTITUENTS HAVE NOT BEEN DETECTED IN THE GROUND WATER. THIS INCLUDES EXISTING LAND-BASED AREAS OF CONTAMINATION.	ACTION CHEMICAL
3745-54-99	A-J	GROUND WATER COMPLIANCE MONITORING PROG; HAZ WASTE FAC	PRESENTS REQUIREMENTS OF GROUND WATER COMPLIANCE MONITORING PROGRAM.	PERTAINS TO ALL SITES WITH LAND-BASED HAZARDOUS WASTE UNITS (SURFACE IMPOUNDMENTS, WASTE PILES, LAND TREATMENT UNITS, LANDFILLS) AT WHICH HAZARDOUS CONSTITUENTS HAVE BEEN DETECTED. THIS INCLUDES EXISTING LAND-BASED AREAS OF CONTAMINATION.	ACTION CHEMICAL
3745-55-01	A-F	GROUND WATER CORRECTIVE ACTION PROGRAM; HAZ WASTE FAC	PRESENTS THE REQUIREMENTS OF A GROUND WATER CORRECTIVE ACTION PROGRAM THAT PREVENTS HAZARDOUS CONSTITUENTS FROM EXCEEDING THEIR RESPECTIVE CONCENTRATION LIMITS AT THE COMPLIANCE POINT BY EITHER REMOVAL OR TREATMENT OF THESE HAZARDOUS CONSTITUENTS.	PERTAINS TO ALL SITES WITH LAND-BASED HAZARDOUS WASTE UNITS (SURFACE IMPOUNDMENTS, WASTE PILES, LAND TREATMENT UNITS, LANDFILLS) AT WHICH HAZARDOUS CONSTITUENTS HAVE BEEN DETECTED. THIS INCLUDES EXISTING LAND-BASED AREAS OF CONTAMINATION.	ACTION CHEMICAL
3745-55-011	A,C	CORRECTIVE ACTION FOR WASTE MANAGEMENT UNITS	REQUIRES AN APPLICANT FOR A HAZARDOUS WASTE PERMIT TO INSTITUTE CORRECTIVE ACTION FOR ALL RELEASES OF HAZARDOUS WASTE OR CONSTITUENTS FROM ANY WASTE MANAGEMENT UNIT, REGARDLESS OF THE TIME AT WHICH WASTE WAS PLACED IN SUCH UNIT.	PERTAINS TO ALL SITES WITH LAND-BASED HAZARDOUS WASTE UNITS (SURFACE IMPOUNDMENTS, WASTE PILES, LAND TREATMENT UNITS, LANDFILLS) AT WHICH HAZARDOUS CONSTITUENTS HAVE BEEN DETECTED. THIS INCLUDES EXISTING LAND-BASED AREAS OF CONTAMINATION.	ACTION

SITE NAME COUNTY NAME

ADMINIS. CODE SECTION	PERTINENT PARAGRAPH	TITLE OR SUBJECT OF REGULATION	DESCRIPTION OF REGULATION	APPLICATION OF REGULATION	ARAR TYPE
3745-55-11	A,B,C	GENERAL CLOSURE PERFORMANCE STANDARD; HAZ WASTE FACIL	REQUIRES THAT ALL HAZARDOUS WASTE FACILITIES BE CLOSED IN A MANNER THAT MINIMIZES THE NEED FOR FURTHER MAINTENANCE, CONTROLS, MINIMIZES, ELIMINATES OR PREVENTS POST-CLOSURE ESCAPE OF HAZARDOUS WASTE, HAZARDOUS CONSTITUENTS, LEACHATE, CONTAMINATED RUN-OFF OR HAZARDOUS WASTE DECOMPOSITION PRODUCTS TO THE GROUND OR SURFACE WATER OR THE ATMOSPHERE.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN TREATED, STORED OR DISPOSED OF).	ACTION
3745-55-12	B	CONTENT OF CLOSURE PLAN; HAZ WASTE FACILITIES	SPECIFIES THE MINIMUM INFORMATION REQUIRED IN A CLOSURE PLAN FOR OHIO EPA TO DETERMINE THE ADEQUACY OF THE PLAN.	SUBSTANTIVE REQUIREMENTS PERTAIN TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN TREATED, STORED OR DISPOSED OF).	ACTION
3745-55-14		DISPOSAL/ DECON OF EQUIPMENT, STRUCTURES & SOILS	REQUIRES THAT ALL CONTAMINATED EQUIPMENT, STRUCTURES AND SOILS BE PROPERLY DISPOSED OF OR DECONTAMINATED. REMOVAL OF HAZARDOUS WASTES OR CONSTITUENTS FROM A UNIT MAY CONSTITUTE GENERATION OF HAZARDOUS WASTES.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE IS TO BE TREATED, STORED OR DISPOSED OF (OR HAS BEEN TREATED, STORED OR DISPOSED OF).	ACTION
3745-55-17	B	POST-CLOSURE CARE AND USE OF PROPERTY	SPECIFIES THE POST-CLOSURE CARE REQUIREMENTS, INCLUDING MAINTENANCE, MONITORING AND POST-CLOSURE USE OF PROPERTY.	PERTAINS TO ALL SITES WITH LAND-BASED HAZARDOUS WASTE UNITS (LANDFILLS AND SURFACE IMPOUNDMENTS, WASTE PILES, LAND TREATMENT UNITS AND TANKS THAT MEET REQUIREMENTS OF LANDFILLS AFTER CLOSURE). THIS INCLUDES EXISTING LAND-BASED AREAS OF CONTAMINATION.	ACTION
3745-55-18	B	POST-CLOSURE PLAN	PRESENTS THE INFORMATION NECESSARY FOR OHIO EPA TO DETERMINE THE ADEQUACY OF A POST-CLOSURE PLAN.	PERTAINS TO ALL SITES WITH LAND-BASED HAZARDOUS WASTE UNITS (LANDFILLS AND SURFACE IMPOUNDMENTS, WASTE PILES, LAND TREATMENT UNITS AND TANKS THAT MEET REQUIREMENTS OF LANDFILLS AFTER CLOSURE). THIS INCLUDES EXISTING LAND-BASED AREAS OF CONTAMINATION.	ACTION
3745-55-19	B	NOTICE TO LOCAL LAND AUTHORITY	REQUIRES THAT A RECORD OF THE TYPE, LOCATION AND QUANTITY OF HAZARDOUS WASTES DISPOSED OF IN EACH UNIT BE SUBMITTED TO THE LOCAL LAND AUTHORITY AND THE DIRECTOR OF THE OHIO EPA. ALSO REQUIRES THAT A NOTATION TO THE DEED TO THE FACILITY PROPERTY BE MADE INDICATING THAT THE LAND WAS USED TO MANAGE HAZARDOUS WASTES AND THAT CERTAIN USE RESTRICTIONS MAY APPLY TO THE PROPERTY.	PERTAINS TO ALL SITES WITH LAND-BASED HAZARDOUS WASTE UNITS (LANDFILLS AND SURFACE IMPOUNDMENTS, WASTE PILES, LAND TREATMENT UNITS AND TANKS THAT MEET REQUIREMENTS OF LANDFILLS AFTER CLOSURE). THIS INCLUDES EXISTING LAND-BASED AREAS OF CONTAMINATION.	ACTION
3745-55-71		CONDITION OF CONTAINERS	CONTAINERS HOLDING HAZARDOUS WASTE MUST BE MAINTAINED IN GOOD CONDITION (NO RUST OR STRUCTURAL DEFECTS).	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE STORED IN CONTAINERS.	ACTION
3745-55-72		COMPATIBILITY OF WASTE WITH CONTAINERS	HAZARDOUS WASTES PLACED IN CONTAINER MUST NOT REACT WITH THE CONTAINER MATERIAL OR LINER MATERIAL.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE STORED IN CONTAINERS.	ACTION
3745-55-73		MANAGEMENT OF CONTAINERS	CONTAINERS HOLDING HAZARDOUS WASTE MUST BE CLOSED (EXCEPT TO ADD OR REMOVE WASTE) AND MUST NOT BE HANDLED IN A MANNER THAT MAY RUPTURE THE CONTAINER OR CAUSE IT TO LEAK.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE STORED IN CONTAINERS.	ACTION
3745-55-74		CONTAINER INSPECTIONS	REQUIRES AT LEAST WEEKLY INSPECTIONS OF CONTAINER STORAGE AREAS.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE STORED IN CONTAINERS.	ACTION
3745-55-75	A,B,C,D	CONTAINER STORAGE AREA CONTAINMENT SYSTEM	REQUIRES THAT CONTAINER STORAGE AREAS HAVE A CONTAINMENT SYSTEM AND SPECIFIES THE MINIMUM REQUIREMENTS OF SUCH A SYSTEM.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE STORED IN CONTAINERS.	ACTION

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3745-55-76		CONTAINER REQUIREMENTS FOR IGNITABLE/REACTIVE WASTES	PRESENTS GENERAL PRECAUTIONS TO BE TAKEN TO PREVENT ACCIDENTAL IGNITION OR REACTION OF IGNITABLE OR REACTIVE WASTES THAT WILL BE STORED IN CONTAINERS.	PERTAINS TO ANY SITE AT WHICH POTENTIALLY REACTIVE OR IGNITABLE WASTES THAT ARE STORED, OR ARE TO BE STORED, IN CONTAINERS.	ACTION CHEMICAL
3745-55-77	A,B,C	CONTAINER REQUIREMENTS FOR INCOMPATIBLE WASTES	PRESENTS GENERAL PRECAUTIONS TO BE TAKEN WHEN DEALING WITH INCOMPATIBLE WASTES.	PERTAINS TO ANY SITE AT WHICH POTENTIALLY INCOMPATIBLE WASTES ARE PRESENT.	ACTION CHEMICAL
3745-55-78		CONTAINER CLOSURE REQUIREMENTS	SPECIFIES CLOSURE REQUIREMENTS FOR CONTAINERS AND CONTAINMENT SYSTEM.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE STORED IN CONTAINERS.	ACTION
3745-56-51	A-F	DESIGN & OPERATING REQUIREMENTS FOR WASTE PILES	SPECIFIES THE DESIGN AND OPERATION REQUIREMENTS FOR WASTE PILES. INCLUDES LINER SYSTEM, LEACHATE COLLECTION AND REMOVAL SYSTEM, WIND DISPERSAL PREVENTION AND RUN-ON/RUN-OFF CONTROL.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE EITHER STORED OR TREATED IN WASTE PILES.	ACTION
3745-56-54	A,B	MONITORING & INSPECTION OF WASTE PILES	WASTE PILES MUST BE MONITORED DURING CONSTRUCTION OR INSTALLATION AND OPERATION.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE EITHER STORED OR TREATED IN WASTE PILES.	ACTION
3745-56-56	A,B	WASTE PILE REQUIREMENTS FOR IGNITABLE/ REACTIVE WASTES	PRESENTS GENERAL PRECAUTIONS TO BE TAKEN WHEN DEALING WITH POTENTAILLY IGNITABLE OR REACTIVE HAZARDOUS WASTES THAT ARE STORED OR TREATED IN WASTE PILES.	PERTAINS TO ANY SITE AT WHICH POTENTIALLY IGNITABLE OR REACTIVE HAZARDOUS WASTE WILL BE EITHER STORED OR TREATED IN WASTE PILES.	ACTION CHEMICAL
3745-56-57	A,B,C	WASTE PILE REQUIREMENTS FOR INCOMPATIBLE WASTES	PRESENTS GENERAL PRECAUTIONS TO BE TAKEN WHEN DEALING WITH POTENTAILLY INCOMPATIBLE WASTES THAT ARE STORED OR TREATED IN WASTE PILES.	PERTAINS TO ANY SITE AT WHICH POTENTIALLY INCOMPATIBLE HAZARDOUS WASTE WILL BE EITHER STORED OR TREATED IN WASTE PILES.	ACTION CHEMICAL
3745-56-58	A,B,C	CLOSURE & POST-CLOSURE CARE FOR WASTE PILES	SPECIFIES CLOSURE AND POST-CLOSURE CARE REQUIREMENTS FOR WASTE PILES.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE EITHER STORED OR TREATED IN WASTE PILES.	ACTION
3745-56-59	A	CONSTRUCTION INSPECTIONS FOR WASTE PILES	ALLOWS OHIO EPA THE OPPORTUNITY TO INSPECT WASTE PILES DURING CONSTRUCTION.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE EITHER STORED OR TREATED IN WASTE PILES.	ACTION
3745-56-60	A,B	SPECIAL REQUIREMENTS FOR "F" WASTES IN WASTE PILES	PROHIBITS THE PLACEMENT OF HAZARDOUS WASTES F020, F021, F022, F023, F028 AND F027 IN WASTE PILES.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS E-WASTES WILL BE EITHER STORED OR TREATED IN WASTE PILES.	ACTION CHEMICAL
3745-57-01	A-D	ENVIRONMENTAL PERFORMANCE STANDARDS; LAND-BASED UNITS	SPECIFIES LOCATION, DESIGN, CONSTRUCTION, OPERATION, MAINTENANCE AND CLOSURE REQUIREMENTS FOR LANDFILLS, WASTE PILES, SURFACE IMPOUNDMENTS AND UNDERGROUND INJECTION WELLS.	PERTAINS TO ALL SITES THAT EITHER HAVE OR WILL HAVE AT LEAST ONE OF THE FOLLOWING UNITS ON-SITE: LANDFILLS, WASTE PILES, SURFACE IMPOUNDMENTS, LAND TREATMENT FACILITIES AND UNDERGROUND INJECTION WELLS (THIS INCLUDES EXISTING LAND-BASED AREAS OF CONTAMINATION).	ACTION
3745-57-03	A-I	LANDFILL DESIGN AND OPERATING REQUIREMENTS	PRESENTS DESIGN AND OPERATING REQUIREMENTS FOR LANDFILLS. INCLUDES LINER, LEACHATE COLLECTION AND REMOVAL, RUN-ON/RUN-OFF CONTROL, ETC.	PERTAINS TO ALL SITES AT WHICH A HAZARDOUS WASTE LANDFILL WILL EITHER BE LOCATED OR AN EXISTING LANDFILL WILL BE EXPANDED. THIS RULE ALSO PERTAINS TO EXISTING LAND-BASED AREAS OF CONTAMINATION.	ACTION
3745-57-06	A,B	MONITORING AND INSPECTIONS OF LANDFILLS	REQUIRES INSPECTION OF LANDFILLS DURING CONSTRUCTION OR INSTALLATION AND OPERATION.	PERTAINS TO ALL SITES AT WHICH A HAZARDOUS WASTE LANDFILL WILL EITHER BE LOCATED OR AN EXISTING LANDFILL WILL BE EXPANDED. THIS RULE PERTAINS TO EXISTING LAND-BASED AREAS OF CONTAMINATION.	ACTION
3745-57-10	A,B	LANDFILL CLOSURE AND POST-CLOSURE CARE	SPECIFIES CLOSURE AND POST-CLOSURE REQUIREMENTS FOR HAZARDOUS WASTE LANDFILLS. INCLUDES FINAL COVER AND MAINTENANCE.	PERTAINS TO ALL SITES AT WHICH A HAZARDOUS WASTE LANDFILL WILL EITHER BE LOCATED OR AN EXISTING LANDFILL WILL BE EXPANDED. THIS RULE PERTAINS TO EXISTING	ACTION

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				LAND-BASED AREAS OF CONTAMINATION.	
3745-57-12	A,B	LANDFILL REQUIREMENTS FOR IGNITABLE/REACTIVE WASTES	PROHIBITS THE DISPOSAL OF IGNITABLE OR REACTIVE WASTE IN A LANDFILL, UNLESS THE WASTE IS TREATED, RENDERED OR MIXED SO THAT THE RESULTANT MATERIAL NO LONGER MEETS THE DEFINITION OF IGNITABLE OR REACTIVE WASTE.	PERTAINS TO ALL SITES AT WHICH POTENTIALLY IGNITABLE OR REACTIVE HAZARDOUS WASTE MAY BE LANDFILLED.	ACTION CHEMICAL
3745-57-13		LANDFILL REQUIREMENTS FOR INCOMPATIBLE WASTES	PROHIBITS THE DISPOSAL OF INCOMPATIBLE WASTE IN THE SAME CELL OF A LANDFILL.	PERTAINS TO ALL SITES AT WHICH POTENTIALLY INCOMPATIBLE HAZARDOUS WASTE MAY BE LANDFILLED.	ACTION CHEMICAL
3745-57-14	A-D	LANDFILL REQUIREMENTS FOR BULK & CONTAINERIZED LIQUIDS	THE PLACEMENT OF BULK OR NON-CONTAINERIZED LIQUID HAZARDOUS WASTE OR HAZARDOUS WASTES CONTAINING FREE LIQUIDS (WHETHER OR NOT ABSORBANTS HAVE BEEN ADDED) IN ANY LANDFILL IS PROHIBITED.	PERTAINS TO ALL SITES AT WHICH A LIQUID HAZARDOUS WASTE OR HAZARDOUS WASTE CONTAINING FREE LIQUIDS ARE CONSIDERED FOR LANDFILLING.	ACTION
3745-57-15	A,B	LANDFILL REQUIREMENTS FOR CONTAINERS	UNLESS THEY ARE VERY SMALL, CONTAINERS MUST EITHER BE AT LEAST 90% FULL WHEN PLACED IN THE LANDFILL OR CRUSHED/SHREDDED PRIOR TO PLACEMENT IN THE LANDFILL.	PERTAINS TO ALL SITES AT WHICH A HAZARDOUS WASTE LANDFILL WILL EITHER BE LOCATED OR AN EXISTING LANDFILL WILL BE EXPANDED AND CONTAINERS ARE TO BE DISPOSED OF IN THE LANDFILL.	ACTION
3745-57-16	A-E	DISPOSAL OF SMALL CONTAINERS OF HAZ WASTES IN OVERPACKS	LAB PACKS CONTAINING HAZARDOUS WASTE MAY BE PLACED IN A LANDFILL IF CERTAIN REQUIREMENTS ARE MET.	PERTAINS TO ALL SITES AT WHICH A HAZARDOUS WASTE LANDFILL WILL EITHER BE LOCATED OR AN EXISTING LANDFILL WILL BE EXPANDED AND LAB PACKS ARE TO BE PLACED IN THE LANDFILL.	ACTION
3745-57-17	A	LANDFILL CONSTRUCTION INSPECTIONS	ALLOWS OHIO EPA OPPORTUNITY TO INSPECT LANDFILL DURING CONSTRUCTION.	PERTAINS TO ALL SITES AT WHICH A HAZARDOUS WASTE LANDFILL WILL EITHER BE LOCATED OR AN EXISTING LANDFILL WILL BE EXPANDED. THIS RULE PERTAINS TO EXISTING LAND-BASED AREAS OF CONTAMINATION.	ACTION
3745-57-18	A,B	SPECIAL REQUIREMENTS FOR "F" WASTES IN LANDFILLS	PROHIBITS THE PLACEMENT OF HAZARDOUS WASTES F020, F021, F022, F023, F026 AND F027 IN LANDFILLS.	PERTAINS TO ALL SITES AT WHICH A HAZARDOUS WASTE LANDFILL WILL EITHER BE LOCATED OR AN EXISTING LANDFILL WILL BE EXPANDED AND F-WASTES ARE BEING CONSIDERED FOR LANDFILLING.	ACTION CHEMICAL
3745-59-03	A,B	DILUTION PROHIBITED AS A SUBSTITUTE FOR TREATMENT	PROHIBITS DILUTION OF A RESTRICTED WASTE OR THE RESIDUAL FROM TREATMENT OF A RESTRICTED WASTE AS A SUBSTITUTE FOR ADEQUATE TREATMENT IN ORDER TO LAND DISPOSE HAZARDOUS WASTE. DILUTION OF WATER WASTES IS NOT IMPERMISSIBLE DILUTION UNLESS A METHOD HAS BEEN SPECIFIED AS A TREATMENT STANDARD.	PERTAINS TO ANY ALTERNATIVE THAT INCORPORATES DISPOSAL OF HAZARDOUS WASTE ON-SITE.	ACTION
3745-59-07	A,B,C	WASTE ANALYSIS OF HAZARDOUS WASTE	GENERATOR SHALL TEST THE WASTE OR TEST AN EXTRACT OF THE WASTE ACCORDING TO THE FREQUENCY AND TEST METHODS DESCRIBED IN THE RULES, TO DETERMINE IF THE WASTE IS RESTRICTED FROM LANAD DISPOSAL.	PERTAINS TO AN ALTERNATIVE THAT INCORPORATES DISPOSAL OF HAZARDOUS WASTE ON-SITE.	ACTION
3745-59-09	B,C	SPECIAL RULES REGARDING WASTE THAT EXHIB A CHARACTERIST	PROHIBITS LAND DISPOSAL OF CHARACTERISTIC WASTE UNLESS THE WASTE COMPLIES WITH THE TREATMENT STANDARDS OF LISTED WASTES. IF THE WASTE IS BOTH LISTED AND EXHIBITS A CHARACTERISTIC, THE TREATMENT STANDARD FOR THE LISTED WASTE WILL OPERATE IN LIEU OF THE STANDARD FOR THE CHARACTERISTIC WASTE.	PERTAINS TO ANY SITE IN WHICH ON-SITE DISPOSAL OF HAZARDOUS WASTE IS AN ALTERNATIVE.	ACTION CHEMICAL
3745-59-50	A,B,C,D E	PROHIBITION ON STORAGE OF RESTRICTED WASTE	PROHIBITS ON-SITE STORAGE OF HAZARDOUS WASTES RESTRICTED FROM LAND DISPOSAL BEYOND TIME FRAME STATED IN THE RULE.	PERTAINS TO ANY SITE IN WHICH STORAGE OF HAZARDOUS WASTE WILL OCCUR ON SITE TO FACILITATE PROPER RE TREATMENT OR DISPOSAL. IN SOME CASES STORAGE	

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				RESTRICTED WASTES BEYOND ONE YEAR IS ALLOWED.	
3745-81-11	A,B,C	MAXIMUM CONTAMINANT LEVELS FOR INORGANIC CHEMICALS	PRESENTS MAXIMUM CONTAMINANT LEVELS FOR INORGANICS.	PERTAINS TO ANY SITE WHICH HAS CONTAMINATED GROUND OR SURFACE WATER THAT IS EITHER BEING USED, OR HAS THE POTENTIAL FOR USE, AS A DRINKING WATER SOURCE.	CHEMICAL
3745-81-12	A,B,C	MAXIMUM CONTAMINANT LEVELS FOR ORGANIC CHEMICALS	PRESENTS MCLS FOR ORGANICS.	PERTAINS TO ANY SITE WHICH HAS CONTAMINATED GROUND OR SURFACE WATER THAT IS EITHER BEING USED, OR HAS THE POTENTIAL FOR USE, AS A DRINKING WATER SOURCE.	CHEMICAL
3745-81-15	A,B	MAX CONTAMINANT LEVELS FOR RADIUM 226,228,GROSS ALPHAS	PRESENTS MCLS FOR RADIUM-226, RADIUM-228 AND GROSS ALPHA PARTICLE ACTIVITY.	PERTAINS TO ANY SITE WHICH HAS CONTAMINATED GROUND OR SURFACE WATER THAT IS EITHER BEING USED, OR HAS THE POTENTIAL FOR USE, AS A DRINKING WATER SOURCE.	CHEMICAL
3745-81-26	A,B,C	MONITORING FREQUENCY FOR RADIOACTIVITY	PRESENTS MONITORING REQIREMENTS FOR RADIOACTIVITY.	PERTAINS TO ANY SITE WHICH HAS CONTAMINATED GROUND OR SURFACE WATER THAT IS EITHER BEING USED, OR HAS THE POTENTIAL FOR USE, AS A DRINKING WATER SOURCE.	CHEMICAL
3745-81-27	A-E	ANALYTICAL TECHNIQUES	PRESENTS GENERAL ANALYTICAL TECHNIQUES FOR MCLS.	PERTAINS TO ANY SITE WHICH HAS CONTAMINATED GROUND OR SURFACE WATER THAT IS EITHER BEING USED, OR HAS THE POTENTIAL FOR USE, AS A DRINKING WATER SOURCE.	CHEMICAL
3745-9-04	A,B	LOCATION/SITING OF NEW GW WELLS	MANDATES THAT GROUND WATER WELLS BE: A) LOCATED AND MAINTAINED SO AS TO PREVENT CONTAMINANTS FROM ENTERING WELL. B) LOCATED SO AS TO BE ACCESSIBLE FOR CLEANING AND MAINTENANCE.	PERTAINS TO ALL GROUND WATER WELLS ON THE SITE THAT EITHER WILL BE INSTALLED OR HAVE BEEN INSTALLED SINCE FEB. 15, 1975. WOULD PERTAIN DURING THE FS IF NEW WELLS ARE CONSTRUCTED FOR TREATABILITY STUDIES.	LOCATION ACTION
3745-9-06	A1,B-H	CONSTRUCTION OF NEW GW WELLS	SPECIFIES MINIMUM CONSTRUCTION REQUIREMENTS FOR NEW GROUND WATER WELLS IN REGARDS TO CASING MATERIAL, CASING DEPTH, POTABLE WATER, ANNULAR SPACES, USE OF DRIVE SHOE, OPENINGS TO ALLOW WATER ENTRY, CONTAMINANT ENTRY.	PERTAINS TO ALL GROUND WATER WELLS ON THE SITE THAT EITHER WILL BE INSTALLED OR HAVE BEEN INSTALLED SINCE FEB. 15, 1975. WOULD PERTAIN DURING THE FS IF NEW WELLS ARE CONSTRUCTED FOR TREATABILITY STUDIES.	ACTION
3745-9-08	A,B,D,E	CASING REQUIREMENTS FOR NEW GW WELLS	ESTABLISHES SPECIFIC REQUIREMENTS FOR WELL CASINGS, SUCH AS SUITABLE MATERIAL, DIAMETERS AND CONDITION.	PERTAINS TO ALL GROUND WATER WELLS ON THE SITE THAT EITHER WILL BE INSTALLED OR HAVE BEEN INSTALLED SINCE FEB. 15, 1975. WOULD PERTAIN DURING THE FS IF NEW WELLS ARE CONSTRUCTED FOR TREATABILITY STUDIES.	ACTION
3745-9-07	A-F	SURFACE DESIGN OF NEW GW WELLS	ESTABLISHES SPECIFIC SURFACE DESIGN REQUIREMENTS, SUCH AS HEIGHT ABOVE GROUND, WELL VENTS, WELL PUMPS, ETC.	PERTAINS TO ALL GROUND WATER WELLS ON THE SITE THAT EITHER WILL BE INSTALLED OR HAVE BEEN INSTALLED SINCE FEB. 15, 1975. WOULD PERTAIN DURING THE FS IF NEW WELLS ARE CONSTRUCTED FOR TREATABILITY STUDIES.	ACTION
3745-9-08	A,C	START-UP & OPERATION OF GW WELLS	REQUIRE DISINFECION OF NEW WELLS AND USE OF POTABLE WATER FOR PRIMING PUMPS.	PERTAINS TO ALL GROUND WATER WELLS ON THE SITE THAT EITHER WILL BE INSTALLED OR HAVE BEEN INSTALLED SINCE FEB. 15, 1975. WOULD PERTAIN DURING THE FS IF NEW WELLS ARE CONSTRUCTED FOR TREATABILITY STUDIES.	ACTION
3745-9-09	A-C,D1,E-G	MAINTENANCE & OPERATION OF GW WELLS	ESTABLISHES SPECIFIC MAINTENANCE AND MODIFICATION REQUIHEMENTS FOR CASING, PUMP AND WELLS IN GENERAL.	PERTAINS TO ALL GROUND WATER WELLS ON THE SITE THAT EITHER WILL BE INSTALLED OR HAVE BEEN INSTALLED SINCE FEB. 15, 1975. WOULD PERTAIN DURING THE FS IF NEW WELLS ARE CONSTRUCTED FOR TREATABILITY STUDIES.	ACTION
3745-9-10	A,B,C	ABANDONMENT OF TEST HOLES & GW WELLS	FOLLOWING COMPLETION OF USE, WELLS AND TEST HOLES SHALL BE COMPLETELY FILLED WITH GROUT OR SIMILAR MATERIAL OR SHALL BE	PERTAINS TO ALL GROUND WATER WELLS ON THE SITE THAT EITHER WILL BE INSTALLED OR HAVE BEEN INSTALLED SINCE FEB.	ACTION

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			MAINTAINED IN COMPLIANCE OF ALL REGULATIONS.	15, 1975.	

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1518.02		ENDANGERED PLANT SPECIES	Prohiblts removal or destruction of endangered plant species (some private property exceptions).	Applies to remediation sites where chemicals may harm endangered species. Clearly establishes that receptor plant species must be considered in risk assessments. This act may require consideration of endangered species in remediations that involve movement or displacement of large volumes of surface soil.	
3704.05	A-I	PROHIBITS VIOLATION OF AIR POLLUTION CONTROL RULES	PROHIBITS EMISSION OF AN AIR CONTAMINANT IN VIOLATION SEC. 3704 OR ANY RULES, PERMIT, ORDER OR VARIANCE ISSUED PURSUANT TO THAT SECTION OF THE ORC.	MAY PERTAIN TO ANY SITE WHERE EMISSIONS OF AN AIR CONTAMINANT OCCURS EITHER AS A PRE-EXISTING CONDITION OF THE SITE OR AS A RESULT OF REMEDIAL ACTIVITIES. SHOULD BE CONSIDERED FOR VIRTUALLY ALL SITES.	CHEMICAL ACTION
3734.02	(G)	EXEMPTIONS TO SOLID & HAZ. WASTE T/S/D REQUIREMENTS	PROVIDES AUTHORITY AND CONDITIONS BY WHICH THE DIRECTOR MAY EXEMPT ANY PERSON FROM PERMITTING OR OTHER REQUIREMENTS GOVERNING THE GENERATION, STORAGE, TREATMENT, TRANSPORT OR DISPOSAL OF SOLID OR HAZARDOUS WASTE.	PERTAINS TO ANY SITE AT WHICH SOLID OR HAZARDOUS WASTE HAS COME TO BE LOCATED. CERTAIN ALTERNATIVES INCLUDE EXCAVATION ACTIVITIES WHICH MAY UNCOVER SOLID AND/OR HAZARDOUS WASTE. SHOULD THOSE ACTIVITIES REQUIRE THE MANAGEMENT OF SOLID/HAZARDOUS WASTES ON-SITE, AN EXEMPTION TO PERMITTING AND OTHER REQUIREMENTS MAY BE WARRANTED.	ACTION
3734.02	(H)	"DIGGING" WHERE HAZ OR SOLID WASTE FACILITY WAS LOCATED	FILLING, GRADING, EXCAVATING, BUILDING, DRILLING OR MINING ON LAND WHERE HAZARDOUS WASTE OR SOLID WASTE FACILITY WAS OPERATED IS PROHIBITED WITHOUT PRIOR AUTHORIZATION FROM THE DIRECTOR OF THE OHIO EPA.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS OR SOLID WASTE HAS COME TO BE LOCATED. CERTAIN ALTERNATIVES INCLUDE EXCAVATION ACTIVITIES WHICH MAY UNCOVER SOLID AND/OR HAZARDOUS WASTE. SHOULD THOSE ACTIVITIES REQUIRE THE MANAGEMENT OF SOLID/HAZARDOUS WASTES ON-SITE, AN EXEMPTION TO PERMITTING AND OTHER REQUIREMENTS MAY BE WARRANTED.	LOCATION ACTION
3734.02	(I)	AIR EMISSIONS FROM HAZARDOUS WASTE FACILITIES	NO HAZARDOUS WASTE FACILITY SHALL EMIT ANY PARTICULATE MATTER, DUST, FUMES, GAS, MIST, SMOKE, VAPOR OR ODOROUS SUBSTANCE THAT INTERFERS WITH THE COMFORTABLE ENJOYMENT OF LIFE OR PROPERTY OR IS INJURIOUS TO PUBLIC HEALTH.	PERTAINS TO ANY SITE AT WHICH HAZARDOUS WASTE WILL BE MANAGED SUCH THAT AIR EMISSIONS MAY OCCUR. CONSIDER FOR SITES THAT WILL UNDERGO MOVEMENT OF EARTH OR INCINERATION.	
3734.03		PROHIBITS OPEN DUMPING OR BURNING	PROHIBITS OPEN BURNING OR OPEN DUMPING OF SOLID WASTE OR TREATED OR UNTREATED INFECTIOUS WASTE.	PERTAINS TO ANY SITE AT WHICH SOLID WASTE HAS COME TO BE LOCATED OR WILL BE GENERATED DURING A REMEDIAL ACTION.	ACTION LOCATION
3734.04.1	A,C,D,G	EXPLOSIVE GAS MONITORING	REQUIRES EXPLOSIVE GAS MONITORING PLANS FOR SANITARY LANDFILLS AND PROVIDES AUTHORITY TO THE DIRECTOR OF OHIO EPA TO ORDER AN OWNER OR OPERATOR OF A FACILITY TO IMPLEMENT AN EXPLOSIVE GAS MONITORING AND REPORTING PLAN	PERTAINS TO ALL SANITARY LANDFILLS EXCEPT FOR THOSE THAT DISPOSED OF NONPUTRESCIBLE WASTES.	LOCATION ACTION
3734.05	(D)(6)(c)	HAZARDOUS WASTE FACILITY ENVIRONMENTAL IMPACT	A HAZARDOUS WASTE FACILITY INSTALLATION AND OPERATION PERMIT SHALL NOT BE APPROVED UNLESS IT PROVES THAT THE FACILITY REPRESENTS THE MINIMUM ADVERSE ENVIRONMENTAL IMPACT, CONSIDERING THE STATE OF AVAILABLE TECHNOLOGY, THE NATURE AND ECONOMICS OF VARIOUS ALTERNATIVES AND OTHER PERTINENT CONSIDERATIONS.	PERTAINS TO ALL SITES AT WHICH HAZARDOUS WASTE HAS COME TO BE LOCATED AND/OR AT WHICH HAZARDOUS WASTE WILL BE TREATED, STORED OR DISPOSED OF. MAY FUNCTION AS SITING CRITERIA.	
3734.05	(D)6,d,g,h	HAZARDOUS WASTE SITING CRITERIA	(D),6,d. A HAZARDOUS WASTE FACILITY INSTALLATION AND OPERATION PERMIT SHALL NOT BE APPROVED UNLESS IT PROVES THAT THE FACILITY REPRESENTS THE MINIMUM RISK OF ALL OF THE FOLLOWING: (i)CONTAMINATION OF GROUND AND SURFACE WATERS (ii)FIRES OR EXPLOSIONS FROM TREATMENT, STORAGE OR DISPOSAL	PERTAINS TO ALL SITES AT WHICH HAZARDOUS WASTE HAS COME TO BE LOCATED AND/OR AT WHICH HAZARDOUS WILL BE TREATED, STORED OR DISPOSED OF. MAY FUNCTION AS SITING CRITERIA.	ACTION LOCATION

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REVISED CODE SECTION	PERTINENT PARAGRAPH	TITLE OR SUBJECT OF REGULATION	DESCRIPTION OF REGULATION	APPLICATION OF REGULATION	ARAR TYPE
			METHODS (iii)ACCIDENT DURING TRANSPORTATION (iv)IMPACT ON PUBLIC HEALTH AND SAFTEY (v)AIR POLLUTION (vi)SOIL CONTAMINATION (D),6,g,h. PROHIBITS THE FOLLOWING LOCATIONS FOR TREATMENT, STORAGE AND DISPOSAL OF ACUTE HAZARDOUS WASTE: (i) WITHIN 2000 FEET OF ANY RESIDENCE, SCHOOL, HOSPITAL, JAIL OR PRISON; (ii) ANY NATURALLY OCCURRING WETLAND (iii) ANY FLOOD HAZARD AREA (iv) WITHIN ANY STATE PARK OR NATIONAL PARK OR RECREATION AREA		
3767.13		PROHIBITION OF NUISANCES	PROHIBITS NOXIOUS EXHALATIONS OR SMELLS AND THE OBSTRUCTION OF WATERWAYS.	PERTAINS TO ANY SITE THAT MAY HAVE NOXIOUS SMELLS OR MAY OBSTRUCT WATERWAYS.	ACTION CHEMICAL
3767.14		PROHIBITION OF NUISANCES	PROHIBITION AGAINST THROWING REFUSE, OIL, OR FILTH INTO LAKES, STREAMS, OR DRAINS.	PERTAINS TO ALL SITES LOCATED ADJACENT TO LAKES, STREAMS, OR DRAINS.	ACTION CHEMICAL
6101.19		CONSERVANCY DISTRICTS	BOARD OF DIRECTORS OF A CONSERVANCY DISTRICT MAY MAKE AND ENFORCE RULES AND REGULATIONS PERTAINING TO CHANNELS, DITCHES, PIPES, SEWERS, ETC.	THIS STATUTE PERTAINS TO ANY SITE THAT MAY AFFECT A CONSTRUCTION WITHIN A CONSERVANCY DISTRICT.	ACTION
6111.04 3		ACTS OF POLLUTION PROHIBITED	POLLUTION OF WATERS OF THE STATE IS PROHIBITED.	PERTAINS TO ANY SITE WHICH HAS CONTAMINATED ON-SITE GROUND OR SURFACE WATER OR WILL HAVE A DISCHARGE TO ON-SITE SURFACE OR GROUND WATER.	ACTION
6111.04.2		RULES REQUIRING COMPLIANCE WITH NATIONAL EFFLUENT STDS	ESTABLISHES REGULATIONS REQUIRING COMPLIANCE WITH NATIONAL EFFLUENT STANDARDS.	PERTAINS TO ANY SITE WHICH WILL HAVE A POINT SOURCE DISCHARGE.	ACTION
6111.07	A,C	WATER POLLUTION CONTROL REQUIREMENTS - DUTY TO COMPLY	PROHIBITS FAILURE TO COMPLY WITH REQUIREMENTS OF SECTIONS 6111.01 TO 6111.08 OR ANY RULES, PERMIT OR ORDER ISSUED UNDER THOSE SECTIONS.	PERTAINS TO ANY SITE WHICH HAS CONTAMINATED GROUND WATER OR SURFACE WATER OR WILL HAVE A DISCHARGE TO ON-SITE SURFACE OR GROUND WATER.	ACTION

APPENDIX D

LIST OF ACRONYMS

List of Acronyms

AOC:	Administrative Order on Consent
ARARs:	Applicable or Relevant and Appropriate Requirements
Bedford:	Bedford Shale
BERA:	Baseline Ecological Risk Assessment
BRA:	Baseline Risk Assessment
BRC:	Big Run Creek
CD:	Consent Decree
CERCLA :	Comprehensive Environmental Response, Compensation and Liability Act
Ci/hr:	Curies per hour
cm^2/sec:	Square centimeters per second
CMS:	Corrective Measure Study
CAS:	Corrective Action Study
COC:	Chemicals of Concern
Cuyahoga:	Cuyahoga Shale
DOCC:	Description of Current Conditions
ED:	Exposure Duration
MMES:	Martin Marietta Energy Systems
ft^2:	Square Foot
ft^3:	Cubic Foot
ft/d:	Feet per Day
ft^2/d:	Square Feet per Day
ft^3/d:	Cubic Feet per Day
Gallia:	Gallia Sand and Gravel
gal/month:	Gallons per month
gal/yr:	Gallons per year
GC:	Gas chromatograph
GCEP:	Gaseous Centrifuge Enrichment Plant
gpd:	Gallons per Day
gpm:	Gallons per minute
HSWA:	Hazardous and Solid Waste Amendments
in/yr:	Inches per year
IRM:	Interim Remedial Measure
kg/yr:	Kilograms per Year
lbs:	Pounds
LBC:	Little Beaver Creek
m^3/day:	Cubic meters per day
MCL:	Maximum Contaminant Level
mg/l:	Milligrams per Liter

mg/kg:	Milligrams per Kilograms
mg/m^3:	Milligrams per cubic meter
mgd:	Million gallons per day
Minford:	Minford clay and silt
NCP:	National Oil and Hazardous Substances Pollution Contingency Plan
ND:	Not Detected
NDD:	North Drainage Ditch
NEDD:	North East Drainage Ditch
NPDES:	National Pollution Discharge Elimination System
O&M:	Operation & Maintenance
OEPA:	Ohio Environmental Protection Agency
PAHs:	Polynuclear Aromatic Hydrocarbons
PCBs:	Polychloronated Biphenyls
PCE:	Perchloroethylene
*p*Ci/l:	Picocuries per Liter
PERA:	Preliminary Ecological Risk Assessment
PK:	Peter Kiewit
PORTS:	Portsmouth Gaseous Diffusion Plant
ppb:	parts per billion
ppm:	parts per million
PQL:	Practical Quantitation Limit
QI:	Quadrant I
RCRA:	Resource Conservation and Recovery Act
RFI:	RCRA Facility investigation
RME:	Reasonable Maximum Exposure
ROD:	Record of Decision
SARA:	Superfund Amendments and Reauthorization Act
SCS:	Seep Collection System
Sunbury:	Sunbury Shale
SVOCs:	Semivolatile Organic Compounds
SWMUs:	Solid Waste Management Unit
Tc:	Technetium
TCE:	Trichloroethylene
ug/hr:	Micrograms per hour
ug/kg:	Micrograms per kilogram
ug/l:	Micrograms per liter
ug/m^3:	Micrograms per cubic meter
USDOE:	United States Department of Energy
USEPA:	United States Environmental Protection Agency
VOCs:	Volatile organic compounds

APPENDIX C

LIST OF FEDERAL AND STATE ARARs

Federal ARARs and TBCs for Peter Kiewit Landfill at PORTS			
Citation	**Requirement**	**Applicable (A) or Relevant and Appropriate (RA) or To Be Considered (TBC) Designation**	**Rationale**
National Historic Preservation Act 16 U.S.C. 470C Consideration of Historic Properties 36 CFR Part 800	DOE must take into account the effect of an undertaking on Historic Properties and accord the Advisory Council on Historic Preservation a reasonable opportunity to comment. Historic properties are defined as any prehistoric or historic district, building, site, structure, or object included in or eligible for inclusion in, the National Register of Historic Places. This term includes artifacts, records, and persons released to and located within such properties. Historic properties that are to be substantially altered or demolished must be recorded for future use and reference.	A	DOE has conducted appropriate consultation with the SHPO.
Archaeological and Historic Preservation Act 16 U.S.C. 469, 470	Upon discovery that a project may cause the irreparable loss, destruction, significant scientific finding, prehistorical finding, or loss of historical or archeological data, DOE must notify the Department of Interior in writing and provide appropriate information concerning the project. DOE must, with possible assistance from SHPO, undertake recovery, protection, and preservation of the data.	A	DOE has and will continue to consult, as appropriate, with the SHPO.
Procedure for Implementing NEPA 40 CFR 6.302(a) Executive Order 11990	Federal agencies conducting certain activities must avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and to avoid support of new construction in wetlands when a practicable alternative exists.	A	DOE must consider and protect wetlands associated with the area near the Peter Kiewit Landfill.
Procedures for Implementing NEPA 40 CFR 6.302(b) Executive Order 11988	Federal agencies must evaluate the potential effects of actions they may take in a floodplain to avoid, to the extent possible, adverse effects with direct or indirect development of a floodplain.	A	DOE must consider floodplain areas located within or affected by the Peter Kiewit landfill remedial action.
Chemical in Drinking Water (Solid Waste Disposal Facility) 40 CFR 257.4	A solid waste disposal facility shall not contaminate an underground drinking water source beyond the solid waste boundary (outermost perimeter of the waste). The concentration of chemicals shall not exceed background levels or listed maximum contaminant levels (MCL), whichever is higher.	RA	RA because Peter Kiewit Landfill contains several of the chemicals listed in the regulation.

Federal ARARs and TBCs for Peter Kiewit Landfill at PORTS			
Citation	**Requirement**	**Applicable (A) or Relevant and Appropriate (RA) or To Be Considered (TBC) Designation**	**Rationale**
Classification of Solid Waste Disposal Facilities and Practices 40 CFR 257.3-2	Solid waste disposal facilities or practices shall not cause or contribute to the taking of any endangered or threatened species of plants, fish, or wildlife. Solid waste disposal facilities or practices shall not result in the destruction or adverse modification of the critical habitat of endangered or threatened species identified in 50 CFR Part 17.	A	No threatened or endangered species have been identified at PORTS.
Endangered Species Act 16 U.S.C. 1531, et. seq. Endangered and Threatened Wildlife and Plants 50 CFR 17.21, 17.31, 17.61, 17.71, and 17.94 Interagency Cooperation-Endangered Species Act 50 CFR 402.01	All Federal agencies must ensure that any action authorized, funded, or carried out by them is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of the constituent elements essential to conservation of a listed species within a defined critical habitat. Additional requirements apply if it is determined that proposed activity could adversely affect these species or their habitat.	A	No threatened or endangered species have been identified at PORTS.
Archeological Resources Protection Act 16 U.S.C. 47099 Protection of Archaeological Resources 43 CFR 7.4(a)	No person may excavate, remove, damage, or otherwise alter or deface or attempt to excavate, remove, damage, or otherwise alter or deface any archaeological resource located on public lands unless such activity is pursuant to a permit.	A	DOE has conducted appropriate consultation with the SHPO.
DOE Compliance with Floodplains/Wetlands Environmental Review Requirements 10 CFR 1022.3(a), (b)(1), (2), (3), (5), (6), (c), (d), (e), 1022.5(b), (h), and 1022.11(a), (b), ©	DOE shall exercise leadership and take action in regard to floodplains/wetlands to avoid adverse impacts, incorporate floodplain management foals and wetland protection consideration into its planning, regulatory, and decision-making process, take appropriate steps to make floodplain determinations.	A	DOE must consider floodplain and wetland areas located within or affected by the Peter Kiewit Landfill remedial action.

Federal ARARs and TBCs for Peter Kiewit Landfill at PORTS			
Citation	**Requirement**	**Applicable (A) or Relevant and Appropriate (RA) or To Be Considered (TBC) Designation**	**Rationale**
Best Management Practices Program (BMP) Clean Water Act 40 CFR 125.104 Subpart K	BMP programs shall be developed in accordance with good engineering practices and (1) be documented in a narrative form, including necessary plot plans, drawings, and maps (2) establish specific objectives for the control of toxic and hazardous pollutants, and (3) establish specific best management practices to meet the specific objectives for control of toxic and hazardous pollutants to the waters of the United States.	A	The substantive portions of this regulation apply to the remedial action at Peter Kiewit Landfill.
Noise Control Act, as amended 42 U.S.C. 4901 et. seq. Noise Pollution and Abatement Act 42 U.S.C. 7641	The public must be protected from noises that jeopardize health and welfare.	A	Because equipment and vehicles would be involved in certain aspects of the remedial action at Peter Kiewit Landfill, all substantive requirements of the act are applicable.
RCRA Subtitle D Municipal Solid Waste Closure Regulations 40 CFR Part 258 Subpart F	RCRA Subtitle D regulations cover the location, operation, and closure of municipal solid waste landfills. Subpart F of 40 CFR Part 258 covers closure and post-closure.	RA	The substantive portions of 40 CFR Part 258 Subpart F are relevant and appropriate to the capping of Peter Kiewit Landfill.
RCRA Corrective Actions Under Sections 3004(u), 3005(c)(3), 3008(h), and 7003	Federal statutory requirements for RCRA corrective actions.	A	The Peter Kiewit Landfill remedial action is being conducted pursuant to RCRA and CERCLA.

Federal ARARs and TBCs for Peter Kiewit Landfill at PORTS			
Citation	**Requirement**	**Applicable (A) or Relevant and Appropriate (RA) or To Be Considered (TBC) Designation**	**Rationale**
DOE Order 5400.5	DOE orders relating to radiation dose limit, as low as reasonably achievable policy, control of residual radioactive material, management and control of radioactive materials in liquid discharges, radiation protection of public and the environment, and derived concentration guides for radionuclides contain criteria and guidelines to be considered for management of radioactive materials.	TBC	Management of any materials at the Peter Kiewit Landfill that are contaminated with radioactive compounds should consider the criteria and guidelines established in this DOE Order.
Management of Low Level Radioactive Waste DOE Order 5828.2A	DOE Order relating to the management of low level radioactive waste.	TBC	Management of any materials that may be considered low level radioactive waste should consider the criteria and guidelines established in this DOE Order.
RCRA Corrective Action Proposed Regulations 40 CFR 264 Subpart S	Proposed regulations for implementing RCRA corrective actions.	TBC	The proposed Subpart S regulations pertaining to RCRA corrective actions are to be considered for the Peter Kiewit Landfill.
RCRA Corrective Action Plan OSWER Directive No. 9902.3-2A	Guidance from EPA on conducting RCRA corrective actions.	TBC	The RCRA Corrective Action Plan guidance is to be considered for the Peter Kiewit Landfill remedial action.

State of Ohio ARARs for the Remedial Action at Peter Kiewit Landfill					
Revised Code Section	**Pertinent Paragraph**	**Title or Subject of Regulation**	**Description of Regulation**	**Application of Regulation**	**ARAR Type**
3767.13		Prohibition of nuisances	Prohibits noxious exhalation or smells and the obstruction of waterways.	Pertains to any site that may have noxious smells or may obstruct waterways.	Action
3767.14		Prohibition of nuisances	Prohibition against throwing refuse, oil, or filth into lakes, streams, or drains.	Pertains to all sites located adjacent to lakes, streams, or drains.	Action Chemical
6111.04		Acts of pollution prohibited	Pollution of waters of the state is prohibited.	Pertains to any site which has contaminated on-site ground or surface water or will have a discharge to on-site surface or groundwater	Action
6111.04.2		Rules requiring compliance with national effluent STDs	Establishes regulations requiring compliance with national effluent standards.	Pertains to any site which will have a point source discharge.	Action
6111.07	A, C	Water pollution control requirements. Duty to comply	Prohibits failure to comply with requirements of sections 6111.01 to 6111.08 or any rules, permit or order issued under those sections.	Pertains to any site which has contaminated ground water or surface water or will have a discharge to on-site surface or groundwater.	Action
1518.02		Endangered plant species	Prohibits removal or destruction of endangered plant species (some private property exceptions).	Applies to remediation sites where chemicals may harm endangered species. Clearly establishes the receptor plant species must be considered in risk assessments. This act may require consideration of displacement of large volumes of surface soil.	
3734.02	(H)	"Digging" where haz or solid waste facility was located	Filling, grading, excavating, building, drilling or mining on land where hazardous waste or solid waste facility was operated is prohibited without prior authorization from the director of the Ohio EPA.	Pertains to any site at which hazardous or solid waste has come to be located. Certain alternatives include excavation activities which may uncover solid and/or hazardous waste. Should those activities require the management of solid/hazardous wastes on-site, an exemption to permitting and other requirements may be warranted.	Location Action

State of Ohio ARARs for the Remedial Action at Peter Kiewit Landfill					
Revised Code Section	**Pertinent Paragraph**	**Title or Subject of Regulation**	**Description of Regulation**	**Application of Regulation**	**ARAR Type**
3734.04.1	A,C,D,G	Explosive gas monitoring	Requires explosive gas monitoring plans for sanitary landfills and provides authority to the director of Ohio EPA to order an owner or operator of a facility to implement an explosive gas monitoring and reporting plan.	Pertains to all sanitary landfills except for those that disposed of nonputrescible wastes.	Location Action
1501-18-1	03, A	List of endangered plant species	Plant species considered endangered in Ohio.	May apply at remediation sites where chemical release threatens listed species. Should also be considered where remediation activities may disrupt habitats.	
1501:31-23-	01, A-B	List of endangered animal species	List of Ohio animal species considered endangered.	May apply to remediation sites where listed species are threatened by chemical releases. May also apply at sites where remediation could disturb existing habitats.	
3745-1-03		Analytical and collection procedures	Specifies analytical methods and collection procedures for surface water discharges.	Pertains to both discharges to surface waters as a result of remediation and any on-site surface waters affected by site conditions.	Action
3745-1-04	A,B,C,D,E	The "Five Freedoms" for surface water	All surface water of the state shall be free from: A) objectional suspended solids. B) floating debris, oil, and scum. C) materials that create a nuisance. D) toxic, harmful, or lethal substances. E) nutrients that create nuisance growth	Pertains to both discharges to surface waters as a result of remediation and any on-site surface waters affected by site conditions.	Chemical
3745-1-05	A,B,C	Antidegradation policy for surface water	Prevents degradation of surface water quality below designated use or existing water quality. Existing instream uses shall be maintained and protected. The most stringent controls for treatment shall be required by the director to be employed for all new and existing point source discharges. Prevents any degradation of "State Resource Waters".	Requires that best available technology (BAT) be used to treat surface water discharges. DWOPA uses this rule to set standards when existing water quality is better than the designated use.	Chemical

State of Ohio ARARs for the Remedial Action at Peter Kiewit Landfill					
Revised Code Section	**Pertinent Paragraph**	**Title or Subject of Regulation**	**Description of Regulation**	**Application of Regulation**	**ARAR Type**
3745-1-06	A, B	Mixing zones for surface water	(A) Presents the criteria for establishing non-thermal mixing zones for point source discharges. (B) Presents the criteria for establishing thermal mixing zones for point source discharges.	Applies as a term of discharge permit to install (PTI). Would pertain to an alternative which resulted in a point source discharge.	Chemical
3745-1-07	C	Water quality criteria	Establishes water quality criteria for pollutants which do not have specific numerical or narrative criteria identified in Tables 7-1 through 7-15 of this rule.	Pertains to both discharges to surface water as a result of remedial action and any surface waters affected by site conditions.	Chemical Action
3745-1-09		Water use DES for Scioto River	Establishes water use designations for stream segments within the Scioto River Basin. Seep collection system discharge is governed by NPDES Permit No. 01000000*ED (Outfall 01000000606) which has the following discharge limitations: Zinc, total: Monitor Flow Rate: Monitor ph: Monitor 1,2 Trans-Dichloroethylene: 26 Micrograms/L(30 day) 66 Micrograms/L (daily)	Pertinent if stream or stream segment is on-site and is either affected by site conditions or if remedy includes direct discharge. Used by DWOPA to establish waste load allocations.	Action Location
3745-15-07	A	Air pollution nuisances prohibited	Defines air pollution nuisance as the emission or escape into the air from any source(s) of smoke, ashes, dust, dirt, grime, acids, fumes, gases, vapors, odors, and combinations of the above that endanger health , safety or welfare of the public or cause personal injury or property damage. Such nuisances are prohibited.	Pertains to any site which causes, or may reasonably cause, air pollution nuisances. Consider for sites that will undergo excavation, demolition, cap installation, methane production, clearing and grubbing, water treatment, incineration, and waste fuel recovery.	Action

State of Ohio ARARs for the Remedial Action at Peter Kiewit Landfill					
Revised Code Section	**Pertinent Paragraph**	**Title or Subject of Regulation**	**Description of Regulation**	**Application of Regulation**	**ARAR Type**
3745-17-02	A, B, C	Particulate ambient air quality standards	Establishes specific standards for total suspended particulates.	Pertains to any site that may emit measurable quantities of particulate matter both stack and fugitive. Consider for sites that will undergo excavation, demolition, cap installation, clearing and grubbing, incineration and waste fuel recovery.	Chemical
3745-17-05		Particulate non-degradation policy	Degradation of air quality in any area where air quality is better than required by 37-46-17-05 is prohibited.	Pertains to sites in certain locations that may emit or allow the escape of particulates (both stack and fugitive). Consider for sites that will undergo excavation, demolition, cap installation, clearing and grubbing, incineration.	Chemical Location
3745-17-08	A1,A2,B,D	Emission restrictions for fugitive dust	All emissions of fugitive dust shall be controlled.	Pertains to sites which may have fugitive emissions (non-stack) of dust. Consider for sites that will undergo grading, loading operations, demolition, clearing and grubbing and construction.	Action
3745-27-06	B,C	Required technical information for sanitary landfills	Specifies the minimum technical information required of a solid waste permit to install. Included are a hydrogeologic investigation report, leachate production and migration information, surface water discharge information, design calculations, plan drawings.	This paragraph presents substantive requirements of a solid waste permit to install. Pertains to any new solid waste disposal facility created on-site and expansions of existing solid waste landfills. Also pertains to existing areas of contamination that are capped per solid waste rules. This rule establishes the minimum information required during the remedial design stage.	Action

State of Ohio ARARs for the Remedial Action at Peter Kiewit Landfill					
Revised Code Section	**Pertinent Paragraph**	**Title or Subject of Regulation**	**Description of Regulation**	**Application of Regulation**	**ARAR Type**
3745-27-10	B, C, D	Sanitary landfill-groundwater monitoring	Groundwater monitoring program must be established for all sanitary landfill facilities. The system must consist of a sufficient number of wells that are located so that samples indicate both upgradient (background) and downgradient water samples. The system must be designed per the minimum requirements specified in this rule. The sampling and analysis procedures used must comply with this rule.	Pertains to any new solid waste facility and any expansions of existing solid waste landfills on-site. Also may pertain to existing areas of contamination that are capped in-place per the solid waste rules.	Action
3745-27-11	B, G	Final closure of sanitary landfill facilities	Requires closure of a landfill in a manner which minimizes the need for post-closure maintenance and minimizes post-closure formation and release of leachate and explosive gases to air, soil groundwater or surface water, specifies acceptable cap design; soil barrier layer, granular drainage layer, soil and vegetative layer. Provides for use of comparable materials to those specified with approval of director.	Substantive requirements pertain to any new solid waste landfills created on-site any expansions of existing solid waste landfills on-site and any existing areas of contamination that are capped in-place per the solid waste rules.	Action
3745-27-12	A, B,D, E, M, N	Sanitary landfill-explosive gas monitoring	Establishes when an explosive gas monitoring plan is required for solid waste landfills. Specifies the minimum information required in such a plan, including detailed engineering plans, specifications, information on gas generation potential, sampling and monitoring procedures, etc. Mandates when repairs must be made to an explosive gas monitoring system. This rule only applies to landfills which received "putrescible" solid wastes.	Pertains to any site which has had or will have putrescible solid wastes placed on-site and which has a residence or other occupied structure located within 1000 feet of the emplaced solid waste.	Action Location

State of Ohio ARARs for the Remedial Action at Peter Kiewit Landfill					
Revised Code Section	**Pertinent Paragraph**	**Title or Subject of Regulation**	**Description of Regulation**	**Application of Regulation**	**ARAR Type**
3745-27-12	I, J	Explosive gas monitoring for sanitary landfills	Identifies parameters and schedule for explosive gas monitoring	Pertains to any disposal site where explosive gas generation and migration may be a threat.	Action Chemical
3745-27-13	C	Disturbance where haz or solid waste facility was operated	Requires that a detailed plan be provided to describe how any proposed filling, grading, excavating, building, drilling or mining on land where a hazardous waste facility or solid waste facility was operated will be accomplished. This information must demonstrate that the proposed activities will not create a nuisance or adversely affect the public health or the environment. Special terms to conduct such activities may be imposed by the director to protect the public and the environment.	Pertains to any site at which hazardous or solid waste has been managed, either intentionally or otherwise. Does not pertain to areas that have had one-time leaks or spills.	Action Location
3745-27-14	A	Post-closure care of sanitary landfill facilities	Specifies the required post-closure care for solid waste facilities. Includes continuing operation of leachate and surface water management systems, maintenance of the cap system and groundwater monitoring.	Substantive requirements pertain to any newly created solid waste landfills on-site, any expansions of existing solid waste landfills on-site and any existing area of contamination that are capped per the solid waste rules.	Action
3745-27-19	H	Sanitary landfill operations - final cover	Includes requirements for the final cap system for areas at final elevations.	Pertains to new solid waste disposal facilities to be created on-site and existing landfills that will be expanded during remediation. Portions also may pertain to existing areas of contamination that will be capped in-place per solid waste rules.	Action
3745-27-19	J	Sanitary landfill operations - surface water management	Surface water must be diverted from areas where solid waste is being, or has been, deposited, also requires run-on and run-off to be controlled to minimize infiltration through the cover material and to minimize erosion of the cap system.	Pertains to new solid waste disposal facilities to be created on-site and existing landfills that will be expanded during remediation. Portions also may pertain to existing areas of contamination that will be capped in-place per solid waste rules.	Action

APPENDIX D

LIST OF ACRONYMS

State of Ohio ARARs for the Remedial Action at Peter Kiewit Landfill					
Revised Code Section	**Pertinent Paragraph**	**Title or Subject of Regulation**	**Description of Regulation**	**Application of Regulation**	**ARAR Type**
3745-27-19	K	Sanitary landfill operations - leachate management	Requires repair of leachate outbreaks; collection and treatment of leachate on the surface of the landfill; and actions to minimize, control, or eliminate conditions causing leachate outbreaks.	Pertains to new solid waste disposal facilities to be created on-site and existing landfills that will be expanded during remediation. Portions also may pertain to existing areas of contamination that will be capped in-place per solid waste rules.	Action
3745-31-05		Water/air permit criteria for decision by the director	A permit to install (PTI) or plans must demonstrate best available technology (BAT) and shall not interfere with or prevent the attainment or maintenance of applicable ambient air quality standards.	Pertains to any site that will discharge to on-site surface water or will emit contaminants into the air.	Action
3745-32-05		Water quality criteria for decision by the director	Specifies substantive criteria for Section 401 water quality criteria for dredging, filling, obstructing or altering waters of the state.	Pertains to any site that has or will affect waters of the state.	Action
3745-81-26	A, B, C	Monitoring frequency for radioactivity	Presents monitoring requirements for radioactivity.	Pertains to any site which has contaminated ground or surface water that is either being used, or has the potential for use, as a drinking water source.	Chemical
3745-9-09	A-C,D1,E,-G	Maintenance & Operation of GW Wells	Establishes specific maintenance and modification requirements for casing, pump and wells in general	Pertains to all gw wells on the site that either will be installed or have been installed since Feb. 15, 1975. Would pertain during the FS if new wells are constructed for treatability studies.	Action
3745-9-10	A, B, C	Abandonment of test holes and GO wells	Following completion of use, wells and test holes shall be completely filled with grout or similar material or shall be maintained in compliance of all regulations.	Pertains to all groundwater wells on the site that either will be installed or have been installed since Feb. 16, 1976.	Action

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DOCC:	Description of Current Conditions
ED:	Exposure Duration
ft^2:	Square Foot
ft^3:	Cubic Foot
ft/d:	Feet per Day
ft^2/d:	Square Feet per Day
ft^3/d:	Cubic Feet per Day
Gallia:	Gallia Sand and Gravel
gal/month:	Gallons per month
gal/yr:	Gallons per year
GC:	Gas chromatograph
GCEP:	Gaseous Centrifuge Enrichment Plant
gpd:	Gallons per Day
gpm:	Gallons per minute
HSWA:	Hazardous and Solid Waste Amendments
in/yr:	Inches per year
IRM:	Interim Remedial Measure
kg/yr:	Kilograms per Year
lbs:	Pounds
LBC:	Little Beaver Creek
m^3/day:	Cubic meters per day
MCL:	Maximum Contaminant Level
mg/l:	Milligrams per Liter
mg/kg:	Milligrams per Kilograms
mg/m^3:	Milligrams per cubic meter
mgd:	Million gallons per day
Minford:	Minford clay and silt

MMES:	Martin Marietta Energy Systems
NCP:	National Oil and Hazardous Substances Pollution Contingency Plan
ND:	Not Detected
NDD:	North Drainage Ditch
NEDD:	North East Drainage Ditch
NPDES:	National Pollution Discharge Elimination System
O&M:	Operation & Maintenance
Ohio EPA:	Ohio Environmental Protection Agency
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*p*Ci/l:	Picocuries per Liter
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PORTS:	Portsmouth Gaseous Diffusion Plant
ppb:	parts per billion
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RCRA:	Resource Conservation and Recovery Act
RFI:	RCRA Facility investigation
RME:	Reasonable Maximum Exposure
ROD:	Record of Decision
SARA:	Superfund Amendments and Reauthorization Act
SB:	Statement of Basis
SCS:	Seep Collection System
Sunbury:	Sunbury Shale
SVOC:	Semivolatile Organic Compounds
SWMU:	Solid Waste Management Unit
Tc:	Technetium
TCE:	Trichloroethylene
*u*g/hr:	Micrograms per hour
*u*g/kg:	Micrograms per kilogram
*u*g/l:	Micrograms per liter
ug/m^3:	Micrograms per cubic meter
U.S. DOE:	United States Department of Energy
U.S. EPA:	United States Environmental Protection Agency
VOC:	Volatile organic compounds