Final

Volume 4: JN-3, Research Reactor Building

Battelle Columbus Laboratories Decommissioning Project

Baseline, Revision 3

June 28, 2002

Volume 4—JN-3, Research Reactor Building

A. Outline of Volume
B. Approach
C. Cost by Year (separate volume)
D. Schedule
E. Logic Networks
F. Pricing Sheets (separate volume)
   & Data Templates

BCLDP Baseline: Activity ID / Work Package Matrix

Open Plan ID	Work Package Number	Description
Building JN-3		
E033	7E2-B05	Prepare JN-3 Characterization and Final Status Report
E037	7E2-B06	Survey & Monitor Underground
E037P	7E2-B06	PLAN: Survey & Monitor Underground
E051	7E2-B07	Survey and Monitor Remaining Surfaces
E051P	7E2-B07	PLAN: Survey and Monitor Remaining Surfaces
E062	7E2-B08	Survey and Monitor Mat Surface in Pool
E062P	7E2-B08	PLAN: Survey and Monitor Mat Surface in Pool
E014	7E4-B05	Remove Underground Drains and Dry Storage Wells
E014P	7E4-B05	PLAN: Remove Underground Drains and Dry Storage Wells
E034	7E4-B16	Remove NESHAPS Material
E034P	7E4-B16	PLAN: Remove NESHAPS Material
E035	7E4-B17	Demolish Surface Structure
E035P	7E4-B17	PLAN: Demolish Surface Structure
E039	7E4-B18	Excavate Underground Material
E039P	7E4-B18	PLAN: Excavate Underground Material
E040	7E4-B19	Perform JN-3 Underground Completion Survey
E050	7E4-B20	Remove Remaining Mechanical and Electrical Equipment from Building
E050P	7E4-B20	PLAN: Remove Remaining Mechanical and Electrical Equipment from Building
E052	7E4-B21	Decontaminate Remaining Surfaces
E052P	7E4-B21	PLAN: Decontaminate Remaining Surfaces
E053	7E4-B22	Perform Remaining Decon Completion Surveys
E055	7E4-B24	JN-3 Final Status Survey before Demolition
E055P	7E4-B24	PLAN: JN-3 Final Status Survey before Demolition
E059	7E4-B27	Remove Machine Shop Material and Utilities from JN-3 Annex
E059P	7E4-B27	PLAN: Remove Machine Shop Material and Utilities from JN-3 Annex
E061	7E4-B28	Remove Reactor Pool Floor
E061P	7E4-B28	PLAN: Remove Reactor Pool Floor
E063	7E4-B28	Remove Reactor Coolant Piping and Drain.Decon Mat
E063P	7E4-B28	PLAN: Remove Reactor Coolant Piping and Drain.Decon Mat
E060	7E4-B29	Remove Contaminated Column and Footer from Pump Room
E060P	7E4-B29	PLAN: Remove Contaminated Column and Footer from Pump Room
ES013	7E5-B01	Prepare JN-3 Areas Characterization & Final Status Report before Backfill of Site
ES014	7E5-B01	Conduct JN-3 Areas IVC
ES014P	7E5-B01	PLAN: Conduct JN-3 Areas IVC
E056	7E5-B02	JN-3 IVC before Demolition
E056P	7E5-B02	PLAN: JN-3 IVC before Demolition

BCLDP Baseline, Revision 3

Approach

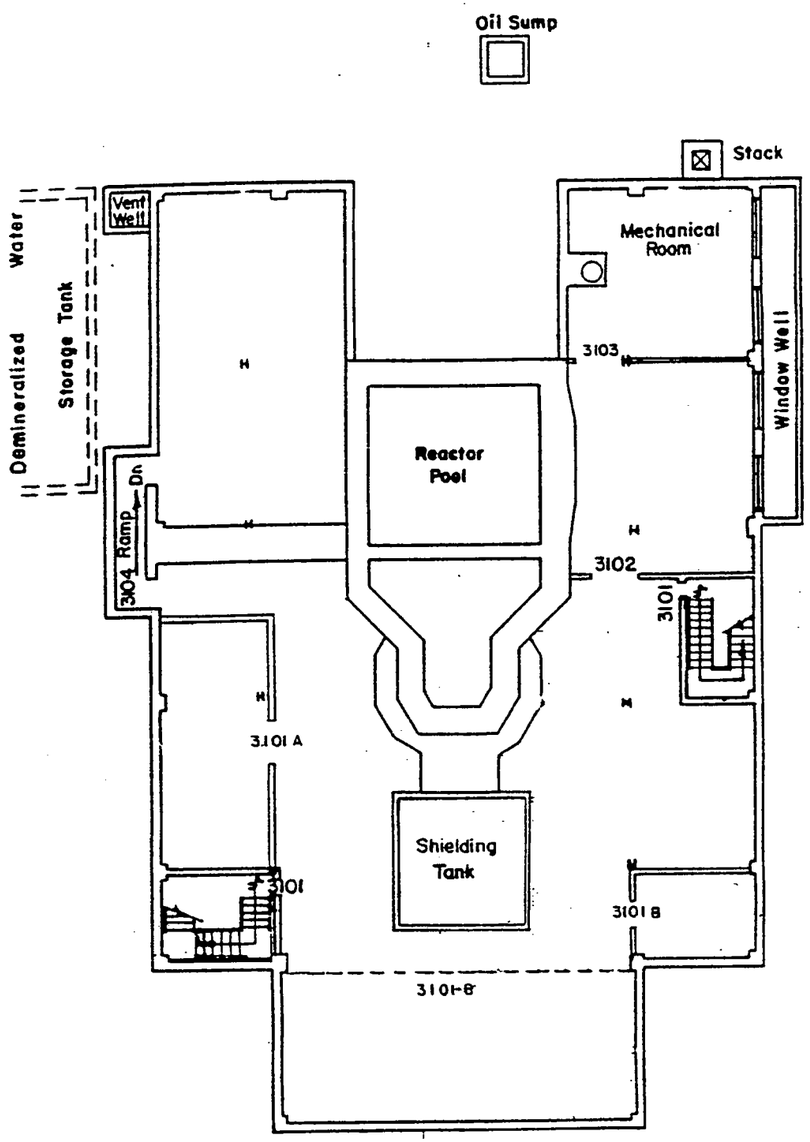
History – Building JN-3, Research Reactor Building

The Battelle Research Reactor housed a 2-megawatt-swimming-pool-design reactor that operated from 1956 through 1974. The building was partially decontaminated after shutdown. Removal of fuel, major operating components and fixtures and selected decontamination occurred in 1975. Removal of remaining contaminated building components and storage of waste awaiting shipment for burial are the current principal uses of the building. Remaining contamination consists primarily of fission products and activation products, including carbon-14.

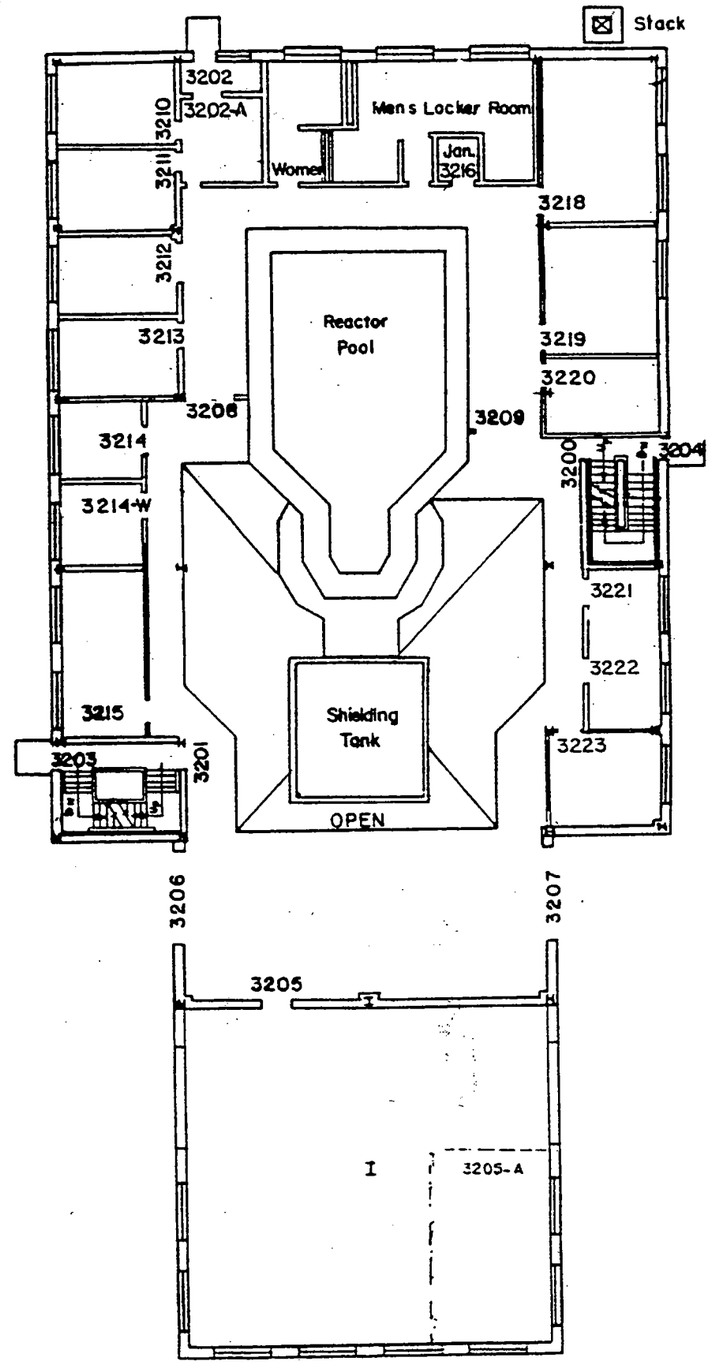
Planned Approach for D&D of Building JN-3

The D&D process is almost completed in Building JN-3. Unneeded materials and utilities, including tanks, piping, electrical, and ductwork have been removed from the basement and second floor areas. Removal of the nonstructural portion of the reactor pool, bioshield, and thermal column has also been completed. Completion of both internal and external material and utility removal followed by surface decontamination to less than regulatory limits was achieved this year. Buried drain line removal and, finally, demolition of the building and its foundation according to standard industrial practice remain to be performed. Radiological oversight will be provided for the duration of these activities to ensure worker protection and to assure that no contaminated materials are improperly disposed of.

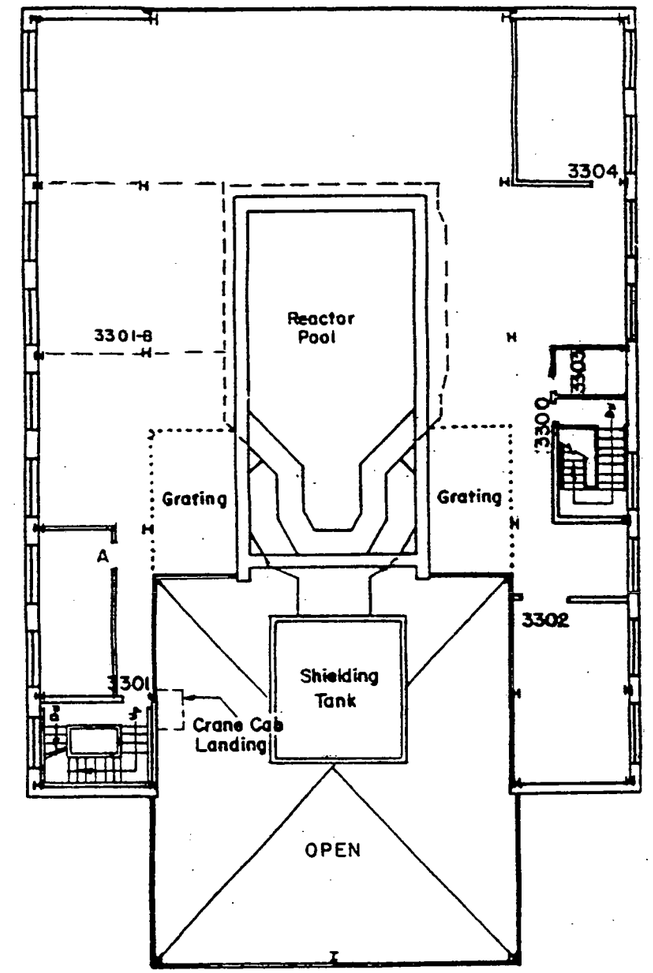
This planned sequence of activities to finish Building JN-3 involves implementation of a groundwater dewatering system using wells and lowering the lake level. Once the water level is lowered, underground drain lines within the building perimeter will be excavated and removed, followed by sampling and survey of the surrounding soil. Completion surveys will be performed to verify that all identified contamination has been eliminated. The building surface structure and basement floors will then be demolished and removed according to industrial standards. Surveys of the underlying soils will be conducted, and any contaminated soil will be removed for disposal as LLW prior to complete removal of foundations and footers. The excavation will remain open pending IVC confirmation that no soil contaminated above regulatory limits remains.



Basement



First Floor



Second Floor

Building JN-3

OPEN PLAN - POM
Report: ZBAR
Project: BASELINE
Timenow: 01OCT02
Date: 27JUN02
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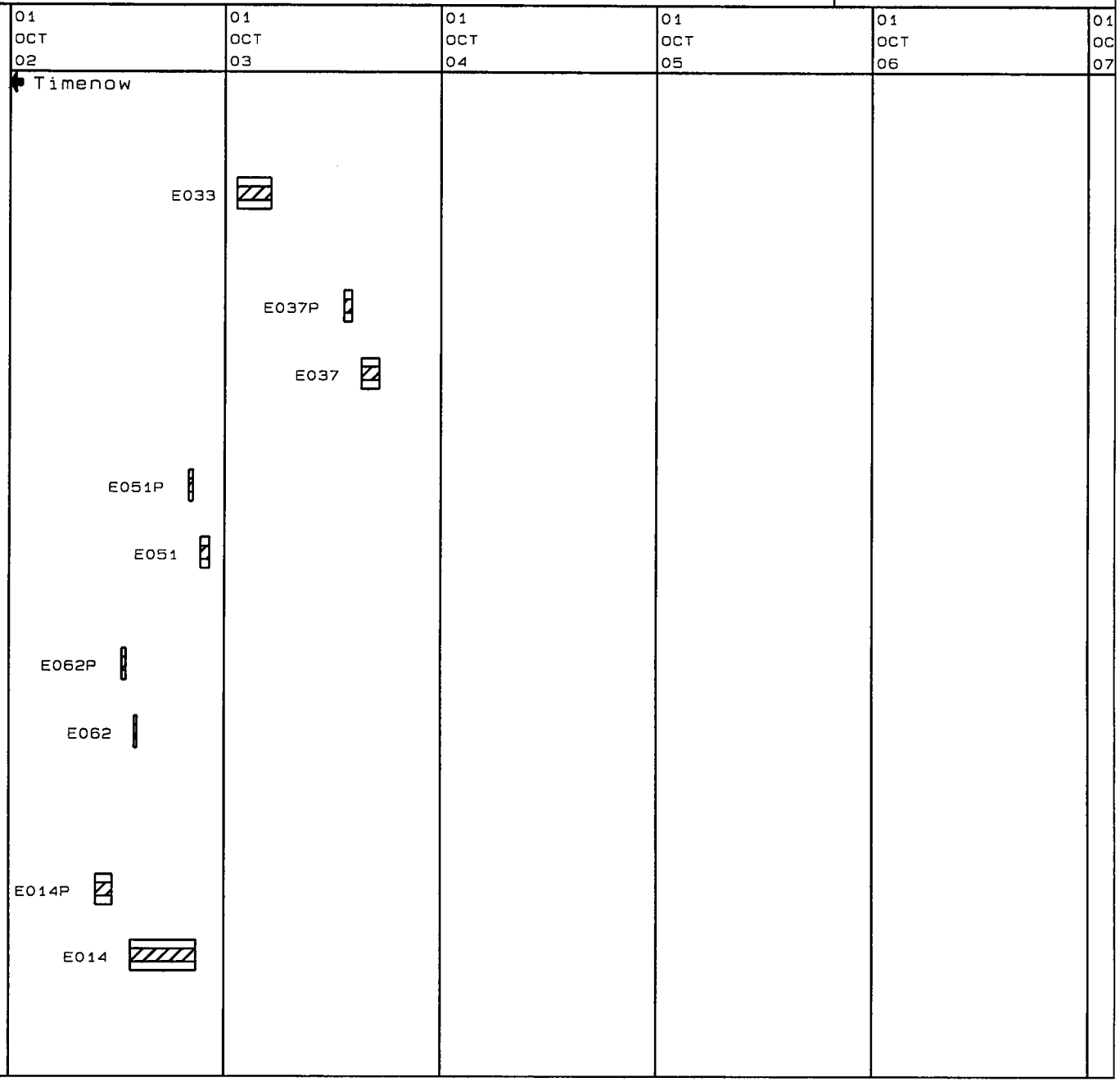
BCLDP BASELINE: JN-3

BAR LEGEND
Actuals
Forecast
Baseline

WORKPKG	BCOST	PCT	OU	RDU	BSTART	BFINISH	ESDATE	EFDATE	
1.7.E.2. JN-3 CHARACTERIZATION									
7E2-B05 : PREPARE JN-3 CHARACTERIZATION/FINAL STATUS REPORT									
E033 Prepare JN-3 Characterization and Final Status Report									1
7E2-B05	$ 50554		40	40	21OCT03	17DEC03	21OCT03	17DEC03	
7E2-B06 : SURVEY AND MONITOR JN-3 UNDERGROUND MATERIAL									
E037P PLAN: Survey & Monitor Underground									1
7E2-B06	$ 14427		10	10	20APR04	03MAY04	20APR04	03MAY04	
E037 Survey & Monitor Underground									1
7E2-B06	$ 61294		21	21	20MAY04	18JUN04	20MAY04	18JUN04	
7E2-B07 : SURVEY AND MONITOR REMAINING JN-3 SURFACES									
E051P PLAN: Survey and Monitor Remaining Surfaces									1
7E2-B07	$ 10015		5	5	01AUG03	07AUG03	01AUG03	07AUG03	
E051 Survey and Monitor Remaining Surfaces									1
7E2-B07	$ 32927		10	10	21AUG03	04SEP03	21AUG03	04SEP03	
7E2-B08 : SURVEY AND MONITOR MAT SURFACE IN POOL									
E062P PLAN: Survey and Monitor Mat Surface in Pool									1
7E2-B08	$ 7466		5	5	10APR03	16APR03	10APR03	16APR03	
E062 Survey and Monitor Mat Surface in Pool									1
7E2-B08	$ 14014		3	3	01MAY03	05MAY03	01MAY03	05MAY03	
1.7.E.4. JN-3 DECONTAMINATION OPERATIONS									
7E4-B05 : REMOVE UNDERGROUND DRAINS AND DRY STORAGE WELLS									
E014P PLAN: Remove Underground Drains and Dry Storage Wells									1
7E4-B05	$ 10192		20	20	25FEB03	24MAR03	25FEB03	24MAR03	
E014 Remove Underground Drains and Dry Storage Wells									1
7E4-B05	$ 287190		77	77	25APR03	13AUG03	25APR03	13AUG03	
7E4-B16 : REMOVE JN-3 NESHAPS MATERIAL									



OPEN PLAN - PDM
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BCLDP BASELINE: JN-3

BAR LEGEND
Actuals
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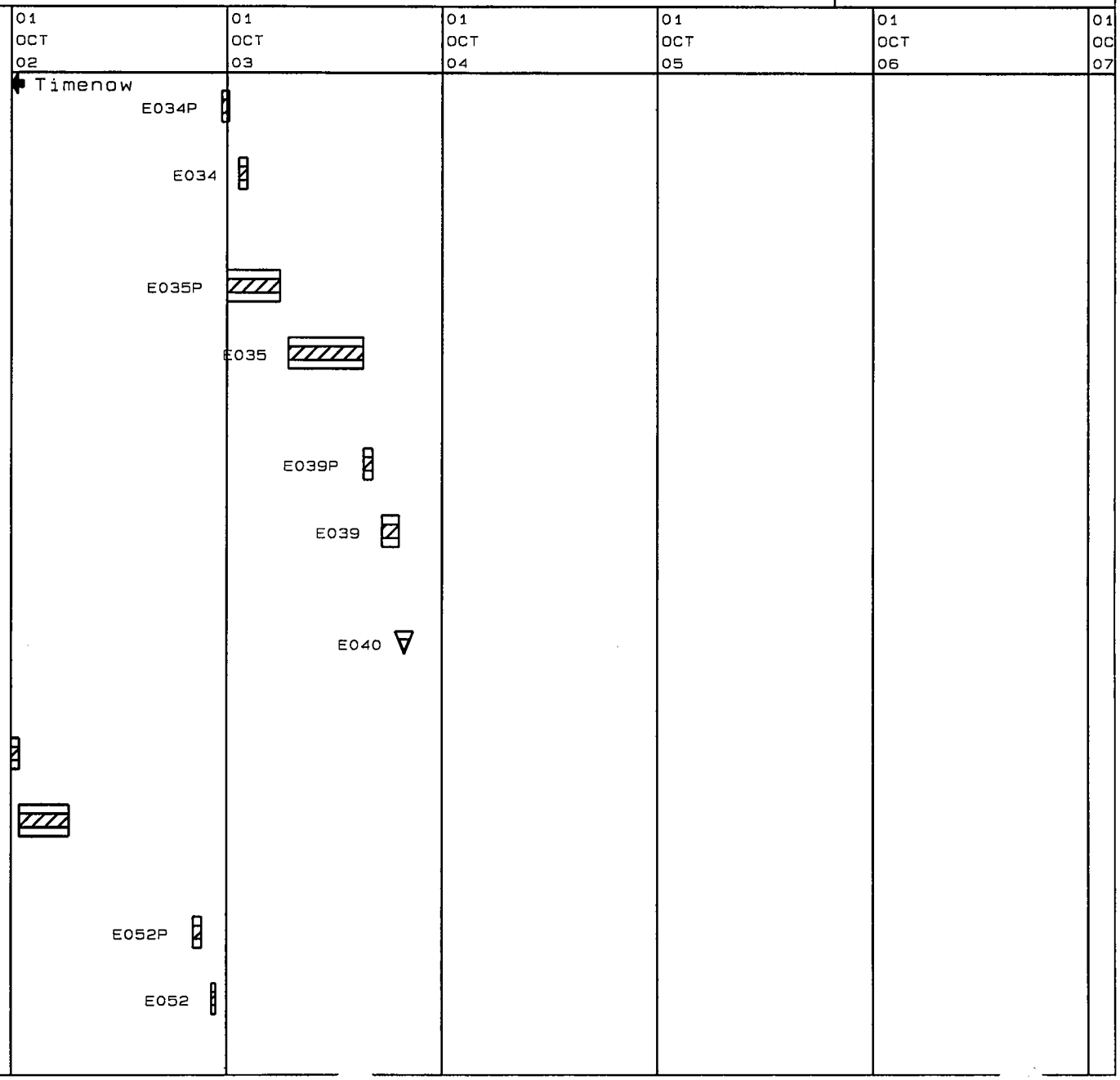
Baseline

WORKPKG	BCOST	PCT	DU	ROU	BSTART	BFINISH	ESDATE	EFDATE	
E034P PLAN: Remove NESHAPS Material									1
7E4-B16	$ 6595		10	10	22SEP03	03OCT03	22SEP03	03OCT03	
E034 Remove NESHAPS Material									1
7E4-B16	$ 31936		10	10	21OCT03	03NOV03	21OCT03	03NOV03	
7E4-B17 : DEMOLISH JN-3 BUILDING STRUCTURE									
E035P PLAN: Demolish Surface Structure									1
7E4-B17	$ 11785		60	60	01OCT03	29DEC03	01OCT03	29DEC03	
E035 Demolish Surface Structure									1
7E4-B17	$ 482853		91	91	14JAN04	19MAY04	14JAN04	19MAY04	
7E4-B18 : EXCAVATE JN-3 UNDERGROUND MATERIAL									
E039P PLAN: Excavate Underground Material									1
7E4-B18	$ 6411		10	10	21MAY04	04JUN04	21MAY04	04JUN04	
E039 Excavate Underground Material									1
7E4-B18	$ 74427		20	20	21JUN04	19JUL04	21JUN04	19JUL04	
7E4-B19 : PERFORM JN-3 UNDERGROUND COMPLETION SURVEY									
E040 Perform JN-3 Underground Completion Survey									1
7E4-B19	$ 3710		1	1	29JUL04	29JUL04	29JUL04	29JUL04	
7E4-B20 : REMOVE REMAINING MECHANICAL/ELECTRICAL FROM JN-3									
E050P PLAN: Remove Remaining Mechanical and Electrical Equipment from Bu									1
7E4-B20	$ 5858		10	10	01OCT02	14OCT02	01OCT02	14OCT02	
E050 Remove Remaining Mechanical and Electrical Equipment from Building									1
7E4-B20	$ 191045		55	55	15OCT02	06JAN03	15OCT02	06JAN03	
7E4-B21 : DECONTAMINATE REMAINING JN-3 SURFACES									
E052P PLAN: Decontaminate Remaining Surfaces									1
7E4-B21	$ 4635		10	10	05AUG03	18AUG03	05AUG03	18AUG03	
E052 Decontaminate Remaining Surfaces									1
7E4-B21	$ 51421		5	5	05SEP03	11SEP03	05SEP03	11SEP03	
7E4-B22 : PERFORM REMAINING JN-3 DECON COMPLETION SURVEYS									



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BCLDP BASELINE: JN-3

BAR LEGEND
Actuals
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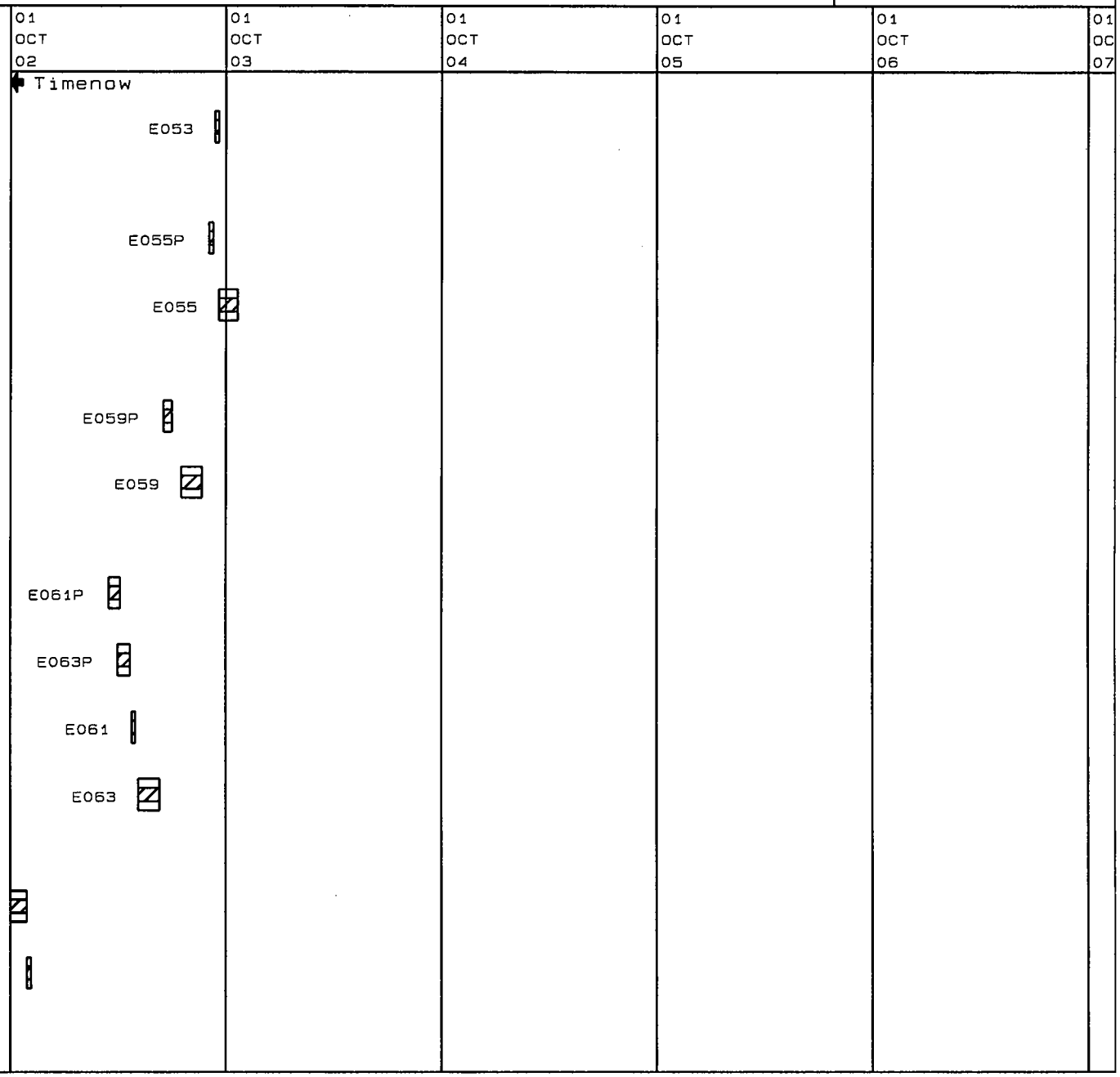
WORKPKG	BCOST	PCT	DU	RDU	BSTART	BFINISH	ESDATE	EFDATE	
E053 Perform Remaining Decon Completion Surveys									1
7E4-B22	$ 16463		5	5	12SEP03	18SEP03	12SEP03	18SEP03	
7E4-B24 : JN-3 FINAL STATUS SURVEY BEFORE DEMOLITION									
E055P PLAN: JN-3 Final Status Survey before Demolition									1
7E4-B24	$ 10015		5	5	02SEP03	08SEP03	02SEP03	08SEP03	
E055 JN-3 Final Status Survey before Demolition									1
7E4-B24	$ 68678		22	22	19SEP03	20OCT03	19SEP03	20OCT03	
7E4-B27 : REMOVE MACHINE SHOP/MATERIAL FROM JN-3 ANNEX									
E059P PLAN: Remove Machine Shop Material and Utilities from JN-3 Annex									1
7E4-B27	$ 6411		10	10	17JUN03	30JUN03	17JUN03	30JUN03	
E059 Remove Machine Shop Material and Utilities from JN-3 Annex									1
7E4-B27	$ 86970		25	25	17JUL03	20AUG03	17JUL03	20AUG03	
7E4-B28 : REMOVE REACTOR POOL FLOORTOP/DECON/EMBEDDED PIPES									
E061P PLAN: Remove Reactor Pool Floor									1
7E4-B28	$ 7891		15	15	17MAR03	04APR03	17MAR03	04APR03	
E063P PLAN: Remove Reactor Coolant Piping and Drain.Decon Mat									1
7E4-B28	$ 7891		15	15	01APR03	21APR03	01APR03	21APR03	
E061 Remove Reactor Pool Floor									1
7E4-B28	$ 15645		4	4	25APR03	30APR03	25APR03	30APR03	
E063 Remove Reactor Coolant Piping and Drain.Decon Mat									1
7E4-B28	$ 135772		25	25	06MAY03	10JUN03	06MAY03	10JUN03	
7E4-B29 : REMOVE PUMP ROOM CONTAMINATED COLUMN AND FOOTER									
E060P PLAN: Remove Contaminated Column and Footer from Pump Room									1
7E4-B29	$ 10192		20	20	01OCT02	28OCT02	01OCT02	28OCT02	
E060 Remove Contaminated Column and Footer from Pump Room									1
7E4-B29	$ 24090		5	5	29OCT02	04NOV02	29OCT02	04NOV02	
1.7.E.5. JN-3 CERTIFICATION AND RELEASE									



OPEN PLAN - PDM
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BCLDP BASELINE: JN-3

BAR LEGEND
Actuals
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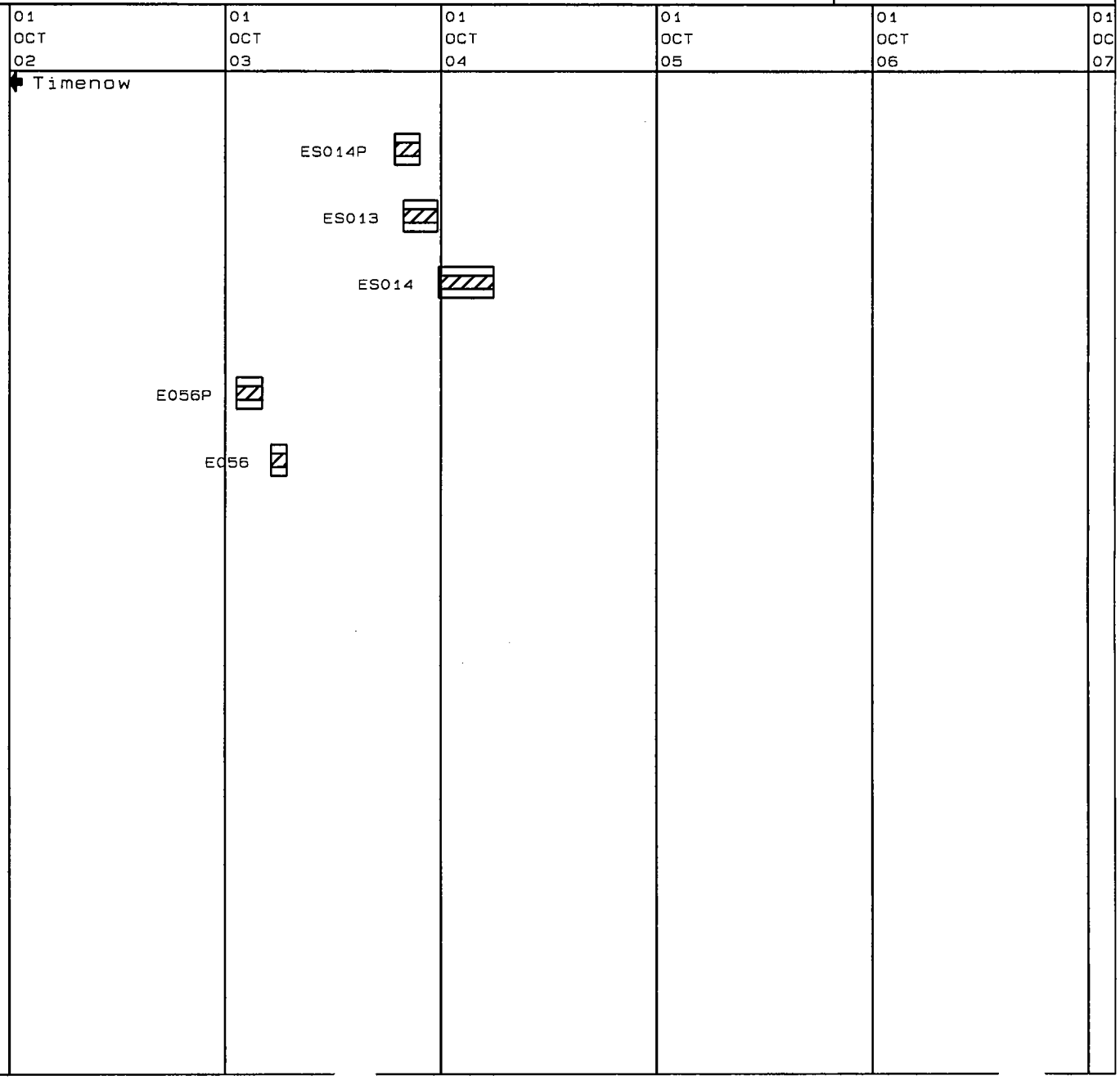
WORKPKG	BCOST	PCT	DU	RDU	BSTART	BFINISH	ESDATE	EFDATE
7E5-B01 : PREPARE JN-3 FINAL STATUS REPORT AND IVC								
ES014P PLAN: Conduct JN-3 Areas IVC								1
7E5-B01	$ 3243		30	30	15JUL04	25AUG04	15JUL04	25AUG04
ES013 Prepare JN-3 Areas Characterization & Final Status Report before B								1
7E5-B01	$ 54002		40	40	30JUL04	24SEP04	30JUL04	24SEP04
ES014 Conduct JN-3 Areas IVC								1
7E5-B01	$ 47514		64	64	27SEP04	28DEC04	27SEP04	28DEC04
7E5-B02 : CONDUCT IVC OF JN-3 BEFORE BUILDING DEMOLITION								
E056P PLAN: JN-3 IVC before Demolition								1
7E5-B02	$ 3243		30	30	20OCT03	02DEC03	20OCT03	02DEC03
E056 JN-3 IVC before Demolition								1
7E5-B02	$ 67863		15	15	18DEC03	13JAN04	18DEC03	13JAN04



A1

BCLDP BASELINE LOGIC: Building JN-3

06/27/02
11:35:37
Page 1

___ Critical

C014 60 7C44-B02 22APR03 16JUL03 JN1
Decon/Stabilize High Energy Cell and Cask Washdown Room Surfaces

E059P 10 7E4-B27 17JUN03 30JUN03 JN3
PLAN: Remove Machine Shop Material and Utilities from JN-3 Annex

E050P 10 7E4-B20 01OCT02 14OCT02 JN3
PLAN: Remove Remaining Mechanical and Electrical Equipment from Building

E059 25 7E4-B27 17JUL03 20AUG03 JN3
Remove Machine Shop Material and Utilities from JN-3 Annex

SS

E051P 5 7E2-B07 01AUG03 07AUG03 JN3
PLAN: Survey and Monitor Remaining Surfaces

E050 55 7E4-B20 15OCT02 06JAN03 JN3
Remove Remaining Mechanical and Electrical Equipment from Building

E051 10 7E2-B07 21AUG03 04SEP03 JN3
Survey and Monitor Remaining Surfaces

E052P 10 7E4-B21 05AUG03 18AUG03 JN3
PLAN: Decontaminate Remaining Surfaces

E060P 20 7E4-B29 01OCT02 28OCT02 JN3
PLAN: Remove Contaminated Column and Footer from Pump Room

E052 5 7E4-B21 05SEP03 11SEP03 JN3
Decontaminate Remaining Surfaces

E060 5 7E4-B29 29OCT02 04NOV02 JN3
Remove Contaminated Column and Footer from Pump Room

I195 100 7I2-B13 04FEB04 23JUN04 EXT
Survey and Monitor Sanitary Sewer Lines

E014P 20 7E4-B05 25FEB03 24MAR03 JN3
PLAN: Remove Underground Drains and Dry Storage Wells

E014 77 7E4-B05 25APR03 13AUG03 JN3
Remove Underground Drains and Dry Storage Wells

SS 20

E061P 15 7E4-B28 17MAR03 04APR03 JN3
PLAN: Remove Reactor Pool Floor

E061 4 7E4-B28 25APR03 30APR03 JN3
Remove Reactor Pool Floor

E062P 5 7E2-B08 10APR03 16APR03 JN3
PLAN: Survey and Monitor Mat Surface in Pool

E062 3 7E2-B08 01MAY03 05MAY03 JN3
Survey and Monitor Mat Surface in Pool

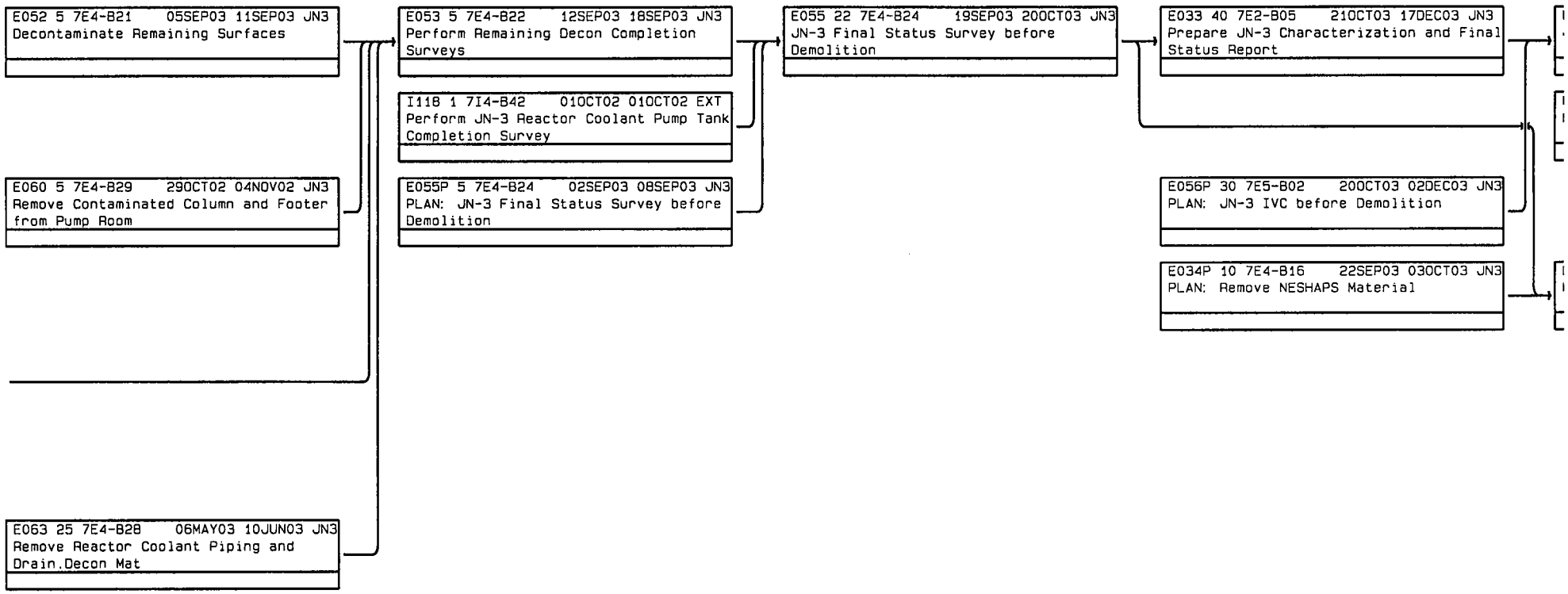
E063P 15 7E4-B28 01APR03 21APR03 JN3
PLAN: Remove Reactor Coolant Piping and Drain.Decon Mat

E063 25 7E4-B28 06MAY03 10JUN03 JN3
Remove Reactor Coolant Piping and Drain.Decon Mat

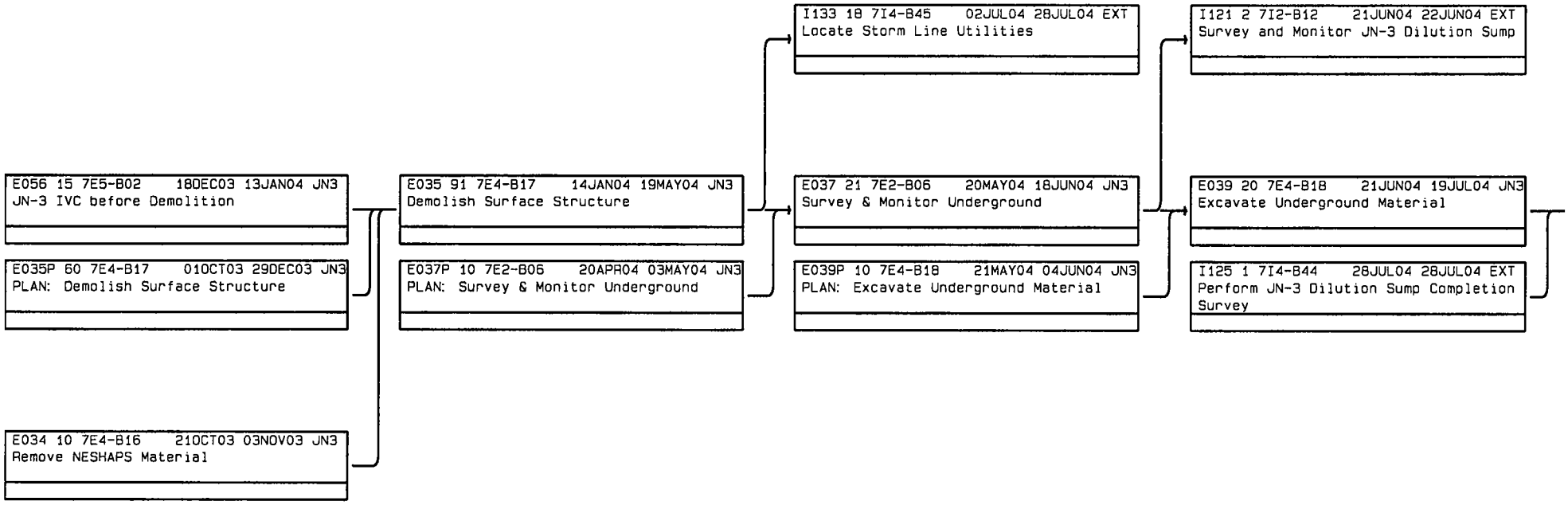
SS 20

IG007 450 7I4-B65 28MAR03 10JAN05 WATER
Dewatering of JN-3

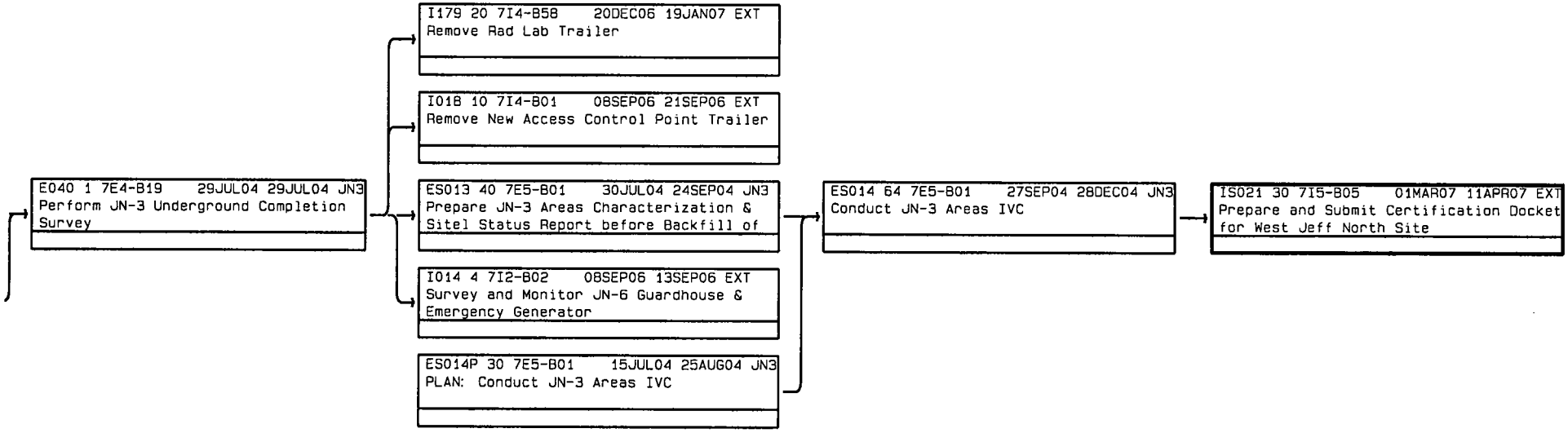
A2


E052 5 7E4-B21 05SEP03 11SEP03 JN3
Decontaminate Remaining Surfaces
E060 5 7E4-B29 29OCT02 04NOV02 JN3
Remove Contaminated Column and Footer from Pump Room
E063 25 7E4-B28 06MAY03 10JUN03 JN3
Remove Reactor Coolant Piping and Drain.Decon Mat
E053 5 7E4-B22 12SEP03 18SEP03 JN3
Perform Remaining Decon Completion Surveys
I11B 1 7I4-B42 01OCT02 01OCT02 EXT
Perform JN-3 Reactor Coolant Pump Tank Completion Survey
E055P 5 7E4-B24 02SEP03 08SEP03 JN3
PLAN: JN-3 Final Status Survey before Demolition
E055 22 7E4-B24 19SEP03 20OCT03 JN3
JN-3 Final Status Survey before Demolition
E033 40 7E2-B05 21OCT03 17DEC03 JN3
Prepare JN-3 Characterization and Final Status Report
E056P 30 7E5-B02 20OCT03 02DEC03 JN3
PLAN: JN-3 IVC before Demolition
E034P 10 7E4-B16 22SEP03 03OCT03 JN3
PLAN: Remove NESHAPS Material

A3


E056 15 7E5-B02 18DEC03 13JAN04 JN3
JN-3 IVC before Demolition
E035P 60 7E4-B17 01OCT03 29DEC03 JN3
PLAN: Demolish Surface Structure
E034 10 7E4-B16 21OCT03 03NOV03 JN3
Remove NESHAPS Material
E035 91 7E4-B17 14JAN04 19MAY04 JN3
Demolish Surface Structure
E037P 10 7E2-B06 20APR04 03MAY04 JN3
PLAN: Survey & Monitor Underground
I133 18 7I4-B45 02JUL04 28JUL04 EXT
Locate Storm Line Utilities
E037 21 7E2-B06 20MAY04 18JUN04 JN3
Survey & Monitor Underground
E039P 10 7E4-B18 21MAY04 04JUN04 JN3
PLAN: Excavate Underground Material
I121 2 7I2-B12 21JUN04 22JUN04 EXT
Survey and Monitor JN-3 Dilution Sump
E039 20 7E4-B18 21JUN04 19JUL04 JN3
Excavate Underground Material
I125 1 7I4-B44 28JUL04 28JUL04 EXT
Perform JN-3 Dilution Sump Completion Survey

A4


E040 1 7E4-B19 29JUL04 29JUL04 JN3
Perform JN-3 Underground Completion Survey
I179 20 7I4-B58 20DEC06 19JAN07 EXT
Remove Rad Lab Trailer
I018 10 7I4-B01 08SEP06 21SEP06 EXT
Remove New Access Control Point Trailer
ES013 40 7E5-B01 30JUL04 24SEP04 JN3
Prepare JN-3 Areas Characterization & Sitel Status Report before Backfill of
I014 4 7I2-B02 08SEP06 13SEP06 EXT
Survey and Monitor JN-6 Guardhouse & Emergency Generator
ES014P 30 7E5-B01 15JUL04 25AUG04 JN3
PLAN: Conduct JN-3 Areas IVC
ES014 64 7E5-B01 27SEP04 28DEC04 JN3
Conduct JN-3 Areas IVC
IS021 30 7I5-B05 01MAR07 11APR07 EXT
Prepare and Submit Certification Docket for West Jeff North Site

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: E014 **Work Pkg. No.:** 7E4-B05

Function Name: Remove underground drains and dry storage wells

Component Name: Basement and Annex of JN-3

Function Description: Excavate and remove underground process drains and dry storage wells in Annex.

Basis of Estimate

Strategy for Accomplishing Function: After surface decontamination is complete, mark locations of underground drain lines within the building. Engage concrete cutting contractor and excavator operator to remove floor and excavate soil above drain lines and cut the floor around the dry storage wells. Excavate and remove drain lines and dry storage wells and deliver to Waste Management for processing.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04 & 05; DD-OP-029 & 090; HP-AP-1.0, 5.0, 8.0, 9.0, & 29.0; HP-OP-012 & 017; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, & 7.1; SIH-PP-06; SIH-PP-08; TD-AP-2.0 &3.0

Input Descriptions:

1. Building JN-3 (including annex) after surface decontamination complete
2. 752 ft of buried VCP drain piping.
3. Dry Storage wells in annex
4. 2 Contaminated sumps

Output Descriptions:

1. Building JN-3 with drain lines removed
2. Completed work instruction data package
3. Containerized drain removal waste:

Excavated piping	784 ln ft	Excavated suspect soil	1100 cu ft
Excavated clean soil	5600 cu ft	Concrete floor blocks	2120 cu ft
Cutting water & sludge	32 cu ft	Concrete well block	920 cu ft
Job control waste	135 cu ft	Mixed waste	11 cu ft
144 Storage wells and surrounding concrete		600 cu ft	
Soil samples: 248 gamma spec, 25 alpha isotopic			

Assumptions:

1. Underground drains are contaminated with Hg, RCRA material, and/or Rad.
2. Average depth of drains is 3 ft below bottom of 8-in thick concrete slab.
3. Leakage/breakage of pipes as excavated is 15%.
4. Concrete cutting rate is 50 lin ft per hr, soil excavation rate is 6 bags (cu yds) per day.
5. Sumps are contaminated with Hg, RECRA materials, and/or Rad. and are about 6.5 feet below the floor
6. Dry storage wells can be removed in one block with the surrounding concrete
7. Various activities can be conducted concurrently after appropriate lead time for startup.

Estimated Time to Plan the Work (Including Review and Approval): 20 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1 / 4 / 4 *
Technical Advisors	HBTA	1 /20 / 10
Project Manager/HP Manager	HBPM	2 / 20 / 40 1 / 4 / 4 *
Task Leader	HBTL	1 / 20 / 20
Secretary/Clerical	HBS	1 / 10 / 10
Support Professional	HBP	
Bartlett Health Physics	HRH	1 / 5 / 5

*** Additional review time for Level 2 hazard rating**

Estimated Time to Perform the Work: 77 days with 1 crew

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 77 / 77		
Project Manager/HP Manager	HBPM	2 / 77 / 236	None	
Task Leader	HBTL	1 / 77 / 616	Group 0	77
Battelle Technician	HBT	2 / 77 / 77		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	4 / 77 / 2464	Group 0	308
Bartlett Maint Specialist	HRDS	1 / 12 / 48	Group 0	12
Bartlett Health Physics	HRH	2 / 77 / 1232	Group 0	154
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

1. Concrete cutting – 3000 linear feet @ $2.78/ft = $8,340
2. Excavation Contractor – 50 days (400 hours) operator = $19,036; TB015 excavator 50 days = $5,140

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? Twenty-five years of nuclear submarine

operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

What experience is directly related to BCLDP? Nine years of training, and two and a half years of project management in JN-3.

Did we apply a complexity factor during our thought process? A complexity factor of two was used. The compounding factor is used because very wet soil must be taken into consideration. The production rate will be lower due to the increased weight of the soil, the increased potential of cross contamination and the problem of trenches sliding back into the work area. The necessity of drying the soil for disposal will also lengthen the work schedule considerably.

Completed by: C. A. Brenner **Date:** 04/30/02 **Rev. No.:** 4

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: E033 **Work Pkg. No.:** 7E2-B05

Function Name: Prepare JN-3 Characterization & Final Status Report

Component Name: JN-3 Building

Function Description: Characterization & Final Status Report of Building JN-3. This report will be used to document the condition of the building (i.e. as a "clean" facility) prior to demolition.

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization & Final Status Survey consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Survey Plan for the West Jefferson North Site March 2000; DD-CP-002 & 004; DD-93-04; DD-97-02; QD-AP-6.1; TD-AP-2.0

Input Descriptions:

Characterization

1. Completed Data Sheets from Characterization Field Work
2. 1500 grids with 3 data values for each grid.
3. 1500 smear results from laboratory
4. 2 data values/smear.

Final Status

1. Completed data sheets from final status
2. 1200 grids with 3 data values each
3. 1200 smear results from lab

Output Descriptions:

1. Characterization & Final Status Report for Building JN-3

Assumptions:

1. Data Reduction & Report Generation will take 20 working days post field activities
2. Review & Comment Resolution will take 15 working days in schedule
3. Report Schedule will take 40 working days total.
4. Map production will take 10d of labor
5. 6 professionals will take 8 hrs each to review/comment/resolve comments
6. 5 d of technician time is necessary to resolve/incorporate comments
7. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
8. IVC/NRC approval necessary for Building Characterization & Final Status Report
9. Only one Building Report will be produced.
10. 5% of grids contaminated; 40%grids are adjacent; 55% of grids unaffected and scanned @ 10%
11. 50% of grids rescanned for final status survey

Estimated Time to Plan the Work (Including Review and Approval): 0 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	NA
Technical Advisors	HBTA	NA
Project Manager/HP Manager	HBPM	NA
Task Leader	HBTL	NA
Secretary/Clerical	HBS	NA
Support Professional	HBP	NA
Bartlett Health Physics	HRH	NA

Estimated Time to Perform the Work: 40 working days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/40/200	NA	NA
Technical Advisors	HBTA	6/1/48	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL			
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics –Data	HRH	1/25/200	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: CAD Map Generation Services, DC Graphics (80 hours) = $3,384

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is estimator's experience :
15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?
10 years BCLDP characterization & radiological release program experience

Was a complexity factor used?
No, work similar to KA

Completed by: J. F. Poliziani (updated by PJW) **Date:** 5/30/01 (updated 4-22-02) **Rev. No.:** 2

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: E034 **Work Pkg. No.:** 7E4-B16

Function Name: Remove NESHAPS Material

Component Name: JN-3 building with windows containing asbestos material

Function Description: Asbestos abatement subcontractor will remove and dispose of building windows and any other residual asbestos material. Subcontractor will be responsible for providing all materials and for disposal of all asbestos related materials and windows.

Basis of Estimate

Strategy for Accomplishing Function: Procure asbestos abatement subcontractor to perform task

Applicable Requirements/Procedures:

Approved work instruction; Contract for asbestos abatement subcontractor; OEPA and ODOH asbestos abatement regulations; DD-93-04; DD-97-02; DD-CP-02 & 04; QD-AP-6.1; TD-AP-2.0

Input Descriptions:

1. JN-3 less internal materials, building ready for demolition
2. Approved Work Instruction.

Output Descriptions:

1. JN-3 building ready for demolition less any NESHAPS material
2. All asbestos related waste to be disposed of by subcontractor
3. Asbestos release surveys, air sampling results (if required) and final disposal documents.

Assumptions:

1. No rad contaminated material is involved.
2. All asbestos related material to be disposed of in local approved landfill by asbestos abatement subcontractor.
3. Price quote is based on work being performed in FY 2001.

Estimated Time to Plan the Work (Including Review and Approval): 10 days planning and notification to ODOH and OEPA by subcontractor.

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	1 / 10 / 10
Project Manager/HP Manager	HBPM	2 / 10 / 20
Task Leader	HBTL	1 / 10 / 20
Secretary/Clerical	HBS	1 / 10 / 10
Support Professional	HBP	
Bartlett Health Physics	HRH	1 / 10 / 5
Bartlett Technician	HRD	

Estimated Time to Perform the Work: 10 days to remove windows

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 10 / 10		
Project Manager/HP Manager	HBPM	2 / 10 / 15		
Task Leader	HBTL	1 / 10 / 30		
Battelle Technician	HBT	1 / 10 / 10		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	1 / 10 / 30	N/A	
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH	1 / 10 / 40		
Bartlett Admin Support				
Asbestos Abatement Subcon.		440 hours		

Subcontract/Purchased Service: Asbestos Abatement subcontractor (AHC Inc.) = $22,165.

Special Equipment/Material: Ladders and manlifts to be supplied by BCLDP. All other material to be supplied by asbestos abatement subcontractor.

Comments/Explanations: No rad contamination is involved. All material to be disposed of by asbestos abatement subcontractor

Basis of Estimate:

What is the estimator's experience? Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

What experience is directly related to BCLDP? Nine years of training, and two and half years of project management in JN-3.

Did we apply a complexity factor during our thought process? No complexity factor applied to this estimate

Completed by: C. A. Brenner **Date:** 04/26/02 **Rev. No.:** 3

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: E035 **Work Pkg. No.:** 7E4-B17

Function Name: Demolish Surface Structure

Component Name: Building JN-3

Function Description: Engage demolition contractor to take down Building JN-3 and the external reactor coolant storage tank, and dispose of clean rubble.

Basis of Estimate

Strategy for Accomplishing Function: Demolition contractor takes down building according to industrial protocol, including floor slab, and removes rubble from site. Contractor pauses while BCLDP surveys and removes contaminated soil from below building footprint, then returns and removes foundations, reactor pool mat, and external reactor coolant tank.

Applicable Requirements/Procedures:

DD-93-04; DD-93-05; PR-AP-17.1; QD-AP-4.1 & 7.1; TD-AP-2.0

Input Descriptions:

1. Building shell minus windows, roof flashings, mechanical systems
2. Signed demolition contract
3. Demolition contractor with all tools, materials, equipment needed for task.

Output Descriptions:

Concrete rubble above grade	337 cu yd	Masonry rubble	356 cu yd
Structural Steel	20 cu yd	Metal Siding	78 cu yd
Foundations	257 cu yd		

Building site (including underground pool water storage tank) with excavation ready for IVC.

Assumptions:

1. Once work begins, each step of the operation (above grade & foundations) will be carried out by demolition contractor without BCLDP interaction beyond PM & ES&H oversight.
2. Duration is 35 days for building and slab and 15 days for foundations, pool mat, and external tank based on budgetary estimate from commercial demolition contractor (S.G. Loewendick & Sons, 5/15/2002)
3. The duration for planning this activity also includes the bid and selection process for the demolition contractor.

Estimated Time to Plan the Work (Including Review and Approval): 60 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1 / 4 / 4 *
Technical Advisors	HBTA	1 / 60 / 10
Project Manager/HP Manager	HBPM	2 / 60 / 60 1 / 4 / 4 *
Task Leader	HBTL	1 / 60 / 10
Secretary/Clerical	HBS	1 / 60 / 10
Support Professional	HBP	
Bartlett Health Physics	HRH	1 / 10 / 10

* Additional review time for Level 2 hazard rating.

Estimated Time to Perform the Work: 91 days including waiting period for survey and excavate underground contamination (E037 & E039).

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 50 / 50		
Project Manager/HP Manager	HBPM	2 / 50 / 100	N/A	
Task Leader	HBTL	1 / 50 / 100	N/A	
Battelle Technician	HBT	1 / 50 / 50		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH			
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Demolition contractor - per Loewendick estimate = $350,000 for surface structure and $100,000 for foundations, pool mat, and external tank.

Special Equipment/Material: Provided by demolition contractor

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

What experience is directly related to BCLDP? Nine years of training, and two and a half years of project management in JN-3.

Did we apply a complexity factor during our thought process? No complexity factor applied to this estimate

Completed by: C. A. Brenner **Date:** 04/26/02 **Rev. No.:** 3

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: E037 **Work Pkg. No.:** 7E2-B06

Function Name: Survey and Monitor Underground

Component Name: JN-3 Underground Materials

Function Description: Baseline Characterization Survey of JN-3 Underground Materials. These surveys will be used to identify areas within the building footprint which will require remediation after building demolition.

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Survey Plan for the West Jefferson North Site March 2000; DD-93-04 & 05; DD-97-02; DD-CP-002, 004, & 030; HP-AP-1.0, 2.0, & 5.0; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, & 7.1; RL-AP-1.0; SIH-PP-08; TD-AP-2.0

Input Descriptions:

1. JN-3 footprint
2. Excavation is open and footers and grade beams are in place.
3. 752 ft underground drain trenches.

Output Descriptions:

Radiological Background Established for Underground materials
Decision Level Values DLVs established for surveys
All footprint samples from footprint to lab (8gridsx4locx2smpl/loc=64 samples)
Highest survey result sent to laboratory for each location and depth per perimeter grid.
72 samples to be submitted to laboratory for gamma spec for final status.
Hotspot rate @ 5% of all grids= 1 grid @ 8 samples
8 alpha isotopic samples
251 gamma spec samples from underground drain trenches
25 alpha spec samples from underground drain trenches.

Assumptions:

Establish Background and Survey Decision Level Values (DLV) :
1. 2 types of materials are present (1 soil; 1 concrete)
2. (40) 1 minute measurements for alpha & beta window per material
3. (40) 1 minute measurements for alpha window per material
4. (40) 2 minute measurements for gamma soil measurements
5. 3 minute prep/setup/taking floor & soil readings (100%) = 8 hr
6. 1.25 hr to establish DLV for each material = 8 hr
7. No significant downtime; 1 d to perform

Survey:

1. 100% of all ground area will be surveyed. Does not include perimeter / adjacent grids
2. Building Footprint is = 8660 square feet = 796 square meters (Building 81'x70' High Bay
3. Ext 23'x46' Annex 46'x42') ; 8 footprint grids (100 sq.m)
4. 1 Grid contaminated needs hotspot confirmation sampling 8+1 = 9
5. Walkover rate 200 square meters/h; 900/600 = 1.5 h
6. Sampling Rate 2 locations per hour; 9 grids x 4 locations/grid = 36 locations 36/2 = 18 hrs
7. 2.5d for sampling + 0.25d for survey = ~3d
8. No deep core samples necessary.
9. All Utilities Identified
10. WI to perform soil sampling under planning section
11. No significant down time
12. Initial Instrument Calibration @ 8hrs + 10% time
13. WI takes 16 hr to prep./ Safety Pro. 8 hrs for WI/SCL/ 8hr Rad/ALARA review/ 4hrWM/ 8hr for 2 MgrsRev./ 8 hrcomment resolve/ 8hr data clerk
14. Line Loc. 2techs for 2 days / 1 tech for 2 days to documnt/Outside Vendor = 48 hrs; BCO Utilities 2 persons 2days to review & Approve = 32 hrs
15. Planning includes E040
16. Underground drain trenches will be sampled every 3 ft for gamma spec and every 30 ft for alpha spec.

Estimated Time to Plan the Work (Including Review and Approval): 10 days (5 days Line Loc; 5d WI)

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	3/4/32
Technical Advisors	HBTA	3/3/20
Project Manager/HP Manager	HBPM	1/4/8
Task Leader	HBTL	1/4/8
Secretary/Clerical	HBS	1/1/8
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 21 work days for survey/sampling

Estimated Resources Required to Perform the Work

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/21/42	NA	NA
Technical Advisors--Safety	HBTA	1/21/21	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/21/84	0	21
Battelle Technician--HP	HBT	1/21/168	0	21
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			

BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics Instruments Data	HRH	3/21/504 1/21/14 1/21/168	0 NA NA	63 NA NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Utilocate Line/Utility Location Services crew of 2 for 5 days = $4,018

Special Equipment/Material: Geoprobe and attachments for sampling (captured under WP 783).

Comments/Explanations:
Basis of Estimate:

What is the estimator's experience?
15 years of health physics and radiological release program management

What experience is directly related to BCLDP?
10 years of BCLDP characterization & radiological release programs

Was a complexity factor used?
Grounds considered similar to KA grounds. No complexity factor used.

Completed by: J. F. POLIZIANI (updated by PJW) **Date:** 5/08/01 (updated 4-22-02) **Rev. No.:** 2

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

Activity No.: E039 **Work Pkg. No.:** 7E4-B18

Function Name: Excavate underground material

Component Name: JN-3 Footprint

Function Description: Excavate contaminated soil from below building footprint.

Basis of Estimate

Strategy for Accomplishing Function: D&D technicians hand excavate contaminated soil into bags for disposal off site. Soil is screened for activity during excavation and delivered to waste management.

Applicable Requirements/Procedures/Work Instructions:

DD-93-04; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; HP-AP-1.0, 2.0, & 5.0; MA-AP-20.1; PR-AP-17.1; RL-AP-1.0; QD-AP-5.2 & 6.1; SM-OP-001; TD-AP-2.0 & 3.0; WA-OP-020 & 036

Input Descriptions:

1. JN-3 footprint

Output Descriptions:

1. Contaminated soil containerized in 25 one cu yd bags for shipping off site.
2. Characterization completion survey data.
3. 56 Marinelli soil samples for analysis; gamma spec.
4. Job control waste 64 cu ft
5. Completed Work Instruction data package.
6. 6 alpha isotopic samples.

Assumptions:

1. Production rate is four bags per day hand dug allowing for field screening and sampling.
2. 670 cu ft of contaminated soil to a depth of 2 ft within 5% of JN-3 footprint.

Estimated Time to Plan the Work (Including Review and Approval): 10 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1 / 4 / 4 *
Technical Advisors	HBTA	1 / 10 / 10
Project Manager/HP Manager	HBPM	2 / 10 / 20 1 / 4 / 4 *
Task Leader	HBTL	1 / 10 / 10
Secretary/Clerical	HBS	1 / 5 / 5
Support Professional	HBP	
Bartlett Health Physics	HRH	1 / 5 / 5

* Additional review time for Level 2 hazard rating.

Estimated Time to Perform the Work: 20 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 20 / 20		
Project Manager/HP Manager	HBPM	1 / 20 / 45		
Task Leader	HBTL	1 / 20 / 160	Group 0	20
Battelle Technician	HBT	1 / 20 / 40		
Battelle Technician O/T	HBTO			
RAL Staff	HBL	2 / 20 / 10		
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	4 / 20 / 640	Group 1	160
Bartlett Maint Specialist	HRDS	1 / 20 / 32	Group 1	20
Bartlett Health Physics	HRH	2.5 / 20 / 400	Group 1	100
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: N/A

Special Equipment/Material: N/A

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

What experience is directly related to BCLDP? Nine years of training, and two and a half years of project management in JN-3.

Did we apply a complexity factor during our thought process? A complexity factor of two was used for this estimate. The soil below JN-3 is very wet. It will take longer to dig it up, the work area is harder to work in, and there is always the problem of wet soil sliding into the work area. The wet soil will also have to be dried prior to being sent for disposal.

Completed by: C. A. Brenner **Date:** 04/26/02 **Rev. No.:** 3

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity Number: E040 **Work Package:** 7E4-B19

Function Name: Perform JN-3 Underground Decon Completion Survey

Component Name: JN-3 Underground

Function Description: Perform Decon Completion Survey after completion of the underground excavation.

Basis of Estimate

Strategy for Accomplishing Function: Perform Decon Completion Survey consistent with NUREG 5849

Applicable Requirements/Procedures:

1. NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"
2. Characterization & Final Status Survey Plan for the West Jefferson North Site March 2000
3. BCLDP Procedures DD-CP-004 / DD-CP-002

Input Descriptions:

1. Underground excavation completed.
2. Low Radiation Background
3. Open excavation with footers and grade beams in place.
4. WI from E037

Output Descriptions:

1. Total footprint grids = 8
2. Hotspot rate @ 5% of all grids = 1 grid @ 8 samples
3. Additional soil samples to lab

Assumptions:

1. 100% of all ground area will be surveyed.
2. Building Footprint is =8660 square feet = 796 square meters (Building 81'x70' High Bay
3. Ext 23'x46' Annex 46'x42') ; 8 footprint grids (100 sq.m)
4. Walkover rate 200 square meters/h; 100/200 = 0.5 tech hrs = <1 d survey
5. Sampling Rate 2 locations per hour; 1 grids x 4 locations/grid=4 locations 4/2= 2 hrs
6. 1d for sampling + survey
7. 4 locations/grid; 2 samples/location; 8 samples/grid
8. Sample @ surface & sample @ 1m @ each location
9. No deep core samples necessary.
10. All Utilities Identified
11. WI under E037
12. No significant down time

Estimated Time to Plan the Work (Including Review and Approval): 0 days; WI under E037

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	NA
Technical Advisors	HBTA	NA
Project Manager/HP Manager	HBPM	NA
Task Leader	HBTL	NA
Secretary/Clerical	HBS	NA
Support Professional	HBP	NA
Bartlett Health Physics	HRH	NA

Estimated Time to Perform the Work: 1 work day for survey/sampling

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/1/2	NA	NA
Technical Advisors—Safety	HBTA	1/1/1	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/1/4	0	1
Battelle Technician	HBT	1/1/8	0	1
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics	HRH	3/1/24	0	3
Instruments		1/1/3	NA	NA
Data		1/3/24	NA	NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: Geoprobe with soil sampling attachments

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?
15 years of health physics programs and radiological release program experience

What experience is directly applicable to BCLDP?
10 years of BCLDP characterization & radiological release program experience : 2 years At West Jefferson

Was a complexity factor used?
No. Work similar to KA

Completed by: J. F. POLIZIANI (updated by PJW) **Date:** 6/14/01 (updated 4-22-02) **Rev. No.:** 2

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: E050 **Work Pkg. No.:** 7E4-B20

Function Name: Remove Remaining Mechanical & Electrical Equipment from Building

Component Name: Remainder of JN-3

Function Description: Dismantle & remove HVAC systems, ductwork, plumbing & electrical systems to expose building surfaces for characterization, decontamination and final demolition.

Basis of Estimate

Strategy for Accomplishing Function: Mobilize work crew, assemble tools and equipment, dismantle & remove HVAC systems, ductwork, plumbing & electrical systems to expose building surfaces for characterization, decontamination and final demolition.

Applicable Requirements/Procedures:

DD-93-04 & 05; DD-97-02; DD-CP-002, 004, 010, & 030; HP-AP-1.0, 2.0, 5.0, & 8.0; HS-AP-2.0, 4.0, & 5.0; HP-OP-011& 012; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, & 7.1; RL-AP-1.0; SIH-PP-06; SM-OP-001; TD-AP-2.0

Input Descriptions:

1. Vacated building areas and rooms (12,930 sq ft)
2. Waste containers
3. Approved WI

Lamp Ballasts	9 cu ft	Drink Fountain	11 cu ft
Boiler	483 cu ft	Fluorescent Tubes	36 cu ft
Electrical Service	440 cu ft	Ducting	223 cu ft
Hg Vapor Lights	32 cu ft	Light Fixtures	338 cu ft
Supply Piping	500 cu ft	Drain Piping	175 cu ft
Transformers	48 cu ft	Water Heater	12 cu ft
Bath/Shower Ceramics	147 cu ft	Registers	25 cu ft
Tank	54 cu ft		

Output Descriptions:

1. Building minus utilities
2. Completed WI data package
3. Containerized utility waste:

LLW metal waste	1778 cu ft	PCB Waste	9 cu ft
Clean Metal Waste	506 Cu ft	Pb/Hg waste	70 cu ft
Job Control Waste (comp.)	170 cu ft	Ceramic Waste	147 cu ft

Assumptions:

1. Production rate will be approximately 235 sq ft per day with one crew.
2. Power and services routed through JN-3 to other locations have been re-routed.
3. All abandoned utilities were removed during FY 2002
4. All drain piping above the floor slab will be removed.

Estimated Time to Plan the Work (Including Review and Approval): 10 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	1 / 10 / 10
Project Manager/HP Manager	HBPM	2 / 10 / 20
Task Leader	HBTL	1 / 10 / 10
Secretary/Clerical	HBS	1 / 10 / 15
Support Professional	HBP	
Bartlett Health Physics	HRH	1 / 5 / 5

Estimated Time to Perform the Work: 55 days

Estimated Resources Required to Perform the Work

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 55 / 55		
Project Manager/HP Manager	HBPM	2 / 55 / 165	N/A	
Task Leader	HBTL	1 / 55 / 440	Group 0	55
Battelle Technician	HBT	1 / 55 / 55		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE	1 / 55 / 110	Group 0	25
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	4 / 55 / 1760	Group 0	220
Bartlett Maint Specialist	HRDS	1 / 11 / 44	N/A	
Bartlett Health Physics	HRH	2 / 55 / 880	Group 0	55
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

What experience is directly related to BCLDP? Nine years of training, and two and half years of project management in JN-3.

Did we apply a complexity factor during our thought process? No complexity factor applied to this estimate

Completed by: C. A. Brenner **Date:** 4/26/02 **Rev. No.:** 1

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: E051 **Work Pkg. No.:** 7E2-B07

Function Name: Survey and Monitor JN-3 Remaining Surfaces

Component Name: JN-3 Remaining Areas

Function Description: Baseline Characterization of the Remaining Areas of JN-3 after shop and remaining mechanical/electrical have been removed from the building.

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; DD-90-02; DD-93-04 & 05; DD-97-02; DD-CP-002, 004, 010, & 030; HP-AP-1.0, 2.0, 5.0, & 8.0; HP-OP-011 & 012; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, & 7.1; RL-AP-1.0; SIH-PP-06; SM-OP-001; TD-AP-2.0 & 3.0

Input Descriptions:

1. Rooms and Areas that have undergone material and M&E removal
2. Background established.
3. Shop has been removed.

Output Descriptions:

1. Smears to lab 1per 3grids (~500); gross alpha/beta
2. 16 sediment & solid samples to lab; gamma spec
3. Data to report generation
4. 2 alpha isotopic samples.

Assumptions:

1. 100% of all floor area will be surveyed.
2. 100% of all wall area up to 2m will be surveyed.
3. 120% of all ceilings will be surveyed (20% added for horizontal surfaces)
4. 10%or 30sq. meters whichever is larger of wall areas greater than 2m will be monitored
5. Normal rate for characterization surveys is 6 square meters per technician-hour
6. Ladder rate for characterization surveys is 5 square meters per technician-hour
7. Lift rate for characterization surveys is 4 square meters per technician-hour
8. Drain Samples 2/hr; 16 samples total
9. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha,alpha+beta 2min counts required, perform smears.
10. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
11. WI takes 24 hr to prepare/Safety Prof. 8hr for WI/SCL/6 Prof @ 2 hr For Rev/ Appr.
12. Initial Instrument Calibration 8hrs +10% time
13. No significacnt down time
14. See Assump. 11; D006
15. Technician inputs 3 data values for each grid into spreadsheet
16. Technician also performs QA/QC for data input & data sheets
17. Technician identifies grids above release criteria & background
18. Planning done under FY2001 Activity E004.

Estimated Time to Plan the Work (Including Review and Approval): 5 days for WI

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	3/4/32
Technical Advisors	HBTA	3/3/20
Project Manager/HP Manager	HBPM	1/4/8
Task Leader	HBTL	1/4/8
Secretary/Clerical	HBS	1/1/8
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 10 work days for survey

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/10/40	NA	NA
Technical Advisors	HBTA	2/10/20	NA	NA
Project Manager/HP Manager	HBPM	1/10/40		
Task Leader	HBTL	1/10/40	0	10
Battelle Technician (HP)	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments) (Data)	HRH	3/10/240 1/10/20 1/10/80	0 NA NA	30 NA NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?
15 years of health physics & radiological release program management

What experience is directly related to BCLDP?
10 years of BCLDP characterization & radiological release program experience.

Was a complexity factor used?
No, similar to KA work

Completed by: J.F. POLIZIANI (updated by PJW) **Date:** 6/14/01 (updated 4-22-02) **Rev. No.:** 1

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: E052 **Work Pkg. No.:** 7E4-B21

Function Name: Decontaminate Remaining Surfaces

Component Name: JN-3 and JN-3 annex

Function Description: Assemble material resources and work crews and decontaminate designated surfaces according to work instruction.

Basis of Estimate

Strategy for Accomplishing Function: Brief work crews on scope of activities, procedures, radiological & safety concerns and requirements. Assemble materials, equipment and supplies; institute radiological and engineering controls & perform decontamination activities with Characterization support to monitor progress and determine completion.

Applicable Requirements/Procedures:

DD-90-02; DD-93-02 & 04; DD-CP-004 & 030; DD-OP-029, 065, 075, 077, 195, & 215; HP-AP-1.0, 2.0, 5.0, 8.0, 9.0, 11.0, 15.0, & 19.0; HP-OP-011, 012, 017, 018, 019, & 023; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2 & 6.1; RL-AP-1.0; SIH-PP-06; SM-OP-001; TD-AP-2.0 & 3.0; WA-OP-020

Input Descriptions:

1. Demarcated Contaminated areas
2. Characterization data
3. Authorization Letter from DOE
4. Decon equipment
   - Hilti guns
   - HEPA Vacs
   - portable enclosures
   - waste containers.
5. Approved Work Instruction

Output Descriptions:

1. JN-3 and Annex minus contamination
2. Completion survey data
3. Completed Work Instruction data package
4. Containerized LLW:
   - Concrete rubble & HEPA filters – 20 cu ft
   - Job control waste (compactable) – 25 cu ft
   - Sanitary piping (6 linear foot) - 2 cu ft

Assumptions:

1. Contamination on the areas behind removed ducts and electrical panels, the crane hook cables, sanitary piping in the boiler room, a drain line behind the main breaker board in the south basement and areas in the annex are identified by characterization.
2. Contamination can be removed using Group 0 PPE by employing hooded HEPA enclosures at point of contact.
3. Surfaces can be scabbled to a depth of ¼ inch using Hilti guns at a rate of 25 sq ft per crew day.

Estimated Time to Plan the Work (Including Review and Approval): 10 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	1 / 10 / 5
Project Manager/HP Manager	HBPM	2 / 10 / 20
Task Leader	HBTL	1 / 10 / 10
Secretary/Clerical	HBS	1 / 5 / 5
Support Professional	HBP	
Bartlett Health Physics	HRH	1 / 5 / 5

Estimated Time to Perform the Work: 15 days with 1 crew

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 15 / 15		
Project Manager/HP Manager	HBPM	2 / 15 / 60		
Task Leader	HBTL	1 / 15 / 120	Group 0	15
Battelle Technician	HBT	1 / 15 / 15		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	4 / 15 / 480	Group 0	60
Bartlett Maint Specialist	HRDS	1 / 15 / 15	Group 0	5
Bartlett Health Physics	HRH	2 / 15 / 240	Group 0	30
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: N/A

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

What experience is directly related to BCLDP? Nine years of training, and two and a half years of project management in JN-3.

Did we apply a complexity factor during our thought process? No complexity factor applied to this estimate

Completed by: C. A. Brenner **Date:** 04/30/02 **Rev. No.**: 2

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: E053 **Work Pkg. No.:** 7E4-B22

Function Name: Decon Completion Survey JN-3 Remaining Areas

Component Name: JN-3 Remaining Areas

Function Description: Baseline Characterization of the Remaining Areas of JN-3

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; DD-90-02; DD-93-04 & 05; DD-97-02; DD-CP-002, 004, 010, & 030; HP-AP-1.0, 2.0, 5.0, & 8.0; HP-OP-011 & 012; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, & 7.1; RL-AP-1.0; SIH-PP-06; SM-OP-001; TD-AP-2.0 & 3.0

Input Descriptions:

1. Deconned rooms and Areas that have undergone material and M&E removal
2. Background established.
3. WI from E051

Output Descriptions:

1. Smears to lab 1per 3grids (~250; gross alpha/beta
2. 8 sediment & solid samples to lab; gamma spec
3. Data to report generation
4. 1 alpha isotopic samples.

Assumptions:

1. 10% of all floor area will be surveyed; 10% contamination rate assumed
2. 10% of all wall area up to 2m will be surveyed.
3. 20% of all ceilings will be surveyed (20% added for horizontal surfaces)
4. 10%or 30sq. meters whichever is larger of wall areas greater than 2m will be monitored
5. Normal rate for characterization surveys is 6 square meters per technician-hour
6. Ladder rate for characterization surveys is 5 square meters per technician-hour
7. Lift rate for characterization surveys is 4 square meters per technician-hour
8. Drain Samples 2/hr; 16 samples total
9. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha,alpha+beta 2min counts required, perform smears.
10. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
11. WI takes 24 hr to prepare/Safety Prof. 8hr for WI/SCL/6 Prof @ 2 hr For Rev/ Appr.
12. Initial Instrument Calibration 8hrs +10% time
13. No significacnt down time
14. See Assump. 11; D006
15. Technician inputs 3 data values for each grid into spreadsheet
16. Technician also performs QA/QC for data input & data sheets
17. Technician identifies grids above release criteria & background
18. Planning done under FY2001 Activity E004

Estimated Time to Plan the Work (Including Review and Approval): Planning done under E051

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	
Task Leader	HBTL	
Secretary/Clerical	HBS	
Support Professional	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 5 work days for survey

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/5/20	NA	NA
Technical Advisors	HBTA	2/5/10	NA	NA
Project Manager/HP Manager	HBPM	1/5/20		
Task Leader	HBTL	1/5/20	0	5
Battelle Technician (HP)	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instruments) (Data)	HRH	3/5/120 1/5/10 1/5/40	0 NA NA	15 NA NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: None

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?
15 years of health physics & radiological release program management

What experience is directly related to BCLDP?
10 years of BCLDP characterization & radiological release program experience.

Was a complexity factor used?
No, similar to KA work

Completed by: J.F. POLIZIANI (updated by PJ Weaver) **Date:** 6/14/01 (4-19-02 update) **Rev. No.:** 1

☐JN-1 ☒ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Monit. ☐ Sample Analysis ☐ Waste Mgmt

Activity No.: E055 **Work Pkg. No.:** 7E4-B24

Function Name: Perform JN-3 Final Status Survey before Demolition
Component Name: JN-3 Building

Function Description: Final Status Survey of JN-3 in preparation for demolition as a clean facility.

Basis of Estimate

Strategy for Accomplishing Function: Perform Final Status Survey consistent with NUREG 5849

Applicable Requirements/Procedures/Work Instructions:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Plan for the West Jefferson North Site; DD-CP-002, 004, 010, & 030; DD-93-04; DD-97-02; HS-AP-4.0 & 5.0; HS-OP-001; PR-AP-17.1; QD-AP-5.2 & 6.1; TD-AP-2.0

Input Descriptions:

1. Rooms and Areas that have undergone material removal, M&E removal, and characterization & decon.
2. Approved Work Instruction.

Output Descriptions:

1. Data to report generation
2. 1200 grids (50%) of total will be scanned producing 3 data values per grid
3. 1200 final status smears

Assumptions:

1. 5% of all monitored areas were contaminated
2. Time for Interim Decon Effectiveness Surveys are part of the Decontamination Crew
3. 100% of all floor area were surveyed.
4. 100% of all wall area up to 2m were surveyed.
5. 120% of all ceilings were surveyed (20% added for horizontal surfaces)
6. 10%or 30sq. meters whichever is larger of wall areas greater than 2m were monitored
7. Normal rate for characterization surveys is 6 square meters per technician-hour
8. Ladder rate for characterization surveys is 5 square meters per technician-hour
9. Lift rate for characterization surveys is 4 square meters per technician-hour
10. Drain Samples 2/hr; 16 samples total
11. The rate for characterization surveys includes : 5cm/sec survey rate, documentation, assess elevated levels>DLV , alpha, alpha + beta 2min counts required, perform smears.
12. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
13. Instrument Tech @ 10% Repair & Cal.
14. 50% of grids rescanned for final status survey
15. Characteriztion of Building takes 43d ...Final Status estimated at 22d

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	3/4/32
Technical Advisors	HBTA	3/3/20
Project Manager/HP Manager	HBPM	1/4/8
Task Leader	HBTL	1/4/8
Secretary/Clerical	HBS	1/1/8
Support Professional	HBP	NA
Bartlett Health Physics	HRH	NA

Estimated Time to Perform the Work: 22 work day for decon survey

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA		NA	NA
Manager / Senior Staff	HBB	1/22/44		
Technical Advisors (Safety)	HBTA	1/22/22	NA	NA
Project Manager / HP Manager	HBPM			
Task LeaderSafety Prof.	HBTL	1/22/88	0	22
Battelle Technician (HP)	HBT	1/22/176	0	22
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary / Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics (Instrument) (Data)	HRH	3/22/528 1/22/22 1/22/176	0 NA NA	132 NA NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: None identified

Special Equipment/Material: 22 days of 60' aerial lift = $2,50; 22 days of 80 foot aerial lift = $5,394; necessary for survey of building exterior, high bay, walls > 12 ft

Comments/Explanations:

Basis of Estimate

What is the estimator's experience?
15 years of health physics and radiological release program management

What experience is directly related to BCLDP?
10 years of BCLDP characterization & radiologicalrelease program experience; 2 years at West Jefferson

Was a complexity factor used?
Work is similar to KA-2 & KA-3, no complexity factor used

Completed by: J.F. POLIZIANI (updated by PJ Weaver) **Date:** 05/08/00 (4-19-02 update) **Rev. No.:** 2

☐ JN-1 ☐ JN-2 ☐ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☒ Release Site

Activity No.:E056 **Work Pkg. No.:** 7E5-B02

Function Name: Conduct IVC for JN-3

Component Name: IVC for JN-3

Function Description: An Independent Verification Contractor (IVC) will be utilized to perform verification surveys & sampling of the JN-3 building consistent with the requirements of NUREG 5849. This work will be completed prior to demolition of the JN-3 building.

Basis of Estimate

Strategy for Accomplishing Function: Inside Fence General Area will be subjected to the release process defined in NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination" Part of the process is to perform an IVC type survey to ensure release criteria have been satisfied.

Applicable Requirements/Procedures:

NUREG 5849 " Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization and Final Status Plan for West Jefferson North Site (DD-97-02), March 2000; HS-AP-5.0; HS-OP-001.

Input Descriptions:

1. Areas to be IVC surveyed are remediated & a BCLDP final status survey performed.
2. BCLDP Characterization & Final Status Report for Building JN3

Output Descriptions:

1. IVC Survey Plan
2. IVC survey results & soil samples
3. IVC Survey Report

Assumptions:

1. Onsite survey & sampling takes IVC 5 days (1 day travel)
2. One Task Leader to assist full time
3. Two Bartlett HP tech to assist full time
4. Additional Significant Remediation not needed.
5. Spot decon @ 3 techs for 1 day
6. Decision to proceed with clean demolition of building based on informal verbal decision by IVC, formal report to follow

Estimated Time to Plan the Work (Including Review and Approval): 30 d

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1/30/20
Technical Advisors	HBTA	NA
Project Manager/HP Manager	HBPM	NA
Task Leader	HBTL	NA
Secretary/Clerical	HBS	NA
Support Professional	HBP	NA
Bartlett Health Physics	HRH	NA

Estimated Time to Perform the Work: 15 Total Days ;5 d onsite/travel; 10d lab analysis and informal decision.

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/5/40	NA	NA
Technical Advisors—Safety Technical Advisor ---Char	HBTA	1/5/5 1/5/40	NA 0	NA 5
Project Manager/HP Manager	HBPM			
Task Leader-Decon	HBTL			5
Battelle Technician (HP)	HBT		0	0
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician-Decon	HRD	2/1/16	0	4
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics Bartlett Health Physics (full)	HRH	 2/5/80	0 0	 10
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: IVC Services for $50,000

Special Equipment/Material: 80 ft aerial lift for 5 days = $1,506

Comments/Explanations: Estimate to be verified w/IVC

Basis of Estimate

What is the estimator's experience?
15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?
10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?
No, work similar to KA

Completed by: J.F. POLIZIANI (updated by PJ Weaver) **Date:** 5/30/2001 (4-19-02 update) **Rev. No.:** 2

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: E059 **Work Pkg. No.: 7E4-B27**

Function Name: Remove Machine Shop material and utilities from JN-3 Annex.

Component Name: Machine Shop Area is located in the JN-3 Annex.

Function Description: Equipment and non-structural materials/waste and utilities will be removed from the Machine Shop Area.

Basis of Estimate

Strategy for Accomplishing Function: The Machine Shop Area is used as a shop for small manufacture and repair. It is estimated that 10% of the waste/material from this area could be free released. Remove tools, parts and disassemble machines. Destroy the divider wall and pull the crane rails from the floor. Remove utilities and turn all removed items to Waste Management for disposal. .

Applicable Requirements/Procedures:

BCLDP-90-1, 2; DD-90-02; DD-93-02, 03, 04; EN-PC-4.0; HP-AP-1.0, 2.0, 5.0, 29.0; HP-OP-011, 012, 018, 019, 106; HS-AP-4.0, 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2, 6.1; SM-OP-001; TD-AP-2.0, 3.0; WA-OP-020

Input Descriptions:

1. No longer a need for a machine shop.
2. Systems such as water, gas and electric power running to other buildings from the annex have been re-routed

Output Descriptions:

1. JN-3 Annex with machines and tools, material and utilities removed
2. Completed work instruction package
3. Characterized waste

- Concrete block	108 cu ft	Crane rails (40 lin. Ft)	50 cu ft
- Hand tools & spare parts	50 cu ft	Storage bins and closets	800 cu ft
- Work Benches and bench tools	1100 cu ft	large machines	1250 cu ft
- Job Control waste	50 cu ft		

Assumptions:

1. The Machine Shop Area waste/material & utilities removal can begin when there is no longer a need for a machine shop.
2. All utilities being fed from or through the annex to other buildings have been re-routed.

Estimated Time to Plan the Work (Including Review and Approval): 10 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Total Hours
Manager/Senior Staff	HBB	1/1/4*
Technical Advisors	HBTA	1/10/10
Project Manager/HP Manager	HBPM	2/10/20 1/1/4*
Task Leader	HBTL	1/10/10
Secretary/Clerical	HBS	1/5/5
Support Professional	HBP	
Bartlett Health Physics	HRH	1/5/5

* Additional review time for Level 2 Hazard rating

Estimated Time to Perform the Work: 25 days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Total Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 25 / 25		
Project Manager/HP Manager	HBPM	2 / 25 / 100		
Task Leader	HBTL	1 / 25 / 200	Group 0	25
Battelle Technician	HBT	1 / 25 / 25		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	4 / 25 / 800	Group 0	100
Bartlett Maint Specialist	HRDS	1 / 25 / 50	Group 0	15
Bartlett Health Physics	HRH	2 / 25 / 400	Group 0	50
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: N/A

Special Equipment/Material: N/A

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? Twenty-five years of nuclear submarine operation and repair. Planning, nuclear quality assurance, and nuclear repair planning.

Activity Number: E059

What experience is directly related to BCLDP? 9 years of training and 2.5 years of project management.

Did we apply a complexity factor during our thought process? The estimate was based on prior experience conducting similar work on the BCLDP. No complexity factor was used.

Completed by: C. A. Brenner **Date:** 4/25/02 **Rev. No.:** 0

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: E060 **Work Pkg. No.:** 7E4-B29

Function Name: Remove Contaminated Footer and Column from the Pump Room

Component Name: JN-3 Pump Room

Function Description: Assemble material resources and work crews and decontaminate designated surfaces according to work instruction.

Basis of Estimate

Strategy for Accomplishing Function: Engage Chamberlain to do engineering analysis for column removal. Install column base supports on the first floor. After the groundwater control is effective, install column base supports, cut column at the ceiling and floor in the pump room , if necessary have concrete cutter cut the pump room floor to provide access to the footer and perform decontamination efforts necessary to the footer.

Applicable Requirements/Procedures:

DD-90-02; DD-93-02 & 04; DD-CP-004 & 030; DD-OP-029, 065, 075, 077, 195, & 215; HP-AP-1.0, 2.0, 5.0, 8.0, 9.0, 11.0, 15.0, & 19.0; HP-OP-011, 012, 017, 018, 019, & 023; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-5.2 & 6.1; RL-AP-1.0; SIH-PP-06; SM-OP-001; TD-AP-2.0 & 3.0; WA-OP-020

Input Descriptions:

1. Demarcated building surfaces for decontamination (49 sq ft footer)
2. Authorization Letter from DOE
3. Decon equipment
   - Hilti guns
   - HEPA Vacs
   - portable enclosures
   - waste containers.
4. Approved Work Instruction

Output Descriptions:

1. JN-3 pump room minus a column and decontaminated footer
2. Completion survey data
3. Completed Work Instruction data package
4. Containerized LLW:
   - Concrete rubble & HEPA filters – 40 cu ft
   - Job control waste (compactable) – 15 cu ft
   - "I" Beam 8 cu ft

Assumptions:

1. Contamination is confined to the pump room column and top surface of the footer,
2. Contamination can be removed using Group 0 PPE by employing hooded HEPA enclosures at point of contact.
3. When approved by competent authority, the" I" beam above the pump room will have to be braced to support the second floor above it.
4. The I-beam column will be removed and the column footer can be decontaminated without complete removal.

Estimated Time to Plan the Work (Including Review and Approval): 20 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1 / 4 / 4 *
Technical Advisors	HBTA	1 / 20 / 10
Project Manager/HP Manager	HBPM	2 / 20 / 40 1 / 4 / 4 *
Task Leader	HBTL	1 / 20 / 20
Secretary/Clerical	HBS	1 / 10 / 10
Support Professional	HBP	
Bartlett Health Physics	HRH	1 / 5 / 5

***Additional review time for Level 2 hazard rating.**

Estimated Time to Perform the Work: 5 days with 1 crew

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 5 / 5		
Project Manager/HP Manager	HBPM	2 / 5 / 20	N/A	
Task Leader	HBTL	1 / 5 / 40	Group 0	5
Battelle Technician	HBT	1 / 5 / 10		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	4 / 5 / 160	Group 0	20
Bartlett Maint Specialist	HRDS	1 / 5 / 10		2
Bartlett Health Physics	HRH	2 / 5 / 60	Group 0	10
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: Concrete cutting 47 linear feet = $373 and DQSOSN Licensed Engineering Services for 80 hours @ $85.00 hour = $6,800

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

What experience is directly related to BCLDP? Nine years of training, and two and a half years of project management in JN-3.

Did we apply a complexity factor during our thought process? No complexity factor applied to this estimate

Completed by: C. A. Brenner **Date:** 04/26/02 **Rev. No.:** 0

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: E061 **Work Pkg. No.:** 7E4-B28

Function Name: Remove Reactor Pool floor

Component Name: Basement of JN-3

Function Description: Cut and remove the concrete floor from the reactor pools

Basis of Estimate

Strategy for Accomplishing Function: After the water management system is in operation, cut and remove the reactor pool 8 inch concrete floor. Engage concrete cutting contractor. Cut and remove the blocks and deliver to Waste Management for processing.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04 & 05; DD-OP-029 & 090; HP-AP-1.0, 5.0, 8.0, 9.0, & 29.0; HP-OP-012 & 017; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, & 7.1; SIH-PP-06; SIH-PP-08; TD-AP-2.0 &3.0

Input Descriptions:

1. Building JN-3 reactor pool walls and surrounding surfaces decontaminated
2. Reactor pool floors intact

Output Descriptions:

1. Reactor mat exposed and ready for characterization
2. Completed work instruction data package
3. Containerized floor removal waste:

Concrete floor blocks	435 cu ft
Cutting water & sludge	10 cu ft
Job control waste	10 cu ft

Assumptions:

1. Water management successful and in progress
2. Concrete cutting rate is 50 lin ft per hr
3. Various activities can be conducted concurrently after appropriate lead time for startup.

Estimated Time to Plan the Work (Including Review and Approval): 15 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1 / 4 / 4 *
Technical Advisors	HBTA	1 /15 / 7
Project Manager/HP Manager	HBPM	2 / 15 / 30 1 / 4 / 4 *
Task Leader	HBTL	1 / 15 / 15
Secretary/Clerical	HBS	1 / 7 / 7
Support Professional	HBP	
Bartlett Health Physics	HRH	1 / 5 / 5

*** Additional review time for Level 2 hazard rating**

Estimated Time to Perform the Work: 4 days with 1 crew

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 4 / 4		
Project Manager/HP Manager	HBPM	2 / 4 / 16	None	
Task Leader	HBTL	1 / 4 / 32	Group 0	4
Battelle Technician	HBT	1 / 4 / 4		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	4 / 4 / 128	Group 0	16
Bartlett Maint Specialist	HRDS	1 / 4 / 16	None	
Bartlett Health Physics	HRH	2 / 4 / 48	Group 0	8
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

1. Concrete cutting – 257 linear feet @ $7.93/ft = $2,038

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

What experience is directly related to BCLDP? Nine years of training, and two and a half years of project management in JN-3.

Did we apply a complexity factor during our thought process? No complexity applied.

Completed by: C. A. Brenner **Date:** 04/29/02 **Rev. No.:** 0

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: E062 **Work Pkg. No.:** 7E2-B08

Function Name: Survey and Monitor Mat Surface in Pool

Component Name: JN-3

Function Description: Baseline Characterization Survey of JN-3 mat surface in pool. These surveys will be used to identify areas within the map footprint, which will require remediation after pool floor removal.

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization consistent with NUREG 5849

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Survey Plan for the West Jefferson North Site March 2000; DD-93-04 & 05; DD-97-02; DD-CP-002, 004, & 030; HP-AP-1.0, 2.0, & 5.0; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, & 7.1; RL-AP-1.0; SIH-PP-08; TD-AP-2.0

Input Descriptions:

1. JN-3 mat with pool floor removed

Output Descriptions:

Radiological Background Established for Underground materials
Decision Level Values DLVs established for surveys
All mat area samples from mat to lab (1 grid x 4 loc x 2smpl/loc=8 smpl)
Highest survey result sent to laboratory for each location and depth per perimeter grid.
9 samples to be submitted to laboratory for gamma spec for final status.
1 alpha isotopic samples

Assumptions:

Establish Background and Survey Decision Level Values (DLV):

1. 1 type of material is present (concrete)
2. (40) 1 minute measurements for alpha & beta window per material
3. (40) 1 minute measurements for alpha window per material
4. (40) 2 minute measurements for gamma soil measurements
5. 3 minute prep/setup/taking mat readings (100%) = 8 hr
6. 4 hr to establish DLV for each material = 4 hr
7. No significant downtime; 1 d to perform

Survey:

1. 100% of all mat area will be surveyed. Does not include perimeter / adjacent grids
2. Mat Footprint is = 728 square feet = 20.6 square meters (Mat area 28'x26')
3. Sampling Rate 2 locations per hour; 1 grids x 4 locations/grid = 4 locations 4/2 = 2 hrs
4. No deep core samples necessary.
5. All Utilities Identified
6. No significant down time
7. Initial Instrument Calibration @ 8hrs + 10% time

Estimated Time to Plan the Work (Including Review and Approval): 5 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1 / 4 / 32
Technical Advisors	HBTA	
Project Manager/HP Manager	HBPM	1 / 4 / 8
Task Leader	HBTL	1 / 4 / 8
Secretary/Clerical	HBS	1 / 1 / 8
Support Professional—Line Loc	HBP	
Bartlett Health Physics	HRH	

Estimated Time to Perform the Work: 3 work days for survey/sampling

Estimated Resources Required to Perform the Work

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/3/6	NA	NA
Technical Advisors--Safety	HBTA	1/3/3	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/3/12	0	3
Battelle Technician--HP	HBT	1/3/24	0	3
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics Instruments Data	HRH	3/3/188 1/3/8 1/3/24	0 NA NA	9 NA NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

Special Equipment/Material:

Comments/Explanations:
Basis of Estimate:

What is the estimator's experience?
15 years of health physics and radiological release program management

What experience is directly related to BCLDP?
10 years of BCLDP characterization & radiological release programs

Was a complexity factor used?
Grounds considered similar to KA grounds. No complexity factor used.

Completed by: P.J. Weaver **Date:** 5-28-02 **Rev. No.:** 0

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: E063 **Work Pkg. No.:** 7E4-B28

Function Name: Remove Reactor Coolant Piping and Drain from the Reactor Mat and Pool Wall, and Decontaminate Mat.

Component Name: Basement of JN-3

Function Description: Decontaminate the reactor mat. Cut the reactor coolant piping and drains from the concrete pool mat and shield wall.

Basis of Estimate

Strategy for Accomplishing Function: Engage concrete cutting contractor. Cut the concrete away from the imbedded coolant piping and drain and remove the piping. Deliver the concrete and piping to Waste Management for processing. Decontaminate the remaining reactor mat.

Applicable Requirements/Procedures:

DD-90-02; DD-93-04 & 05; DD-OP-029 & 090; HP-AP-1.0, 5.0, 8.0, 9.0, & 29.0; HP-OP-012 & 017; HS-AP-2.0, 4.0, & 5.0; HS-OP-001; MA-AP-20.1; PR-AP-17.1; QD-AP-4.1, 5.2, 6.1, & 7.1; SIH-PP-06; SIH-PP-08; TD-AP-2.0 &3.0

Input Descriptions:

1. Building JN-3 reactor pool walls and surrounding surfaces decontaminated
2. Reactor pool floors removed
3. Reactor coolant piping and drain have been grouted to fix contamination in the piping
4. Characterization data is available for the mat

Output Descriptions:

1. Reactor mat with the reactor piping removed
2. Completed work instruction data package
3. Containerized piping and decontamination waste:

Concrete floor & wall cuttings	340 cu ft	Cutting water & sludge	20 cu ft
Job control waste	42 cu ft	Aluminum Piping	14 cu ft
Soil from pump room	20 cu ft		

Assumptions:

1. Water management successful and in progress
2. Concrete floor cutting rate is 25 lin ft per hr
3. Concrete wall cutting rate is 10 lin ft per hr
4. Core boring rate 8" hole 6 lin ft per hr
5. Various activities can be conducted concurrently after appropriate lead time for startup.

Estimated Time to Plan the Work (Including Review and Approval): 15 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1 / 4 / 4 *
Technical Advisors	HBTA	1 /15 / 7
Project Manager/HP Manager	HBPM	2 / 15 / 30 1 / 4 / 4 *
Task Leader	HBTL	1 / 15 / 15
Secretary/Clerical	HBS	1 / 7 / 7
Support Professional	HBP	
Bartlett Health Physics	HRH	1 / 5 / 5

*** Additional review time for Level 2 hazard rating**

Estimated Time to Perform the Work: 25 days with 1 crew

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB			
Technical Advisors	HBTA	1 / 25 / 8		
Project Manager/HP Manager	HBPM	2 / 25 / 100	None	
Task Leader	HBTL	1 / 25 / 200	Group 0	25
Battelle Technician	HBT	1 / 25 / 25		
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	4 / 25 / 800	Group 0	100
Bartlett Maint Specialist	HRDS	1 / 25 / 16	None	8
Bartlett Health Physics	HRH	2 / 25 / 400	Group 0	50
Bartlett Admin Support	HRA			

Subcontract/Purchased Service:

1. Concrete cutting 6,643 linear feet x $7.93/linear foot and core boring as per estimate from Central Ohio Concrete Cutting = $52,679

Special Equipment/Material:

Comments/Explanations:

Basis of Estimate:

What is the estimator's experience? Twenty-five years of nuclear submarine operations and repair. Planning, nuclear quality assurance, and nuclear repair planning.

What experience is directly related to BCLDP? Nine years of training, and two and a half years of project management in JN-3.

Did we apply a complexity factor during our thought process? No complexity applied.

Completed by: C. A. Brenner **Date:** 04/29/02 **Rev. No.:** 0

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: ES013 **Work Pkg. No.:** 7E5-B01

Function Name: Prepare JN-3 Areas Characterization and Final Status Report to document the final status of the JN-3 grounds prior to the backfilling of the excavation site.

Component Name: JN-3 Areas

Function Description: Produce the Characterization & Final Status Report for the JN-3 Areas

Basis of Estimate

Strategy for Accomplishing Function: Perform Baseline Characterization and Final Status Surveys consistent with NUREG 5849. Compile and summarize characterization and final status survey data into report with narrative description.

Applicable Requirements/Procedures:

NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization & Final Status Survey Plan for the West Jefferson North Site March 2000; BCLDP Procedures DD-CP-002, 004; DD-93-04; PR-AP-17.1; TD-AP-2.0.

Input Descriptions:

1. Completed Data Sheets form Characterization & Final Status Field Work

Output Descriptions:

1. Characterization & Final Status Report for the JN-3 Area

Assumptions:

1. Data Reduction & Report Generation will take 20 working days post field activities
2. Review & Comment Resolution will take 15 working-d in schedule
3. Report Schedule will take 40 working days total.
4. Map production will take 10 days of labor
5. 6 professionals will take 8 hrs each to review/comment/resolve comments
6. 5 days of technician time is necessary to resolve/incorporate comments
7. Room & Area Volumes were taken from the REV3 Baseline waste volume inventory.
8. IVC/NRC approval necessary for Area Report
9. Only one Area Report will be produced.

Estimated Time to Plan the Work (Including Review and Approval): 0 days

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	NA
Technical Advisors	HBTA	NA
Project Manager/HP Manager	HBPM	NA
Task Leader	HBTL	NA
Secretary/Clerical	HBS	NA
Support Professional	HBP	NA
Bartlett Health Physics	HRH	NA

Estimated Time to Perform the Work: 40 working days

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 Group 1 160

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/40/200	NA	NA
Technical Advisors	HBTA	6/1/48	NA	NA
Project Manager/HP Manager	HBPM			
Task Leader	HBTL			
Battelle Technician	HBT			
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD			
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics –Maps Data	HRH	1/10/80 1/25/200	NA NA	NA NA
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: CAD Map Generation Services = $3,384

Special Equipment/Material: None Identified

Comments/Explanations: None

Basis of Estimate

What is the estimator's experience?
15 years of health physics & radiological release program management

What experience is directly related to the BCLDP?
10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?
No, work similar to KA

Completed by: J. F. Poliziani (updated by PJ Weaver) **Date:** 5/30/01 (4-19-02 update) **Rev. No.:** 2

☐ JN-1 ☐ JN-2 ☒ JN-3 ☐ Ext. Area ☐ Env. Mtr. ☐ Samples ☐ TRU/Waste ☐ Release Site

Activity No.: ES014 **Work Pkg. No.:** 7E5-B01

Function Name: Conduct JN-3 Areas IVC

Component Name: JN-3 Areas

Function Description: An Independent Verification Contractor (IVC) will be utilized to perform verification surveys & sampling of the JN-3 remediation area consistent with the requirements of NUREG 5849. This will be completed prior to back filling the JN-3 area excavation.

Basis of Estimate

Strategy for Accomplishing Function: JN-3 (IVC) will be subjected to the release process defined in NUREG 5849 "Manual for Conducting Radiological Surveys in Support of License Termination" Part of the process is to perform an IVC type survey to ensure release criteria have been satisfied.

Applicable Requirements/Procedures:

NUREG 5849 " Manual for Conducting Radiological Surveys in Support of License Termination"; Characterization and Final Status Plan for West Jefferson North Site (DD-97-02), March 2000; HS-AP-5.0; HS-OP-001.

Input Descriptions:

1. Areas to be IVC surveyed are remediated & a BCLDP final status survey performed.
2. BCLDP Characterization & Final Status Report for JN-3 Area

Output Descriptions:

1. IVC Survey Plan
2. IVC survey results & soil samples
3. IVC Survey Report

Assumptions:

1. Onsite survey & sampling takes IVC 4 days (1 day travel)
2. One HBTA to assist full time
3. One Bartlett HP tech to assist full time
4. Geoprobe Crew to sample for 2 days
5. Additional Significant Remediation not needed.
6. Crew of 3 techs for 1 day spot decon

Estimated Time to Plan the Work (Including Review and Approval): 30 d

Estimated Resources Required to Plan the Work

In the following table, for each appropriate labor type enter the # of Persons involved in planning the activity, the # of Days (full or partial) they will be involved, and the total # of person-Hours necessary to plan the work, e.g., 2/5/36

Labor Type	Code	Persons/Days/Hours
Manager/Senior Staff	HBB	1/30/20
Technical Advisors	HBTA	NA
Project Manager/HP Manager	HBPM	NA
Task Leader	HBTL	NA
Secretary/Clerical	HBS	NA
Support Professional	HBP	NA
Bartlett Health Physics	HRH	NA

Estimated Time to Perform the Work: 64 Total Days ;4 d onsite/travel; 30d lab analysis; 30d report generation

Estimated Resources Required to Perform the Work

In the following table, for each appropriate labor type enter the # of Persons working on the activity, the # of Days (full or partial) they are involved, and the total # of Hours necessary to actually perform the work; the PPE/Laundry Group to be used during the performance of the work; and the Total # of Jumps; e.g., 4/20/640 *Group 1* *160*

Labor Type	Code	Persons/Days/Hours	PPE/Laundry Group	Total Jumps
Program Manager	HBA			
Manager/Senior Staff	HBB	1/4/14	NA	NA
Technical Advisors—Safety Technical Advisor ---Char	HBTA	1/3/3 1/3/24	NA 0	NA 3
Project Manager/HP Manager	HBPM			
Task Leader	HBTL	1/1/8	0	2
Battelle Technician (HP)	HBT	1/3/24	0	3
Battelle Technician O/T	HBTO			
RAL Staff	HBL			
Support Professional	HBP			
Secretary/Clerical	HBS			
Decon Ops Hourly	HBH			
BCO Support	HBCO			
BCO Skilled Laborer	HCE			
BCO Skilled Laborer O/T	HCEO			
BCO Facility Manager	HCF			
Bartlett Technician	HRD	3/1/24	0	4
Bartlett Maint Specialist	HRDS			
Bartlett Health Physics Bartlett Health Physics (full)	HRH	3/2/48 1/3/24	0 0	12 6
Bartlett Admin Support	HRA			

Subcontract/Purchased Service: IVC Services for $35,000

Special Equipment/Material: None Identified

Comments/Explanations: Estimate to be verified w/IVC

Basis of Estimate

What is the estimator's experience?
15 years of health physics & radiological release program management

What experience is directly applicable to the BCLDP?
10 years of BCLDP characterization & radiological release program experience; 2 years at West Jefferson

Was a complexity factor used?
No, work similar to KA

Completed by: J.F. POLIZIANI (updated by PJ Weaver) **Date:** 5/30/2001 (4-19-02 update) **Rev. No.:** 2