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OPERABLE UNIT 3 REMEDIAL DESIGN/REMEDIAL ACTION WORK PLAN FOR INTERIM REMEDIAL ACTION - VOLUME 1 OF 2 - APPENDICES A THROUGH C - MARCH 1993 ***FINAL***

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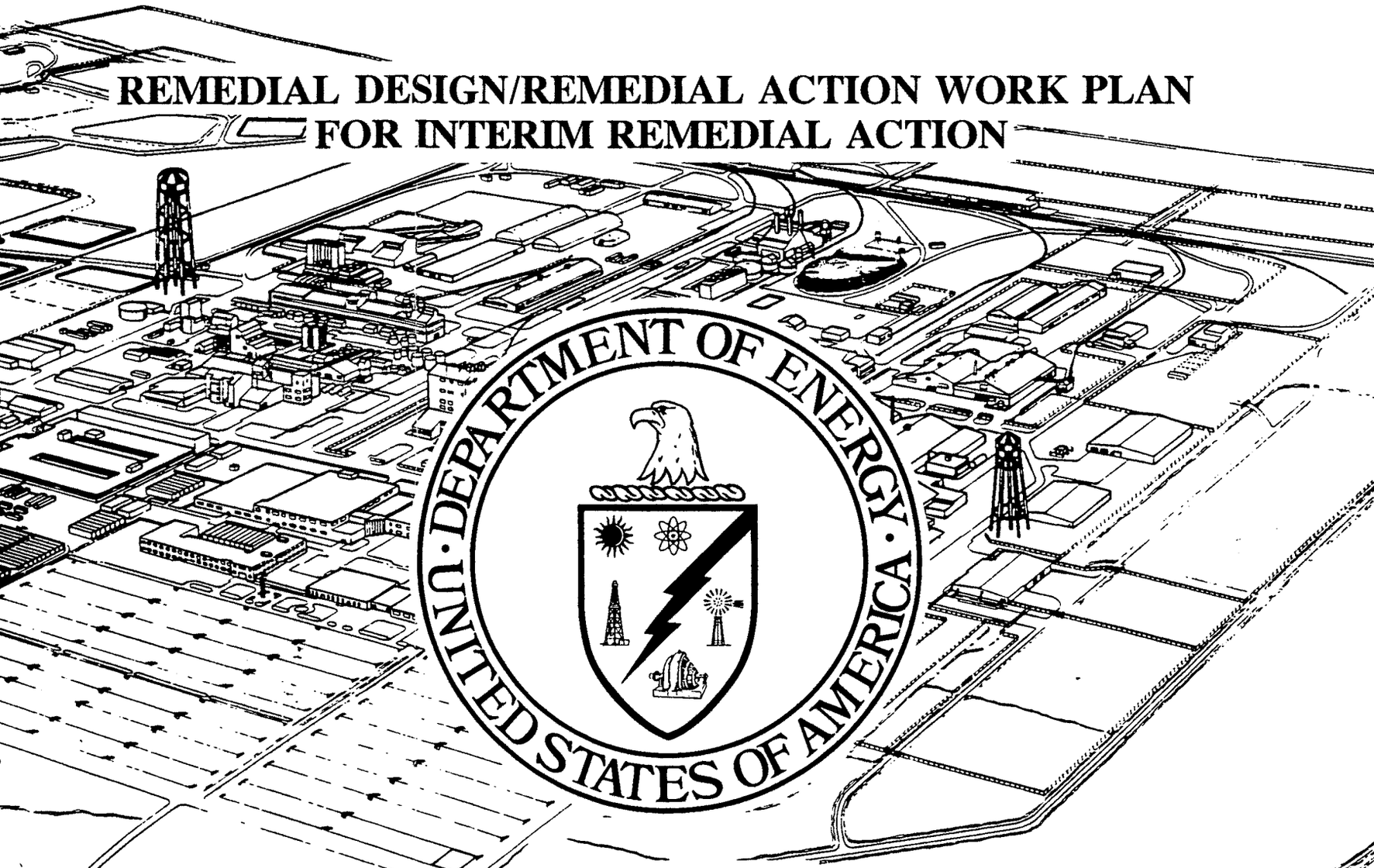
OPERABLE UNIT 3

REMEDIAL DESIGN/REMEDIAL ACTION WORK PLAN FOR INTERIM REMEDIAL ACTION



VOLUME 1 OF 2
SECTIONS 1-7, APPENDICES A through C

MARCH 1995

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

U.S. DEPARTMENT OF ENERGY
FERNALD FIELD OFFICE

FINAL

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Department of Energy
Fernald Environmental Management Project
P. O. Box 398705
Cincinnati, Ohio 45239-8705
(513) 648-3155

MAR 16 1995

DOE-0718-95

Mr. James A. Saric, Remedial Project Director
U.S. Environmental Protection Agency
Region V - 5HRE-8J
77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF FINAL VERSIONS OF THE OPERABLE UNIT 3 REMEDIAL DESIGN/REMEDIAL ACTION WORK PLAN AND BUILDING 4A IMPLEMENTATION PLAN

Reference: 1) Letter, J. A. Saric to J. R. Craig, "Approval of the OU3 RD/RA Work Plan and Building 4A Implementation Plan," dated February 17, 1995.

2) Letter, T. A. Schneider to J. R. Craig, "Conditional Approval of the OU3 RD/RA WP and Building 4A Implementation Plan," dated January 20, 1995.

The purpose of this letter is to transmit to the U.S. Environmental Protection Agency (U.S. EPA) and Ohio Environmental Protection Agency (OEPA) the enclosed final versions of the Operable Unit 3 (OU3) Remedial Design/Remedial Action (RD/RA) Work Plan (Volumes 1 and 2) and the Building 4A Implementation Plan. Also, enclosed is the U.S. Department of Energy's (U.S. DOE) response to the comment provided by OEPA in the above referenced letter.

There were several non-substantive changes made to both documents that reflect recent developments with other key documents that impact the Operable Unit 3 (OU3) Interim Remedial Action. One change includes the revision of Section 5 of the OU3 Remedial Design/Remedial Action (RD/RA) Work Plan to reflect community relations activities committed by the revised site-wide Community Relations Plan, which was approved by the U.S. EPA on January 12, 1995. The other notable change is the elimination of the alphabetical nomenclature (e.g., Category A, Category B, etc.) that was used in both the RD/RA Work Plan and the Building 4A Implementation Plan to assist in the identification of material segregation categories. Text in the OU3 RD/RA Work Plan that was affected by this change includes Section 3.4 and Appendix A.

Recycled and Recyclable

Affected sections of the Building 4A Implementation Plan include Section 2.2 and Appendix A. In both documents, material management strategies are unaffected by this change. Due to the use of a similar system of identifying material segregation categories proposed in the OU3 Feasibility Study, it is evident that there was a need to provide consistency between these three documents.

If you or your staff have any questions, please contact Anand Shah at (513) 648-3146.

Sincerely,

Johnny Reising

for Jack R. Craig
Fernald Remedial Action
Project Manager

FN:Shah

Enclosures: As Stated

cc w/encs:

K. H. Chaney, EM-423/QO
D. R. Kozlowski, EM-423/QO
G. Jablonowski, USEPA-V, 5HRE-8J
J. Kwasniewski, OEPA-Columbus
P. Harris, OEPA-Dayton
M. Proffitt, OEPA-Dayton
S. McClellan, PRC
R. Cohan, GeoTrans
F. Bell, ATSDR
R. Owen, ODOH
R. D. George, FERMCO/52-2
T. Hagen, FERMCO/65-2
AR Coordinator, FERMCO

cc w/o encs:

J. Thiesing, FERMCO
M. Yates, FERMCO/9

OPERABLE UNIT 3

REMEDIAL DESIGN/REMEDIAL ACTION WORK PLAN FOR INTERIM REMEDIAL ACTION

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

FERNALD, OHIO

VOLUME 1 OF 2
SECTIONS 1-7, APPENDICES A through C

MARCH 1995

U.S. DEPARTMENT OF ENERGY
FERNALD FIELD OFFICE

FINAL

Acknowledgement

The Remedial Design/Remedial Action Work Plan for the Operable Unit 3 Interim Remedial Action was prepared with the support of many individuals representing a wide variety of expertise and organizations at the FEMP. Contributors represented Fernald Environmental Restoration Management Corporation, Parsons Engineering, Brown and Root Environmental and the U.S. Department of Energy Fernald Field Office. The principal authors of this document are:

Joe Boudreaux
Dennis Cook
Paul Courtney
Dennis Dalga
Doug Dunderman
Christina Elsea
Jim Forrelli
Matt Frost
Laurie Hagen
Lyle Hampshire
Mike Hundley
Kathryn Kenter
Katharine Little
Susan Madaris
Dan Menefee
David Muenzenmayer
Christine Newman
Matthew Whitaker

OPERABLE UNIT 3

INTERIM REMEDIAL ACTION

REMEDIAL DESIGN/REMEDIAL ACTION WORK PLAN

FINAL

MARCH 1995

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OPERATION AND MAINTENANCE PLAN

CONSTRUCTION QUALITY ASSURANCE PLAN

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NOTATION

Abbreviations, Acronyms, and Initials

ACA	Amended Consent Agreement
ACM	asbestos-containing material(s)
ACOE	United States Army Corps of Engineers
ALARA	As Low As Reasonably Achievable
Anti-C's	anti-contamination clothing
ARAR(s)	Applicable or Relevant and Appropriate Requirement(s)
ASL	analytical support level
AWWT	advanced wastewater treatment
BDN	Biodenitrification
BMP	Best Management Practice
CAMU	Corrective Action Management Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFC	Certified for Construction
CFR	Code of Federal Regulations
CPID	Closure Plan Information and Data
CQAP	Construction Quality Assurance Plan
CRP	Community Relations Plan
CWA	Clean Water Act of 1977, as amended
DEC	Design-Engineering-Construction [Team]
DF&O	Directors Findings and Orders
DOE	United States Department of Energy
DOE-FN	United States Department of Energy - Fernald Field Office
DOE-NV	United States Department of Energy - Nevada Office of Operations
DOT	United States Department of Transportation
DQO(s)	data quality objective(s)
EA	environmental assessment
FEMP	Fernald Environmental Management Project
FERMCO	Fernald Environmental Restoration Management Corporation
FID	flame ionizing detector
FMPC	Feed Materials Production Center
FR	Federal Register
FS	feasibility study
FY	fiscal year
HASP	health and safety plan
HEPA	high-efficiency particulate air [filter]
HSL	hazardous substance list
HVAC	heating, ventilating, and air conditioning

HWMU	Hazardous Waste Management Unit
HX(s)	heat exchanger(s)
IFB	invitation for bid
ICP	inductively coupled plasma
IROD	Record of Decision for Interim Remedial Action
JIT	just-in-time
MCL	maximum contaminant level
MCLG	maximum contaminant level goal
MEF	material evaluation form
MSCC	Material Segregation and Containerization Criteria [form]
N/A	not applicable
NCP	National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300
NEPA	National Environmental Policy Act
NESHAPs	National Emissions Standards for Hazardous Air Pollutants
No.	number
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NTS	Nevada Test Site
NWP	Nationwide Permit Program
O&M	operations and maintenance
OAC	Ohio Administrative Code
OEPA	Ohio Environmental Protection Agency
OU(s)	operable unit(s)
OU1	Operable Unit 1
OU2	Operable Unit 2
OU3	Operable Unit 3
OU3 PP/EA	OU3 Proposed Plan/Environmental Assessment for Interim Remedial Action
OU3 RI/FS WPA	OU3 RI/FS Work Plan Addendum
OU4	Operable Unit 4
OU5	Operable Unit 5
PCB(s)	polychlorinated biphenyl(s)
PPE	personal protective equipment
PSP	project-specific plan
PWID	project waste identification and disposition [form]
QA	quality assurance
QAPjP	Quality Assurance Project Plan
QC	quality control
RCRA	Resource Conservation and Recovery Act
RD/RA	remedial design/remedial action

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RI	remedial investigation
ROD	Record of Decision
RSE	removal site evaluation
RSO	Remediation Support Operations
SACD	Stipulated Amendment to the Consent Decree
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act of 1986
SCQ	FEMP Sitewide CERCLA Quality Assurance Project Plan
SED	site-wide environmental database
SOW	statement of work
SOP	standard operating procedure
SSOP	site-wide standard operating procedure
SVOC(s)	semi-volatile organic compound(s)
SWCR	Site-wide Characterization Report
SWIFTS	site-wide waste information, forecasting, and tracking system
SWMU	Solid Waste Management Unit
SWRB	stormwater retention basin
TAL	target analyte list (per Contract Laboratory Program)
TBC	to be considered
TCL	target compound list (per Contract Laboratory Program)
TSCA	Toxic Substance Control Act of 1976, as amended
TSI	thermal system insulation
TSS	tension support structure
USC	United States Code
UST	Underground storage tank
USEPA	United States Environmental Protection Agency
VOC(s)	volatile organic compound(s)
WMB	small (white) metal boxes
WM/PP	Waste minimization and Pollution Prevention Awareness Plan
WWTS	wastewater treatment system

Units of Measure

cm	centimeter(s)
cm^3	cubic centimeter(s)
cpm	counts per minute
CY	cubic yard(s)
°C	degree(s) Celsius
°F	degree(s) Fahrenheit
dpm	disintegration(s) per minute
ft	foot (feet)
ft^2	square foot (feet)
g	gram(s)
gal	gallon(s)
Hr	hour
in.	inch
keV	kilo-electron volt(s)
kg	kilogram(s)
L	liter(s)
lb	pound(s)
m	meter(s)
m^3	cubic meter(s)
ml	milliliter
μg	microgram(s)
μR/h	microRoentgen(s) per hour
mi	mile(s)
mg	milligram(s)
mg/L	milligram(s) per liter
mrem	millirem(s)
nCi/g	nanocurie(s) per gram
pCi	picocurie(s)
ppm	part(s) per million
ppmv	part(s) per million by volume
sec	second(s)

Chemical Symbols

Ac	actinium
Ag	silver
Am	americium
Bi	bismuth
CO	carbon monoxide
CO_2	carbon dioxide
Cs	cesium
H_2S	hydrogen sulfide
NaI	sodium iodide
NH_3	ammonia
NO_2	nitrogen dioxide
Np	neptunium
O_2	oxygen
Pa	protactinium
Pb	lead
Po	polonium
Pu	plutonium
Ra	radium
Rn	radon
Ru	ruthenium
Sr	strontium
Tc	technetium
Th	thorium
Tl	thallium
U	uranium
ZnS	zinc sulfide

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GLOSSARY

Administrative controls -
Ensure protection against hazards by management, procedures, record keeping, and assessments. Not intended to physically stop individuals or remove hazards.

Asbestos abatement containment area -
An enclosed area maintained under negative pressure to prevent or minimize the spread of asbestos fibers. Often a plastic enclosure with HEPA-filtered ventilation. Also referred to as asbestos abatement regulated area.

Bid package -
Documents which include the technical Statement of Work, legal, commercial, safety, environmental, and quality requirements of the work to provide guidance to potential bidders.

Complex -
A set of components grouped by location, scope of work required, and/or cost of dismantlement to be remediated under one or more design document(s).

Component -
The smallest physically distinct unit of OU3 that is considered separately in the development and implementation of this work plan including, but not limited to, buildings, pads, roads, piping/utilities, and ponds/basins.

Containment structure -
A barrier constructed to prevent or minimize the spread of contamination during decontamination and dismantlement activities.

DEC Team -
An acronym for Design-Engineering-Construction Team, containing representatives from DOE, various FERMCO organizations, and the remedial design subcontractor responsible for the overall development of each design package.

Design package -
Detailed set of plans and specifications for implementation of the interim remedial action in manageable portions of the entire work scope. Refer to section 4.5 for a more detailed description of a design package.

Disposal cell -
Engineered facility designed to meet requirements necessary for disposal of materials.

End-loading containers -
An end-loading metal box measuring approximately 8′ x 8′ x 20′ with a weight capacity of 36,000 lbs. These containers have a volume capacity of 971 cubic feet and a burial volume of 1,024 cubic feet. Also known as SEA/LAND and ISO containers.

GLOSSARY

Engineering controls -
Eliminate hazards by mechanical means or by process design; apparatus and/or mechanisms which physically prevent entry, minimize hazards, or create some kind of barrier.

Free-release -
Unrestricted release of materials from DOE control to an uncontrolled environment. Materials must meet the release criteria established by Nuclear Regulatory Commission (NRC) regulation 1.86 and DOE Order 5400.5.

Hazard Waste Management Unit (HWMU) -
A contiguous area of land on or in which hazardous waste is placed or the largest area in which there is significant likelihood of mixing hazardous waste constituents in the same area. Examples of hazardous waste include a surface impoundment, a waste pile, a land treatment area, a landfill cell, an incinerator, a tank and its associated piping and underlying containment system, and a container storage area.

Hold-up material -
Includes material (both liquid and solid) within any process equipment or reservoir other than residuals which cling to the surfaces of the various pumps, piping, vessels, or other surfaces of equipment.

Implementation Plan -
Document which provides specific details on a decontamination and dismantlement project including, but not limited to, background information, Hazardous Waste Management Unit closure activities, waste management, and proposed environmental monitoring. This document will serve as the primary mechanism for regulatory agencies to use to determine if the proposed action is consistent with the IROD.

Interim remedial action -
Course of action that may be pursued in the short-term, before a final Record of Decision, in order to quickly reduce existing risks at a Superfund site. Also refers to the OU3 interim remedial action to decontaminate and dismantle all OU3 structures.

Interim storage facility -
On-site area for temporary storage of material or debris generated during the OU3 interim remedial action.

Interval period -
The period between the issuance of the OU3 Record of Decision for Interim Remedial Action and the execution of the OU3 final remedial action.

GLOSSARY

Jobsite -

Geographic area which contains the primary components of a specific decontamination and dismantlement project, and can be used for various remediation subcontractor operations, including decontamination and dismantlement, material staging, and administrative support.

Large top-loading metal boxes -

A top-loading metal box measuring approximately 8' x 8' x 20' with a weight capacity of 36,000 lbs. These containers have a volume capacity of 1,280 cubic feet and a burial volume of 1,349 cubic feet.

Lay-down area -

A cleared area located near a jobsite that is used to place materials from dismantlement operations for immediate further handling.

Liners -

A relatively impermeable barrier designed to prevent the release of liquids from a work area, a storage area, or a disposal area.

Material -

Solids and liquids generated from decontamination and dismantlement operations; includes non-recoverable/non-recyclable material (waste) and recoverable/recyclable material.

Operable Unit -

A distinct action that comprises an incremental step toward comprehensively addressing site problems. The five FEMP operable units, as defined by the Amended Consent Agreement (ACA), have been specified based on specific site problems. Each of the units are summarized as follows: OU1 - waste pits; OU2 - ash pile, sanitary landfill, and lime sludge ponds; OU3 - all buildings and associated facilities (roads, railroads, drummed waste, inventory, fences, telephone poles, electrical and sewage lines, etc.); OU4 - four large storage silos and associated facilities; OU5 -contaminated environmental media. Refer to section 2.1 for a more detailed description of each operable unit.

Plant 4 Complex -

A group of OU3 components that, by design, will be decontaminated and dismantled as one remediation project, including: Green Salt Plant (4A), Plant 4 Warehouse (4B), and Plant 4 Maintenance Building (4C). Building 4C has been removed under the Plant 7 Dismantling project (Removal No. 19).

Primary material -

The material generated as a result of dismantlement activities of a specific project, including the structure, associated equipment, and contents of the building.

GLOSSARY

Process knowledge -
Information available about a process from documentation of past operations or information from individuals who participated in the operation. This information includes, but is not limited to, process chemistry, history of accidents/spills, maintenance chemicals/materials, and other uses of the process vessels or work space.

Program -
Refers to the overall OU3 Remedial Design/Remedial Action process which encompasses all specific decontamination and dismantlement projects governed by this work plan.

Project -
A specific decontamination and dismantlement remedial design and remedial action effort; beginning with pre-design scoping activities and ending with the submittal of a remedial action report to the regulatory agencies.

Project-specific HASP -
Facilitates coordination and communication of health and safety issues among personnel by providing the mechanisms to minimize the risks of employee exposure to hazardous substances and other unsafe conditions associated with a specific project. This document evaluated a project on a task by task basis, identifying potential hazards and mitigators.

Queuing Area -
An area established within the construction boundaries that is used for placement of full containers to await relocation by FEMP waste management for interim storage or disposition.

Remedial action -
An action that is consistent with the final remedy following a formal examination of the nature and extent of the release, or threat of release, assessment of the risk, and selections of the final remedy based on an evaluation of possible alternatives.

Remedial design -
The technical analysis and procedures which follow the selection of a site remedy resulting in a set of plans and specifications for implementation of the remedial action.

Remediation subcontractor -
The group, or groups, subcontracted to FERMCO that will be responsible for implementation of the remedial action.

Removal action -
Any action necessary to abate an immediate threat to human health and the environment, including actions necessary to monitor, assess, or evaluate the threat.

GLOSSARY

Roll-off box -

A reinforced top-loading metal box measuring approximately 7' x 5.5' x 22' with the gross weight capacity of 42,000 lbs. These containers have a volume capacity of 810 ft^3.

Safe Shutdown -

Program designated as Removal No. 12 at the FEMP which provides planning, engineering, and program control for the proper disposition of all uranium product and in-process hold-up materials, excess supplies, chemicals, and associated process equipment. The program also is intended to ensure the proper characterization, emptying, and isolation of utilities for the majority of existing previously-operated, production-related equipment.

Secondary waste -

Waste other than primary waste associated with a remedial action generated as a result of occupying a jobsite, conducting decontamination and dismantlement activities, utilizing PPE, and demobilization activities.

Sequence -

The logical order in which complexes of components are planned to be remediated.

Small white metal boxes -

A top-loading metal box measuring approximately 3' x 4' x 6' with a weight capacity of 6,800 lbs. These containers have a volume capacity of 82 cubic feet and a burial volume of 105 cubic feet. Also known as B-25s.

Staging area -

A temporary holding area established outside the construction boundary for empty containers prior to use.

Surface decontamination -

The reduction of existing surface contamination levels, thereby reducing direct exposure potential, as well as reducing available sources for air-borne or water-borne contamination.

Tension support structures -

Engineered facilities designed for temporary covered storage consisting of a structural steel skeleton and covered with an impervious fabric.

Transite -

Common construction material used as sheeting for walls and roofs for many OU3 components. It consists of a mixture of asbestos and cement.

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Section 1

1.0 INTRODUCTION

1.1 Purpose and Scope

The purpose of this Remedial Design/Remedial Action (RD/RA) Work Plan is to identify the activities required to design and implement the *interim remedial action*[1] for *Operable Unit* 3 (OU3) at the U.S. Department of Energy's (DOE) Fernald Environmental Management Project (FEMP) in Fernald, Ohio. The OU3 interim remedial action, as outlined in the OU3 Record of Decision for Interim Remedial Action (IROD) (DOE 1994b), consists of decontaminating and dismantling all OU3 structures and related facilities to reduce any current or potential threat to public health, welfare, and the environment. The overall goal of the OU3 interim remedial action is to safely decontaminate and dismantle all OU3 *components*, in a timely, efficient, and cost-effective manner which assures compliance with all Applicable or Relevant and Appropriate Requirements (ARARs), is protective of human health and the environment, and which would be consistent with alternatives being considered for the OU3 final remedial action. The OU3 interim remedial action is being implemented in accordance with the National Oil and Hazardous Substance Pollution Contingency Plan (NCP), the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA), (hereinafter jointly referred to as "CERCLA"), and the Resource Conservation and Recovery Act (RCRA). The OU3 interim remedial action is being implemented by the DOE, as the lead agency responsible for CERCLA activities at the FEMP.

The IROD, as issued by the United States Environmental Protection Agency (USEPA) on July 22, 1994, documents the decision to decontaminate and dismantle all OU3 structures and facilities, with the temporary storage and disposition of the resulting waste and *material* during the *"interval period"* between the implementation of the IROD and the OU3 final remedial action Record of Decision (ROD). This action does not constitute the final remedy for OU3; a final remedial action to address the treatment and disposition of dismantlement debris and waste will be determined through the ongoing CERCLA response action process and documented by the OU3 final ROD. As part of the CERCLA process for OU3, the OU3 draft Remedial Investigation (RI) and Feasibility Study (FS) Reports, along with the draft OU3 Proposed Plan, will be submitted concurrently to the USEPA on September 11, 1995. These reports will be prepared in accordance with the OU3 RI/FS Work Plan Addendum (WPA) (DOE 1993e). The purpose of the OU3 RI is to characterize the nature and extent of chemical and radiological contamination in OU3, based on *process knowledge* and limited sampling and analyses, to the extent necessary for development of the OU3 FS. The purpose of the OU3 FS is to identify and evaluate alternatives for the treatment and permanent disposition of the resulting material and waste to support selection of the final remedial action.

The IROD allows for the *surface decontamination* and dismantlement of all above-, at-, and below-grade man-made components within OU3. The major elements of the decontamination and dismantlement activities covered by this Work Plan consist of *Hazardous Waste Management Unit* (HWMU) closure, if required, asbestos abatement/removal, surface decontamination, above-grade component dismantlement, at- and below-grade component removal, and material storage, recycling and limited disposition. Activities to be completed prior to initiation of the decontamination and dismantlement *project*, under existing FEMP programs and not within the scope of this Work Plan, consist of the removal of existing

[1] *Words that have been italicized are defined in the glossary.*

product and waste inventories and *safe shutdown* activities. During the interval period, materials will be either transported to an on-site interim storage facility/area or, when acceptable, transported to permitted off-site facilities for disposal or recycling/reuse. The OU3 final remedial action ROD will specify the type of waste treatment and permanent disposition of all remaining OU3 materials, including those in interim storage.

1.2 Summary of Work Plan Approach

The OU3 RD/RA Work Plan provides the overall framework for performing remedial design and remedial action authorized under the IROD. Presented in this Work Plan is the overall OU3 RD/RA strategy, including the approach for developing a *sequence* for implementation, and general decontamination and dismantlement design and remediation project guidelines and tasks. This Work Plan defines the framework for developing specific decontamination and dismantlement projects to remediate OU3. They will be described in future project-specific *implementation plans*. The general approach of this Work Plan is as follows:

- summarize pertinent site and OU3 background information;
- summarize the purpose and scope of the OU3 interim remedial action as proposed in the OU3 Proposed Plan/Environmental Assessment (PP/EA) (DOE 1993c) for the OU3 Interim Remedial Action and documented in the IROD;
- describe programmatic and action-specific strategies and requirements for the design and implementation of all decontamination and dismantlement projects included in the OU3 interim remedial action;
- identify the primary regulatory requirements and considerations necessary for performing the remedial activities;
- develop a framework document from which individual reports, implementation plans, and other documents will be prepared for each decontamination and dismantlement project that summarizes the project-specific design and planned remedial field activities, thus replacing the need to submit multiple design documents (identified in Sections 4.5.1 through 4.5.4) for each decontamination and dismantlement project; and
- develop the approach and methodology for determining the priority for the remediation of OU3 structures which will serve as the basis for subsequently developing schedules for the OU3 interim remedial action.

The Amended Consent Agreement (ACA) (USEPA 1991) requires that this RD/RA Work Plan include a schedule for implementation of RD and RA activities. The decontamination and dismantlement of over 200 components in OU3 (as identified in Section 2.2) is a multi-faceted project that is anticipated to require at least sixteen years and approximately $750 million[2]

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[2] *The cost estimate reported in the PP/EA was approximately $1 billion. The current cost estimate for the OU3 interim remedial action is approximately $750 million and is subject to further revision based on the results of the OU3 RD Prioritization and Sequencing Report due to regulatory agencies on March 17, 1995.*

to complete, according to the assumptions presented in the OU3 PP/EA. This Work Plan presents a methodology for prioritizing and scheduling the decontamination and dismantlement projects to complete the OU3 interim remedial action. An RD/RA schedule for the first project to be implemented is provided, along with a commitment to supply the sequence and schedules for the decontamination and dismantlement of the remaining projects and associated project-specific documents in a subsequent report entitled the OU3 Remedial Design Prioritization and Sequencing Report, as discussed in Section 6.3 of this Work Plan. The long-term base schedule and a five-year, funding-based schedule to be included in that report, will be developed pursuant to the strategies presented in Section 3.2 and task descriptions presented in Sections 4.2 and 4.3 of this Work Plan.

The ACA requirement to provide certain project plans with this Work Plan has been met with the inclusion of the project plans that have been identified in Section 1.3 and compiled in a separate volume of this Work Plan that includes program planning support documentation (Volume 2 of 2). The remaining plans required by the ACA, a groundwater monitoring plan and a plan for the satisfaction of permitting requirements, have been addressed by incorporating the requirements that would be included in such plans into the body of this Work Plan. The groundwater monitoring requirements are addressed in Section 3.7.1. Satisfaction of permitting requirements is addressed in Section 3.6 and in the tables contained in Appendix B; both discuss attainment of ARARs during the interim remedial action.

This Work Plan does not preclude any actions involving either final *remedial design* or *remedial action*; they will be covered by the scope of the OU3 final remedial action ROD. Some strategies presented in this Work Plan (e.g., waste and material management) may be superseded by final decisions made under the OU3 final remedial action ROD.

This Work Plan has been prepared in compliance with the ACA, CERCLA, Superfund Remedial Design and Remedial Action Guidance (USEPA 1986), the Stipulated Amendment to the Consent Decree (SACD) (State of Ohio, 1993), and the FEMP's DOE-CERCLA integrated project management process developed on November 9, 1993. Although Section XI of the ACA requires both a Remedial Design Work Plan and a Remedial Action Work Plan to be submitted, this Work Plan combines both requirements into one document in order to more efficiently utilize time, budget, and resources.

1.3 Work Plan Organization

This Work Plan is comprised of the main document (seven sections), a reference section, and three appendices. An outline and a brief description of these seven sections and appendices are provided below.

SECTION 1 - Introduction, provides the purpose and scope of the OU3 RD/RA for the interim remedial action, the Work Plan approach, and the Work Plan organization.

SECTION 2 - Background, provides pertinent background information essential to understanding the basis of the OU3 interim remedial action.

SECTION 3 - Implementation of the OU3 Interim Remedial Action, presents the programmatic and implementation strategies for the OU3 interim remedial action.

SECTION 4 - Tasks, describes each of the programmatic tasks that must be performed to implement the OU3 interim remedial action, including planning, scheduling, remedial design, and remedial action.

SECTION 5 - Community Relations, describes the community relations activities that will be performed throughout the OU3 interim remedial action.

SECTION 6 - Schedule and Deliverables, provides a schedule for finalization of the Work Plan, submittal of an implementation plan for the initial decontamination and dismantlement project, and submittal of long-term schedules and reports. Section 6 also lists RD/RA reports for review, comment, and/or approval by the regulatory agencies.

SECTION 7 - Management, describes the overall management structure for performing the remedial design and remedial action.

A reference section follows Section 7 which identifies references cited in the preceding sections.

Appendix A - Material Segregation and Containerization Guidance, consists of material management guidance developed to support the OU3 interim remedial action.

Appendix B - ARARs Attainment Tables, indicates how ARARs and other requirements of the IROD will be attained by the OU3 interim remedial action.

Appendix C - Performance Specifications, provides the performance specifications for the Building 4A decontamination and dismantlement project, as an example.

Supplementing this Work Plan are the following *program*-level plans which provide basic requirements potentially applicable to each decontamination and dismantlement project. These documents are included in a separate volume submitted concurrently with this Work Plan:

- Sampling & Analysis Plan (SAP)
- Health and Safety Plan (HASP)
- Operations and Maintenance Plan (O&M)
- Construction Quality Assurance Plan (CQAP)

A separately bound implementation plan for the decontamination and dismantlement of Building 4A also accompanies this Work Plan. This implementation plan provides an example of the content and style to be used during the development of implementation plans for remaining decontamination and dismantlement projects.

Section 2

2.0 BACKGROUND

A summary of OU3 and FEMP background information is presented in this section. A fold-out site map is enclosed (inside the back cover of Volume 1) to show the site in detail. Extensive background information for the site may be found in the Sitewide Characterization Report (SWCR) (DOE 1993f), the 1993 Annual Site Environmental Report (DOE 1994a), the OU3 RI/FS WPA, and the OU3 PP/EA.

2.1 Site History

The FEMP is a DOE-owned, contractor-operated federal facility that produced high-purity uranium metal products for the DOE and its predecessor agency, the Atomic Energy Commission, during the period 1952 to 1989. Thorium was also processed, but on a smaller scale, and is stored on the site. Production activities ceased in 1989, and the production mission of the facility was formally ended in 1991. The FEMP was included on the CERCLA National Priorities List in 1989. The current mission of the site is environmental restoration in accordance with the requirements of CERCLA.

The ACA defines the terms and schedules for remediation of the FEMP. Under the ACA, the FEMP has been divided into five operable units (OUs), representing a logical grouping of facilities and/or like waste units and/or geographical orientation. These operable units are described below, with the exception of OU3, which is described in more detail in Section 2.2.

Operable Unit 1 (OU1) covers approximately 37 acres and consists of on-site facilities that were used during uranium production for storage of low-level radioactive waste. OU1 contains:

- Waste Pits 1 through 6;
- Clearwell;
- Burn Pit;
- berms;
- *liners*; and
- soils and perched water within its boundaries.

Operable Unit 2 (OU2) consists of facilities used for the storage or disposal of solid wastes from the site operations. These are as follows:

- active and inactive Flyash Piles;
- South Field Disposal Area;
- North and South Lime Sludge Ponds;
- Solid Waste Landfill;

- soils beneath and immediately surrounding the above solid waste areas; and
- perched groundwater encountered in the vicinity of the above solid waste areas during implementation of cleanup activities.

Operable Unit 3: (Described in Section 2.2.)

Operable Unit 4 (OU4) contains:

- Silos 1 and 2 and their contents (K-65 residues, by-product material);
- Silo 3 and its contents (cold metal oxides, by-product material);
- Silo 4 (empty, except for rainwater infiltration);
- K-65 decant sump tank and its contents;
- a radon treatment system;
- a portion of a concrete pipe trench and other concrete structures;
- an earthen berm surrounding Silos 1 and 2;
- soils beneath and immediately surrounding Silos 1, 2, 3, and 4; and
- perched groundwater encountered in the vicinity of the silos during the implementation of cleanup activities.

Operable Unit (OU5) consists of environmental media that can serve as pathways for transporting contaminants. These media include:

- soils not included in OUs 1, 2 and 4;
- flora and fauna;
- surface water and sediments; and
- groundwater not included in OUs 1, 2 and 4.

A "Comprehensive Sitewide Operable Unit," as defined in the ACA has been created to evaluate remedies selected for OU1 through OU5 (including remedial and *removal actions*) to ensure that they are collectively protective of human health and the environment on a sitewide basis, as required by CERCLA, the NCP, and applicable USEPA policy and guidance.

2.2 Description of Operable Unit 3

OU3 includes the former production area and associated facilities, materials, and equipment including, but not limited to, the following:

- all above-, at- and below-grade improvements;
- equipment, utilities, drums, tanks;
- solid waste;
- waste product;
- thorium;
- effluent lines;
- K-65 transfer line;
- wastewater treatment facilities;
- fire training facilities;
- scrap metal piles;
- feed stocks; and
- coal pile.

The structures and supporting facilities within OU3 are referred to as components. The basis for identifying and categorizing OU3 components was presented in the OU3 RI/FS WPA. The OU3 interim remedial action primarily addresses the decontamination and dismantlement of components and the management of material generated by those activities; not the removal of product and waste inventory listed above. These latter items are being addressed by other programs as discussed later in this Work Plan.

The former production area occupies about 136 acres near the center of the FEMP site and contains many buildings, containerized materials, storage pads, roads, railroad tracks, above-grade and below-grade tanks, utilities, and equipment. OU3 components located outside the aforementioned area include approximately thirty acres of non-production area support facilities such as the administrative area, sewage treatment plant, fire training facility, parking lots, several impoundments, ponds, and basins. OU3 specifically excludes the soil and groundwater located under the various components. These media are included in OU5; however, soil piles located throughout the former production area from removal actions and construction projects are included in OU3. This document and the OU3 IROD do not address remediation of OU3 soil piles which will be addressed in the OU3 final ROD.

Table 2-1 provides a list of the 233 components within OU3 as identified in the OU3 RI/FS WPA. The table lists the name of each component and its alpha-numeric designation. This list also identifies components (with footnotes) that have been or will be dismantled or removed under removal actions or past operation and maintenance activities. This list will be updated during the OU3 interim remedial action if any additional structures are identified (e.g., temporary storage structures). Additionally, the list will be updated in project-specific remedial action reports as components are removed due to the OU3 interim remedial action

or removal actions. A current plate map of the FEMP OU3 components is included inside the back cover of this volume of the Work Plan.

Table A.2.1 in the OU3 RI/FS WPA provides descriptive information about the components in OU3. The table describes in detail eleven process facilities, six administrative facilities, twenty warehouses, and all other major structures in OU3. Table A.2.1 also summarizes structural design information and identifies each entry with its unique alpha-numeric component designator as identified in Table 2-1 of this Work Plan. This information will be summarized in the individual implementation plans to assist in understanding the particular features of the individual projects.

2.3 Nature and Extent of Contamination in OU3

The processes and operations within the former production area at the FEMP used a variety of radioactive feed materials and other radioactive and chemical reactants for both production and secondary operations. Production operations generated a wide variety of waste materials containing both radiological and chemical constituents. Process and material-handling procedures resulted in chemical and radiological contamination within some OU3 components. As a result, these components may serve as current and/or future sources of environmental contamination.

The following subsections, supported by Appendix B of the OU3 PP/EA, present an overview of existing information on chemical and radiological contamination associated with OU3 components. This summary is based upon process knowledge and data presented in the OU3 RI/FS WPA, which also provides additional information.

Because of the nature of the uranium-processing activities at the site, the predominant contaminants of concern are radionuclides, inorganics, and volatile and semi-volatile organic compounds (known as VOCs and SVOCs, respectively). VOCs are not expected to be contained in component media because the media are not likely to have retained such compounds in the period since production ceased in July of 1989. The OU3 RI will provide information concerning the nature of OU3 radiological and chemical contamination to add to previous site information. Prior to completion of the RI, data will be available for use in the initial decontamination and dismantlement projects. See Section 3.5.1 for discussions regarding use of the RI data.

Radiological Contamination

Historical information and process knowledge, as detailed for each OU3 component in Table B-1 of the OU3 PP/EA, indicate that the primary radiological contaminants in OU3 are uranium (isotopes 234, 235, 236, 238, and, to a lesser degree, 233), thorium (isotopes 228, 230, and 232), radium (isotopes 226 and 228), and the associated daughters, including isotopes of lead and polonium. Additional, but minute quantities of radiological contaminants within OU3 include isotopes of neptunium, plutonium, technetium, strontium, cesium, and americium.

Appendix B of the OU3 PP/EA provides the most recent summary of radiological data for OU3. Table B-1 of the OU3 PP/EA lists potential radiological contaminants for each component within OU3, Table B-2 summarizes radiological smear and direct survey results by component, and Table B-3 provides airborne concentrations of alpha- and beta-emitting radionuclides.

TABLE 2-1 OU3 Component Identification

Component	Component Designation	Component	Component Designation
1. Preparation Plant	1A	45. Plant 8 Railroad Filter Bldg.	8D
2. Plant 1 Storage Shelter	1B	46. Drum Conveyor Shelter	8E
3. Plant 1 Ore Silos (a)	1C	47. Plant 8 Old Drum Washer	8F
4. Ore Refinery Plant	2A	48. Special Products Plant	9A
5. General/Refinery Sump Control Bldg.	2B	49. Plant 9 Sump Treatment Facility	9B
6. Bulk Lime Handling Bldg.	2C	50. Plant 9 Dust Collector	9C
7. Metal Dissolver Bldg.	2D	51. Plant 9 Substation	9D
8. NFS Storage and Pump House	2E	52. Plant 9 Cylinder Shed	9E
9. Cold Side Ore Conveyor	2F	53. Electrostatic Precipitator	9F
10. Hot Side Ore Conveyor	2G	54. Boiler Plant	10A
11. Conveyor Tunnel (from Plant 1)	2H	55. Boiler Plant Maintenance Bldg.	10B
12. Maintenance Bldg.	3A	56. Wet Salt Storage Bin	10C
13. Ozone Bldg.	3B	57. Contaminated Oil/Graphite Burn Pad	10D
14. NAR Control House	3C	58. Utility Heavy Equipment Bldg.	10E
15. NAR Towers	3D	59. Services Bldg.	11
16. Hot Raffinate Bldg.	3E	60. Main Maintenance Bldg.	12A
17. Harshaw Digestion Fume Recovery	3F	61. Cylinder Storage Bldg.	12B
18. Refrigeration Bldg.	3G	62. Lumber Storage Bldg.	12C
19. Refinery Sump	3H	63. Maintenance Bldg. Warehouse	12D
20. Combined Raffinate Tanks	3J	64. Pilot Plant Wet Side	13A
21. Old Cooling Water Tower	3K	65. Pilot Plant Maintenance Bldg.	13B
22. Electrical Power Center Bldg.	3L	66. Sump Pump House	13C
23. Green Salt Plant	4A	67. Pilot Plant Thorium Tank Farm	13D
24. Plant 4 Warehouse	4B	68. Administration Bldg.	14A
25. Plant 4 Maintenance Bldg. (b)	4C	69. Bldg. 14 EOC Generator Set	14B
26. Metals Production Plant	5A	70. Laboratory	15A
27. Plant 5 Ingot Pickling	5B	71. Laboratory Chemical Storage Bldg.	15B
28. Plant 5 Electrical Substation	5C	72. Main Electrical Station	16A
29. West Derby Breakout/Slag Milling	5D	73. Electrical Substation	16B
30. Plant 5 Filter Bldg.	5E	74. Electrical Panels & Transformer	16C
31. Plant 5 Covered Storage Pad	5F	75. Main Electrical Switch House	16D
32. Plant 5 Ingot Storage Shelter	5G	76. Main Electrical Transformers	16E
33. Metals Fabrication Plant	6A	77. Trailer Substation #1	16F
34. Plant 6 Covered Storage Area	6B	78. Trailer Substation #2	16G
35. Plant 6 Electrostatic Precipitator South	6C	79. 10-Plex North Substation	16H
36. Plant 6 Electrostatic Precipitator Central	6D	80. 10-Plex South Substation	16J
37. Plant 6 Electrostatic Precipitator North	6E	81. BDN Surge Lagoon	18A
38. Plant 6 Salt Oil Heat Treat Bldg.	6F	82. General Sump	18B
39. Plant 6 Sump Bldg.	6G	83. Coal Pile Runoff Basin	18C
40. Plant 7 (b)	7A	84. Biodenitrification Towers	18D
41. Plant 7 Overhead Crane (b)	7B	85. Storm Water Retention Basin	18E
42. Recovery Plant	8A	86. Clearwell Pump House	18G
43. Plant 8 Maintenance Bldg.	8B	87. BDN Effluent Treatment Facility	18H
44. Rotary Kiln/Drum Reconditioning	8C	88. Methanol Tank	18J

TABLE 2-1 OU3 Component Identification (Cont'd)

Component	Component Designation	Component	Component Designation
89. Low Nitrate Tank	18K	132. Skeet Range Building	28F
90. High Nitrate Tank	18L	133. Guard Post South of Bldg. 51	28G
91. High Nitrate Storage Tank	18M	134. Chemical Warehouse	30A
92. Dissolved Oxygen Bldg.	18P	135. Drum Storage Warehouse	30B
93. IAWWT Valve House	18Q	136. Old Ten Ton Scale	30C
94. Main Tank Farm	19A	137. Engine House/Garage	31A
95. Pilot Plant Ammonia Tank Farm	19B	138. Old Truck Scale	31B
96. Tank Farm Control House	19C	139. Magnesium Storage Bldg.	32A
97. Old North Tank Farm	19D	140. Bldg. 32 Covered Loading Dock	32B
98. Tank Farm Lime Slitter Bldg.	19E	141. Pilot Plant Annex	37
99. Pump Station & Power Center	20A	142. Propane Storage	38A
100. Water Plant	20B	143. Cylinder Filling Station	38B
101. Cooling Towers	20C	144. Incinerator Bldg.	39A
102. Elevated Potable Storage Tank	20D	145. Waste Oil Decant Shelter	39B
103. Well House #1	20E	146. Incinerator Sprinkler Riser House	39C
104. Well House #2	20F	147. Sewage Treatment Plant Incinerator	39D
105. Well House #3	20G	148. Rust Engineering Bldg.	45A
106. Process Water Storage Tank	20H	149. Utility Shed East of Rust Trailers	45B
107. Gas Meter Bldg.	22A	150. Heavy Equipment Bldg.	46
108. Storm Sewer Lift Station	22B	151. Six to Four Reduction Facility #2	51
109. Truck Scale	22C	152. Health and Safety Bldg.	53A
110. Scale House & Weigh Scale	22D	153. In Vivo Bldg.	53B
111. Utility Trench to Pit Area	22E	154. Six to Four Reduction Facility #1	54A
112. Meteorological Tower	23	155. Pilot Plant Shelter	54B
113. Railroad Scale House	24A	156. Pilot Plant Dissociator Shelter	54C
114. Railroad Engine House	24B	157. Slag Recycling Bldg.	55A
115. Chlorination Bldg.	25A	158. Slag Recycling Pit/Elevator	55B
116. M.H.#175/Eff. Line/Sampling Bldg.	25B	159. CP Storage Warehouse	56A
117. Sewage Lift Station Bldg.	25C	160. Storage Shed (West)	56B
118. U.V. Disinfection Bldg.	25D	161. Storage Shed (East)	56C
119. Digester & Control Bldg.	25E	162. Quonset Hut #1	60
120. Sludge Drying Beds	25F	163. Quonset Hut #2	61
121. Primary Settling Basins	25G	164. Quonset Hut #3	62
122. Trickling Filters	25H	165. KC-2 Warehouse	63
123. 10-Plex Sewage Lift Station	25J	166. Thorium Warehouse	64
124. Pump House-HP Fire Protection	26A	167. (Old) Plant 5 Warehouse	65
125. Elevated Water Storage Tank	26B	168. Drum Reconditioning Bldg.	66
126. Main Electrical Strainer House	26C	169. Plant 1 Thorium Warehouse	67
127. Security Bldg.	28A	170. Pilot Plant Warehouse	68
128. Human Resources Bldg.	28B	171. Decontamination Bldg.	69
129. Guard Post on South End of D St. (c)	28C	172. General In-Process Warehouse	71
130. Guard Post on West End of 2nd St.	28D	173. Drum Storage Bldg.	72
131. Guard Post at T-81	28E	174. Fire Brigade Training Center Bldg. (d)	73A

TABLE 2-1 OU3 Component Identification (Cont'd)

Component	Component Designation	Component	Component Designation
175. Fire Training Pond (d)	73B	205. Receiving/Incoming Materials Inspection	82
176. Fire Training Tank (d)	73C	206. Clearwell Line	88
177. Fire Training Burn Trough (d)	73D	207. Parking Lot	89
178. Confined Space Burn Tank (d)	73E	208. Railroad Tracks	G-01
179. Plant 2 East Pad	74A	209. Roads	G-02
180. Plant 2 West Pad	74B	210. Storm Sewer System	G-03
181. Plant 8 East Pad	74C	211. Utility Lines	G-04
182. Plant 8 West Pad	74D	212. Underground Storage Tanks	G-05
183. Plant 4 Pad	74E	213. Process Trailers	G-06
184. Plant 7 Pad	74F	214. Non-process Trailers	G-07
185. Plant 5 East Pad	74G	215. Pipe Bridges	G-08
186. Plant 5 South Pad	74H	216. Drums (Non-RCRA) (e)	G-09
187. Plant 6 Pads	74J	217. RCRA Drums (e)	G-10
188. Plant 9 Pad	74K	218. Inventory (f)	G-11
189. Bldg. 65 West Pad	74L	219. Mobile Containers (Sea-Land) (e)	G-12
190. Bldg. 64 East Pad & R.R. Dock	74M	220. Soil Piles	G-13
191. Bldg. 12 North Pad	74N	221. Rock Salt Pile	P-01
192. Decontamination Pad	74P	222. Sand Piles	P-02
193. Plant 8 Old Metal Dissolver Pad	74Q	223. Gravel Pile	P-03
194. Plant 8 North Pad	74R	224. Copper Metal Scrap Pile (g)	P-04
195. Bldg. 63 West Pad	74S	225. Coal Pile	P-05
196. Plant 1 Storage Pad	74T	226. Scrap Metal Pile (g)	P-06
197. Pilot Plant Pad	74U	227. Outside Equipment Storage Area	P-07
198. Laboratory Pad	74V	228. Tension Support Structure #1 (h)	TS-01
199. Bldg. 39A Pad	74W	229. Tension Support Structure #2 (h)	TS-02
200. Finished Products Warehouse (4A)	77	230. Tension Support Structure #3 (h)	TS-03
201. D & D Bldg.	78	231. Tension Support Structure #4	TS-04
202. Plant 6 Warehouse	79	232. Tension Support Structure #5	TS-05
203. Plant 8 Warehouse	80	233. Tension Support Structure #6	TS-06
204. Plant 9 Warehouse	81		

(a) removed as part of Removal No. 13
(b) removed as part of Removal No. 19
(c) removed during O&M activities
(d) removed as part of Removal No. 28
(e) to be removed as part of Removal No. 9
(f) to be removed as part of Removal No. 12
(g) removed as part of Removal No. 15
(h) removed as part of Removal No. 7

Through the ongoing radiation protection program at the FEMP, radiological data on most components are available. As part of this program, the following types of radiological information are routinely collected:

- radiological smear and direct measurements for many individual OU3 components;
- smear and direct survey information on some abandoned in-place equipment;
- radon-222 and radon-220 monitoring; and
- airborne alpha- and beta-emitting concentrations.

Chemical Contamination

Data on chemical contamination associated with individual components of OU3 are presented in Appendix B of the OU3 PP/EA. This information is based on chemical analyses and process knowledge of all operations over a 38-year timeframe. The information presented in Table B-1 of that document is qualitative and duplicates the information developed for the OU3 RI/FS WPA. Additional data has been gathered as part of ongoing OU3 RI activities although much of it is undergoing validation. As validated data becomes available, it will be integrated with the remedial design activities to implement the OU3 interim remedial action.

Table B-1 of the OU3 PP/EA includes several classes of chemical or contaminant groups that pose potential environmental concerns in OU3. The principal chemical contaminants of concern are trace metals, other inorganics, VOCs, SVOCs, and polychlorinated biphenyls (PCBs).

In addition to the chemical contaminants discussed above, many of the components have been identified as having asbestos-containing material (ACM). Analyses of bulk samples, however, indicate wide variations in the percentage of asbestos in the samples that displayed positive ACM results. This data is presented in Table A.4.4 of the OU3 RI/FS WPA.

Hazardous Wastes

The hazardous waste management program at the FEMP has identified a total of 54 Hazardous Waste Management Units (HWMUs), with 44 in OU3 that are regulated by RCRA. Prior to the OU3 interim remedial action, closure of inactive HWMUs was achieved by submitting a Closure Plan Information and Data (CPID) package to OEPA, which oversees RCRA compliance at the FEMP, for review and approval. Section 3.6.3 discusses the CERCLA-RCRA integration strategy for specific HWMUs in the OU3 interim remedial action.

Mixed Waste

Mixed wastes are hazardous wastes that have been radiologically contaminated. On the basis of information from process knowledge and the potential chemical contamination previously discussed, some of the materials and wastes associated with OU3 components may be categorized as mixed waste. The volume of waste included in this category is currently unknown. The OU3 RI characterization is expected to identify mixed wastes within components. Until validated RI data is received, the nature of contamination, and to a lesser degree, the extent of contamination, will not be fully known. Field characterization may be used to verify or modify conclusions that have been based on data and process knowledge used during remedial design and remedial action.

2.4 Summary of the OU3 Interim Record of Decision

A summary of the selected interim remedial action from the OU3 IROD, addressing decontamination and dismantlement of structures and facilities, is presented below and is illustrated in Figure 2-1.

- Decontamination of more than 200 buildings and structures in OU3 by removing loose contamination. This activity involves in situ gross decontamination of interior and exterior surfaces of above-grade structures prior to dismantlement to reduce direct exposure potential, as well as reduce available sources for airborne or water-borne contamination migration. Methods to be employed depend on the contamination type, level of contamination found, and matrix on which it is found. Additional decontamination procedures would be implemented during dismantlement to remove previously inaccessible contamination.

- Dismantlement of the above-grade structures. Above-grade dismantlement includes the removal of asbestos, electrical equipment, piping, water lines, gas lines, tanks, heating, ventilation and air conditioning ductwork, and electrical lines. The last steps of the dismantling action would depend on the structure but would generally involve the removal of any air filtration apparatus and the removal of the roof, exterior walls, and structural members.

- Removal of foundations, storage pads, ponds, basins, underground utilities, and other at- and below-grade structures. Once an acceptable area has been cleared down to grade level, at- and below-grade remediation can begin. The at- and below-grade remediation will require coordinated efforts to coincide this activity with OU5 remedial actions involving soil excavation and possible groundwater remediation. OU3 and OU5 coordination will allow excavation of environmental media in a timely manner while minimizing the potential for infiltration of rainwater into contaminated soils.

- Use of existing facilities or construction and operation of new *interim storage facilities* in or near the former production area. Existing storage facilities will be used to the maximum extent practical for the temporary storage of materials. If existing storage space is not available, interim storage facilities will be designed and constructed in accordance with Removal No. 17 - Improved Storage of Soil and Debris, to store the material generated from the OU3 interim remedial action.

- Off-site disposal at DOE's Nevada Test Site (NTS) of some non-recoverable or non-recyclable material generated by dismantlement. To prevent constraints on the decontamination and dismantlement action due to storage space limitations for the resulting construction debris, a limited quantity of wastes would be shipped off-site for disposition. A maximum of ten percent of all remediation wastes generated by implementing the interim remedial action would

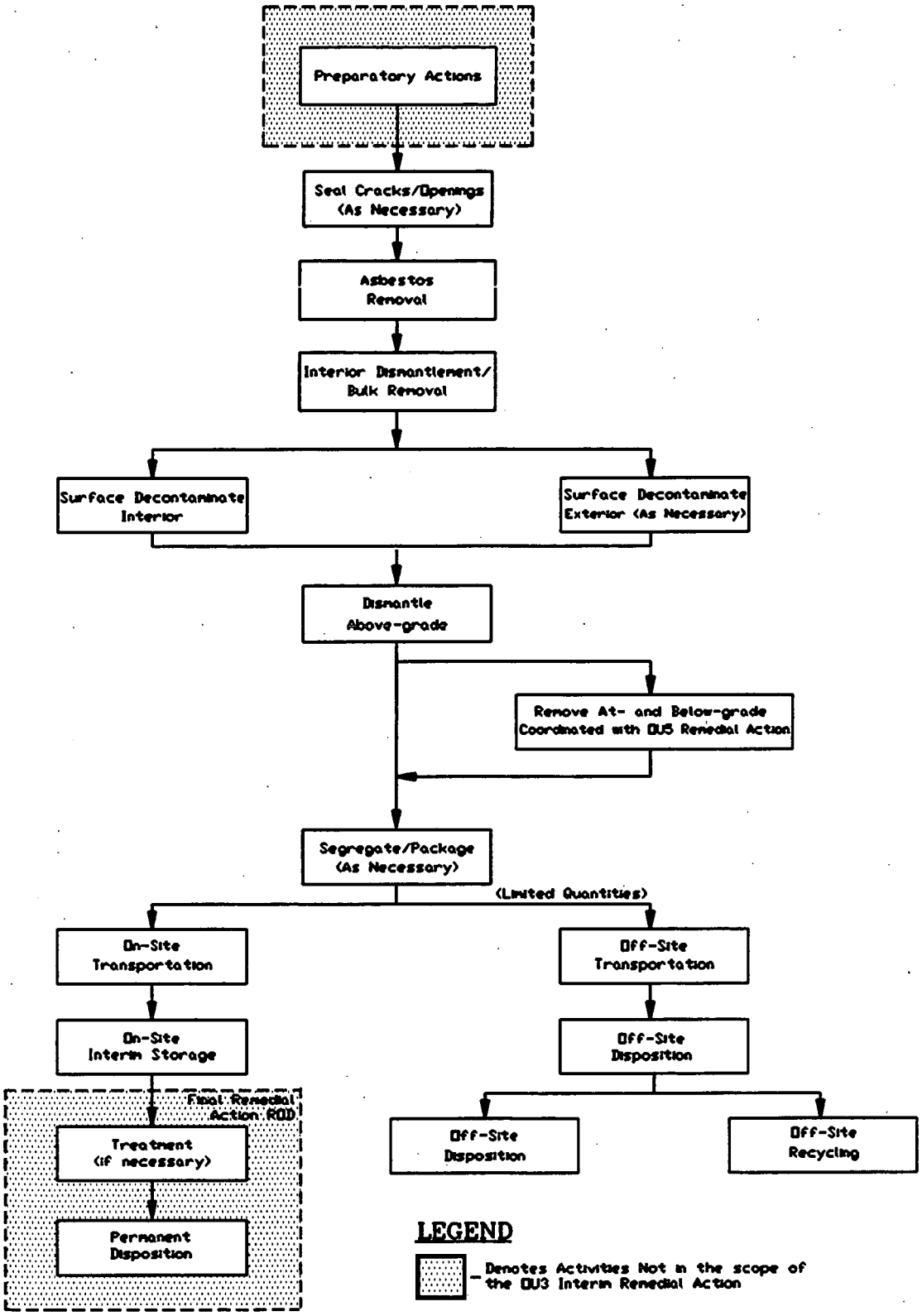

FIGURE 2-1 OU3 Interim Remedial Action Flowchart

potentially be shipped off-site for disposition and recycling during the interval period. Non-recoverable and non-recyclable materials destined for off-site disposal would be containerized using strong-tight containers and shipped off-site by truck for disposition at the NTS. The identification of the NTS does not preclude the use of other licensed disposal facilities once National Environmental Policy Act (NEPA) requirements for these facilities are met.

- Off-site recycling of some recyclable material from dismantlement. Materials transported offsite will be recycled or reused to the maximum extent practical. Opportunities for employing resource recovery, recycling, and waste minimization will be factored into the planning process for each remedial activity.

- Storage of the remaining material in interim storage facilities or existing facilities until treatment and disposition are selected in the OU3 final remedial action ROD. All materials resulting from the OU3 interim remedial action that cannot be recycled or disposed offsite will be stored on-site in interim storage facilities. The material storage and disposition strategies (to be implemented during the period prior to the implementation of the OU3 final remedial action ROD) are described in Section 3.4 of this Work Plan.

Before implementation of the OU3 interim remedial action within a facility, preparatory actions will have been completed. Removal actions - Removal of Waste Inventories (Removal No. 9) and Safe Shutdown (Removal No. 12) will have been completed for a facility prior to remediation of that facility.

To address concerns regarding a potential increase in airborne radionuclide concentrations above natural background levels, project-specific air monitoring may be conducted at potential receptor locations during OU3 cleanup activities. Mobile air samplers will be used in work areas to monitor airborne levels of radionuclides. In addition to air monitoring for OU3 project-specific work areas, air monitoring will continue to be conducted at the site perimeter in coordination with the other OUs throughout site clean-up activities. During project-specific monitoring, if airborne concentrations are detected at levels significantly above background at nearby receptor locations, control measures will be re-evaluated and new measures implemented to reduce contaminant emissions. For example, to ensure that on-site workers and nearby members of the general public would not be adversely impacted, *engineering controls* could be increased for affected exposed areas, or work could be stopped until engineering controls become effective.

In addition to air monitoring, groundwater and surface water monitoring will occur during decontamination, dismantlement, and interim storage activities. Administrative and engineering controls will be utilized throughout the OU3 interim remedial action to minimize releases and to maintain a safe work environment. Further discussion of each type of environmental monitoring is provided in Section 3.7 and the SAP included in Volume 2 of this Work Plan.

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Section 3

3.0 STRATEGY FOR IMPLEMENTING THE OU3 INTERIM REMEDIAL ACTION

Section 3 discusses the primary programmatic and engineering strategies that have been considered, evaluated, and integrated into implementation of the OU3 interim remedial action. Each of the strategies discussed herein will be applied to each decontamination and dismantlement project during the OU3 interim remedial action to reflect changes in site strategies.

The strategy for implementing the OU3 interim remedial action encompasses the following elements described in this section:

- project delivery strategy - describes the overall strategy for project planning and implementation;
- management of components into prioritized groups - describes the strategy for grouping components for individual projects and the approach towards scheduling those projects;
- remediation tasks - describes the overall approach to performing decontamination and dismantlement activities;
- materials management - describes the strategy for managing materials that result from decontamination and dismantlement;
- coordination of the interim remedial action with other site activities - describes the consideration and integration of other FEMP programs and activities with the OU3 interim remedial action;
- compliance with ARARs - describes the plan for satisfying permitting requirements as required by the ACA; and
- environmental monitoring - describes the plan for addressing requirements for monitoring groundwater, surface water, and air emissions.

3.1 Project Delivery Strategy

This subsection discusses the overall strategy for completion of the OU3 decontamination and dismantlement program, from planning through implementation. Key elements of the program are discussed in this section.

3.1.1 Scope of the Interim Remedial Action

The OU3 interim remedial action decontamination and dismantlement program scope includes all planning, design, and construction activities required to implement the following remedial tasks as necessary: HWMU closure; asbestos removal; surface decontamination; dismantlement of above-grade and removal of at- and below grade portions of components; material storage; and limited disposition. There are two additional remedial tasks which are

not part of the scope of the OU3 interim remedial action, but are preparatory actions which must be performed before the other remedial tasks can be initiated. These preparatory actions are inventory removal under Removal No. 9 and Safe Shutdown under Removal No. 12, both of which will be carried out through other existing FEMP programs.

3.1.2 Decontamination and Dismantlement Program Planning

The design documents preparation process will be carried out according to the requirements of the ACA and CERCLA RD/RA guidance, with some modifications due to the size and complexity of the OU3 decontamination and dismantlement program. The RD/RA documentation is also intended to satisfy the technical and functional requirements of DOE Order 4700.1 - Project Management System (DOE 1992a) (i.e., Conceptual Design Report, Design Criteria, Title I and II Design).

The planning activities will be carried out in two stages addressing both remedial design and remedial action activities to reduce cost and expedite the schedules. The results of the first stage of planning is provided for in this document which includes the development of the general program strategy (Section 3.1), methodology for sequencing and scheduling (Section 3.2), engineering design approach (Section 3.3), tasks descriptions (Section 4), and reporting required for successful completion of a decontamination and dismantlement project (Section 6). The second stage of the planning effort will produce a sequence and schedule for OU3 decontamination and dismantlement projects, as well as a detailed plan for management of material resulting from the projects.

The OU3 interim remedial action will be accomplished through a series of decontamination and dismantlement projects subcontracted by DOE's environmental management contractor to qualified design and construction firms with required technical expertise and resources. To effectively plan and execute the decontamination and dismantlement of the over 200 components comprising OU3, the operable unit will be subdivided into projects of manageable scope. Each project will address the decontamination and dismantlement of components which have been grouped based on several criteria discussed in Section 3.2.1. Sequencing and scheduling will be addressed at the project level as discussed in Sections 3.2.2 and 3.2.3. The product of this second stage planning effort will be the order of decontamination and dismantlement project progression across OU3. It is anticipated that one to three decontamination and dismantlement projects will be initiated each year of the OU3 interim remedial action program, depending on funding availability and estimated project costs.

The schedule for the OU3 decontamination and dismantlement program as discussed in Section 3.2.3 is intended to be flexible, allowing for changes due to funding constraints, unanticipated events, or new program information.

3.1.3 Design Document Preparation

In the preliminary stage of each decontamination and dismantlement project design, a contracting strategy will be developed that considers number and scope of contracts, contract types, contracting procedures, and design approach. The number and scope of contracts will be dependent on the complexity of each project and funding availability. The preferred method for the majority of subcontracts supporting the interim remedial action will be firm-fixed-price construction contracting procured through competitive bidding. This method

requires a well-defined scope of work, adequate competition, and realistic estimates of proposed costs and uncertainties. If circumstances such as unusual complexity limit the number of qualified contractors and solicitation of sealed bids is not appropriate, then competitive bids may be requested.

Decontamination and dismantlement project *design packages* will be prepared with the assistance of the remedial design subcontractor. A design package will be prepared for each group of components and will consist of engineering design drawings, photographs and videos, specifications, cost estimate, and schedule. The design will be of sufficient detail for inclusion into a *bid package* suitable for distribution to qualified remediation contractors for bid preparation. Decontamination and dismantlement project specifications will likely be performance-based, unless project-specific situations dictate descriptive specifications.

Performance specifications differ from descriptive or detailed specifications in that the remediation work methods are not specified. The performance specifications state what is to be done, what regulations, codes, and standards apply, and identify any limitation on activities while leaving details of how to accomplish the task to the *remediation subcontractor*. This approach allows the remediation subcontractor to use past experience and existing equipment in the development of a competitive bid. By allowing maximum remediation subcontractor flexibility in the decontamination and dismantlement methods to be used, costs will be minimized. The remediation subcontractor will be required to submit remediation subcontractor's work plans for review and approval which will include all appropriate task-specific work plans. These work plans will contain the specific methods to be used to meet the requirements of the performance specifications.

A single report that summarizes the design and proposed remediation activities for each decontamination and dismantlement project, referred to as an implementation plan, will be prepared by DOE for submittal to the regulatory agencies. This document will replace the need to submit design documents (e.g., preliminary, intermediate, and final designs) and will represent the design parameters provided to the potential remediation subcontractors.

3.1.4 Bid Package Preparation/Remediation Subcontractor Procurement

The remedial action phase for each decontamination and dismantlement project may be bid as one contract or as multiple contracts, depending on the complexity and type of work necessary to complete the project. For example, during design it may be determined that it would be more cost effective to perform the project in phases, addressing only some of the components contained in a design package, or it may be more cost effective to bid specific types of work, such as asbestos abatement, under a separate contract.

To convey the requirements for bidding, the technical scope and the administrative requirements of each contract to potential remediation subcontractors, a bid package will be assembled from the design drawings and specifications, and with additional subcontracting documentation as described in Section 4.6 of this Work Plan.

Invitations for Bid (IFB) will be used to execute the decontamination and dismantlement contracts when the requirements are well defined. Discussions will be held with the low bidder prior to award to ensure the work scope, list of deliverables, schedule, work phasing, and all other requirements of the subcontract are truly understood. If appropriate, bidders will

be pre-qualified to determine their resources and capabilities prior to being allowed to compete in the bid process.

For certain work elements of the decontamination and dismantlement program, it is more effective to use the services of the FEMP construction support contractor rather than acquire the services through competitive bid contracting. The construction support contractor provides trained labor on an hourly basis to perform assigned tasks. Some of the circumstances that favor use of the support contract include, but are not limited to: the work cannot be sufficiently defined for fixed-price contracting; the work is experimental or exploratory; the element of work is small and training fixed-price personnel is not cost effective; work is urgent or an emergency and cannot be supported by the competitive bid process; and a decontamination and dismantlement project can be expedited by front end work while the contract is being bid.

3.1.5 Remediation Activities

Remediation subcontractor work will be managed by DOE's environmental management contractor. Support activities such as health and safety compliance, environmental monitoring activities, and material management will be performed by DOE's environmental management contractor.

Prior to initiating decontamination and dismantlement project field activities, inventory removal and safe shutdown activities should be complete within the project boundaries. However, limited safe shutdown work should not restrict the decontamination and dismantlement remediation subcontractor's activities.

Prime consideration required for the selection of specific dismantling techniques by the remediation subcontractor will be worker safety, and protection of public health and the environment. Potential dismantling techniques include floor-by-floor dismantling, cutting techniques for low structures, dynamic demolition of high structural steel assemblies that include pullover or tripping, and controlled detonation. Building construction and physical layout will be major selection factors.

Depending on the alternatives developed for disposal, material generated by dismantlement activities will be monitored for radiological contamination and appropriately size-reduced, packaged, if required and temporarily stored for recycling or disposal. The management of material (i.e., tracking, inspection, storage, and disposal) will be performed under existing FEMP programs as documented in Section 3.4.

An individual remedial action report will document the completion of each project (i.e., remediation included within the scope of a design package), as described in Section 4.6.5.

3.2 Management of Components in Prioritized Groups

This section presents the approach that will be used to develop a base schedule for the OU3 interim remedial action. The base schedule will be utilized as an effective and flexible tool to manage the in situ gross decontamination and dismantlement of all OU3 components and to provide the methodology for developing a five-year schedule for the interim remedial action that reflects a current understanding of future funding.

As stated in Section 1.1, the overall goal of the interim remedial action is to safely decontaminate and dismantle all OU3 components in a timely, efficient, and cost-effective manner that ensures compliance with all ARARs and contributes to the performance of the OU3 final remedial action. In keeping with this goal, the following approach is proposed for use in the development of logical remediation schedules.

3.2.1 Assembling Components into Complexes for Remediation

Using the concept of economies of scale, the expenses for a decontamination and dismantlement project can be reduced significantly by addressing multiple components in a single project instead of remediating components as individual projects. The cost and time involved in the development, review, and submittal of contracts, work plans, health and safety plans, etc. are relatively independent of structure size or the number of structures within a project. Other expenditures, such as subcontractor training, establishing control zones, mobilization and demobilization of construction equipment and crews, and air monitoring are also relatively independent of the size or number of components within a project. Therefore, the above-grade portion of individual components will be combined into groups of components called *complexes*, to reduce remediation costs.

Due to their size, the nine major processing facilities: Boiler Plant/Water Plant, Pilot Plant, Plant 1, Plant 2/3, Plant 4, Plant 5, Plant 6, Plant 8, Plant 9, (and the smaller, peripheral structures immediately surrounding those processing facilities) will be classified as distinct complexes. The remaining components will be assembled into additional complexes based on many considerations, such as relative location of components, historic and future facility use, type and level of contaminants, and availability of the components to be remediated. Also, components that are structurally connected and cannot be dismantled independently will be identified and logically grouped into a complex during scheduling activities. At- and below-grade portions of individual components will be remediated in conjunction with OU5 soil remediation activities.

3.2.2 Prioritizing the Complexes for Remediation

For the purposes of this document, the sequence is the logical order that complexes should be remediated. The sequence, in theory, represents the ideal case for the remediation of OU3. However, scheduling, funding, and logistical constraints may make this sequence unachievable. Therefore, the sequence serves as the driver for developing the base schedule (as discussed in Section 3.2.3) and will serve as a prioritizing tool if more than one complex becomes available for remediation at a given time.

Since OU5 will be responsible for at- and below-grade soil remediation, including related surface and groundwater monitoring, the development of the sequence in which above-grade structures will be dismantled focuses on the need to clear an upgradient area to support OU5 soil remediation and for a potential on-property *disposal cell*. Surface and groundwater generally flow from the north to the south, with some gradual east-to-west migration as well. Therefore, in order to avoid contamination of remediated soils, at- and below-grade dismantlement will have more near-term priority in the northeast corner of the former production area. To support this, OU3 above-grade structures will be dismantled, to the extent possible, to integrate with the OU5 contaminated soil excavation schedule. Also, the dismantlement of structures with basements will be integrated with OU5 to prevent these

basements from becoming large collection basins of contaminated storm water run-off or a safety hazard for remediation workers.

In the event that the selected remedies for OU2, OU3, and OU5 involve an on-property disposal cell, construction of the cell would most likely occur in phases to accommodate the varying schedules of soil remediation and the dismantlement of structures in the former production area. In general, at- and below-grade remediation activities will progress from the northeast corner of the former production area and proceed sequentially to the southwest corner of the former production area, finishing near the planned location of the Advanced Wastewater Treatment Facility (AWWT) and soils and debris treatment systems. This sequence will permit the existing storm sewer system, which flows from northeast to south, to be utilized during remediation activities to prevent run-off of contaminated surface waters as construction of the cell modules progresses. Run-off from the disposal cell area will likely be directed to the Storm Water Retention Basin (SWRB) to provide overall containment until final closure of the cell.

The unoccupied area to the northeast of the former production area will most likely be the site of the initial cell module for the on-property disposal cell. Once the construction of the cell liner is completed in this area, the cell module can begin receiving soils and debris from existing interim storage facilities and/or directly from the OU3 interim remedial action dismantlement projects, stockpiles, off-site areas, and rubble and soil from the future expansion of the cell. As additional adjacent areas of the former production area are made available, they would be developed into new cell modules for advancement of the decontamination and dismantlement activities. This series of activities would be repeated until the entire on-property disposal cell is complete.

The results of implementing this sequencing methodology for above-grade components will be contained in the OU3 Remedial Design Prioritization and Sequencing Report, as discussed in Section 6.3. The report will also contain an integrated OU3/OU5 schedule for at- and below-grade remediation within the former production area, based on the outcome of planning related to the preferred alternative for OU5. The report will be delivered six months after submittal of the initial draft OU3 RD/RA Work Plan in order to: allow DOE time to incorporate any changes, as necessary, that result from the OU5 FS; provide the public and regulators the opportunity to review and comment on the prioritization and sequencing methodology early in the process; and allow DOE adequate time to determine suggested enforceable milestones for implementing the sequencing and scheduling methodology.

3.2.3 Developing Base Schedules for the Interim Remedial Action

The OU3 PP/EA stated that the OU3 interim remedial action will span sixteen years if annual funding does not become a constraint. Although it is not realistic to expect unlimited funding, the development of a component remediation schedule is important to establish a base plan for the OU3 interim remedial action. The application of funding constraints could potentially change this base schedule, as well as the length of time in which overall remediation would occur. This subsection describes the proposed approach to be used in both developing and revising an initial long-term base schedule that represents the overall schedule of remedial activities for the entire OU3 interim remedial action.

The OU3 PP/EA identified the probable duration and period for the interim remedial action as sixteen years, beginning in fiscal year (FY) 1996 and ending in early FY-12. This anticipated schedule was based on a rough estimate of schedule durations. However, because of an accelerated signing of the IROD, coupled with beginning design to remediate the first complex before the finalization of the OU3 RD/RA Work Plan, field activities for the interim remedial action are now anticipated to begin in FY-95 and be completed by the end of FY-10, using assumptions similar to those presented in the OU3 PP/EA.

An initial base schedule will be developed to plan remedial activities over the entire period of the OU3 interim remedial action. The approach to developing the sequence, as discussed in Section 3.2.2, is to prioritize the decontamination and dismantlement of complexes in a timely fashion to support OU5 soil remediation needs. However, this sequence can be limited by scheduling, funding, and logistical constraints, resulting in potential changes to the order in which complexes are remediated.

The following assumptions will be used during the initial development and any subsequent revision of the base schedule:

- component scheduling constraints determine the earliest time that each component would be available for decontamination and dismantlement;
- costs to decontaminate and dismantle a complex are assumed to be spread evenly over the duration of activities for each complex;
- since design and procurement activities are generally not subject to any scheduling restrictions, they may begin at any time prior to remedial activities and will not necessarily occur immediately prior to the remedial action activities in the schedule;
- dismantlement, rather than waste containerization and shipping, is assumed to be the critical path for OU3 activities;
- all containerized wastes (i.e., drums) are assumed to be removed from, and all safe shutdown activities are assumed to be completed within a component before decontamination and dismantlement actions begin within that component; and
- OU3 RI/FS activities will remain on schedule in accordance with the ACA, delivering a draft OU3 final remedial action ROD for treatment and disposition by July 1996. (Note: This assumption will be changed to reflect agreements regarding accelerating the OU3 final remedial action ROD. These agreements affect implementing the interim remedial action, the deletion of the OU3 Baseline Risk Assessment, the combination of the OU3 RI and FS reports and the revision of their submittal dates, and specific other items).

The proposed approach to developing a base schedule for the remediation of above-grade structures is explained below. This approach is an iterative process to ensure that all factors are considered and to allow the adaptation of the base schedule to changing site strategies and plans.

- The first step in developing the base schedule once the sequence has been determined is to establish the earliest possible starting date that the complex will be available for remediation. This date is based on scheduling constraints for the components within a complex. There are many component-specific scheduling constraints that must be factored into the schedule because many components are necessary to either support remediation activities or required site activities (i.e., AWWT, RCRA warehouses, ongoing maintenance, etc.) and cannot be scheduled for removal until these activities are relocated, replaced, or no longer necessary. Although the objective is to decontaminate and dismantle the complexes in the northeast quadrant first, many of these complexes may not become available until interim remedial activities are well underway. If the highest priority complex is not immediately available, remediation of that complex will be deferred until it becomes available. The availability of the second highest priority complex would then be assessed, and so on.

- The second step is to factor in the impacts of several logistical constraints. Reasonable limitations on the number of workers in a given area, traffic patterns, and waste handling routing must be established to prevent overcrowding and to minimize potential health and safety hazards during remedial activities while pursuing the overall goal of a timely, efficient, and cost-effective remediation. Therefore, it is currently anticipated that no more than four projects would occur at the same time. Also, careful consideration will be given to avoid two construction crews working on adjacent complexes at the same time.

- To the extent possible, the total project cost for the interim remedial action will be evenly distributed over the projected duration of the action to avoid large fluctuations in the work force and other resources. It is anticipated that this will be done by distributing larger and more costly complexes, such as the major production facilities, over the duration of the OU3 interim remedial action. Smaller, less costly complexes will be used to "even out" the activity level and the total cost of remedial activities each year.

- The final step is to ensure that the changes to the sequence will not heavily impact the network of required site utilities. Site utilities include electricity, plant air (used for air-supplied respirators), instrument air, natural gas, propane gas, fire water, sanitary water, process water, steam, sanitary sewers, storm water, cooling water, roadways, and telephones. If the utilities are not required for the

safe, efficient, and cost-effective removal of a complex, the utility lines will be capped or terminated near the boundaries of each complex (for above-grade activities) or remediation area (for at- and below-grade activities) before dismantlement begins. Utility connections to the occupied areas of the FEMP will be maintained by temporary connections, as needed.

The results of implementing this approach in developing a base schedule for the remediation of above-grade structures will be provided in the OU3 Remedial Design Sequencing and Prioritization Report. Also, as discussed in Section 3.2.2, the report will contain an integrated OU3/OU5 schedule for at- and below-grade remediation within the former production area, based on ongoing planning related to the preferred alternative for OU5.

3.2.4 Developing Five-Year Schedules for the Interim Remedial Action

The five-year, near-term remediation schedule for OU3 results from applying funding constraints to the base schedule. To support the development of a five-year schedule, funding estimates for interim remedial action costs associated with FY-95 will be assumed from the budget estimates that were produced to support the FY-95 Work Plan; interim remedial action budget estimates for FY-96 through FY-2000 will be taken from the FY-96 Five Year Plan. Although anticipated funding is projected over a five-year span, actual funding occurs on a year-to-year basis and cannot be guaranteed. For example, it appears that FY-95 funding for the FEMP will be reduced by more than 30 percent of the anticipated funding level stated in the FY-95 Work Plan.

Funding and scheduling constraints can be overcome by dividing the complexes into multiple phases. Within each complex, the components that have scheduling constraints can be included in a subsequent phase so that the remediation of the unconstrained components is not delayed.

DOE anticipates that the five-year schedule and, if necessary, the initial base schedule will be adjusted periodically to incorporate lessons learned and to reflect revised constraints, improved operation and project management, revisions to cost estimates, and, most importantly, changing funding levels. Also, as incremental levels of funds become available, smaller remediation projects will be added to the schedule. These revised schedules will be submitted annually for review and approval to the regulatory agencies, as discussed in Section 6.1.

One of the assumptions and considerations discussed in Section 3.2.3 is that the remediation of complexes will be scheduled, as funding allows, to utilize as many as four construction crews to remediate separate areas of the site at one time. To support this, after the larger construction activities have been scheduled, several smaller projects may be considered to fill in any gaps between large projects that have been caused by scheduling constraints. For this reason, and to be able to quickly capitalize on the availability of unplanned funding, the remediation of a number of complexes may be designed significantly in advance of their scheduled remedial action start dates.

3.2.5 Prioritizing Components Within a Complex

Once complexes are formed, emphasis will be placed on scheduling the remediation of components within that complex to allow for safe and efficient maneuvering of heavy machinery and to establish suitable *lay-down areas*. These considerations may cause heavy impacts to remediation activities during the first years of dismantlement but should have smaller effects as the density of structures decrease over the duration of the action. Clearing land for suitable lay-down areas can be accomplished by removing any small structures on the perimeter of the complex. This also increases the maneuvering room for heavy machinery utilized during the dismantlement of larger structures.

In most cases, the sequence, or order, for the decontamination and dismantlement of components within a complex will be specified by DOE in the bid package. However, in some cases when flexibility may be allowed, the remediation subcontractor may be permitted to propose an alternate sequence, subject to approval. Such an alternate sequence could be permitted when maximizing the use of space, time, resources, and utilization of the remediation subcontractor's knowledge and ingenuity is recognized during the bid process. Any restrictions on sequencing imposed by storage requirements, technical feasibility, or other constraints will be included in that particular bid package.

3.2.6 Selection of the First Complex for Remediation

In the spirit of accelerating the remediation of OU3, design of decontamination and dismantlement activities for the first complex has been initiated. Until the sequencing and scheduling methodologies can be fully developed and agreed upon and the OU3 interim remedial action schedules developed, submitted, and approved, the selection of the first complex was based primarily on the current availability to remediate one of the nine major processing plants rather than the proposed methodology for sequencing.

Although most of the processing plants are no longer being used for their original intended purpose, these buildings can be useful to support the future goals of the site until their scheduled remediation. For example, the Metals Fabrication Plant (6A) is currently being used as a short-term storage facility and the Ore Refinery Plant (2A) is currently planned to be used to neutralize uranyl nitrate.

Three of the major processing plants no longer have a useful purpose: the Preparation Plant (1A); the Green Salt Plant (4A); and the three structurally connected process buildings that comprise the "Pilot Plant." Of these three currently available processing plants, the Green Salt Plant, or Plant 4, was selected as the logical starting point for OU3 remediation because it does not have a current or future value as a usable structure and it has exceeded its intended design life. Also, with the dismantlement of Plant 7 (7A), the Plant 7 Overhead Crane (7B), and the Plant 4 Maintenance Building (4C) under Removal No. 19, there is a large area that can be used for lay-down and *staging* activities. Further, the dismantlement of the Green Salt Plant will leave an open area, almost the size of a complete city block, in the center of the former production area for future use either as a location for storage of heavy construction equipment or unused shipping containers, a central staging area, etc.

Additional information on the specifics of implementing the remedial design and remedial action activities on this complex, including estimated project durations and costs, can be

found in the draft Building 4A Implementation Plan, submitted concurrently with this Work Plan.

3.3 Remedial Tasks

Aside from the management of material generated from remediation (described in Section 3.4), the actions which support the OU3 interim remedial action will be implemented through a series of seven remedial tasks and performed under existing FEMP programs or through subcontractors. The first two tasks are "preparatory" actions based on their performance under existing removal actions that are not specifically included within the scope of the OU3 interim remedial action. These seven tasks are described in the following subsections (3.3.1 through 3.3.7) and illustrated in Figure 3-1. Activities under these tasks will be implemented as required for each component, and may not necessarily be implemented in sequential order (e.g., activities associated with more than one task could occur at the same time). Rather, the remedial tasks are described by similar types of activities that will take place prior to and during remedial action. Task I includes preparatory actions performed under Removal No. 9 - Removal of Waste Inventories. Task II includes preparatory actions performed under Removal No. 12 - Safe Shutdown. Task III includes HWMU closure activities. Task IV includes asbestos removal. Task V includes surface decontamination efforts. Task VI includes dismantlement and removal of above-grade components or portions thereof. Task VII includes the removal of all at- and below-grade components, including all portions remaining after Task VI.

O&M activities to support decontamination and dismantlement operations are discussed in the O&M Plan (included in Volume 2 of this Work Plan). Activities addressed by the O&M Plan include various activities that will be performed by FEMP personnel in support of the primary remedial tasks. This plan does not provide a detailed discussion of actual O&M activities that will be performed, rather it identifies site procedures that apply to the various remedial tasks described in this section.

Contaminant control measures that will be implemented during remedial action include both engineering and *administrative controls*. Such controls will be specified for each decontamination and dismantlement project in the respective performance specifications and summarized in the implementation plans. Typical engineering controls likely to be employed include physical barriers, containments, air locks, wetting agents, decontamination water collection systems, fixatives, filtration, treatment equipment, sealants, wetting agents, proper cutting/breaking equipment, and other items that will increase safety and decrease the potential for airborne dust. These controls are discussed throughout the performance specifications. For example, Section 01517 of the performance specifications discusses controls relative to the decontamination of structures, including decontamination, water collection, fixing contamination onto material surfaces, etc.; Section 15067 discusses containment and ventilation requirements; and fugitive emission controls are discussed throughout the various specifications in Appendix C. Typical administrative controls likely to be employed include establishing control zones, contamination reduction zones, support zones, construction areas, access/egress corridors, personnel monitoring, air monitoring, and other items designed to increase safety and reduce the potential for the spread of contamination.

Task I	**Preparatory Action: Inventory Removal** Activities prior to the remediation of components, performed under existing FEMP programs (i.e., Removal No. 9) • Removal of existing waste inventories from components • Removal of miscellaneous stored materials
Task II	**Preparatory Action: Safe Shutdown** Activities prior to remediation of components that will primarily be performed by FEMP personnel prior to the remediation of components, under Removal No. 12, to prepare components for decontamination and dismantlement. • Isolate and de-energize utilities • Remove hold-up material • Gross cleaning of component surfaces
Task III*	**HWMU Closure (optional)** Performance of RCRA-required closure activities for HWMUs to be closed under CERCLA (as described in Section 3.6). • Initial (above-grade) HWMU clean closure efforts or activities
Task IV*	**Asbestos Removal** Removal of friable asbestos and related surface decontamination activities as specified under Removal No. 26 procedures, performed either by FEMP personnel as a preparatory action or by the remediation subcontractor pursuant to the remediation statement of work. • Abatement of friable ACM, such as thermal system insulation (TSI) on pipes and equipment using enclosure systems/glove bags • In situ surface cleaning as necessary (dry and hydro-cleaning) • Aggressive air sampling to release enclosure(s)
Task V*	**Surface Decontamination** In situ surface decontamination to remove loose, unfixed radiological and chemical contaminants (release cleaning). • High-efficiency particle air filter (HEPA) vacuuming of surfaces • Hydro-cleaning • Scabbling (as needed, for HWMU closures) • Lock-down of remaining contaminants
Task VI*	**Above-Grade Dismantlement** Material and structural dismantlement and removal of materials. • Establishment of additional control measures • Removal of ductwork, piping, conduit, and remaining equipment • Removal of interior and exterior siding • Removal of structural steel and above-grade concrete • Seal or cover at- and below-grade components
Task VII	**At- and Below-Grade Dismantlement** Final remediation to components to coincide with OU5 soil remediation schedule. • Removal of slabs, foundations, at- and below-grade utilities, below-grade storage tanks, roads, and railroads • Size reduction and segregation • Excavation of remaining soil and potential placement of backfill and re-seeding the area

* Grouping of activities within and between tasks is not necessarily reflective of their overall sequence of performance during a project.

FIGURE 3-1 Remedial Tasks Prior to/During Remedial Action

Interim remedial action activities may result in long-term and direct impacts from the permanent filling of wetlands on the east and west sides of OU3. Continuous equipment traffic and stockpiling of material will alter the topography, resulting in sediment deposition into wetland areas. Additionally, removal of roads, utilities, trenches, and piping may impact wetlands through excavation and soil stockpiling activities, resulting in possible sediment deposition into wetland areas. Impacts to wetland areas, however, would be positive due to the removal of contaminant sources. In accordance with Federal requirements for the protection of wetlands (i.e., Executive Order 11990, 10 CFR (Code of Federal Regulations) 1022, and 40 CFR 6), best management practices will be utilized to minimize the amount of wetland area impacted. Mitigation for wetland impacts would be determined using the 404 (b)(1) guidelines of the Clean Water Act (CWA) in consultation with the U.S. Army Corps of Engineers (ACOE), USEPA, and OEPA.

The tasks described in the following subsections represent typical activities for most components. Table 3-1 summarizes differences in the application of these activities for various types of components. Components are classified into five groups, including buildings, bulk material, storage pads/parking lots/railroads, piping/utilities/equipment, and ponds and basins. Buildings have been classified into five types according to their materials of construction.

3.3.1 Preparatory Action: Inventory Removal (Task I)

Task I activities will occur before surface decontamination and dismantlement activities begin. These activities include removal of waste inventories and stored materials. These activities will be conducted in accordance with Removal No. 9 - Removal of Waste Inventories. Under Removal No. 9, existing material inventories will either be relocated to other buildings if marketable or, if the inventories are valueless, they will be disposed of as waste in accordance with Removal No. 9. Task I activities are applicable to the buildings and storage pads/parking lots/railroads component categories.

3.3.2 Preparatory Action: Safe Shutdown (Task II)

Task II activities include removing *hold-up material*, general cleaning of accessible interior surfaces, disconnection of utilities, and removing salvageable equipment or moving equipment in order to access and remove salvageable equipment. Task II activities are applicable to all component categories except for bulk materials. These activities will be conducted in accordance with Removal No. 12 - Safe Shutdown.

Removal No. 12 includes the isolation and permanent shutdown of all electrical, mechanical, and civil utilities. Electrical power feeds to each building will be permanently disconnected. Mechanical and civil utilities, such as steam lines, process lines, water lines, and sewer lines, will be disconnected and drained.

Salvageable equipment and auxiliary ductwork and piping that contain hold-up materials will be decontaminated, as necessary, and removed from the building. Equipment that is not salvageable but is moved in order to access and remove salvageable equipment will remain in the building at this stage. Salvageable equipment will be segregated as it is removed

TABLE 3-1 Remedial Tasks for OU3 Components

Component Groups	Preparatory Action: Inventory Removal Task I	Preparatory Action: Safe Shutdown Task II	HWMU Closure Task III	Asbestos Removal Task IV	Surface Decontamination Task V	Dismantlement Above-Grade Task VI	Dismantlement At-,Below-Grade Task VII
1. Buildings TYPE A Structural steel with *transite* siding and roofing	Removal of existing inventories from components; removal of miscellaneous stored material.	Isolation of electrical/ mechanical/civil utilities; general clearing/ cleaning of exterior work areas around building; inspection of equipment and process lines for hold-up material; and removal of hold-up material from equipment, process lines, and ductwork; and potential removal of equipment.	HWMU decontamination and clean closure efforts.	Establishment of control measures associated with interior friable ACM removal; removal of interior friable ACM from components; and surface decontamination activities within asbestos abatement areas.	Establishment of control measures associated with surface decontamination; surface decontamination (biological, radiological, and chemical); and coordination with OU5 regarding handling of waters generated from the surface decontamination process.	Establishment of additional control measures (construction zone, lay-down/staging, and turnover zone boundaries); removal of any remaining interior ductwork, piping, conduit, and equipment; removal of interior siding/roofing (transite or otherwise) and any wall/roof insulation, walls from the components within the bid package; removal of exterior ducts, vents, and piping; removal of exterior siding/roofing (transite or otherwise and walls); dismantling of the structural members (steel, concrete, masonry, etc); and size reduction, segregation, and containerization of material/waste.	Establishment of additional control measures (construction zone, lay-down/staging, and turnover zone boundaries); preparation, stabilization, and removal of slabs, foundations, below-grade utilities, below-grade storage tanks, road, and railroads; removal of below-grade asbestos covered utilities (if applicable); size reduction, segregation, and containerization of material/waste; coordination with OU5 regarding excavation of remaining soil, potential placement of backfill, and re-seeding the area.
TYPE B Concrete Block with Built-up Roofing	Activities are the same as Type A Buildings.	Activities are the same as Type A Buildings.	Activities are the same as Type A Buildings.	Activities are the same as Type A Buildings.	Activities are the same as Type A Buildings.	Activities are the same as Type A Buildings, except no removal of interior or exterior siding (transite or otherwise).	Activities are the same as Type A Buildings.
TYPE C Pre-engineered with metal siding and roofing	Activities are the same as Type A Buildings.	Activities are the same as Type A Buildings.	Activities are the same as Type A Buildings.	Activities are the same as Type A Buildings.	Activities are the same as Type A Buildings.	Activities are the same as Type B Buildings.	Activities are the same as Type A Buildings.
TYPE D Wood frame with metal siding and roofing	Activities are the same as Type A Buildings.	Activities are the same as Type A Buildings.	Activities are the same as Type A Buildings.	Activities are the same as Type A Buildings.	Activities are the same as Type A Buildings.	Activities are the same as Type B Buildings.	Activities are the same as Type A Buildings.

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TABLE 3-1 Remedial Tasks for OU3 Components (Cont'd)

Component Groups	Preparatory Action: Inventory Removal Task I	Preparatory Action: Safe Shutdown Task II	HWMU Closure Task III	Asbestos Removal Task IV	Surface Decontamination Task V	Dismantlement Above-Grade Task VI	Dismantlement At-,Below-Grade Task VII
1. Building (cont'd)							
TYPE E Tension Support Structures	Activities are the same as Type A Buildings.	Isolation of electrical/ mechanical/civil utilities and general clearing/cleaning of exterior work areas around building.	Activities are the same as Type A Buildings, if determined to be a HWMU.	N/A	N/A	Establishment of additional control measures (construction zone, lay-down/staging, and turnover zone boundaries); removal of PVC fabric/siding; dismantlement of framework and concrete anchors, and size reduction, segregation, containerization of material/waste.	Activities are the same as Type A Buildings.
2. Bulk Material	N/A	N/A	N/A	N/A	N/A	Establishment of additional control measures (construction zone, lay-down/staging, and turnover zone boundaries) and size reduction, segregation, containerization of material/waste.	Coordination with OU5 regarding excavation of remaining soil, potential placement of backfill, and re-seeding the area.
3. Storage Pads/ Parking Lots/ Railroads	Removal of existing inventories from components; removal of miscellaneous stored material.	Isolation of electrical/ mechanical/civil utilities and potential removal of equipment.	Activities are the same as Type A Buildings, if determined to be a HWMU.	Activities are the same as Type A Buildings.	Activities are the same as Type A Buildings.	In addition to activities listed for Bulk Material, removal of lighting, fencing, rails, and guard posts, and/or other above-grade elements.	Activities are the same as Type A Buildings.
4. Piping/ Utilities/ Equipment (Above- and below-grade)	N/A	Activities are the same as Type A Buildings.	N/A	Activities are the same as Type A Buildings.	Activities are the same as Type A Buildings.	Activities are the same as Storage Pads/Parking Lots/Railroads (for above-grade elements).	Activities are the same as Type A Buildings. (for below-grade elements.
5. Ponds and Basins	N/A	Isolation of electrical/ mechanical/civil utilities.	Activities are the same as Type A Buildings.	N/A	N/A	Establishment of additional control measures (construction zone, lay-down/staging, and turnover zone boundaries).	Removal of solids/liquids in component coordination with OU5 regarding excavation of backfill and reseeding the area.

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according to material and contamination type and disposed in accordance with Section 3.4 of this Work Plan. The decontamination efforts associated with safe shutdown will consist of dry removal of dust, debris, and rubble from the component.

3.3.3 HWMU Closure (Task III)

Task III activities will be implemented for OU3 components that contain HWMUs to be closed under the integrated RCRA/CERCLA process (Section 3.6.3). Task III activities are applicable to all component categories except for bulk material and piping/utilities/equipment. Activities in Task III include initial remediation efforts and closure of HWMUs. Any hazardous wastes stored in the HWMU will have been removed during Task I. Any hold-up material would have been removed during Task II.

The remediation efforts for this task will consist of decontaminating or scabbling the surfaces of HWMUs in a structure to non-hazardous levels to the extent practicable. By completing remediation of all HWMUs within a structure, remaining remedial activities may proceed at a steady rate without imposing the additional restrictions on dismantlement activities that could be involved with HWMU closure activities (e.g., handing larger volumes of hazardous wastes).

3.3.4 Asbestos Removal (Task IV)

Activities include asbestos abatement for friable asbestos and some surface decontamination within *asbestos abatement containment areas*. Task IV activities are applicable to all component categories except for bulk material, ponds, and basins. These activities will be performed prior to demolition either by FEMP workforces in accordance with the procedures provided under Removal No. 26 - Asbestos Abatement, or by a qualified remediation subcontractor in accordance with performance specifications for that activity, which incorporate Removal No. 26 requirements, and an approved asbestos abatement Work Plan as required by the remediation subcontract. Regardless of who performs the work, asbestos will be removed in accordance with the National Emissions Standard for Hazardous Air Pollutants (NESHAPs) (40 CFR 61, Subpart M, Sections 145, 149, 150, and 153), and the Ohio Air Pollution Regulations (Ohio Administrative Code (OAC) 3745-20-02 through -05). For further clarification regarding the coordination of asbestos removal activity by FEMP workforces under Removal No. 26 and that by the remediation subcontractor under a remediation subcontract, please refer to Section 3.5.3.2. Section 01516 of the performance specifications (see Appendix C) is the specification which discusses the methods to be used for removal, transportation, and disposition on-site of ACM.

Support activities to be performed early in this task include establishing control zones, support zones, access/egress corridors, and construction areas for abatement. Also included will be the installation of containment and airlock facilities for asbestos abatement and associated decontamination efforts. Temporary showers and change rooms will be installed at the airlocks of asbestos abatement containment areas in a configuration that is in compliance with asbestos regulations and DOE policies.

In some cases, the whole building undergoing asbestos abatement will be turned into a *containment structure*. All containment structures will be air tight with ventilation provided so containment is under negative pressure and sufficient air exchanges take place to mitigate fugitive emissions. Items such as sumps, dikes, and shoveling pads (for shoveling adsorbents) for removing and containing decontamination water and solutions will be installed as part of

the containment. If the entire building is to be used as a containment, all cracks, joints, gaps, and other openings will be sealed shut to prevent spread of contamination during remediation. Directions to remediation subcontractors regarding ventilation and local containment is provided in Section 15067 of the performance specifications (see Appendix C).

Friable asbestos removal activities will take place prior to decontamination efforts in the asbestos abatement containment area. Typical removal procedures include saturating ACM with an amended water solution; removing ACM in manageable sections without throwing or dropping material wrapping; removing all visible residue with a wet brush or sponge or equivalent method; and containerizing ACM contained within two layers of 6-mil polyethylene sheeting secured with tape and labels. After friable asbestos is removed, decontamination will include removal of other loose contaminants in the asbestos abatement containment area. Areas adjacent to asbestos abatement containment areas will be decontaminated such that the abated areas are not re-contaminated. Asbestos will be removed in accordance with the performance specifications established for that activity in a bid package (see Section 01516 of Appendix C).

3.3.5 Surface Decontamination (Task V)

Task V activities include surface decontamination (also referred to as "release cleaning") of areas in addition to those decontaminated in asbestos abatement containment areas. This decontamination effort goes beyond the general surface cleaning activities in Task II by using several different methods to remove both fixed and removable contamination. Decontamination method(s) for each component of the remedial action will be proposed by the remediation subcontractor and evaluated by DOE. Section 01517 of the performance specifications provides direction to the remediation subcontractor regarding this activity. Specifically, this specification establishes a framework by which the remediation subcontractor must remove and/or fix contamination within the structures, including the identification of acceptable methods, limits to the activity, etc.

The selection of a particular decontamination method is contingent upon many factors. Based on a review of available and proven decontamination methods, those recommended or determined to be potentially applicable to the various material types in OU3 have been identified in Table 3-2, entitled "Decontamination and Dismantlement Methodology Matrix." The table of methodologies and technologies distinguishes between those that are recommended (i.e., proven and preferable for this remedial activity (identified with an "X") and those that are optional (identified with an "O"), based on an initial evaluation of their safety and efficiency in meeting performance-based design specifications. The remediation subcontractor will be required, pursuant to Part 1.6.A of Section 01517 to demonstrate that the method(s) proposed will be effective. The effectiveness of any approved method will be verified on a continual basis through oversight through the life of the project. Task V activities apply to all component categories and bulk materials (if this option is utilized), except for ponds and basins. Task V activities could generate water from pressure washing items and surfaces to remove contamination. *Secondary wastes* include wastewater and residues generated during this activity. The water could potentially be filtered and recycled, which would reduce the volume of wastewater to be treated. Section 3.4.2 of this plan discusses the management of these types of secondary wastes. Within Section 01517 of the performance specifications, particularly Part 3, direction is given to the remediation subcontractor on limiting the amount of secondary waste generated, collecting the waste, etc.

It should be noted that the sequence for performing most of the surface decontamination activities will likely take place after interior dismantlement and bulk removal operations and before exterior dismantlement. The goal of surface decontamination is to remove radiological contamination to levels below 1,000 dpm/100 cm^2 removable or greater than 50,000 dpm/100 cm^2 total for uranium, or greater than 200 dpm/100 cm^2 removable or greater than 10,000 dpm/100 cm^2 total for thorium 232, before the containment of a structure can be opened to the environment. These levels were established specifically for the OU3 decontamination and dismantlement activities based on levels stipulated by DOE Order 5400.5. Removal of radiological contamination to at least these levels will allow for the removal of air containment systems prior to dismantlement of the building's exterior and structural frame.

3.3.6 Above-Grade Dismantlement (Task VI)

This task includes removal of any additional previously inaccessible loose contamination and removal of above-grade utilities and the above-grade portions of structures. This task also includes all associated work such as establishing work zones, materials segregation, size reduction, staging, containerization, construction equipment decontamination, personnel decontamination, and containerizing the wastes generated by decontamination and dismantlement activities. Task VI activities are applicable to all component categories identified in Table 3-1, except for ponds and basins; and to a much lesser extent, bulk materials; storage pads; parking lots, and railroads; and piping, and utilities/equipment.

The initial strategy to dismantle each building is by removing all remaining equipment, piping, ductwork, conduits, wiring, etc.; removing the siding; and then taking the structure apart down to the floor slabs and foundations using conventional methods. Conventional methods of dismantlement that may be employed include traditional wrecking methods for uncontaminated or fixed contaminated buildings, shaped charge demolition for buildings that might not be safely dismantled using conventional dismantling and demolition techniques, pulling the buildings in on themselves, tripping the building to the ground, and other methods that may be proposed and approved by DOE. The proposal and selection of a particular dismantling method will have to take into consideration any potential affects to surrounding structures and areas. Regardless of the method used to dismantle a building, performance specifications for executing such activity will be met. Refer to Table 3-2 for acceptable dismantlement technologies. Some structures may require two or more methods of demolition. For example, the transite-sided and transite-roofed buildings could use the piece-by-piece dismantling method for siding, and the tip-over or shape charge method for structural steel.

Activities required prior to dismantlement include setting up controlled zones, contamination reduction zones, support zones, and construction areas. Controlled zones include all areas where work or storage will take place in contaminated areas. Contamination reduction zones are buffer zones between the support zone and the controlled zone. The contamination reduction zones typically contain the access and egress corridors, air locks, equipment decontamination area, personnel decontamination area, and personal protective equipment (PPE) removal areas. The support zones include all uncontaminated areas within the construction area. The construction areas include all areas where construction activities will require the use of construction PPE (such as hard hats and safety glasses), where personnel hazards from construction activities exist, or where special construction-related training may be needed.

DECONTAMINATION AND DISMANTLEMENT (D&D) METHODOLOGY MATRIX

X = RECOMMENDED METHODS
O = OPTIONAL METHODS

TECHNIQUES/METHODS →	INITIAL DECONTAMINATION										HEPA VENTILATION SYSTEMS					DISMANTLEMENT & SIZE REDUCTION																					MATERIAL HANDLING EQUIPMENT											PACKAGING METHODS						
MATERIALS ↓	SURFACE HEPA VACUUM	SURFACE WIPE DOWN	HAND / AUTOMATED BRUSHING		VACUUM GRIT / SHOT BLASTING	VACUUM SCABBLING / SCARIFYING		HIGH PRESS / LOW VOL WATER WASHING	CHEMICAL FOAMS / GELS / PASTES	FIXATIVE	INTERIOR FLUSHING	ENTIRE BUILDING / FLOOR	LOCAL CONTAINMENT STRUCTURE	LOCAL WITHOUT CONTAINMENT			ONE PIECE REMOVAL (FOR "SMALL" ITEMS)	MANUAL DISASSEMBLY	OXYGEN CUTTING	ABRASIVE SAWING	IMPACT HAMMERING / RAMMING	SHEAR CUTTING / NIBBLING	GRABBLER / MASSIVE SHEARING	ABRASIVE WATER JET CUTTING	PLASMA ARC CUTTING	SHREDDING / BALING / COMPACTING	CONTROL EXPLOSIVE CUTTING	CONCRETE TORCH	CIRCULAR (MECHANICAL) CUTTING	WRECKING BALLS / SLABS	DEMOLITION COMPOUNDS	DIAMOND WIRE CUTTING	HACKSAW / GUILLOTINE SAW	PAVING CUTTING / CHIP HAMMERING	BACKHOE MOUNTED RAM	WALL AND FLOOR SAWING			MANUAL HOIST (CHAIN/ELEC.)	SCISSOR LIFT / MAN LIFT	CHERRY PICKER / BOOM TRUCK	FORK LIFT / HAND STACKER	CRANE (FIXED BOOM)	ELEVATOR (PERSON/EQUIP HOIST)	FLATBED TRUCK	LOADER / BACKHOE	MOBILE CONVEYORS	OVERHEAD CRANES			STORAGE CONTAINER	DISPOSAL CONTAINER	SEAL EXPOSED OPENINGS	PLASTIC WRAP / BAGS	BUNDLED / BANDED		
PROCESS EQUIPMENT																																																							
TANKS (SHOP FAB.)	X				O			X	O	X	X	O	O				X	X		O		O		O					X									X		O				X		O					X	O			
TANKS (FIELD FAB.)					O			X	O	X	X	O	O				O	O						O					X											O	X	X		X								O	X		
PROCESS VESSELS (SOLIDS)	X	O			O			X	O	X	X	O	O				X	X						O					X									O		O	O			X		O					X	O			
PROCESS VESSELS (LIQUIDS)								X	O	X	X	O	O				X	X		O				O					X				O					O		O	X			X		O					X	O			
FURNACES (ELECTRIC)	X	O						X	O	X		O		O			X	X	O					O					O				O					O		O	O			X		O					X	O			
(2) DNP. FURNACES (GAS FIRED)	X	O			O			X	O	X		O		O			O	X	O	O				O	O				O									O		O	O			X		O					X	O			
CRUSHERS, MILLS(SIZE REDUCTION)	X				O	O		X	O	X		O		O			O	X	O	O				O	O				O				O					O		O	O			X		O					O	X	X		
LATHES/SAWS/MACHINING	O	X						X	O	X		O	O	O			O	X	O					O					X									O		O	O			X		O					O	O	X		
PUMPS								X		X	X	O	O	O			X	X	O						O					X								O	O					X		X	O			O	O	O			
AGITATORS/DRIVES								X		X		O	O	O			X	X	O											O				O				X	O	O				X		X	O			O			O			
INSTRUMENTATION	O				O				O	X		O	O	O			O	X		O					O	O				O								O	O				X	X		X				O	X		O			
PIPING	X				X			O		X	X	O	O	O			O	X	X	O		O		O	X				O				O					X	O	X				X		X	O			O	O	X		X		
VALVES/FITTINGS	O							X	O	X	X	O		O			X	X	O	O				O					O									X	O	O	X		X	X							X		O			
ACM PIPE INSULATION	X											O	X				O	X							O																								O	X		X			
MISC. PROCESS EQUIPMENT	O	O			O			X	O	O	X	O		O			X	X	O	O				O					O				O					O	O	O	X		O	X		O	O			O	X	X	X			
ROTARY KILN	O				O			X	X	O			O	O			O	O											O				O					O		O	O						O						X	X		
(1) HX(S), MX(S)	X							X	O	X	X		O	O			O	O	O	O									X									X			X						O							X		
HVAC EQUIPMENT																																																							
DUST COLLECTOR HOUSINGS	X				O			X	O	X	X	O	X	O				X	O	O		O			O					O				O				O	O	X				X		O	O			X	O	X	O			
VENTILATION FANS/BLOWERS	X							X	O	X	X	O	X	O			O	X	O						O	O				O				O						X				X		X	O			X	O	X	O			
STEAM UNIT HEATERS	X							X	O	X			X	O			X	X	O						O					O				O					X	X		O		X		X				O	X		O			
AIR SUPPLY OUTLETS	X				O			X	O	X	X	O	X	O			X	X	O	O					O					O				O					X	O	O		O	X		O				O	X					
DUCT	X				O			X	O	X	X	O	X	O			O	O	X	O		O			O	O				O				O				X	O	X	O			X						O	X	O				
ELECTRICAL EQUIPMENT																																																							
SUBSTATIONS	X	X							O	X		O	O	O				X				O								O								O	O	X		O		X		O				O	X		O			
MOTOR CONTROL CENTERS	X	X							O	X		O	O	O			X	X	O			O				O				O				O				O	O	X	O		O	X		O	O			O	X		O			
CKT BREAKERS/SAFETY SWS	X	X							O	X		O	O	O			X	X								O				O								O	O		X		X	X		O					X		O			
CONTROL PNLS/PNL BOARDS	X	X							O	X		O	O	O			X	X				O								O								O	O		X		O	X		O	O			X	O		O			
MOTORS / GENERATORS	X	O							O	X		O	O	O			X	X																				X	O		O	O	O	X		O	O				X		O			
LIGHTING	X											O	O	O			X	X							O								O																	X		O			
CONDUIT / WIRE / GROUND	X								O	O		O	O	O			O	O							O								O													O			O	X		O	X		
TRANSFORMERS	X	X							O	X		O	O	O			X	X																				O	O	X			O	X							X		O			
GENERATOR DRIVE UNITS	X	O						X	O	X			O				X	X											O								X	O	X		O		X			O							O			
CAPACITOR	X	X							O	X			O	O			X	X											O									O	X			O	X							X		O			

FOOTNOTES: (1) HX(S) = HEAT EXCHANGERS, MX(S) = MIXTURE EXTRACTORS / SETTLERS
(2) DENITRIFICATION POTS

TABLE 3-2 Decontamination & Dismantlement Methodology Matrix

DECONTAMINATION AND DISMANTLEMENT (D&D) METHODOLOGY MATRIX

X = RECOMMENDED METHODS
O = OPTIONAL METHODS

| TECHNIQUES/METHODS → | INITIAL DECONTAMINATION | | | | | | | | | | HEPA VENTILATION SYSTEMS | | | | | DISMANTLEMENT & SIZE REDUCTION | | | | | | | | | |

Interior dismantlement includes removal of all remaining equipment, piping, ductwork, conduits, wiring, lights, interior transite siding, and other items that may be safely removed without affecting the structural integrity. As the interior items are removed, loose contamination will be removed and/or fixatives sprayed onto the contaminants to fix them in place. The interior of ducts, piping, conduits, etc., will be decontaminated if practicable or the openings of each piece will be sealed before the pieces are sent to the segregation area. Removal, handling, and disposition of interior transite siding will be in accordance with the procedures in SR-002, Large Project Work Asbestos Practices, that address asbestos abatement. Site standard operating procedures SSOP-0060,-75,-78, and-79 address the containerization, packaging, and standard operating procedures SOP-20-C-616 and -630 address the inspection and storage requirements of ACM.

Exterior dismantlement will follow interior dismantlement and surface decontamination tasks as described in Section 3.3.5. Exterior dismantlement includes removal of all vents, stacks, lights, glass, transite siding and roofing, and other items that can easily be removed from the exterior without affecting the integrity of the structure. Transite siding and roofing will be removed before the structural frame is dismantled. Removal, handling, and disposal of exterior transite siding and roofing will be in accordance with the same procedures for interior transite siding outlined above. Glass will be removed before the structure is dismantled to minimize injuries and PPE damage.

After completing removal of interior and exterior items, dismantlement of the building's structural frame will begin. Worker safety and minimization of airborne dust are two primary concerns for selecting dismantlement methods. Steel structures are identified as the easiest to dismantle without generating airborne contamination. Steel structures can be pulled over, dropped in place with explosive shape charges, removed in pieces with cranes and large hydraulic shears, and torch cut and dismantled piece by piece. All these methods produce minimal airborne dust. Although the piece-by-piece, crane-and-shears methods may produce lower dust levels, there are more risks to personnel associated with these methods than with other methods. Concrete structures (slabs, walls, beams, and columns) are the hardest to dismantle without creating some airborne dust. The concrete must be broken into reasonably sized pieces for disposal. This process will raise some dust even if a water spray is used. Piece-by-piece dismantlement of concrete is difficult and more dangerous to the workers than controlled explosives demolition or pulling over the building. Wood structures can be dismantled easily using the pull-over method with a light spray of water.

The materials removed during remedial action activities may be reduced in size to accommodate transportation of the materials (e.g., to fit into shipping and disposal containers) and to minimize the volume of the materials (e.g., flattening ductwork). As they are removed, materials will be segregated into categories such as contaminated and uncontaminated debris, recyclable materials, mixed hazardous waste, and hazardous waste. A detailed segregation strategy for debris and other waste materials has been developed and is presented in the material segregation and containerization guidance contained in Appendix A. Whenever possible, containerization will be performed at the *jobsite* to minimize additional handling of the materials. Many personnel will need to wear PPE, such as coveralls, boot covers, gloves, tape, etc., that contribute to the secondary waste volume. Section 3.4.2 of this plan discusses the management of these secondary wastes.

The next stage of activity, following the physical dismantlement and removal of the above-grade portion of a component, is the preparation of any portion of the component that remains

at- and below-grade. Depending on the condition of the at- and below-grade portion, it may be necessary to seal any exposed surfaces, pits, piping, utilities, and any openings until at- and below-grade dismantlement is initiated. Sealing surfaces may be performed by using sealants and cover systems that are proposed by the remediation subcontractor and approved by DOE.

3.3.7 At- and Below-Grade Dismantlement (Task VII)

At- and below-grade dismantlement activities include removal of floor slabs, foundation walls, footings, underground tanks, underground utilities, underground asbestos, roads and railroads, material in ponds and basins, and other at- and below-grade items and associated waste management activities. The soils that are excavated during these activities will be handled and managed in accordance with the OU5 ROD. Some of the activities that may take place prior to the OU5 soil excavation activities include slab removal, utility pole removal, pavement removal, and railroad removal. Otherwise, the sequence for OU3 at- and below-grade removals will be dependent on OU5's schedule for soils excavation. Task VII activities are applicable to all component categories identified in Table 3-1.

Minimization of airborne dust and protection of worker safety are primary environmental and health concerns for this task, as well. Concrete dismantlement will typically produce airborne dust; however, this can be minimized by wetting the concrete during dismantlement activities. Soils and soil stockpiles can also be kept wet so that airborne dust is minimized.

Preparation, stabilization, and removal of slabs, foundation walls, and footings will be one of the first remedial activities during this task. Removal of these items will make the removal of underground utilities easier, especially deep utilities such as sewer lines. Basement walls will be removed by excavating behind the walls prior to demolition, to prevent cave-in hazards and to make it easier to push the walls over or demolish them. Roads will be dismantled by removing pavement and road base to the required grades. Railroads will be dismantled by removing the rails and ties. All at- and below-grade material will be removed in coordination with OU5 soil excavation activities.

Removal of utilities includes removing all water lines, sewer lines, conduit banks, underground conduit, direct buried wire, process pipelines, steam lines, underground tanks, underground asbestos insulation, and other remaining utilities at- or below-grade. Portions of above-grade utilities such as pipe rack footings, and power poles may also be removed during this task. Underground steam lines, and possibly some process lines, may be insulated with asbestos insulation. Experience has shown that the asbestos insulation will likely be friable and mixed into the adjacent soils. The asbestos insulation will be removed in accordance with procedures proposed by the remediation subcontractor and approved by DOE, and the asbestos contaminated soils will be managed and disposed of in accordance with the requirements of the OU5 remedial action work plan.

All remaining underground storage tanks (USTs) will be removed during this task. They will be removed in accordance with federal and state UST rules and regulations as a minimum, and with the additional constraints required by the type(s) of contaminated soil that may be around the tank. After removal of the tanks, they will be reduced in size and taken to the appropriate segregation area.

During the interval period, all material removed during this task will be segregated from the soil and reduced in size and volume prior to subsequent segregation and containerization in shipping and disposal containers.

3.4 Materials Management

The strategy for management of materials generated during the "interval period" is to dispose of low-level, non-reusable or non-recoverable material, process/treat and sort recoverable material for immediate recycling or re-use off-site, and provide secure storage for materials that cannot be disposed of off-site until a final disposition determination is made through the OU3 final remedial action ROD. The term "material" used throughout this section refers to both recyclable or reusable and non-recoverable or non-reusable materials. The term "waste" refers to only the non-reusable or non-recoverable portion of the materials. This discussion covers management of primary and secondary material streams, waste minimization, and material volume estimating. In an effort to plan for the attainment of the material management objectives stated above, this section presents the implementation strategy and approach for managing materials resulting from the OU3 interim remedial action.

3.4.1 Management Of Primary Materials

Material management strategies during the interval period are primarily oriented towards the following disposition options: disposition of low-level radioactive material at DOE's Nevada Test Site facility; disposal of mixed waste at the Envirocare of Utah, Inc. facility; recycling/reuse of controlled material, when possible; disposal of unrestricted (free-releasable) material at municipal landfills; and the on-site interim storage of materials that will either await the disposition options identified above or be disposed of under the OU3 final remedial action ROD. Of these five disposition options, NTS disposal and interim storage will constitute the disposition route for most materials generated during the interval period. Since potentially recoverable metal will constitute the majority of material from OU3, management of potentially recyclable/reusable material will consist of interim storage until an accepting facility is contracted to take that material. Since the scope of the OU3 final remedial action includes the treatment and final disposition of remedial action wastes, the forthcoming OU3 Feasibility Study Report and Proposed Plan will provide a more detailed basis for material handling, segregation, and containerization with respect to final disposition options. For the interval period, however, the material management effort will primarily be accomplished through the following actions:

- characterization of material to determine proper material handling, containerization, and segregation for compliance with material acceptance criteria for off-site disposal and on-site storage (current material acceptance criteria are identified in Appendix A);

- quality control to ensure material handling operations are in compliance with site procedures and that all excess materials are packaged and disposed of in accordance with site requirements, procedures, and regulatory guidelines;

- implementation of proper segregation of materials in a manner consistent with Removal No. 17 guidelines; and

- inspection, certification, and supplemental sampling (if necessary) of materials for disposition at NTS, Envirocare, municipal landfills, interim storage or other approved disposal facilities per the FEMP Waste Certification Program.

Although existing data/process information may be sufficient, the OU3 RD/RA SAP provides the framework for obtaining additional data needed to ensure compliance with the above-mentioned disposition options.

Primary material refers to the material generated from dismantlement activities that include the structure, associated equipment, and contents of a component. Integral to the implementation strategy for primary materials are several documents used to determine material management requirements, including attainment of waste acceptance criteria: Removal Action 17 (RA 17) Work Plan (DOE 1993a); Site Standard Operating Procedure - Management of Excess Soil, Debris, and Waste from a Project (SSOP-0044, January 31, 1994); and Material Segregation and Containerization Guidance documentation (included in Appendix A). The Material Segregation and Containerization Guidance documentation is subject to revision to address interim storage alternatives. These documents provide key guidance for material management during the interval period.

The principal documentation to be used during the management of primary materials include:

- Material Evaluation Form - The document that identifies unique FEMP materials streams to be managed. A completed MEF establishes a "material profile" that identifies requirements for managing materials that match the profile. SSOP-0002, "Initiating Waste Characterization Activities Using the Material Evaluation Form (MEF)" describes the use of the MEF for waste characterization.

- Project Waste Identification and Disposition (PWID) Form - The form utilized for planning and disposition of excess soil, debris, and waste from a project. This form identifies all material that will be generated during a project and will determine how the material will be managed. It is prepared during remedial design to pre-qualify material, based on new and existing data and MEFs for future containerization, segregation, and disposition.

- Material Segregation and Containerization Criteria (MSCC) Form - The form utilized to document the category that a particular material stream falls under and the type of container to be used for each type of material that is generated. The MSCC utilizes the material segregation categories and information contained in the PWID as a basis for determining the containerization of material. The current MSCC Form is shown in Table A-2 of Appendix A of this Work Plan.

In order to successfully implement the strategy to manage primary materials during the OU3 interim remedial action, key planning activities must be performed during remedial design. Site Standard Operating Procedure - SSOP-0044 assigns responsibilities for the activities to specific FEMP organizations. The activities include the following:

- estimation of the quantities of all excess materials anticipated from the project;
- completion of a PWID form in order to properly characterize and estimate quantities of all material for current and future disposition;
- compilation of any process knowledge, and previous sampling and analysis results in the project area for the purpose of making a preliminary contaminant assessment, and identification of the presence of any RCRA contaminants in the project area, pursuant to the Solid Waste Disposal Act (42 United States Code (USC) 6901, et. seq.) and the Ohio Hazardous Waste Management Regulations Ohio Administrative Code (OAC) 3745-52-11);
- verification that all MEFs are properly established for the materials before the disposition options are considered;
- completion of the MSCC to select the appropriate category and containers for materials; and
- coordination between Design-Engineering-Construction team (DEC team) and waste management personnel to ensure that waste minimization is incorporated into the design where possible.

During the design and planning stages, quantities of materials will be estimated. Information obtained as a result of a project site walk-down will be used to prepare the PWID form, which will provide a list of the material types anticipated with corresponding estimated quantities. Following the preparation of a PWID form, a review of any process knowledge, existing sampling analysis results of the project area, and all existing MEFs that correspond to the material categories identified in the PWID form will be performed. If an MEF does not exist for a material stream identified on the PWID form, a contaminant assessment must be performed. It is unlikely that additional sampling and analysis will be required due to the volume of process knowledge that currently exists (compiled in the OU3 RI/FS WPA) and the availability of RI data (as discussed in Section 3.5.1 of this Work Plan). If additional characterization data are required to complete a new MEF, or to determine if materials meet an existing MEF, additional data will be obtained by sampling and analysis in accordance with the SAP (Volume 2 of this Work Plan).

If applicable, an MSCC will be prepared for each design in which containers will be specifically assigned to hold materials anticipated to be generated during the remedial action. If possible, the MSCC will also be used to specify a sequence for the removal of material streams. The sequence for removal will be utilized for material anticipated to be generated from remedial activities.

The completed PWID, MEF, MSCC, and/or a contaminant assessment will supply the information necessary to determine whether the materials must be containerized, placed in a controlled stockpile, or stored in an improved storage facility.

Planning is essential during the design to arrange for the appropriate staging and storage needs (containers, lay-down areas, staging areas, etc.). Subsequent to the completion of the

material identification, quantifying and container assignment documentation, several staging/storage planning options will be assessed. These options are listed below but are not limited to the following:

- package at the point of generation for disposal at an approved off-site facility (e.g., NTS);
- stage in bulk in a controlled, covered stockpile until off-site shipment can be arranged;
- stage in bulk in an improved storage facility until treatment can be performed under the OU3 final remedial action ROD;
- containerize and store for eventual off-site disposal;
- package for storage of hazardous or mixed waste materials;
- package for off-site shipment to a recycling facility; and
- package for shipment to commercial or industrial landfill.

3.4.1.1 Segregation of Materials

Material segregation is based on how materials were used or impacted by processes that occurred during production at the FEMP. Process knowledge and characterization reveal that approximately 98 percent of OU3 materials are low-level radioactive with the remaining approximate 2 percent being mixed waste. Characterization of materials constitutes the first criteria for segregation; however, since most materials in OU3 are low-level radioactive, the main focus of segregation in this Work Plan is according to material type to facilitate off-site disposal, potential off-site processing/disposition, on-site interim storage, and potential on-site treatment.

To facilitate current and potential disposition options, materials generated during implementation of the OU3 interim remedial action will be placed in containers or bulk piles as specified in Table A-2 of Appendix A of this Work Plan (also shown in Appendix A of Section 01120 of the performance specifications - example shown in Appendix C of this Work Plan) and tracked according to the existing FEMP lot marking system specified in procedure RM-0005, "FEMP Lot Marking And Color Coding System." This marking system will be used to identify the contents for inventory control, support the tracking of materials from its generation to its final disposition, and provide the documentation needed to determine attainment of material acceptance criteria. This information will be entered into the FEMP Sitewide Waste Information, Forecasting and Tracking System (SWIFTS) database. The SWIFTS database will provide "cradle-to-grave" tracking of all wastes generated.

Materials generated will be managed consistent with the Removal Action 17 Work Plan, criteria for implementing those concepts developed in SSOP-0044, and the Material Segregation Categories developed specifically for the interim remedial action (Table A-1, Appendix A). The Material Segregation Categories are divided according to current and potential future disposition options for materials. There are three major categories of alternatives to disposition materials: Off-Site Disposal; On-Site Interim Storage; and Off-Site

Processing/Disposition. One other segregation category is On-Site Treatment. These categories are further described in Appendix A.

3.4.1.2 Size Reduction

Size reduction for a portion of the materials will be necessary to accommodate the specific containerization criteria that will be determined by final disposition. Size reduction is anticipated for, but not limited to structural steel, steel decking, specified equipment, and construction rubble (concrete, masonry, brick, etc.). The amount of material to be size reduced will depend on the size of container to be used and the interim storage configuration (managed as piles or containerized), if applicable. Size reduction requirements for specific materials are specified in the MSCC Form contained in Table A-2 of Appendix A of this Work Plan and Appendix A of Section 01120 of the performance specifications (see Appendix C).

Structural steel, steel decking, and equipment will be size reduced to meet the distinct containerization requirements for unrestricted recycling, restricted re-use, and on-site unrestricted release. It is anticipated that roll-off type boxes will be used to transport this material from the project site and to the vendor for recycling or re-use, and to interim storage locations.

Construction rubble (concrete, masonry, brick, etc.) to be managed under Removal No. 17 as controlled piles would require less size reduction than if it were packaged for off-site disposal. Containerizing construction rubble for off-site disposal would require additional size reduction to eliminate as much void space in the container as practical.

Potential locations to perform size reduction will depend on the ultimate destination of the debris or waste materials. The strategy for size reduction is to have that activity be performed by the remediation subcontractor within the boundaries of the dismantlement work zone in order to package and prepare the containers for shipment off-site. If necessary, materials may also be transported from the job site to a central staging and size-reducing area. This area could be potentially used to further segregate materials and to prepare for interim storage or shipment offsite.

3.4.1.3 Storage of Materials

Sufficient interim storage will be required for the materials that will be retained for treatment and/or disposition under the OU3 final remedial action ROD. The material storage scenario presented in Appendix G of the OU3 PP/EA estimated that 16,424 cubic yards of material would be temporarily stored onsite in tension support structures (TSSs) during the interval period. The current strategy for interim storage during the interval period differs from that of the OU3 PP/EA in that utilization of existing storage space that has adequate engineering controls, such as the Plant 1 Pad, will be considered before a decision is made to construct any TSSs. Due to the changing nature of storage space availability at the FEMP, it is more appropriate to specify the preferred interim storage location(s) in project-specific implementation plans for the respective projects rather than in this Work Plan.

In the event that existing interim storage facilities are not available, and it is determined that there is a need for covered storage, alternatives such as constructing TSSs may be pursued. A small amount of the materials generated during the interval period is expected to require covered storage with engineering controls to achieve compliance with ARARs. Although

Removal No. 17 does not currently specify criteria for determining whether material may be inside or outside a storage facility, the primary factor that will be considered in this determination is the extent of radiological contamination that remains on surfaces of bulk material. Since surface decontamination will have been performed along with the potential lock-down of remaining contaminants, it is anticipated that storage of metal and concrete debris in bulk piles or containers outside of the TSSs may be allowed, depending on the characterization (radiological screening, primarily) of the materials.

In general, other types of material could also be containerized and stored in a controlled area, thus eliminating the need for storage within a storage structure. Additionally, as existing FEMP equipment and waste inventories are cleared from facilities, additional storage capacity will become available within the vacated structures and could be made available as temporary interim storage facilities. If, during the preparation of any design package, it is determined that sufficient storage capacity is not available for the debris and waste materials to be generated during dismantlement activities, then additional planning and design will be performed under the appropriate design package to provide for the necessary storage capacity. Storage facilities erected or utilized for interim storage of hazardous wastes will be designed and constructed in accordance with 40 CFR 264, Subpart DD.

The Material Balance Model, to be submitted to USEPA as an appendix to the draft OU3 RD Prioritization and Sequencing Report, will detail storage space availability based on the shipment of backlog waste inventories and/or dismantlement of current storage facilities. This model has been described in more detail in Section 4.4.

3.4.1.4 Disposition of Materials

Limited disposition options are allowed for under the OU3 interim remedial action. As noted in Section 3.4.1, the two primary disposition options that will be used for the majority of materials generated during the interval period are disposal of low-level radioactive waste at NTS and the on-site interim storage of most of the remaining materials, while disposal of mixed wastes and free-releasable materials are minimal. To facilitate disposition for any of these options, the materials to be generated during the OU3 interim remedial action have been classified into one of the four material segregation categories to identify appropriate containerization of materials for disposition under both the OU3 interim remedial action and the OU3 final remedial action. This effort was initiated to hopefully avoid the potential second handling of materials following containerization by the remediation subcontractor. The material segregation categories were used to complete the Material Segregation and Containerization Guidance (Table A-2, Appendix A) to guide the remediation subcontractor for segregating and containerization materials. The performance specification for waste handling for each project will contain either the segregation and containerizing designations listed in Table A-2 or a version that is revised to address applications of that criteria that are more current at the time of remedial design (see Appendix A of performance specification 01120 in Appendix C of this Work Plan).

The two categories in Appendix A that are designated for disposition (Off-Site Processing/Disposition and Off-Site Disposal) may also be classified as either recoverable or non-recoverable materials, respectively. As stated in Section 3.4.1, the primary disposition route for materials during the interval period is to dispose of low-level radioactive non-recoverable material (waste) at NTS, and the interim storage of most other materials. Interim storage will include recoverable materials, which may include steel, non-ferrous metals, and

other material which may be successfully decontaminated for recycling, reuse, or *free-release*. Recycling/reuse of materials is recognized as a positive route for disposition; however, a standing contract does not exist for OU3 materials between the FEMP and outside entities. Contracts for recycling/reuse will be arranged on a project-specific basis. Without having recyclers/reusers identified, specific material acceptance criteria are not known. FEMP material release requirements, however, are specified by the Material Release Policy for the FEMP which is based on DOE Order 5400.5. Some recycling and reuse may not require radiological decontamination if recycling and reuse of materials occur within a radiologically-controlled environment, such as another DOE facility, or, after unrestricted release, by commercial operations. During the interval period, it is anticipated that metal will be the predominant media generated as recoverable materials. Materials that are also potentially recoverable may include, but are not limited to, concrete, coal, asphalt, glass, and ceramics. Recoverable materials may be those which are radiologically contaminated but that can be treated and, as a result, be reclassified for unrestricted release or controlled reuse.

Based on current knowledge of acceptance criteria for commercial recyclers of metal used in the past by the FEMP, recoverable metal may not be excessively oxidized or in a bi-material form where separation from the other materials would not be cost effective. The two generally recognized classifications of recoverable metal at the FEMP are:

- Unrestricted Use Metal - Metal that may be economically decontaminated to a releasable level and all potentially contaminated surfaces of it are accessible for direct contamination survey. In general, unrestricted or "free release" metal has a low surface-area-to-mass ratio. Examples of unrestricted release metal are structural steel, tanks and decking. Metal may be considered for unrestricted release even if there are minor portions that cannot be decontaminated or monitored if that portion can effectively and readily be removed from the form.

- Restricted Use Metal - Metal that cannot be economically decontaminated or surveyed to verify whether release limits have been met. In general, restricted use metal is light gauge with a high surface-area-to-mass ratio or has inaccessible areas where contamination may be present and therefore difficult to remove. Examples include metals such as ductwork, cabinets, machinery, and odd-sized forms. As a materials management practice, some Restricted Use Scrap Metal may include some unrestricted release metal if it is determined that the restricted end use is more cost effective. Refuse metal is radiologically contaminated metal that, in general, includes all metal that does not have the recoverable metal characteristics and, therefore, is also considered Restricted Use Scrap Metal.

Non-recoverable materials (waste) generated during the OU3 interim remedial action will consist primarily of concrete, wood, glass, paper, ACM, construction wastes, and non-recoverable metal. The strategy for management of non-recoverable material generated during the OU3 interim remedial action is off-site shipment. This strategy will adhere to the procedures established under Removal No. 9 for containerization and off-site disposal requirements or on-site interim storage. Interim storage of waste will follow procedures for waste handling and management established under Removal No. 9 and Removal No. 17.

Decontaminated or releasable waste may be disposed in a landfill if it meets FEMP release criteria and waste acceptance criteria of the accepting landfill.

Just-In-Time (JIT) inventory concepts are goals that will be applied to the off-site shipment of materials, whenever possible. These concepts stress containerizing of materials at the point of generation and transferring the materials to a staging area for expedited shipment off site. This will reduce the need for interim storage and associated management costs.

Materials that are not designated for JIT off-site shipment will be packaged, as required, and prepared and staged for interim storage. Table 3-3 presents the materials management options for the major material categories that will be generated during the interim remedial action and outlines the preferred strategy for materials containerization, storage, and disposition during the OU3 interim remedial action. The alternatives selected for each material category are based on economic and technical feasibility considerations. Table 3-3 presents only the preferred strategy for materials management during the interval period; the OU3 final remedial action ROD may specify a different strategy for future remediation activities.

3.4.2 Management of Secondary Waste

As remediation activities proceed, secondary waste materials will be generated and managed in accordance with ongoing site waste management practices. Secondary waste includes solids such as vacuumed dust, High-efficiency Particulate Air (HEPA) filters, personal protective equipment, spent consumable equipment, and secondary liquids/solids resulting from component and equipment decontamination. Requirements for the management of such wastes will be specified in the design for those responsibilities tasked to the remediation subcontractor.

Management of secondary wastes is presented to the subcontractor in various forms within the performance specifications. Part 1.6 of Section 01120 discusses both the minimization of secondary wastes being generated and controls on the use of hazardous materials. Part 3.2 of Section 01517 discusses requirements for secondary waste generation and collection. Part 3.2.I of Section 05126 requires the remediation subcontractor to collect and manage lead-based paint chips and debris during structural steel dismantlement.

The strategy for managing secondary wastes at the FEMP is to characterize, store, treat (as necessary), and dispose of secondary waste resulting from remediation operations. During the remedial design and the remedial action for each complex, coordination and management of all secondary wastes resulting from the surface decontamination of components within OU3 will be performed. The remedial design will specify project-specific secondary waste management requirements for implementing the remedial action.

Secondary solid waste generated during the OU3 interim remedial action will be collected by contaminant type, containerized, and managed in accordance with the strategies presented for other materials.

Contaminants that are likely to be encountered during decontamination and dismantlement activities include oils, greases, solvents, and heavy metals in addition to uranium and other radionuclides. Depending on the contaminants of concern and the performance of the AWWT for pollutants other than uranium, pretreatment may or may not be required. Pretreatment capabilities currently existing at the FEMP include granular activated carbon treatment located

TABLE 3-3 Material Management Alternatives

	Packaging Alternatives		Storage Alternatives		Disposition Alternatives	
Debris Category	At Point of Generation	Staged, then to Central Packaging Facility	Interim Bulk Storage	Interim Containerized Storage	Off-site for disposal or reuse	On-site or as defined in Work Plan
Metal for Decontamination	X		X			X
Metal for Remelt	X		X			X
Non-recoverable metal	X			X	X	X
Scrap Wood	X			X	X NTS	X
Glass, Paper, Cardboard, Plastic, non-hazardous PPE	X	X If compactible		X	X Commercial landfill/ Recycle	
Asphalt, Concrete, Bricks	X		X			X ISF,Stockpile
Regulated Asbestos Containing Material	X			X	X	X
Non-regulated ACM	X			X	X NTS	
Non-contaminated, non-hazardous debris	X			X	X Commercial Landfill	
PPE contaminated with regulated waste		X		X	X ISF	
Debris containing hazardous waste or regulated as PCB item	X If HW not separable	X If HW separable		X ISF	X HW/MW at Envirocare of Utah	X

NTS - Nevada Test Site.
ISF - Interim Storage Facility
HW - Hazardous Waste
MW - Mixed Waste

in the Recovery Plant (8A) for organic compounds, filtration for heavy metal removal, and/or nitrate removal through the biodenitrification (BDN) system. The manner of discharge through the WWTS is defined by expected or actual contaminants in the wastewater, the effluent limitations and conditions in the NPDES permit, and the internal procedures governing uranium and radionuclide thresholds.

Liquid waste generated during the OU3 interim remedial action will be collected in batches and, therefore, can be managed in batches by using sump systems and filtered through twenty micron and five micron filters prior to being transferred to temporary storage tanks.

The point of entry into the WWTS is currently through the general sump. Before being transferred to the general sump, wastewater must be sampled and analyzed as discussed in the SAP (Volume 2), unless sufficient process knowledge or available sampling data identifies that there are no contaminants of concern. If contaminant information about decontamination and dismantlement wastewaters indicates pretreatment is necessary for a specific pollutant or type of pollutant (as discussed above), the wastewater will be directed to the appropriate entry point, or to the general sump if pretreatment is not necessary.

All wastewater generated through decontamination and dismantlement activities and treated through the WWTS will be directed to the BDN Surge Lagoon; however, individual circumstances may require an alternate routine. Currently, the BDN Surge Lagoon discharges to the BDN towers, which in turn discharge to the BDN Effluent Treatment System, Manhole-175, and the Great Miami River. Once the AWWT facility is operational (planned for early 1995), the effluent from the BDN process will be discharged to the AWWT facility prior to discharge to the Great Miami River.

3.4.3 Waste Minimization

Two documents provide guidance in the area of waste minimization principles at the FEMP, the Waste Minimization and Pollution Prevention (WM/PP) Awareness Plan PL-3009, (FERMCO 1994), and the FERMCO Waste Minimization and Pollution Prevention Policy Statement PO-1013, (FERMCO 1993). The WM/PP Awareness Plan specifies those activities and methods that will be employed to reduce the quantity and toxicity of wastes generated at the FEMP. The plan also educates FEMP personnel, sets WM/PP goals, and plans WM/PP actions. It is designed to satisfy DOE Order 5400.1- General Environmental Protection Program (DOE 1990b), and the WM/PP requirements established by the Pollution Prevention Act (PPA), RCRA, and CERCLA/SARA. The WM/PP Program reflects the goals and policies for waste minimization at the FEMP and represents an ongoing effort to make waste minimization/pollution prevention an integral part of the site's operating philosophy.

A primary mechanism for ensuring waste minimization for each project will be the development of performance specifications during remedial design that include provisions which specify the selection of remediation methods that minimize the quantity and types of secondary wastes generated by the remediation subcontractor. In Part 3.2.B of Section 01517 of the performance specifications (see Appendix C of this Work Plan), for example, the remediation subcontractor is prohibited from using decontamination methods that will generate excessive secondary waste. In addition, the specifications require the remediation subcontractor to perform certain activities outside the jobsite, if possible, so as to minimize the generation of waste products (e.g., see Parts 1.6.B of Section 01120 and Section 01515

of the performance specifications. DOE will review the remediation subcontractor activity-specific work plans to ensure that waste minimization goals are going to be met.

Waste minimization will be accomplished by eliminating or minimizing the generation of waste through source reduction where possible. Waste materials that cannot be eliminated or minimized will be recycled, where possible. Waste that cannot be minimized through source reduction or recycling may be treated to reduce volume, toxicity, or mobility before storage or disposal.

All employees at the FEMP, including subcontractors, are responsible for participating in established recycling programs, conserving energy when possible, reusing equipment and materials when feasible, adhering to policies and procedures promoting WM/PP principles, and identifying areas where improvements to current practices can be made. The FEMP will assist employees in exploring waste reduction and recycling methods, and will promote waste minimization through employee education and incentives.

3.4.4 Estimates of Material Volumes

Material volume estimates will be prepared on a project-specific basis. To provide a long-term strategy for managing materials to be generated during the estimated sixteen years of the OU3 interim remedial action, a model is being developed that will, in part, project for any time during the course of the OU3 interim remedial action the volumes of material that will be generated. The Material Balance Model is discussed further in Section 4.4 of this Work Plan.

3.5 Coordination of the Interim Remedial Action With Other Site Activities

This section presents the strategy for consideration and integration of specific activities within OU3 and the site that may impact the OU3 interim remedial action.

3.5.1 OU3 RI Activities

The primary issue regarding the OU3 RI concerns the availability and use of characterization data that may be needed or useful to support the interim remedial action. Existing characterization data will be evaluated to determine the nature and extent of contamination within components to specify work protection, material handling, segregation, storage, and disposition requirements and to determine additional data needs. Although the complete OU3 RI data set may not be available until January 1995 (according to the current schedule), available data will be used to support remedial design activities.

The specific data needed to support remedial design will be determined by a review of all available information, including laboratory analytical data and field screening data compiled from the OU3 RI sampling efforts. The data represent intrusive and non-intrusive sampling for both chemical and radiological analytes of materials as prescribed in the OU3 RI/FS WPA. The data will be made available through the following sources:

- the FEMP Sitewide Environmental Database (SED) contains all analytical data from the laboratory analyses of intrusive samples and field survey data gathered for the OU3 RI data needs;

- the OU3 RI Report will summarize the component-specific nature of contamination, based on the OU3 RI analytical data compiled from the SED; and

- the data from component-specific radiological and chemical field surveys are also available through completed field survey forms and the accompanying field logbook information compiled from OU3 RI sampling activities.

The acquisition and assessment of additional data will be specified as a pre-design or early design sampling requirement. The data will be evaluated for utility early in the remedial design to identify supplemental sampling requirements. The need for and use of OU3 RI data have been identified in the SAP (Table 2-1 of the SAP contained in Volume 2 of this Work Plan).

3.5.2 Operable Unit 3 Final Remedial Action

Material management, including the characterization, handling, segregation, storage, transportation, and disposition of materials generated as a result of surface decontamination and dismantlement operations require significant interface between the OU3 interim remedial action and the final OU3 remedial action. Throughout this document, the strategies and provisions made for managing materials apply only to the time period between the implementation of the OU3 interim remedial action and the implementation of the OU3 final remedial action. The OU3 final remedial action will address the treatment and disposition of materials and may therefore impact the scheduling of components for decontamination and dismantlement if action would have to be undertaken to provide for additional interim storage capacity before further remediation could occur. If the strategy for management of materials differs for the OU3 final remedial action from the strategies presented in Section 3.4 and in the Material Disposition Plan, described in Section 4.4, the RD/RA Work Plan for the OU3 final remedial action will detail such a strategy.

3.5.3 Operable Unit 3 Removal Actions

Within OU3, several EPA-approved removal actions are currently in progress. These removal actions, as defined in the ACA, represent major projects within OU3 and will be coordinated with the OU3 interim remedial action. The removal actions are grouped into two categories based on their relationship to the interim action. Each OU3 removal action is described in one of the subsections below.

3.5.3.1 Removal Actions to Be Completed Before Interim Remedial Action

The following removal actions have been completed or are anticipated to be completed prior to initiating the interim remedial action for the components affected by these removal actions.

- Removal No. 7 - Plant 1 Pad Continuing Release;

- Removal No. 13 - Plant 1 Ore Silos;

- Removal No. 14 - Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator;

- Removal No. 15 - Scrap Metal Piles
  (Phase I - Ferrous metal completed)
  (Phase II - Copper metal ongoing);
- Removal No. 19 - Plant 7 Dismantling;
- Removal No. 20 - Neutralization of Uranyl Nitrate Inventories;
- Removal No. 24 - Pilot Plant Sump (completed);
- Removal No. 25 - Nitric Acid Tank Car and Area (completed);
- Removal No. 27 - Management of Contaminated Structures (as specified in the OU3 PP/EA, this removal action has been incorporated into the scope of the interim remedial action); and
- Removal No. 28 - Fire Training Facility.

Some of these removal actions will support interim remedial action baseline design strategy and the scheduling of activities contained within this Work Plan. These are identified in the following discussions.

3.5.3.2 Removal Actions to Be Coordinated with the Interim Remedial Action

Four removal actions are programmatic in nature and represent actions being applied to OU3 as a whole. These four removal actions (identified below) and their integration into the remedial action was introduced in the OU3 PP/EA and has been previously described in Section 3.3 and Section 3.4 of this Work Plan. The following removal actions and the related programmatic strategy issues are briefly discussed in the following paragraphs.

- Removal No. 9 - Removal of Waste Inventories;
- Removal No. 12 - Safe Shutdown;
- Removal No. 17 - Improved Storage of Soil and Debris; and
- Removal No. 26 - Asbestos Removals.

<u>Removal No. 9 - Removal of Waste Inventories</u>
The purpose of Removal No. 9 is to permit the removal of waste inventories stored at the site. This removal action established waste management procedures, including packaging, shipment, and disposal of these materials at licensed facilities (e.g., NTS). Inventories addressed by this removal action will be removed from each component through existing waste management operations before surface decontamination and dismantlement activities for that component begin, as described in Section 3.3. Inventories removed from components will be transported to interim storage facilities and areas until they can be shipped off site.

Removal No. 12 - Safe Shutdown

This removal action was created to perform the safe shutdown of all process facilities in preparation for remediation. It consists of a compendium of existing procedures and documentation, rather than a removal action work plan. Safe Shutdown provides the planning, engineering, and program control for the proper disposition of all uranium product and in-process residue materials, excess supplies, chemicals, and associated process equipment. The removal action also provides for proper characterization, emptying, isolation and de-energizing all existing production-related equipment and utilities; "gross" cleaning operations such as removal of loose radiological contamination and biological waste, vacuuming, sweeping and wiping of surfaces; removing and/or replacing baghouse type dust collector filters; overpacking and removal of defective containers; cleaning sump systems; and collection and handling of waste liquids, sludges, and solids.

The strategy for coordinating safe shutdown with the interim remedial action is to complete all scheduled safe shutdown activities (described in Section 3.3.2) for that component before starting remedial action field activities. The schedule for decontamination and dismantlement projects, to be provided in the OU3 Remedial Design Prioritization and Sequencing Report (discussed in Section 6.3), will determine the complete schedule for performance of safe shutdown activities. The schedule for remediation will integrate the strategy of preceding component-specific remedial action so as to not delay implementation of the remedial action. If some safe shutdown activities have not been completed for a component contained within a bid package which has been developed during design, a decision will be made whether that component will be rescheduled for remediation at a later time.

Another aspect of coordination with safe shutdown activities is the utilization of qualitative and quantitative analytical sampling results that are generated at the close of safe shutdown to document the levels of contamination that remain in each component prior to remediation. This data will enable FEMP and remediation subcontractor health and safety personnel to determine appropriate personal protective equipment requirements and to determine whether air emissions monitoring efforts will be adequate.

Removal No. 26 - Asbestos Removals

Asbestos removal under Removal No. 26 documents asbestos abatement activity at the FEMP during routine facility maintenance to mitigate potential asbestos release and migration. Abatement within this program is referred to as "maintenance-related" and includes in situ repairs, encasement, and removals. Actions under this removal action are a necessary step prior to initiation of decontamination and dismantlement activities. Asbestos may be removed by FEMP workforces under a FEMP maintenance work order or by the remediation subcontractor under the remediation subcontractor's statement of work. In both instances, Removal No. 26 theoretically governs this activity; however, when asbestos removal is included within the scope of the remediation subcontract, the requirements specified under Removal No. 26 are incorporated into performance specifications for that activity. Removal No. 26 will continue as an ongoing OU3 response action for facilities awaiting remediation; however, at the time when a component is scheduled for remediation, asbestos abatement work that remains will be incorporated into the remediation subcontract. In such a case, the remediation subcontractor will be required to submit for approval an asbestos removal plan prior to such activity.

Removal No. 17 - Improved Storage of Soil and Debris

Removal No. 17 was initiated to provide controlled storage of excess contaminated soils and debris generated during maintenance, construction, removal, and remedial actions at the FEMP. The integration of applicable concepts and strategies from Removal No. 17 into the OU3 interim remedial action has been provided in the waste storage strategies presented in Section 3.4.1.3.

3.5.4 Other Operable Units

The implementation of the OU3 interim remedial action that will be closely coordinated with the remedial activities of other FEMP operable units including the following activities: handling of waste from other operable units, selection of material lay-down and staging areas; transportation, handling, and storage of materials to and into interim storage areas; usage of FEMP components or facilities and utilities for existing or future purposes; and incorporation of waste streams into various operable unit treatment facilities. Any specific coordination requirements of these activities will be reflected in the implementation plan for each complex. Through careful coordination of these activities potential impacts to activities being performed or planned by these operable units will be minimized. Since OU1, OU2, and OU4 are physically distinct and managed separately from OU3, coordination issues during the interim remedial action are expected to be minimal. However, since OU5 addresses environmental media which are in direct contact with OU3 media, it will require the most significant level of coordination.

OU1

OU1 remediation activities are currently scheduled to begin later in 1998. From the waste pits, a significant quantity of debris may be generated. The OU1 Proposed Plan proposes the treatment and disposition of a portion of excavated debris from the waste pits in accordance with final OU3 treatment and disposition. During the interval period, the primary coordination issue is the handling of OU1 waste in a manner to facilitate final disposition. Coordination for the treatment and disposition of OU1 materials will be addressed in the OU3 final remedial action ROD. Another coordination issue with OU1 is the use of existing OU3 rail sidings or the construction of new sidings for the transportation of OU1 wastes. Efforts will be made during the sequencing and scheduling of OU3 remediation to ensure that rail sidings remain in place to support OU1 remedial action.

OU2

OU2 contains a small quantity of debris, estimated to be approximately 16,000 cubic yards (CY). The leading remedial alternative for OU2 is to excavate the waste areas and to disposition the waste in an on-property disposal cell. Integration with the OU3 interim remedial action storage strategy is not expected to be an issue for OU2, since the disposal cell is planned to be constructed before any waste from OU2 is excavated. However, the potential exists to have OU3 temporarily store OU2 wastes. Should an OU2 ROD, currently scheduled for publication in 1995, require the excavation and temporary storage of waste in OU3 interim storage facilities prior to 1997 (end of the interval period), the small volume of waste would have a negligible effect on the availability of interim storage space for OU3 during the interval period. This waste volume will be factored in with the waste disposition modeling to be presented in the Material Balance Model described in Section 4.4.

OU4

OU4 is currently scheduled to begin remediation in 1997. The Proposed Plan for OU4 specifies staging all debris and soil resulting from silo remediation for treatment and disposition in accordance with the final remedial action RODs for OU3 and OU5, respectively. Soil and debris resulting from these actions will require storage before treatment facilities are in place to process the materials. As a result, these materials will be stored in accordance with plans for storage of OU3 interim action debris. As planned, if storage within existing structures is available, it will be utilized to the maximum extent practicable. Only if no existing storage space is available will alternate interim storage facilities be constructed. OU4 has planned a contingency for the construction of temporary storage space within the waste storage area if no other space for these materials is available.

OU5

The draft OU5 Feasibility Study Report (November 1994) excludes soil treatment from the leading remedial alternative. Under this alternative soils that do not meet on-site waste acceptance criteria for placement in a consolidation area or a disposal cell would be packaged for off-site shipment. However, it is anticipated that the final OU5 FS Report will consider treatment of soils as a supporting alternative. If soil washing proves to be a cost-effective alternative, achieving the criteria for on-site consolidation and/or disposal in an on-property disposal cell, a treatment facility will be available in early FY-98. The total volume of soil requiring treatment will depend upon the negotiated risk levels for on-site and off-site receptors and the land use options selected for the FEMP.

Should a facility become available for soil treatment, OU4 soils in storage would be processed and soil from new removal activities would be staged for immediate disposition. As OU1 soil is excavated, those soils exceeding on-site waste acceptance criteria would be sent to the OU5 staging area associated with the soil treatment facility. As briefly discussed in Section 3.2.3, the excavation of soils under facilities in the former production area would be coordinated with OU3 at- and below-grade remediation. The timing for excavation of all soils will be coordinated among the operable units to allow operation of the soil treatment facility without the excess accumulation of soils beyond treatment capacity. Groundwater treatment within the AWWT facility is expected to be operational throughout these remediation programs.

As noted earlier in Section 3.2, coordinating OU5 and OU3 remediation schedules will be the most significant and critical coordination tasks to be performed during the OU3 interim remedial action. Since OU3's at- and below-grade dismantlement activities must be coordinated closely with the removal of OU5 contaminated soils, design and scheduling between the two operable units will be essential. Above-grade portions of individual components will be removed according to the sequence logic for component remediation, as discussed in Section 3.2.3. After portions of above-grade facilities have been cleared, the remaining components which are located at- and below-grade (i.e., pads, foundations, and underground utilities, etc.) will then be removed. It is during this task of the OU3 interim remedial action that soil excavation will be planned and coordinated with OU5. This coordination is necessary because of the need to remove exposed contaminated soils immediately following at- and below-grade dismantling activities to prevent further spread of contamination.

In addition to the activities described above, OU3 will be generating contaminated wastewater throughout remediation, primarily from surface decontamination. This wastewater may need

to be treated using existing and proposed OU5 wastewater treatment facilities. Estimates of decontamination wastewater will be made during the design process for each component to ensure that OU5 will have the capability to process these waters. It should be noted that the initial estimates for wastewater volumes have been provided to the appropriate group within OU5 to ensure that OU5 final designs accommodate the volume and types of anticipated wastewaters.

OU5 groundwater monitoring efforts to support the OU3 interim remedial action are discussed in Section 3.7.1.

In an effort to identify the overlap, coordination, and integration of major remedial activities by each operable unit, Figure 3-2 depicts the tentative schedule of remedial action for each operable unit. Figure 3-2 also indicates that the removal of OU3 at- and below-grade components would begin when the proposed OU5 soil treatment facility is fully operational.

3.6 Compliance With ARARs

The activities undertaken as a result of the OU3 IROD must comply with the ARARs and other requirements listed in Section 10 of the IROD. The information contained in this section and in Appendix B (ARARs Attainment Tables) constitute the plan for satisfying permitting requirements as required by the ACA. The purpose of this section is to identify the primary programs and actions that will be taken during the OU3 interim remedial action to ensure attainment of those ARARs and other requirements. Sections 3.6.1, 3.6.2, and 3.6.3 provide detailed discussions on how ARARs will be attained for three specific facets of the decontamination and dismantlement process: control of air emissions; management of contaminated water; and HWMU closures. Section 3.6.4 and Appendix B describe compliance activities for the remainder of the ARARs and other requirements identified in Section 10.2 of the IROD, including such activities as continuation of existing permitting activities.

3.6.1 Control of Air Emissions

The control of air emissions during decontamination and dismantlement activities will occur through the selection and use of techniques that minimize air emissions and through the implementation of engineering controls. Engineering controls will consist of physical barriers, air locks, fixatives, filtration equipment, sealants, water sprays, and wetting agents that will ensure the safety of workers and decrease airborne dust. The Ohio Air Pollution Control Regulations (OAC 3745-17-08) require these and other engineering controls, as well as best management practices to be used during demolition to control fugitive dust emissions (e.g., forced negative air). The performance specifications require the remediation subcontractor to prepare plans detailing methods and materials to control fugitive emissions for various activities (e.g., see Part 1.5.A.3.c. of Section 03315 for concrete removal. Such measures/controls, along with the project-specific air monitoring performed during the decontamination and dismantlement activities (see Section 3.7.3) will also ensure compliance with DOE Order 5400.5 - Radiation Protection of the Public and the Environment (DOE 1990c).

Two areas of the National Emissions Standards for Hazardous Air Pollutants (NESHAPs) with which the FEMP is required to comply are pertinent to the actions to be taken under the selected remedy. The first is a requirement under 40 CFR 61, Subpart H, for monitoring radionuclide emissions from the site and point sources (i.e., stacks/vents). Emissions

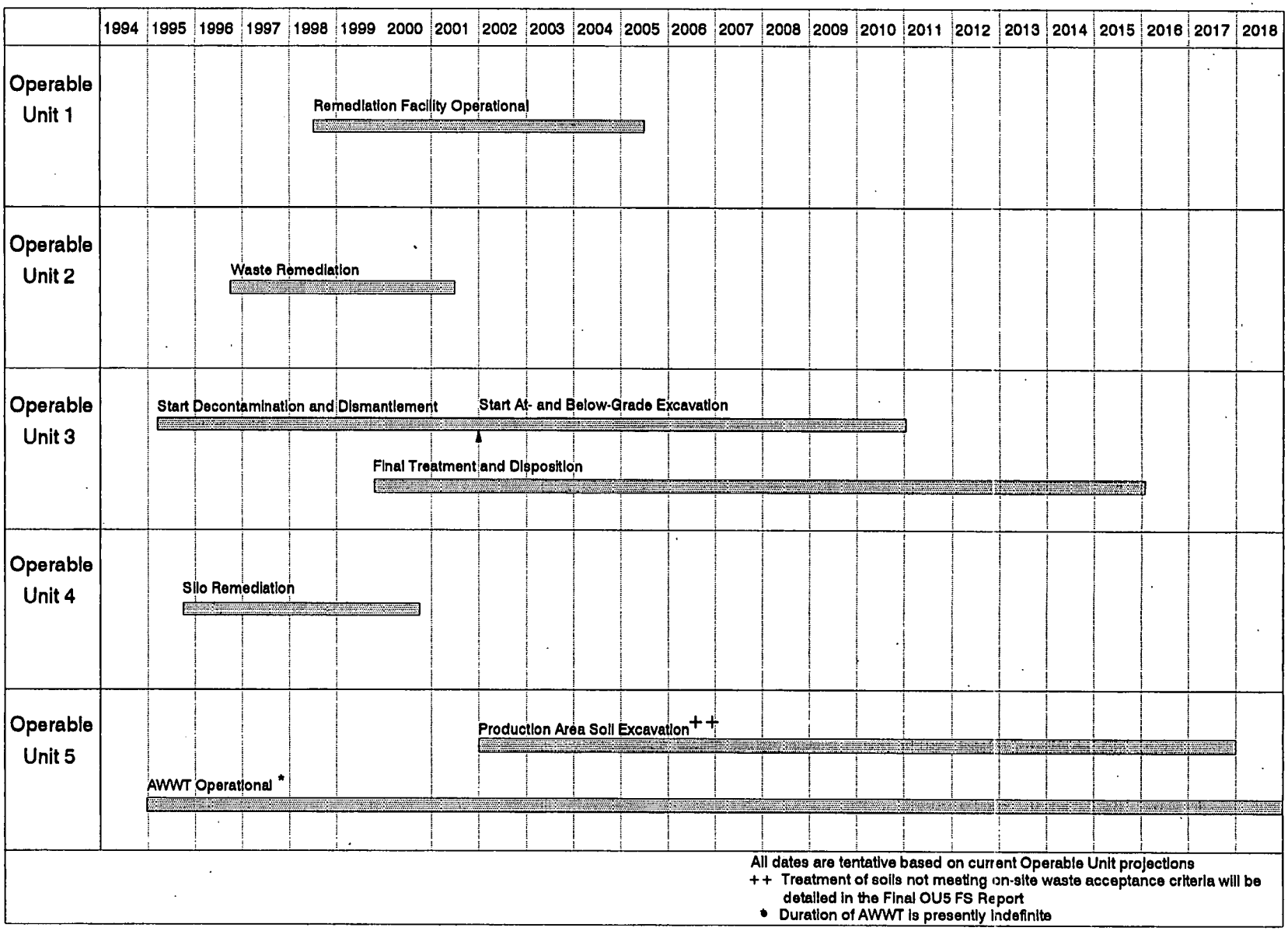

FIGURE 3-2 FEMP Operable Units 1-5 Remedial Action Coordination Schedule

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estimates are prepared for fugitive and point-source air emissions to demonstrate that no off-site member of the general public receives an annual effective dose equivalent in excess of the 10 millirem (mrem)/year standard via the air pathway. Each potential air emissions point source (e.g., a decontamination and dismantlement project) shall be evaluated (by modeling) prior to placement, to determine the contribution that each source has to annual releases and if continuous sampling of the point source is required. Specifically, point sources with the potential for releases that could exceed 0.1 mrem/year dose to any member of these general public will be continuously monitored. Other point sources with a potential to emit radionuclides (but with a potential dose rate less than 0.1 mrem/year) will be evaluated against the factors identified in Section 3.7.3 and monitored accordingly.

The second pertinent area of NESHAPs, 40 CFR 61, Subpart M, includes compliance with applicable asbestos standards for renovation (asbestos abatement) and demolition activities. The FEMP is required to notify the Ohio Department of Environmental Services of its intent to undertake any asbestos abatement and/or demolition project. This local notification serves as notification to both the USEPA and OEPA. The Department of Environmental Services is a multi-county agency which serves this region of Ohio. All subcontractors performing asbestos removal and/or demolition work at the FEMP must also notify the Ohio Department of Health that the project is being undertaken. These requirements are passed on to the remediation subcontractor in Section 01516 of the performance specifications.

Finally, DOE Order 6430.1A - General Design Criteria (DOE 1990a), Section 1324.7 requires that exhaust outlets that contain fission products be provided with two monitoring systems.

3.6.2 Management of Contaminated Water

Water produced during the decontamination and dismantlement activities or from surface runoff during construction will be managed within the project boundary by the uses of engineering and administrative controls. The controls employed will be in accordance with the existing FEMP Stormwater Pollution Prevention Plan (DOE 1994c). For each decontamination phase of a project, the wash water will be collected, containerized, and characterized using a combination of process knowledge and sampling. After the characteristics of the water have been determined, the water may require initial filtration before being transported to the wastewater treatment system or off site for treatment and/or disposal. The water will be managed to prevent flow off site, minimizing the generation of additional waste streams and the spread of contaminants off site. The management of contaminated water will be in accordance with the intent of the Federal Water Pollution Control Act (33 Ohio Administrative Code (OAC) 1251-1376 and 40 Code of Federal Regulations (CFR) 122) relative to impacts on surface waters, and the Ohio Water Quality Standards (OAC 3745-1-01, -04, -07, and -21, and 3745-33) and Safe Drinking Water Act (40 CFR 141) relative to impacts on the drinking water.

3.6.3 HWMU Closures

The OU3 interim remedial action will be performed in accordance with CERCLA requirements and will be consistent with all ARARs identified in the IROD, including compliance with Ohio hazardous waste regulations per the OAC. In particular, activities under the OU3 interim remedial action will be implemented in a manner that ensures efficient integration of all HWMU closure activities. Other activities falling under the scope of the OU3 interim remedial action that must comply with RCRA and CERCLA requirements include storage of mixed low-level

wastes, and the storage, treatment, and disposal of hazardous and mixed wastes generated during the interim remedial action. Storage, treatment, and disposal of hazardous and mixed wastes is discussed in Section 3.4.

3.6.3.1 Integration of CERCLA and RCRA

On February 1, 1994, OEPA and the FEMP began developing a RCRA/CERCLA integration strategy for HWMU closures that could be implemented through an OEPA Director's Final Findings and Orders (DF&O). The integration strategy focuses on dividing the HWMUs into those for which clean closure will be performed through a closure plan under RCRA and those for which final closure will be attained through implementation of response actions under the CERCLA process.

3.6.3.2 Identification of HWMUs

The RCRA program at the FEMP currently identifies a total of 44 HWMUs within OU3 (37 inactive and seven active units for storage of hazardous waste during remediation). Presently, six of these units have been closed or are currently undergoing closure, in accordance with RCRA requirements. Table 3-4 lists HWMUs within OU3 and the corresponding remediation strategies, which consist of either clean closure under RCRA or remediation under a RCRA/CERCLA integrated process.

3.6.3.3 Units to be Clean Closed Under RCRA

Closure Plan Information and Data (CPID) packages will be submitted in compliance with the RCRA closure requirements identified in the SACD for 18 of the 37 inactive HWMUs within OU3. CPIDs specify procedures for closure of HWMUs and each plan constitutes a partial closure of the FEMP facility. Applicable RCRA closure requirements, under OAC 3745-66 (40 CFR 265, Subpart G), require owners or operators of hazardous waste treatment, storage, or disposal facilities to have written and approved closure plans for those units. Clean closure of the 18 HWMUs is anticipated to be complete prior to initiation of interim remedial activities within the respective unit's component. Certifications will be submitted to OEPA for closures completed in accordance with an approved CPID. Some closures will be completed prior to approval of the CPID by OEPA. In this instance, the FEMP will provide OEPA notification that HWMU closures activities have been completed in accordance with the submitted CPID. This notification will provide OEPA the opportunity to inspect and document completion of the HWMU clean closure prior to final remediation. Final remediation (i.e., final dismantlement) of the media, equipment, etc., within the 18 HWMUs will be performed under the interim remedial action upon completion of RCRA closure activities by the FEMP for these units.

3.6.3.4 Unit Remediation to be Completed Under RCRA/CERCLA Integrated Process

The remaining 19 inactive HWMUs, as well as the seven active HWMUs, will be remediated through the integrated OU3 RCRA/CERCLA process as discussed in the DF&O currently under negotiation. As part of this strategy, remediation will occur in these units either through response actions performed by the site work force or by the remedial action subcontractor. Specifically, activities involving the decontamination and dismantlement of the units, including storage and disposal of the materials/wastes generated, and all necessary verification sampling, will be performed in accordance with the substantive requirements of the ARARs for closure of HWMUs under RCRA. The seven active HWMUs used for storage of hazardous

TABLE 3-4 Operable Unit 3 Hazardous Waste Management Unit Closure Status

HWMU Number	HWMU Identification	Component Number	Closure Schedule Submittal\Action *
	INACTIVE HWMUS TO BE CLEAN CLOSED UNDER RCRA		
30	Barium Chloride Salt Treatment Facility	13A	19-Apr-90
3	Waste Oil Storage	31A	17-Feb-95
5	Drum Storage Area South of W-26	15A	06-Oct-92
4	Drum Storage Area Near Loading Dock	15A	02-Mar-94
7	Drummed HF Residue Storage NW of Plant 4A	N/A	24-Jun-93
9	Nitric Acid Rail Car and Area	N/A	31-Oct-94[1]
26	Detrex Still	1A	02-Mar-94
31/32	Bulk Storage Tanks T5 & T6	13D	18-Nov-93
52	North and South Solvent Tanks	13D	5-Jan 95[2]
36	Plant 6 Pads	74J	30-Dec-93
6	Drummed HF Residue Storage	4A	24-Jan-94
38	HF Tank Car	19A	14-Feb-95[3]
8	Drummed HF Residue Storage	19D	To Be Determined
21	Hilco Oil Recovery	5A	To Be Determined
53	Safe Geometry Digestion Sump	1A	13-Feb-95[4]
13	Wheelabrator Dust Collector	66	18-Jul-94
54	Thorium Nitrate Tank (T-2)	13D	15-Nov-95
	INACTIVE HWMUS TO BE COMPLETED UNDER RCRA/CERCLA INTEGRATED PROCESS		
1	Fire Training Facility	73A,B,C,D,E	06-Aug-93
10	NAR System Components	2A	30-Jun-93
11	Tank Farm Sump	19D	To Be Determined
12	Wheelabrator (Building 66)	66	To Be Determined
14	Box Furnace	74R	To Be Determined
15	Oxidation Furnace #1	8A	To Be Determined
16	Primary Calciner	8A	To Be Determined
17	Plant 8 East Pad	74C	To Be Determined
18	Plant 8 West Pad	74D	To Be Determined
22	Abandoned Sump	13A	To Be Determined
25	Plant 1 Storage Building	67	To Be Determined
28	Trane Incinerator	39A,B,74W	To Be Determined
40	Biodenitrification Surge Lagoon	18A	To Be Determined
41	Sludge Drying Beds	25F	To Be Determined
46	UNH Tanks - NFS Storage Area	2E	22-Jun-93
47	UNH Tanks - North of Plant 2A	2A	22-Jun-93
48	UNH Tanks - Southeast of Plant 2A	2A	22-Jun-93
49	UNH Tanks - Digestion Area (2 locations)	2A	22-Jun-93
50	UNH Tanks - Raffinate Building (2 locations)	3E	22-Jun-93

TABLE 3-4 Operable Unit 3 Hazardous Waste Management Unit Closure Status (Cont'd)

HWMU Number	HWMU Identification	Component Number	Closure Schedule Submittal\Action *
	ACTIVE HWMUS TO BE COMPLETED UNDER RCRA/CERCLA INTEGRATED PROCESS		
19	CP Storage Warehouse (Butler Building)	56A	29-Mar-93
20	Plant 1 Storage Pad	74T	29-Mar-93
29	Plant 8 Warehouse	80	29-Mar-93
33	Pilot Plant Warehouse	68	29-Mar-93
34	KC-2 Warehouse	63	29-Mar-93
35	Plant 9 Warehouse	81	29-Mar-93
37	Plant 6 Warehouse	79	29-Mar-93

* Dates are for closure plan submittal as agreed upon in the Stipulated Amendment to the Consent Decree. Dates for closure of HWMUs under the CERCLA/RCRA Integrated Process will be dictated by the schedule provided by the OU3 RD Prioritization and Sequencing Report.
(1) Certification Report to OEPA
(2) Revision 1 (Response to OEPA comments)
(3) OEPA approval CPID (Revision 2)
(4) Letter of closure completion to OEPA
N/A Not Applicable - Unit is not located within the boundaries of an OU3 component.

wastes and listed in the FEMP RCRA Part B Permit Application, are included in the scope of the interim remedial action. Units will continue to be maintained to support the OU3 interim remedial action until hazardous or mixed waste storage is no longer required of these units at the FEMP.

Implementation requirements necessary for proper closure of HWMUs will be specified in the complex-specific implementation plans; upon completion of those activities, reporting will be included in the complex-specific remedial action report. Table 3-5 provides a cross-reference showing where substantive closure requirements will be found within the CERCLA documentation as specified in the DF&O. The DF&O is currently under negotiation. As specific documents are submitted to OEPA for review and approval, a more detailed cross-reference will be provided and updated with each submittal, identifying the specific location of information specific to a particular HWMU.

3.6.4 Compliance with Other ARARs

ARARs are divided into three categories: chemical-specific; location-specific; and action-specific. All chemical-specific, location-specific, and action-specific ARARs and TBCs will be incorporated into the remedial design and complied with during the remedial action. As noted earlier in this section, Section 10.2 of the IROD lists the ARARs, TBCs, and other requirements that the selected remedy must comply with during the OU3 interim remedial action and Appendix B of this Work Plan provide a brief summary of how the OU3 will comply with each of these requirements.

TABLE 3-5 Crosswalk between RCRA Closure Guidance Requirements and CERCLA Documentation for OU3 HWMUs

OEPA Closure Guidance Item	CERCLA Documentation for Above-grade Structural Components	CERCLA Documentation for At- & Below-grade Structural Components
Description/Detailed Drawings of Waste Management Units (Item 3.2/3.4)	Implementation Plan (Section 3, Appendices D and E)	OU5 Remedial Design Documents
List of Hazardous Waste Managed In Units (Item 3.5)	OU3 RI Report, Implementation Plan (Section 3)	OU3/OU5 RI Report
Removal of Waste (Item 3.6)	Implementation Plan (Sections 2.2, and 3)	OU5 Remedial Action Work Plan
Schedule For Closure (Item 3.7)	OU3 RD Prioritization and Sequencing Report, Annual Update of Schedule, and Implementation Plan (Sec. 4.0)	OU5 Remedial Action Work Plan
Health & Safety Issues (Item 3.9)	RD/RA Work Plan, HASP & Project-Specific HASP	OU5 Remedial Action Work Plan
Decontamination Efforts (Item 3.10)	Implementation Plan (Sections 2.4 and 3)	OU5 Remedial Action Work Plan
Remediation Standard for Soil & Ground Water (Item 3.11/23.12)	N/A	OU5 Record of Decision
Sampling Plan to Analytical Procedures (Item 3.13)	OU3 RD/RA, SAP and Implementation Plan (Appendix A)	OU5 Remedial Action Work Plan
Description of Removal Efforts/ Treatment Processes (Item 3.14)	Implementation Plan (Sections 2.2, 2.4, and 3)	OU5 Remedial Action Work Plan and/or Addenda to OU3 RD/RA Work Plan for Interim Remedial Action (Hazardous Waste Treatment Efforts)
Landfill Closure Requirements (Item 3.15)	N/A	N/A
Certification (3.16)	OU3 Remedial Action Report	OU5 Remedial Action Reports
Status of Facility After Closure (Item 3.17)	OU3 Remedial Action Report	OU5 Remedial Action Reports

3.7 Environmental Monitoring

This section discusses monitoring programs that address groundwater, surface water, and air within and at the boundary of the FEMP property. These monitoring programs are designed to monitor contaminant levels within the perched water and groundwater under the former production area, discharge rates of chemicals and radionuclides into the Great Miami River, and ambient air conditions. These three programs are intended to minimize the potential for off-site releases as well as determine effects from site actions on environmental media. Environmental monitoring programs will be developed in accordance with the procedures identified, or referred to, in the SAP (Volume 2). These monitoring programs will specify monitoring approaches which may be supplemented on a project-specific basis to ensure complete/proper monitoring. Each of the environmental monitoring requirements will be incorporated into the remedial design and implemented during the remedial action, if applicable.

3.7.1 Groundwater Monitoring

It is anticipated that additional groundwater monitoring will not be required for project-specific decontamination and dismantlement activities unless a release of contamination occurs or is suspected to have occurred that could potentially impact groundwater quality. The determination for supplemental groundwater monitoring will be made by the responsible Construction project manager, DEC team, and OU5 and OU3 personnel following an assessment of the incident suspected of releasing contamination. OU5 will be responsible for implementing additional groundwater monitoring during above-, at-, and below-grade remediation if it is determined to be necessary.

Groundwater monitoring is currently being conducted by OU5 under two monitoring programs: Removal No. 1 - Contaminated Water Beneath FEMP Buildings; and the Routine Groundwater Monitoring Program. A detailed description of these monitoring programs is included in Sections 3.4.2 and 3.4.3 of the OU3 RD/RA SAP. These two programs currently supply sufficient monitoring data for identifying the effect of the current FEMP activities and are adequate for assessing potential impacts due to planned OU3 remedial activities on groundwater quality. In the event that OU3 decontamination and dismantlement activities require the collection of groundwater samples, these programs will initially provide sufficient data to make a preliminary decision as to whether the activity has affected the groundwater quality and/or if further sampling is necessary.

3.7.1.1 RCRA Routine Monitoring

The routine monitoring system consists of 33 monitoring wells installed at the downgradient property boundaries of the FEMP. The routine monitoring system satisfies RCRA groundwater monitoring requirements for the entire site and additionally provides continual site-wide CERCLA monitoring. The routine monitoring system and alternate program was negotiated with OEPA in the DF&O (OEPA 1993) dated September 10, 1993. The routine monitoring system is described in the July 1993 Project Specific Plan (PSP) for the Routine Groundwater Monitoring Program Along the Downgradient Boundary at the FEMP (DOE 1993e).

The wells included within the routine monitoring system are installed in the upper, middle, and lower regions within the Great Miami Aquifer. The wells are sampled and analyzed quarterly

for metals, radionuclides, VOCs, and water quality parameters. The data quality objective is currently Analytical Support Level (ASL) C, but can be upgraded to ASL D, if required. Groundwater data are compiled, evaluated, and submitted in an annual report to OEPA. Information in the annual report includes:

- groundwater surface level elevations;
- analytical data from the routine monitoring system;
- an update of groundwater-related activities for each operable unit from that of the previous calendar year;
- graphical representation delineating any changes in target parameter contaminant levels for each boundary well that shows changes in groundwater quality; and
- changes in boundary configurations or concentrations of any contamination plume(s) identified. These changes will be related to the routine monitoring system wells as determined by OU5 data from the previous calendar year.

If, during remedial activities, contaminants are identified other than those included in the current parameter list for the routine groundwater monitoring program, the parameter list will be revised to include those contaminants. Order 6 in the Final DF&O addresses handling changes to the routine groundwater monitoring program.

3.7.1.2 OU3/OU5 Groundwater Monitoring Coordination

Even though activities conducted during the OU3 interim remedial action are not expected to impact the groundwater under normal, controlled conditions, it is important that OU3/OU5 coordination efforts be maintained during the interim remedial action. If a contaminant release or activity (i.e., underground storage tank removal) occurs, then OU5 personnel and other appropriate divisions will be alerted immediately. OU5 will determine whether or not there will be a need for additional groundwater sampling and monitoring data to be collected. Data obtained from existing groundwater monitoring programs should provide adequate information to determine the effect of the contaminant release on the groundwater quality. If it is determined during the interim remedial action that existing groundwater monitoring programs are insufficient, consideration will be given to the use of additional monitoring wells that exist on site. If additional monitoring is required, a sampling plan will be submitted to USEPA and OEPA, with details regarding the potential impact due to the release or activity. If sampling results indicate that an impact to the groundwater has occurred due to an activity or release, then a Removal Site Evaluation (RSE) will be initiated to determine if a removal action for the contaminated groundwater should be started. An expansion of Removal No. 1 may also be considered.

The first groundwater region potentially affected is the shallow perched region addressed by Removal No. 1. Under Removal No. 1, groundwater is extracted, sampled and analyzed for constituents of concern, and would serve as an available groundwater monitoring system to support the OU3 interim remedial action. The potential for contaminating groundwater would be evaluated first from within this perched region (Type 1 monitoring wells). If groundwater

samples from the perched region indicate that a release has occurred, then the impact to the Great Miami Aquifer (Type 2, Type 3, and Type 4 wells) would be evaluated.

3.7.2 Surface Water (NPDES)

Existing sitewide surface water sampling programs will continue on the existing schedule of once per week. An outline of the current surface water sampling program activities is presented in the SAP (Volume 2). Activities will be managed to ensure compliance with all effluent limitations and permit conditions stipulated by the National Pollutant Discharge Elimination System (NPDES) permit. The remedial design will include performance specifications that require minimizing the generation of wastewaters during decontamination and dismantlement operations. Close coordination between OU3 and OU5 activities is envisioned for each remediation project to ensure proper handling of wastewaters. Following initial characterization of wastewaters by OU3 for contaminants of concern, wastewaters will be transferred to the AWWT facility or the general sump, as directed by OU5. OU5 will be responsible for monitoring, treatment (if necessary), and discharge of wastewaters that are generated during above-, at-, and below-grade remediation.

3.7.2.1 Wastewater Management

When wash-down of component surfaces is required during surface decontamination, techniques such as high-pressure, low-volume water washing will be employed to minimize wastewater generation. Substances added to the water that are needed to accomplish decontamination and dismantlement objectives will be reviewed for hazardous or toxic characteristics. Optimally, all decontamination materials will be non-hazardous, non-toxic substances capable of being recycled to help simplify treatment requirements and accomplish pollution prevention goals. Decontamination materials that exhibit hazardous or toxic characteristics will be reviewed for treatability by the wastewater treatment system (WWTS).

Liquid waste generated during the OU3 interim remedial action will be collected through an existing sump or other collection system and filtered, then transferred to a U.S. Department of Transportation (DOT)-approved container for storage. The liquid waste will then be handled in accordance with the strategy presented in Section 3.4.2.

3.7.2.2 Stormwater Management

During remedial design, runoff control measures will be specified to protect the storm sewer system, undisturbed land within the former production area, and surrounding drainage ditches from solids build-up. For example, diversion ditches, silt fences, and straw bales may be used to direct storm water to the storm water collection system and to minimize solids in the system. The performance specifications direct the remediation subcontractor to develop a stormwater runoff plan (Part 1.5.A.1.c of Section 01515) and a plan for control of erosion (Part 1.5.A.3 of Section 01515). Each project area will be reviewed for existing drainage patterns and proximity to storm sewer system inlets for the appropriate protection. All runoff control practices will be in accordance with those identified in the existing FEMP Stormwater Pollution Prevention Plan.

Subsequent to completion of below-grade remediation, the site will be stabilized and regraded in an expedient manner. This will include backfill of all excavations and remaining holes as

a result of dismantlement, grading the area in accordance with existing drainage patterns, and seeding the disturbed areas to prevent future erosion, where appropriate.

Debris generated and stockpiled will be stored and, as necessary, protected from exposure to weather by tarps or other temporary enclosures, thus reducing the amount of contamination imparted to stormwater runoff.

Dewatering operations include activities such as pumping perched groundwater to reduce hydrostatic head and pumping accumulated groundwater and/or stormwater runoff from excavations. Decisions for pumping groundwater will be based on existing groundwater monitoring data. The discharge criteria for groundwater will also be used for decontamination wastewater. The pumping of excavations will be decided on a case-by-case basis, depending on how the excavation came into being and the source of the water in the excavation.

3.7.2.3 OU3/OU5 Coordination of Surface Water Management

Prior to the generation of wash waters, the wastewater management group of OU5, as well as the WWTS operators, will be notified of the wastewater volume to be generated and the types and concentration of pollutants encountered for all waste streams discharged to the WWTS. Through this coordination effort, appropriate treatment of wastewaters and the capacity to handle anticipated volumes of wastewater will be ensured. The schedule for remediation of OU3 components (to be specified in the OU3 Remedial Design Prioritization and Sequencing Report) will also integrate the requirements for operating wastewater treatment facilities under OU5 wastewater management programs.

3.7.3 Air Emissions Monitoring Program

The air emissions monitoring program that will support the interim remedial action consists of three separate sub-programs. The Fernald Site Environmental Monitoring Program and the Occupational Air Monitoring Program are established programs that will continue throughout the interim remedial action. The third sub-program, which has been developed specifically for the interim remedial action, is a supplemental environmental air monitoring program that provides remedial action-specific air monitoring support to primarily determine effectiveness of project control measures. Although the primary contaminant of concern during remediation will be radionuclides, air monitoring will be performed for all contaminants of concern (e.g., asbestos during asbestos removal activities) under the appropriate program.

Radiological environmental monitoring will continue under the Fernald Site Environmental Monitoring Program to monitor radiological emissions from the FEMP on a weekly basis. Data will be collected during the implementation of the interim remedial action from the air monitoring stations located on site, near the fence line, and at several locations in nearby communities. This monitoring program has been developed in response to DOE Orders 5400.1 and 5400.5 and is presented in the Fernald Site Environmental Monitoring Plan, PL-1002.

The Occupational Air Monitoring Program, addressed by the RD/RA HASP (Volume 2), will be performed using a combination of personal air samplers, breathing zones, and general area sampling methods to assess personal exposure to airborne contaminants (i.e., radioactivity, asbestos, carbon monoxide) and atmospheres that present a risk to workers. This monitoring

program has been developed in response to Radiological Control Manual, DOE 10 CFR 835 and is presented in the FEMP Environmental Safety and Health procedures manual.

The project-specific air monitoring program will be implemented to monitor project-specific action during decontamination and dismantlement activities. The program will be implemented in response to any of the following concerns: if the maximum release estimates exceed 0.1 mrem/year; if the potential exists for radiological air emissions for a given operation within a facility; or to address public concerns. Although the methodology for the supplemental air monitoring program has been developed, individual project-specific air monitoring plans will be developed during the remedial design and detailed in the project-specific implementation plan. The supplemental air monitoring program provides data on the effectiveness of control measures on a project-by-project basis by comparing field readings during remediation to a baseline concentration determined over a period of pre-remediation background monitoring (typically an eight week period). If airborne concentrations are detected above background levels at nearby receptor locations, contingency measures will be implemented to reduce contaminant emissions. If the 0.1 mrem/year threshold value is exceeded, work may be stopped, exposed areas covered or otherwise controlled, and engineering controls increased prior to restarting work.

During remedial design, the factors listed below will be considered to determine the requirements for the project-specific air monitoring program.

- Project-specific phases and activities that have the potential for radiological air emissions, and the type of monitoring (continuous vs. grab) that should be performed. Continuous sampling is desirable if airborne radionuclide concentrations have the potential to fluctuate widely.

- The need for pre- and post-project monitoring. This data is necessary for comparing data that is obtained during each project. Such data will also be used to verify the success of decontamination techniques.

- The potential hazard of the materials available for release, considering both the expected quantities and relative radiotoxicities. The review of previously obtained characterization data of radionuclides in a particular component, including ratios to other non-measurable radionuclides, is necessary since the control of radionuclide releases depends on the source available and any treatment system used.

- The expected dispersion of airborne releases, including predominant wind directions and the degree to which the radionuclides of concern may be diluted or reconcentrated in the biosphere. Air monitors will generally be concentrated downwind of the monitoring facility, but monitors in all directions are desirable.

- The length of time required to complete each activity that has the potential to cause fugitive emissions.

- Representativeness. Measurements should be made at the points/areas at which the data best represent what is being released to uncontrolled areas.

- Other demolition projects being performed at the same time. More than one project may be occurring simultaneously. Project-specific monitoring with results that can be attributed solely to one project may not be possible.

- The radionuclides or analytes to be measured. Gross radioactivity measurements will probably be inadequate, except under the following circumstances: when gross radioactivity releases are a small fraction of the off site Derived Concentration Guide (DCG) values for "unidentified" mixtures; when ratios of specific radionuclides are sufficiently known (and constant) for which gross activity measurements are truly indicative; and when radionuclide concentrations are so low as to preclude specific nuclide measurements.

- Accessibility to the air monitoring station for maintenance and calibration.

Further details regarding the air emissions monitoring program, including the three sub-programs, have been included in Section 3.4.1 of the SAP (Volume 2 of this Work Plan). The SAP provides sampling and analysis strategies for implementing each sub-program during the interim remedial action.

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Section 4

4.0 TASK PLAN DESCRIPTION

This section describes the six primary programmatic tasks that DOE and subcontractors will perform prior to and during the OU3 interim remedial action.

4.1 Task 1: RD/RA Work Plan Preparation

The OU3 RD/RA Work Plan for the Interim Remedial Action has been prepared concurrent with the development of the OU3 PP/EA and the IROD through extensive coordination among all FEMP groups responsible for implementing the interim remedial action. The preparation of the Work Plan included the following subtasks:

- identifying remedial objectives required by the IROD and developing an approach to achieve those objectives (Section 1.2);
- summarizing the latest information regarding the current description of OU3 and the nature and extent of contamination in OU3 (Sections 2.2 and 2.3);
- developing a strategy for documenting remedial design and remedial action requirements in a phased manner over sixteen years (Section 3.1);
- developing an overall approach to sequencing and scheduling the design and remediation of 232 components (Section 3.2);
- identifying remedial tasks and the methods/technologies available to accomplish these tasks (Section 3.3);
- developing preliminary estimates for material to be generated during the interim remedial action and establishing a strategy for managing this material (Section 3.4 and Appendix A);
- integrating and coordinating OU3 remedial planning with remedial planning for other operable units and other site activities (Section 3.5);
- identifying environmental compliance issues, monitoring activities, and a plan for attainment of ARARs (Sections 3.6, 3.7, and Appendix B);
- identifying the tasks and subtasks needed to perform actual remedial design and remedial action activities (Section 4);
- identifying the need to revise the sitewide community relations plan to reflect OU3 RD/RA activities and identifying RD/RA specific community relations activities that will be performed until the plan is revised (Section 5);

- presenting schedules for RD/RA planning and for development of a detailed sequencing and scheduling report for the interim remedial action, and identifying deliverables to regulatory agencies and for internal use (Section 6);

- identifying project functional organizations and responsibilities (Section 7); and

- preparing the major project plans to support the RD/RA efforts, including the Sampling and Analysis Plan, Health and Safety Plan, Operations and Maintenance Plan, and Construction Quality Assurance Project Plan (Volume 2 of this Work Plan).

These elements are included in this RD/RA Work Plan or presented in subordinate documents submitted concurrently. Due to the long-term nature of the interim remedial action, remedial strategies developed for this Work Plan may be revisited and amended through modification(s), as appropriate.

4.2 Task 2: Sequencing of OU3 Complexes for Remediation

Using the concept of economies of scale, the expenses for a decontamination and dismantlement program can be reduced significantly by addressing multiple components in a single project as opposed to the remediation of components as individual projects. Therefore, the above-grade portion of individual components will be combined into complexes, as discussed in Section 3.2.1, to reduce remediation costs.

Once the components are merged into complexes, the next step is to develop a prioritized ordering of the complexes for remediation, as discussed in Section 3.2.2. This ordering, or sequencing, in theory, represents the ideal case for the remediation of OU3. However, scheduling, funding, and logistical constraints may make this sequence unachievable. Therefore, the sequencing serves as the driver for developing the base schedule (as discussed in Task 3). The sequence would act as the "tie breaker" in the event that more than one complex would be available for remediation at a given time.

The results of Task 2 will be presented in the OU3 Remedial Design Prioritization and Sequencing Report, as discussed in Section 6.3.

4.3 Task 3: Interim Remedial Action Scheduling

The objective of the third task, complex scheduling, is to develop and present project schedules for the OU3 interim remedial action that can be utilized as effective tools to manage the remediation of OU3 components. Developing a component remediation schedule is important to establish a baseline plan for the interim action. Section 3.2.3 describes the methodology to be used in both developing and revising an initial long-term base schedule that represents the overall schedule of remedial activities for the entire interim action.

The development of a five-year schedule involves applying established funding levels to the base schedule to determine a five-year forecast for the decontamination and dismantlement

of OU3 components. The methodology to be used in developing this five-year forecast is presented in Section 3.2.4.

Task 3 will involve extensive coordination among many FEMP programs, as well as strategic planning for the site's eventual use. Input will be solicited from the public, regulatory agencies, FEMP organizations responsible for other operable units and support operations, and various organizations involved in planning the remediation of the FEMP.

The results of Task 3 will be presented in the OU3 Remedial Design Prioritization and Sequencing Report, as discussed in Section 6.3. The assumptions and component scheduling constraints will be reviewed and updated, as necessary, according to any changing plans, programs, and/or agreements between DOE and the regulatory agencies. The updated base and five-year schedules will be revised, as appropriate, and submitted to the agencies annually to establish or revise enforceable milestones for the project.

4.4 Task 4: Material Balance Model

Concurrent and integral with the development of the OU3 Remedial Design Prioritization and Sequencing Report (discussed in Section 6.3) is the task of developing a Material Balance Model to evaluate, based on material disposition options during the interval period, the impact of the base schedule on the capacity by OU3 facilities to temporarily store material from OU1, OU3, and OU4 remedial actions, removal actions, and other FEMP activities. This analysis will identify the impact of using existing storage facilities on the base schedule. The need to project material flow beyond what the OU3 interim remedial action generates is essential because material handling and storage facilities will potentially be shared among the operable units. Both plans allow the flexibility as critical needs arise during the OU3 interim remedial action. It must be emphasized that the Material Balance Model is primarily a strategy document that will be reevaluated in the event of any changes to the base schedule. Material disposition decisions and strategies provided by the OU3 final remedial action may also necessitate a reevaluation of the material balance.

The Material Balance Model will allow for scenarios to be developed to assist with the sequencing and scheduling for the removal of facilities. The model will take into account the waste management schedules to ship legacy wastes, waste container movements (container consolidation among warehouses), dismantlement of storage facilities, and budgets. This model will also provide planned storage locations of other remediation projects that may be implemented during the OU3 interim remedial action.

The Material Balance Model will be prepared and submitted to the USEPA and OEPA for review and comment as Appendix A of the OU3 Remedial Design Prioritization and Sequencing Report. The Material Balance Model will address the following elements:

- type and volume estimates for the future generation of material from the OU3 interim remedial action, removal actions, other operable units and other FEMP activities;

- available storage space and requirements for each storage facility on a schedule integrated with the sequence/proposed sequence of material generation by site-wide activities; and

- off-site shipping schedules for inventory and product residues, construction debris, thorium wastes, legacy wastes, and newly generated wastes from other OUs, removal actions, and other on-going site projects. The Material Balance Model will be updated as needed, until it is superseded by the material disposition strategy provided by the OU3 final remedial action, along with the schedule for the OU3 interim remedial action by summarizing substantive changes to the original plan.

4.5 Task 5: Remedial Design

The remedial design process will be phased over the course of the interim remedial action, through the development of a design package for each complex. Figure 4-1 provides an overview of the design and bid package process. Remedial design tasks will address asbestos removal, HWMU closures, decontamination, dismantlement, segregation, interim storage/staging, and disposition of all material/waste generated. Each design task consists of the following four major subtasks: Preliminary Design, Intermediate Design, Pre-Final Design, and Final Design. Pulling together this design material for summarization, and submittal to the regulatory agencies, a final task involves the development of the implementation plan.

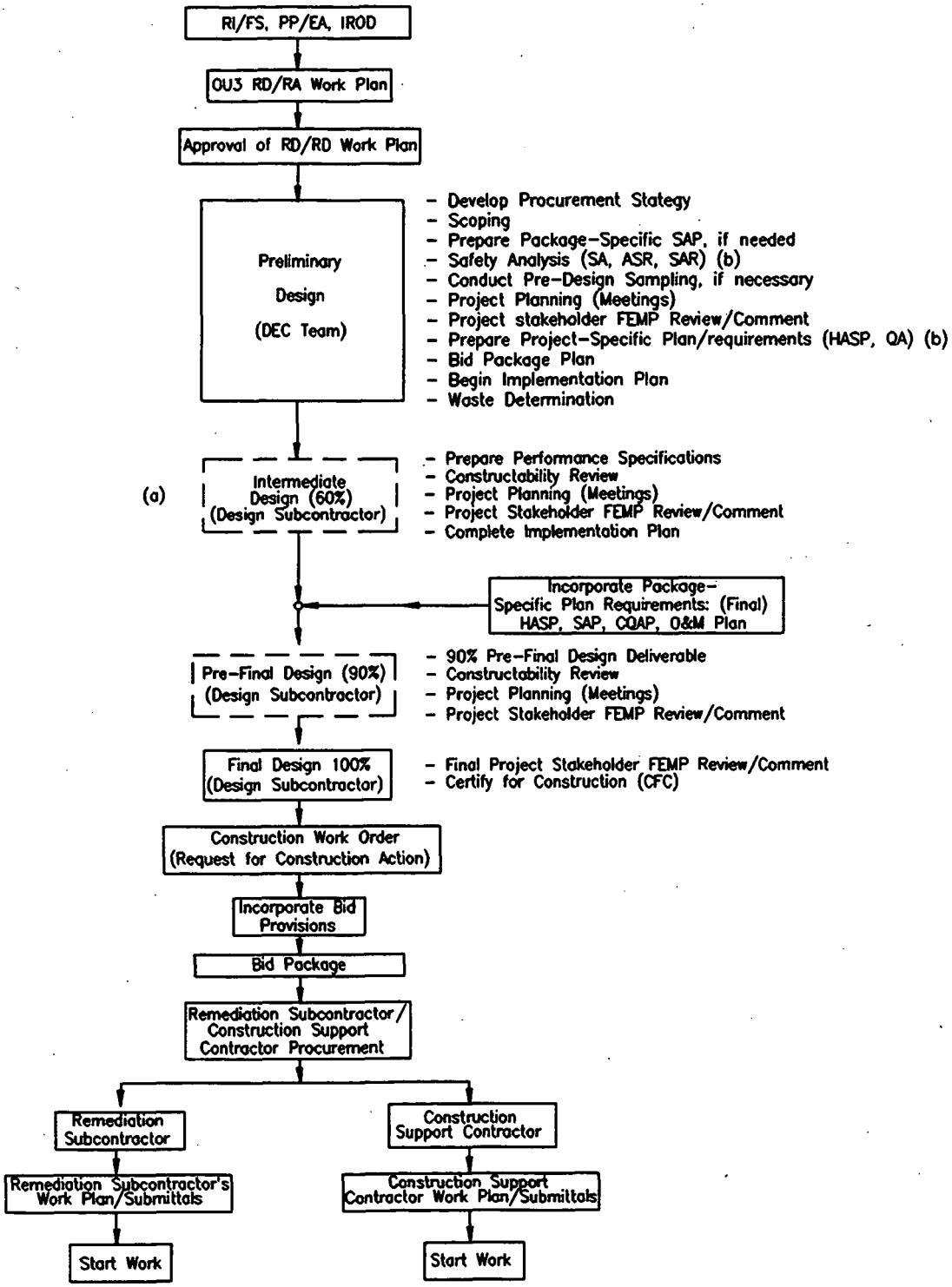
Throughout all remedial design tasks, the value engineering process will be performed to develop alternative concepts that may produce a reduction in project costs and/or life-cycle cost of the project. An independent multi-disciplinary engineering team will evaluate the alternative concepts for feasibility and compliance with the design and performance objectives of the project. The value engineering team, consisting of various FEMP organizations and the remedial design subcontractor, will analyze and document alternative functions, design approaches and activity sequences, and may consider other factors such as public acceptance. Project refinements will be limited to avoid significantly altering the intent of the IROD, unless otherwise approved by USEPA. When the value engineering process is implemented during the interim remedial action, the intent of the Office of Solid Waste Emergency Response (OSWER) Directive 9355.0-4A and DOE Order 4010.1A will be met.

A Design-Engineering-Construction team (*DEC team*) will be formed to facilitate completion of the remedial design activities for each design package. Organizational representation on the DEC team and responsibilities of the DEC team are discussed in Section 7.

4.5.1 Preliminary Design

The DEC team, will develop a Preliminary Design scoping document to establish the framework for completing the remedial design and remedial action activities. This document will include the following sections:

<u>Project Description</u>
This section defines the scope of remedial activities, the purpose of the project, a brief process history of components, and a description of the remedial action activities required to



Footnotes: (a) - Dashed-lined box presents potentail intermediate review stages of design
(b) - SAR: Safety Analysis Report, ASR: Auditable Safety Analysis Report
- QA: Quality Assurance

FIGURE 4-1 Overview of the Design Package/Bid Package Development Process

meet the purpose.

Project Justification
This section summarizes the drivers to perform remedial activities on a complex basis and describes the need to complete this complex in the sequence selected.

Conceptual Drawings
The conceptual drawings provide the extent of the remedial activities in relation to surrounding site conditions.

Applicable Codes, Standards, ARARs, and Specifications
This section reiterates the need to perform all activities in accordance with all applicable federal, state, and local environmental laws and regulations and the ACA.

Budget Data
This section describes the funding sources for the project through the DOE activity data sheets and the project work breakdown structure.

Preliminary Cost Estimate
This section provides the preliminary cost estimate and identifies the need to perform a detailed estimate during pre-final design.

Schedule
The Level I schedule identifies the requirements to track the project from preliminary design through subcontract award. Critical path activities are added to the schedule to incorporate the needs of all project participants.

Statement of Work Methods
The Statement of Work (SOW) provides a flow diagram depicting the general requirements (Level I schedule) from preliminary design to project closeout. The work methods section also describes the primary job responsibilities for the organizations involved in the project. This section includes:

- labor determination;
- preparation of the bid package, evaluation of bids and remediation subcontractor award recommendation;
- preparation of the Certified for Construction (CFC) design package and obtaining preliminary design permissives which includes real estate approval to remove structures;
- preparation of performance specifications; and
- detailing remedial action tasks (Level II scheduling).

Special Conditions
This section depicts project-specific conditions that are unique to the project including pre-qualification requirements for the remediation subcontractor.

Possible Alternatives
This section states a team independent of the DEC team will be formed to use value engineering concepts for defining alternative concepts and cost saving measures.

Environmental Assessment, Health and Safety Plan, Safety Assessment, Risk Assessment, Quality Assurance

These sections state the need to develop project-specific plans and review current documentation to ensure compliance with project requirements.

One preliminary design scoping document will be developed for each design package (i.e., for each OU3 complex).

In addition to developing the preliminary design document, the DEC team will begin to define procurement strategies; long-lead permitting requirements; and coordination needs between safe shutdown activities, other operable units and other site organizations. These organizations could also begin key planning activities related to primary material management as discussed in Section 3.4.1.

During preliminary design, efforts will also be undertaken to identify additional characterization requirements. If HWMU remediation is to be undertaken, the verification sampling discussed in Section 3.6 of the SAP should be defined at this stage. Sampling needed to support materials management should also be defined through the planning activities discussed above. If any baseline monitoring is needed to support assessment of the environment monitoring during decontamination and dismantlement, as discussed in Section 3.4 of the SAP, this sampling could possibly be defined at this point.

The final task of the preliminary design is to develop the remedial design subcontractor's SOW based on the approved preliminary design scoping document (refer to Section 6 for approval requirements). The remedial design subcontractor has the primary responsibility to prepare the intermediate and pre-final design elements through CFC with the assistance/oversight of the DEC team.

The remedial design subcontractor's SOW will consist of the following elements: a description of the work to be performed; the design methodology; design criteria; design deliverables; and other support functions required from the remedial design subcontractor (i.e., meeting participation, additional characterization requirements, submittal reviews and field support during the remedial action). One design SOW will be developed for each design package (i.e., for each OU3 complex).

Design Methodology
The design methodology element of the SOW will be developed, taking the following factors into consideration: component and building configuration, location, structural integrity, types and levels of contamination, and construction type (see Section 3.3); requirements of the OU3 IROD (i.e., ARARS and TBCs); other requirements Engineering/Construction procedures); the

"as low as reasonably achievable" (ALARA) principle; waste minimization requirements; available decontamination, dismantlement, size reduction, and segregation technologies; schedule and funding constraints; the potential need for pre-design studies; division of labor issues; special regulatory considerations (i.e., HWMU issues); and monitoring/sampling requirements. The design methodology developed to support the SOW will meet the conceptual design requirement set forth in DOE Order 4700.1-Project Management System (DOE 1992a).

Design Criteria

Design criteria will include studies, reports, and data related to the project; required formats for document/design submittals; and special design requirements for issues such as HWMUs (i.e., closure requirements/certification). The design criteria established to support the SOW will meet the intent of the design criteria requirement set forth in DOE Order 4700.1.

Design Deliverables

The design deliverables section will detail each of the remedial design subcontractors deliverables with associated due dates. These items include but are not limited to the development of performance specifications, drawings, videos, and photographs.

4.5.2 Intermediate Design

Project design for each complex may necessitate review of the design comments between the preliminary and pre-final/final design phases. At the discretion of the DEC team, a design submittal review may be required at 60 percent completion of the design. This submittal should consist of plans, specifications, and engineering drawings reflective of the expected progress at this point of the design. All design-oriented items will be formally reviewed by the DEC team. Formal written comments will be provided to the remedial design subcontractor who, in turn, will provide written responses that propose comment resolution.

4.5.3 Pre-Final Design

During the pre-final design phase, project-specific design plans, drawings, and specifications representing approximately 90 percent completion will be submitted by the remedial design subcontractor for internal review. All design-oriented items will undergo a formal internal review. Formal written comments will be provided to the remedial design subcontractor who in turn will provide written responses which indicate proposed comment resolution. Subsequent to approval, comment resolutions will document changes required to drawings and specifications for final approval. The Pre-Final Design work is parallel to Title I and Title II Design set forth in DOE Order 4700.1.

Pre-final Design includes the preparation of the: (1) engineering design, drawings, videos, and photographs; (2) specifications; (3) project plans; (4) engineering survey; (5) cost estimate; and (6) schedule.

Engineering Design, Drawings, Videos, and Photographs

As part of the remedial design, engineering drawings, and photographic images will be prepared to convey the following: existing conditions; project boundaries; potential staging; lay-down and turnover areas; utility disconnect points; utility installation locations; recommended and optional dismantlement techniques; container sizes and configurations;

floor loading restrictions; ventilation requirements; and other requirements associated with the remedial design. To the extent practicable, existing drawings will be utilized to depict existing conditions. If the use of existing drawings is not feasible, new engineering drawings will be generated. The required format/presentation for engineering drawings will be included in the SOW to the remedial design subcontractor. Design drawings will usually include the information listed below:

General

- list of symbols and abbreviations; and
- access to the components in the complex.

Plans for Each Project

- project boundaries;
- project site topography;
- project grading and excavation;
- plans and elevations for existing buildings, utilities, drainage, yard piping;
- location of field offices, borrow pits, staging areas, and storage areas;
- location of future storage areas, monitoring wells, containment systems, utility hookups; and
- project site restoration.

Process Design (if required)

- process descriptions; and
- mass and energy balance.

Videos and photographs have proven to be an excellent means of conveying existing conditions in the design package. If desired, videos and photos can be detailed to convey design and removal requirements as well. According to the Advisory Council on Historic Preservation Guidelines, the Ohio Historic Preservation Office has determined that the structures found at the FEMP are of historic significance and are eligible for inclusion on the National Register of Historic Places. To comply with the National Historic Preservation Act, photographic images and engineering drawings will be generated prior to remedial activities in order to document the architectural and historical significance of the site.

Quality assurance criteria will be developed on a project-specific basis and presented to the remediation subcontractor as part of the bid package.

Specifications

Design specifications will be prepared for all major remedial and construction activities. A variety of technical specifications will be developed and included in each design package. The technical specifications used to communicate the project requirements to the remediation subcontractor will be in the form of performance-based specifications. Performance specifications differ from detailed specifications in that the remediation work methods are not specified in the former type. The performance specifications state what is to be done; what regulations, codes, and standards apply; and any limitation on activities, while leaving details of task implementation to the remediation subcontractor. This approach allows the remediation subcontractor to use experience and existing equipment in the development of a competitive bid. By allowing maximum remediation subcontractor flexibility in the decontamination and dismantlement methods to be used, the costs will be minimized. The remediation subcontractor will be required to submit work plans for review and approval. Those work plans will contain the specific methods to be used to meet the requirements of the performance specifications. The performance specifications prepared for the Building 4A decontamination and dismantlement project have been included as Appendix C to this Work Plan, as an example of those to be prepared for other projects.

Project-Specific Plans

Project-specific plans to supplement the general project plans will be developed for the pre-final design for complex projects, and will consist of project-specific documents that support the remedial activity. The project-specific plans are SAP addenda and *project-specific HASP*s.

SAP Addenda - It is anticipated that OU3 RI/FS data, process knowledge, and other existing data will meet the primary data needs for determining the nature and general extent of contamination on or in the material generated during the implementation of the OU3 interim remedial action. Existing data and process knowledge will be evaluated during the preliminary design stage. If it is determined during remedial design that additional data is needed to support the action, a systematic approach for data collection will be developed in accordance with the SAP through the preparation of project-specific SAP addenda. This data will support decisions concerning interim debris/waste material segregation, storage/staging, and disposition. It is also envisioned that such information may be used to support waste management decisions (e.g., treatment/disposal) for the OU3 final remedial action ROD. Sampling requirements that may be necessary during the remediation will be incorporated into the design. The SAP addenda will identify the following general components:

- site background;
- sampling objective(s);
- sampling location and frequency;
- sampling designation;
- sampling equipment and procedures; and
- sample handling and analysis.

Project-Specific Health and Safety Plan - The purpose of the project-specific HASP is to provide health and safety guidance for protecting workers during implementation of the interim remedial action. Specific health and safety guidance and requirements for each major decontamination and dismantlement project will be identified in a project-specific HASP and Health and Safety Requirements Matrix and included in each design package to provide activity-specific health and safety requirements. Based on the package-specific health and safety requirements, the remediation subcontractor will prepare its own health and safety plan. The project-specific HASP identifies the following components:

- project organization and responsibilities;
- hazards associated with the project tasks;
- worker training requirements;
- personal protective equipment for each project task;
- medical surveillance requirements;
- frequency and types of air and personnel monitoring;
- site control measures;
- decontamination procedures;
- emergency response and contingency plans;
- confined space entry procedures, if needed; and
- other standard operating procedures.

Engineering Survey

In accordance with 29 CFR 1910.850, Subpart T, an engineering survey will be performed. The remedial design subcontractor will perform this survey during the design, and complete a report for incorporation into each design package. This survey, performed by a Professional Engineer registered in the State of Ohio, shall include the components identified for that design package to determine the condition of the framing, floors, and walls and the possibility of the unplanned collapse of any portion of those components.

Cost Estimate

A project cost estimate will be prepared that addresses all decontamination and dismantlement project-related activities including construction, operations, maintenance, permitting, sampling and analysis, shipping, disposal (if applicable), administrative, decommissioning, closure, and contingency costs for the project. The cost estimate will provide a detailed breakout of remedial cost and include vendor and subcontractor estimates for the major tasks. The final project cost estimate should be within -10 percent to +15 percent of actual costs.

Schedule
A project schedule that includes a breakout of the tasks required for remediation will be prepared.

4.5.4 Final Design

Final Design represents a design effort that is 100 percent complete and is ready for incorporation, either in part or total, into the bid package for distribution to prospective remediation subcontractors during the bid process. All comments from the review of the Pre-Final Design will have been incorporated through comment resolution. The Final Design, as prepared by the remedial design subcontractor, will undergo formal review and approval. Approval will be indicated by the signatures of cognizant personnel from the FEMP organizations responsible for design review and those of the design subcontractor. Approved drawings and specifications will be issued as CFC and included in the design package. Engineering will develop and issue a Request for Construction Action document to CFC for the design process. The Request for Construction Action contains the following information:

- scope or SOW;
- drawings/specifications/sketches;
- schedule;
- PWID;
- project-specific HASP, safety assessment, and preliminary hazard analysis;
- equipment to be ordered; and
- construction interaction requirements:
- safe shutdown and waste management operations;
- pre-subcontractor site preparation;
- interacting construction projects; and
- operations interfaces.

This design phase completes work parallel to Title II Design set forth in DOE Order 4700.1. The Final Design document will be provided to the USEPA and OEPA upon request.

4.5.5 Implementation Plan

An implementation plan will be prepared for each project and submitted to USEPA and OEPA for review, comment, and approval in accordance with the schedule established in Section 6.1. The implementation plan, which will in most cases be prepared prior to the pre-final design phase using performance specifications, the remediation subcontract SOW,

environmental monitoring requirements (already developed by that stage), will provide a summary of the key elements of a specific design effort that are pertinent to the remediation of one or more buildings/components contained within that design package. It summarizes all project-specific information developed during the remedial design that document how a project will be performed in compliance with the requirements of the OU3 IROD. Listed below are the are the key elements of the remedial design that will be included in each implementation plan.

- an introductory section which provides a project statement, scope of work, and description of the components that make up the project;
- a section which describes the general project remediation approach; including sequencing (if more than one component is included in the project), characterization, material management, environmental monitoring, design drawings, site preparation requirements, references to applicable performance specifications, and remediation activities;
- a section which describes the component-specific remediation approach for each of the components in the project, including requirements for preparatory actions (inventory removal and safe shutdown), HWMU closure, asbestos removal, surface decontamination, and above-grade/at- and below-grade dismantlement, with references to applicable performance specifications;
- a schedule for implementation and deliverables;
- a section describing how the project will be managed; and
- appendices which contain summaries of proposed sampling to support the decontamination and dismantlement activities, potential contaminants, a listing of the performance specifications, selected design drawings, and photographs.

4.6 Task 6: Remedial Action

This section describes the activities that will be performed by the FEMP construction manager and subcontractors, to implement and manage the remedial action, including: subcontractor procurement, execution of work, oversight activities, and documentation and certification of action. The following discussions detail the scope of work and oversight and inspection processes.

4.6.1 Remediation Subcontractor Procurement

Statement of Work

Developed during the remedial design, the remediation SOW defines the activities that the remediation subcontractor will be required to perform. This SOW is a subset of the overall RD/RA project SOW developed by the remedial design subcontractor. The remediation SOW identifies the following project-specific information and requirements for a project:

- General Scope of Work;
- Specific Description of Work;
- Material, Equipment or Services Furnished by the FEMP;
- Interfaces and Restraints;
- Temporary Facilities and Utilities;
- Site Location, Access, Laydown Areas and Limits of Construction Area;
- Work Hours;
- Performance Schedule and Sequence of Work;
- Pay Item Schedule;
- Requirements for Subcontractor's Schedule;
- Subcontract Progress Report;
- Submittals; and
- Alignment and Kickoff Meeting.

Prequalification

Qualifications required for potential remediation subcontractors will be specified in the bid documentation. These qualifications address safety record, similar work experience, government contracting experience (determined on a package-by-package basis), etc., and may range from normal construction experience to very sophisticated experience on heavy industrial and/or hazardous waste sites.

The request for qualifications of prospective bidders is advertised in the *Commerce Business Daily*. "Dodge Reports" and the Cincinnati-Dayton Business Development Center are also used for advertisement. The advertisement identifies the type of work to be contracted and the minimum qualifications for bidders. Qualified and interested bidders are asked to submit an expression of interest. The purpose of the advertisement is to pre-qualify prospective bidders by evaluating their response to the request to determine whether or not they indeed meet the qualification standards. Only pre-qualified prospective bidders will receive a bid package.

Award of Contract

Once all Expressions of Interest from prospective bidders have been received and evaluated, a pre-bid meeting will be held with all qualified bidders. This pre-bid meeting is intended to allow an opportunity for all bidders on a remediation subcontract to resolve questions about the bid package, site policy, and site conditions. The pre-bid meeting may include a tour of the remediation area as well. Typical topics covered at the meeting include the following: introductions; bid and award; scope of work; terms and conditions; project labor agreement

and related documents; substance abuse program; radiation protection requirements, safety plan, special hazards and safety training specific to remediation subcontract; security; quality assurance plan and quality control requirements; temporary utilities and facilities; schedule requirements, milestones, and work coordination; pay item schedule; reporting; invoicing; and submittals.

Following bid opening, the bids are reviewed to ensure that the apparent low bidder is responsive and responsible. Determination of responsiveness is based on proper completion of bid forms, acknowledgement of amendments, and submission of the bid bond. The apparent low bidder will be deemed responsible if this bidder possesses the capability and experience as required in the solicitation to perform the remedial action in a safe and timely manner at the bid price. In addition, a list of questions will be developed for the apparent low bidder which is designed to demonstrate that the bidder understands the SOW, the design methodology, safety and health requirements, and QA requirements. Responses are evaluated to determine if the apparent lowest bidder is both responsive and responsible. If the apparent lowest bidder is determined to be neither responsive nor responsible, the next lowest bidder will be evaluated.

Following determination that the apparent low, responsive bidder is responsible, the contracts administrator recommends award. The recommendation is reviewed based upon authorization thresholds established by DOE. The award is then made to the lowest responsive, responsible bidder.

Identification of tasks during the planning phase and their sequence for implementation form the basis for work sequencing. During bid document preparation, tasks assigned to the remediation subcontractor will be identified. Mandatory work phase sequences may be identified in the bid documents to ensure that hazards are minimized.

For example, the DEC team responsible for scoping and directing the implementation of the Plant 7 Dismantling Removal Action decided that removal of interior asbestos and "lock down" of loose contamination on the interior surfaces of the building should be undertaken using the construction support subcontractor under a labor-hour contract. A firm-fixed-price subcontract was awarded to a subsequent subcontractor for removal of piping, ductwork and equipment, transite, concrete, and structural framing.

As discussed in Section 3.3, Inventory Removal, Safe Shutdown, and HWMU closure activities will probably be accomplished by site labor forces. It is anticipated that the remaining key activities will be included in an above-grade bid package. Most at- and below-grade remediation activities for the same area will be handled under a separate bid package that will be bid in conjunction with OU5 soil remedial action.

4.6.2 Design Reviews

The remediation subcontractor will submit project-specific information, as required, and ensure that remedial action activities meet the requirements set forth in the remedial design. Typical documents/submittals that may require review/input during this oversight may include: the remediation subcontractor's work plans, quality assurance plan, asbestos removal plan, vendor submittals, and Construction Change Requests/Engineering Change Proposals.

Remediation Subcontractor Work Plans

Subsequent to the award of the remediation subcontract for a particular bid package, the successful bidding subcontractor will develop and submit proposed work plans for performing the required remediation activities. These submittals will identify the remediation subcontractor's proposed remediation methodology, plans, techniques, and equipment by which the work will be done. These submittals will undergo formal FEMP review and approval.

Quality Assurance Plan

The remediation subcontractor will be required to submit a fully developed Quality Assurance Project Plan for FEMP review and approval. Typical quality criteria are: qualifications, duties, and responsibilities for all key personnel; an outline of the remediation contractor's training program that assures knowledge and capability in the environmental and technical arenas required for the interim action; the requirement for the remediation subcontractor to report any non-conforming conditions to the construction manager; an outline of the remediation subcontractor's document control system; and how quality inspections will be controlled and performed.

Asbestos Removal Plan

Where appropriate, interior asbestos abatement within OU3 will be integrated into the remedial action. The design approach to the removal of interior ACM will be identified by the remediation subcontractor in an asbestos removal work plan. All activities involved in the removal of ACM will be conducted in accordance with the requirements identified in the design specification and regulatory requirements identified in Section 3.6.4.

Vendor Submittals

Once the remediation subcontractor has been selected, vendor data will be submitted by the remediation subcontractor for review and approval. Vendor data will be reviewed to ensure compliance with the bid package. In general, the remediation subcontractor's work plans will be approved prior to vendor data submittals, with the exception of long-lead procurement items.

Construction Change Requests/Engineering Change Proposals

As the OU3 interim action progresses, the original design may require modification. At that time the remedial design subcontractor will perform any additional design required to address the field modification. Unless these changes are of significant magnitude, the CFC remedial design will not be modified until project completion as the "as-built" remedial design. If the modification constitutes a change of significant magnitude in scope to the CFC remedial design, implementation of that package will be suspended until the CFC remedial design is revised. At the same time, while the CFC remedial design is being revised, DOE will determine, in consultation with the USEPA, if there is a need to perform either of the following: amend the IROD; submit to USEPA an explanation of significant difference to the IROD; amend the implementation plan; and/or amend this Work Plan. Since each design package will provide performance-based specifications rather than detailed specifications, it is not anticipated that a CFC remedial design will require significant changes.

4.6.3 Execution and Oversight of Work

Once a remediation subcontract has been awarded, the remedial activities will be initiated. The alignment meeting will kick off the remedial action. Soon after the alignment meeting, the remediation subcontractor will be issued a Notice to Proceed. At that time, the remediation subcontractor will be required to start compiling the required submittals specified in the bid package. These submittals will be required at various stages of the project and will require, at a minimum, review and approval by the construction manager.

In addition to the alignment meeting, pre-construction meetings and coordination meetings will be held in support of remedial action activities. It is anticipated that these will be held weekly and will include the DOE Facilities Representative, DOE project technical leads, FEMP construction management, the remediation subcontractor, the remedial design subcontractor, and other FEMP functional organizations that need to be involved. These coordination meetings will address progress, deviations, requests for clarification of information, planning, schedule status, and concerns.

Both DOE and FEMP organizations will inspect the performance of remedial activities. DOE will provide direct project oversight in two ways, both of which become a concerted effort to assure performance of remedial activities and adherence to project requirements. DOE will perform independent field oversight of all remedial activities performed under this project by having a representative from DOE Headquarters assigned solely for this role. This DOE representative will have the authority to stop work if conditions warrant such action. The Program Manager from the DOE Fernald Field Office will further ensure that the performance of remedial activities meet specifications and requirements by having technical leads perform oversight. The DOE Facilities Representative and technical leads will immediately notify the DOE Program Manager of any issues or problems that arise in an effort to seek prompt resolution. DOE responsibilities during remedial action are further discussed in Section 7.2.

FEMP Construction inspections of remedial activities will be performed throughout field activities and at two stages at the end of the project. A pre-final inspection will be performed when the project is substantially complete and a final inspection will be performed at the completion of field activities.

Throughout the project execution, quality and safety assessments are performed for the project in support of the project DEC team. These assessments and oversight functions are key portions of the project management function, which provide the ability to assure project compliance. Several other notable key project organization and oversight functions are described below.

4.6.3.1 Alignment Meeting

Remediation Subcontractor representatives, DOE representatives, and FEMP managers from Construction will participate in an alignment meeting prior to the Notice to Proceed. The meeting will include the appropriate site organizations required to support the remedial action. The objective of this meeting is to establish common goals and joint execution plan to accomplish the contracted scope of work with emphasis on safety, quality, compliance with regulatory requirements, budget and schedule.

4.6.3.2 Pre-Construction Meeting

A pre-construction meeting will be held between the construction management organization, the remedial design subcontractor, and the remediation subcontractor to coordinate construction activities, promote efficient planning and performance of the work, and define the requirements for mobilization. The pre-construction meeting members will review the project SOW, applicable changes or modifications, and any pending, unresolved or missing information. The status of technical and engineering deliverables will be stated, safety requirements will be reviewed and discussed, material status and shop fabrication will be reviewed, and coordination of remediation subcontractor's work, inspections, and testing will be planned.

4.6.3.3 Coordination Meetings

Remediation coordination meetings will be scheduled as necessary to support the coordination of specific remediation projects and activities. These meetings will bring the remediation subcontractor, remedial design subcontractor, and site management personnel together to review the schedule and determine if any conflicts or problems exist.

On a sitewide basis, it will be necessary to coordinate activities, resources, and the use of the FEMP infrastructure with other operable units as they implement their remedial actions. The goal is to eliminate or minimize interferences between the remedial activities that will be performed by various subcontractors for each operable unit. The coordination effort includes the management of subcontractors and the construction support contractor's activities where applicable. Also included in these activities are: the coordination of permits and support resources (i.e., radiation protection technicians and quality control inspectors); interfacing with plant operations and waste management personnel; arranging for use of construction equipment and lay-down areas; and interfacing with organizations responsible for preparing facilities for remedial action.

The coordination effort will rely on an established remedial project-related communications system which involves all organizations that are responsible for providing support for the remedial design and management of the remedial action.

4.6.3.4 Daily Surveillance and Inspection

Throughout the remediation subcontractor's field activities, a representative from Construction will inspect the work in progress and provide surveillance of all activities. The surveillance and inspection will verify that the subcontractor's plans, specifications, and drawings are being properly implemented. If changes to the subcontractor's documents are required, then the subcontractor or construction management will initiate a change request as described in Section 4.6.2.

If deficiencies are noted during inspection and surveillance activities, the subcontractor shall be notified immediately so that corrective actions are taken as soon as possible. Failure of the subcontractor to correct deficiencies will constitute cause for FEMP construction management to stop work until the subcontractor is willing to correct deficiencies or until the deficiencies are eliminated using a change request. Situations where there is an immediate

danger to life and health shall be cause for immediate stoppage of work activities until the situation is reviewed and a safe corrective action is implemented.

4.6.3.5 Pre-Final Inspection

When the project is near completion, a pre-final inspection will be conducted to identify and "punchlist" incomplete or deficient work. The pre-final inspection will consist of a walk-through inspection of the entire project site. An inspection of the work will be conducted to determine whether the project is complete and consistent with the contract documents, the OU3 IROD, the implementation plan, and this Work Plan. Responsible site personnel and remediation subcontractor personnel will attend inspections in order to prepare and document a punchlist of unsatisfactory or remaining activities and deliverables. Work activities will be controlled and conducted in accordance with findings of the punchlist. An update on the status of the project will be required at remediation coordination meetings.

Following the pre-final inspection, a Pre-Final Inspection Report will be completed. This report will outline the outstanding remediation items, actions required to resolve them, completion date for these items, and date for the final inspection.

4.6.3.6 Final Inspection

Upon completion of punch-listed activities and deliverables, a final acceptance inspection walk-through will be performed. For the final inspection, the Pre-Final Inspection Report will be used as a checklist, with the inspection focusing on the outstanding remediation items identified in the pre-final inspection. The remediation subcontractor's demobilization activities should also be completed. If any items remain unresolved, the inspection will be considered a pre-final inspection requiring another Pre-Final Inspection Report. The acceptance of all listed items will be verified and documented. Final acceptance and turnover of the project will be documented and signed-off in a final acceptance and turnover document. The remediation subcontractor will be notified of final acceptance of the remediation activities via its receipt of the approved final acceptance document.

4.6.4 Certification of Construction Completion

Following the final inspection and acceptance of completed activities and deliverables, a remediation subcontractor closeout checklist is prepared to document a mutual agreement between the FEMP contractor and the remediation subcontractor. This checklist ensures that all obligations and requirements of both parties, as set forth in the remediation subcontract, have been fully executed. The remediation subcontractor closeout checklist, following review and approval, is the final document certifying that construction is complete, that all engineering requirements are complete and approved, and that all contractual obligations are finalized. As-built engineering drawings will be required after the completion of remediation for each bid package.

4.6.5 Remedial Action Reports

Upon satisfactory completion of the decontamination and dismantlement activities that are within the scope of each bid package, a Remedial Action Report will be prepared and submitted to the USEPA and the OEPA within sixty days following DOE approval of the

Certification of Construction Completion. The Remedial Action Report will include a summary of the following for each design package implementation:

- may be more than one RA Report to close out an implementation plan (close out of project);
- a synopsis of the work defined in the project-specific implementation plan;
- HWMU closure activities;
- the Certification of Construction Completion for each bid package; and
- explanations of any modifications to the OU3 RD/RA Work Plan and/or implementation plan, and why these were necessary for the project.

Additionally, the Remedial Action Report will provide the project engineer's certification that the remedial action was completed in accordance with all contract documents for that bid package and the requirements of this Work Plan.

Section 5

5.0 COMMUNITY INVOLVEMENT

The Community Relations Plan (CRP) is the site-wide plan for all community relations activities at the FEMP. The site-wide CRP was revised to provide guidance on post-ROD public involvement activities and was approved by the USEPA in January 1995. In particular, the revised CRP describes further public involvement activities during the remedial design and remedial action phases of cleanup. The CRP will be reviewed annually by DOE and revised as necessary to reflect changing community concerns as well as changes in the law, regulations, or regulatory agreements.

The requirements for public involvement during the remedial design and remedial action phases are limited to preparing a fact sheet describing the remedial design and offering a public briefing upon completion of the final engineering design and prior to beginning remedial action. For the OU3 interim remedial action, these requirements have been satisfied. In July 1994, a public briefing was held to introduce the public to the remedial design and remedial action process for the OU3 interim remedial action. In January 1995, a fact sheet titled, "Remedial Design and Remedial Action Update for the Operable Unit 3 Interim Remedial Action at Fernald" was distributed to stakeholders; the fact sheet provided an overview of remedial design and remediation for the OU3 interim remedial action and described the first remediation project for OU3. On February 21, 1995, DOE held a public workshop featuring the completion of the first remedial design effort and an update on OU3 remedial design and remedial action planning.

Although the remedial design and remedial action public involvement requirements have been met for the OU3 interim remedial action, DOE shall continue to offer opportunities for public involvement beyond those required by regulations. Throughout the OU3 interim remedial action, the community will be kept informed of remedial action schedules and any new findings or significant developments within OU3. The public will be given opportunities to inspect all formal, completed design-related deliverables submitted to the regulatory agencies. Notices for public inspection will be issued for key decision-making documents, including the RD/RA Work Plan, the RD Prioritization and Sequencing Report, and the project-specific implementation plans. Rather than mandate a formal process for responding to public comments, DOE will consider each comment on a case-by-case basis to determine the appropriate means of response. This "consultative process" of addressing comments may include telephone calls, one-on-one meetings, written responses or other means. Additional community relations activities may be offered at key milestones throughout the RD/RA process including periodic briefings at township and citizens' group meetings, community roundtables or workshops, site tours, publications, and fact sheets.

Copies of this Work Plan, other RD/RA documents (e.g., implementation plans and remedial action reports), and the revised CRP (including any future revisions) will be available to the public in the Administrative Record, located at the FEMP's Public Environmental Information Center, Jamtek Building, 10845 Hamilton-Cleves Highway, Harrison, Ohio 45030, (513), 738-0164 or 738-0165. Copies will also be placed in the USEPA, Region 5, Administrative Record, 77 West Jackson Boulevard, Chicago, Illinois, 60604-3590.

FEMP PUBLIC ENVIRONMENTAL INFORMATION CENTER HOURS
Monday and Thursday, 9 a.m. to 7 p.m.
Tuesday, Wednesday, and Friday, 9 a.m. to 4:30 p.m.
Saturday, 9 a.m. to 1 p.m.

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Section 6

6.0 SCHEDULE AND DELIVERABLES

Documents and reports, as listed in Section 6.1, will be submitted to the regulatory agencies for review, comment, and/or approval throughout the OU3 interim remedial action. This section also discusses scheduling for the OU3 interim remedial action, which has been divided into two parts. Section 6.2 discusses the anticipated planning schedule for the submittal of documents related to the interim remedial action for OU3. Section 6.3 discusses the submittal of remedial design and remedial action schedules for the decontamination and dismantlement of OU3 components.

6.1 Submittals to the Regulatory Agencies

This section identifies the reports and work plans to be submitted to the regulatory agencies to support the OU3 interim remedial action. The descriptions of reports and work plans listed below reflect the initial draft submittals of those documents, which will undergo review, comment and revision, as necessary, until agency approval unless otherwise noted:

- OU3 RD/RA Work Plan for the Interim Remedial Action This document includes the RD/RA Work Plan and Appendices A - C (Volume 1) and support documents (Volume 2) - SAP, HASP, O&M Plan, and CQAP from which project-specific requirements will be derived. (On February 17, 1995, this OU3 RD/RA Work Plan was approved by U.S.EPA.)

- OU3 Remedial Design Prioritization and Sequencing Report Within six months after the submittal of the draft OU3 RD/RA Work Plan for the Interim Remedial Action, the OU3 Remedial Design Prioritization and Sequencing Report will be submitted. This report is discussed in further detail in Section 6.3. Included in this submittal as Appendix A will be the Material Balance Model which was described in Section 4.4.

- Updated Base and Five-Year Implementation Schedules An updated five-year implementation schedule and, if necessary, an updated base schedule will be submitted annually to provide the regulatory agencies with a forecast of anticipated remedial activities for the OU3 interim remedial action. These updated schedules will be submitted annually by the anniversary date of the submittal of the draft OU3 Remedial Design Prioritization and Sequencing Report. These annual submittals will continue until the approval of the last remedial action report for OU3.

- Implementation Plans An implementation plan will be prepared for each remediation project and submitted for review, comment, and approval in accordance with the generic timeframe schedule shown in Figure 6-1. The contents of each implementation plan will cover the subjects described in Section 4.5.5.

- Remedial Action Reports Within sixty days from the DOE approval of the final inspection of the Certification of Construction Completion for decontamination and dismantlement activities addressed in an implementation plan, a draft Remedial Action Report will be submitted for

review and approval. This report will be prepared to document completion of OU3 interim remedial activities contained within the scope of a particular design package, in accordance with the remediation sub-contract documents, the implementation plan, this Work Plan, any package-specific Work Plan addenda, the ACA, and the IROD. In the event that remedial activities contained within the scope of a design package become phased for implementation over an extended period of time not reflected in the schedule in the implementation plan, more than one remedial action report may be prepared and submitted to close-out that project. Elements to be included in this document are discussed in Section 4.6.4.

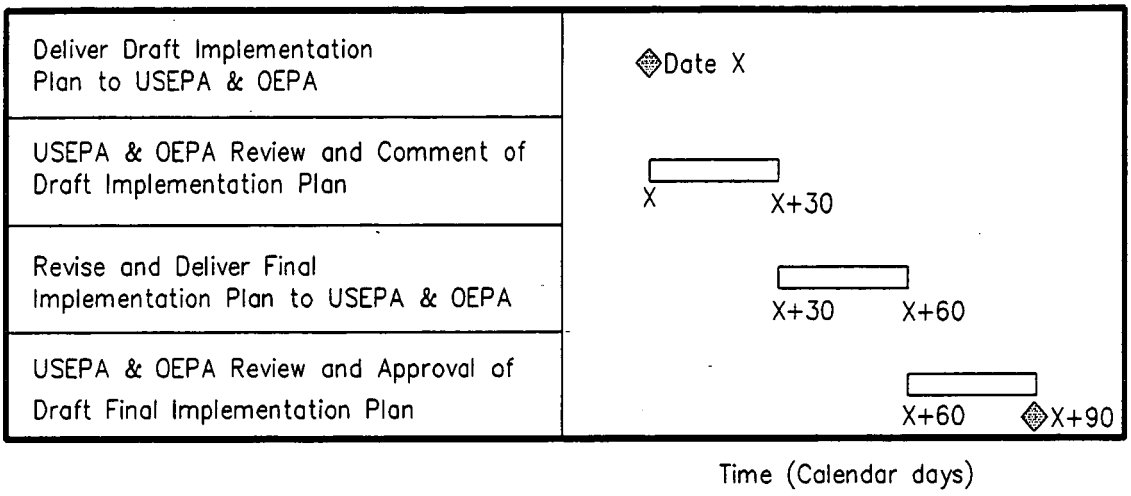


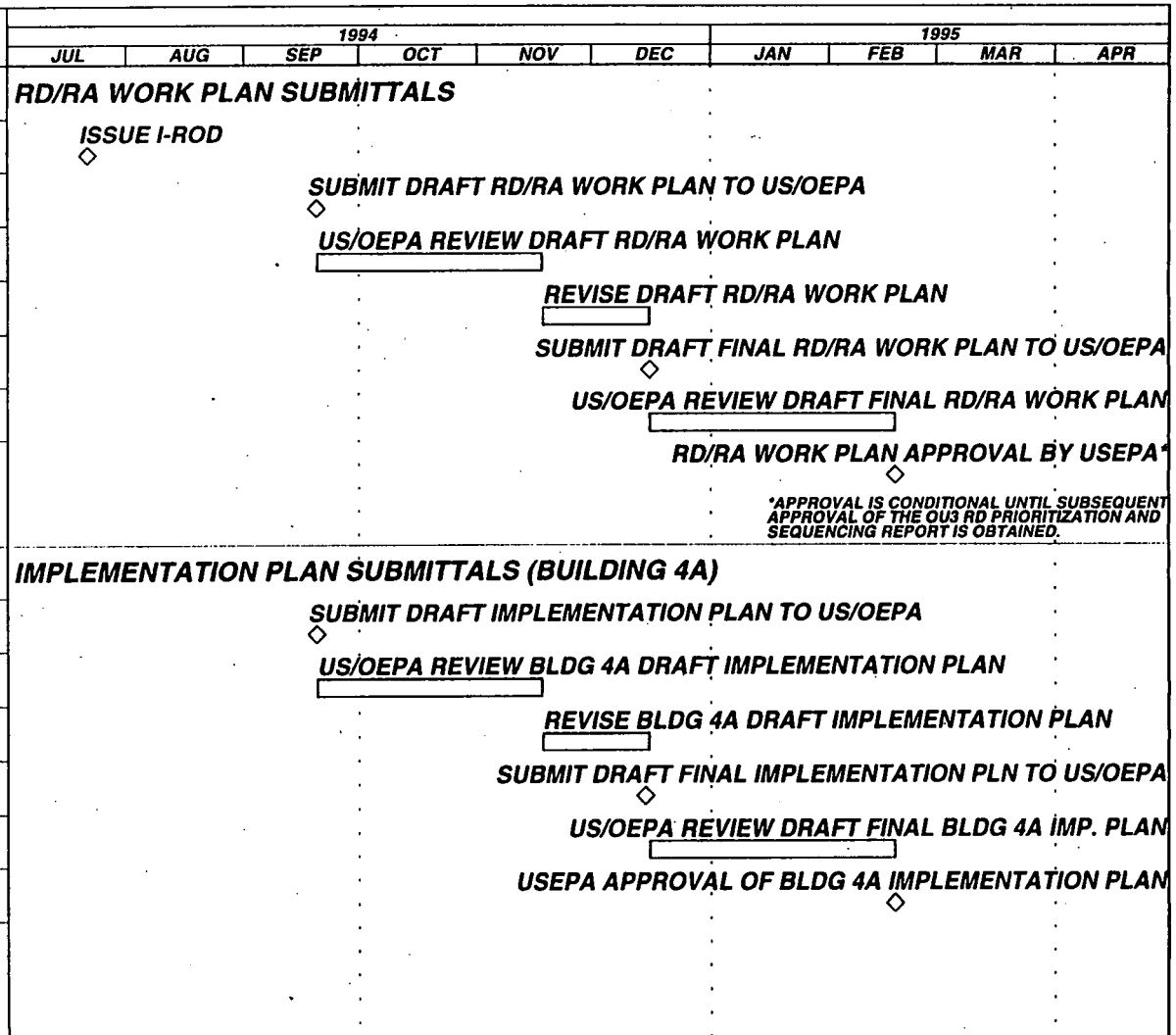
Figure 6-1 Generic Timeline for Implementation Plan Reviews

6.2 Planning Schedule

Figure 6-2 represents a document planning schedule that begins with the finalization of the OU3 IROD on July 22, 1994. The timeframes represented in Figure 6-2 are based on those stipulated in the ACA and in CERCLA statutes. Specifically, the schedule incorporates submittal and review periods for this Work Plan as stipulated by the ACA. The final version of this Work Plan includes a planning schedule that has been revised to reflect actual dates that led up to and include the approval of this Work Plan and Building 4A Implementatation Plan.

The planning schedule shows the actual submittal dates for the draft and draft final versions of the OU3 RD/RA Work Plan. The draft OU3 RD/RA Work Plan was submitted to the regulatory agencies on September 20, 1994 (60 days after the OU3 IROD was finalized). The submittal of the implementation plan for the first project, Building 4A, coincided with the submittal of the OU3 RD/RA Work Plan. Pursuant to CERCLA, OU3 interim remedial action activities are required to begin no later than 15 months after issuance of the IROD. However,

ACTIVITY ID	ORIG DUR	REM DUR	EARLY START	EARLY FINISH
RD/RA WORK PLAN SUBMITTALS				
3B08X01C04	0	0	22JUL94	
3B08X01D04	0	0	20SEP94	
3B08X10670	42	42	20SEP94	17NOV94
3B08X10680	18	18	18NOV94	15DEC94
3B08X01D09	0	0		15DEC94
3B08X10682	42	42	16DEC94	17FEB95
3B08X01D10	0	0		17FEB95
IMPLEMENTATION PLAN SUBMITTALS (BUILDING 4A)				
3B08X01405	0	0	20SEP94	
3B08X20410	42	42	20SEP94	17NOV94
3B08X20420	18	18	18NOV94	15DEC94
3B08X01410	0	0	15DEC94	
3B08X20430	42	42	16DEC94	17FEB95
3B08X01415	0	0		17FEB95



Plot Date 24FEB95
Data Date 1JUL94

(c) Primavera Systems, Inc.

Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity

LYL6

Sheet 1 of 1

OPERABLE UNIT 3
REMEDIAL DESIGN/REMEDIAL ACTION
SCHEDULE OF DELIVERABLES

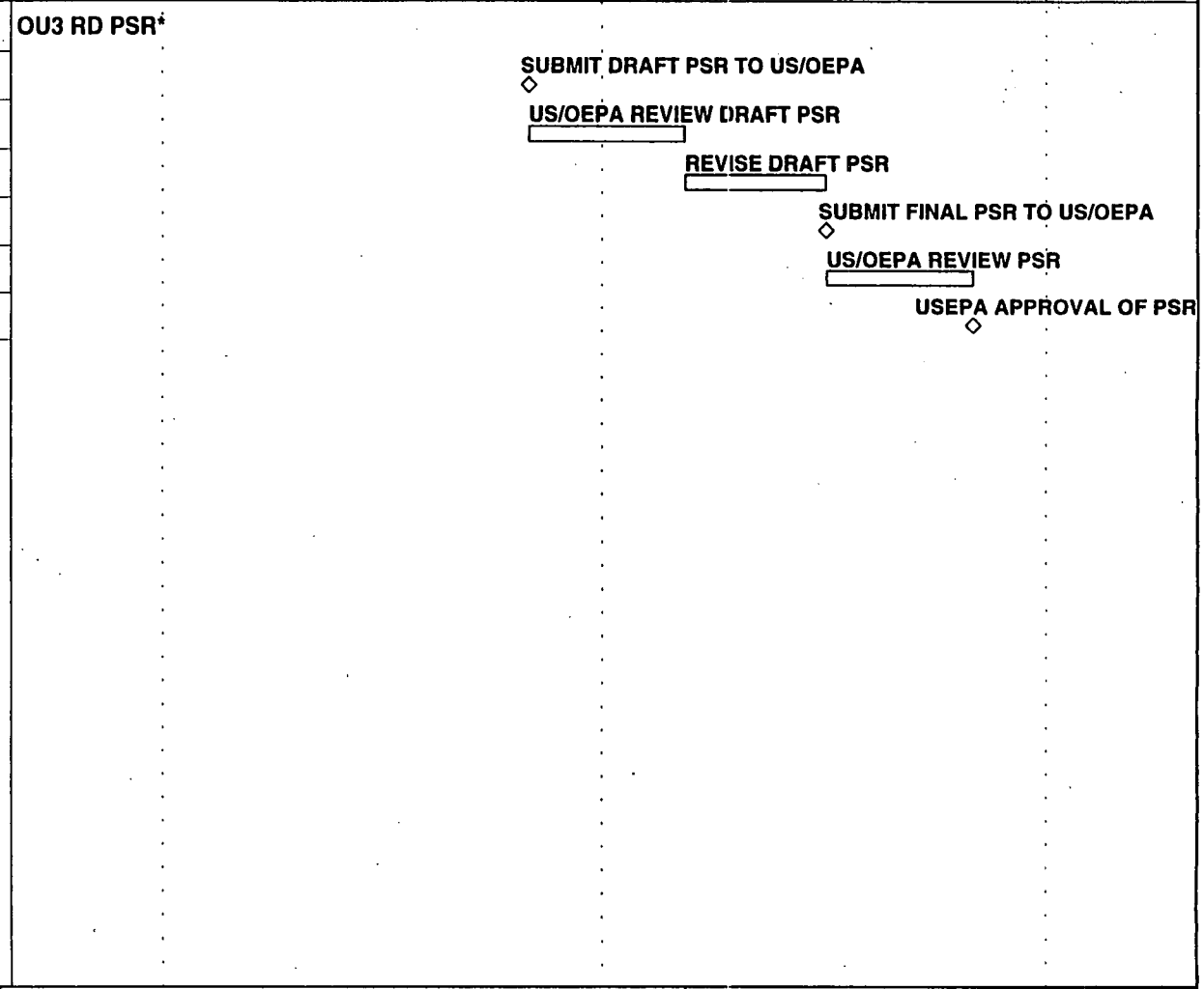
Fernald Env. Restoration Management Corporation

Date	Revision	Checked	Approved

FIGURE 6-2 RD/RA Planning Schedule for the OU3 Interim Remedial Action

ACTIVITY ID	ORIG DUR	REM DUR	EARLY START	EARLY FINISH
3B08X01R05	0	0	17MAR95	
3B08X35R20	21	21	17MAR95	17APR95
3B08X35R30	21	21	18APR95	16MAY95
3B08X01R10	0	0	17MAY95	
3B08X35R40	21	21	17MAY95	15JUN95
3B08X01R15	0	0	16JUN95	

*OU3 PSR: OPERABLE UNIT 3 REMEDIAL DESIGN PRIORITIZATION AND SEQUENCING REPORT.



Plot Date 12DEC94
Data Date 1JUL94

(c) Primavera Systems, Inc.

Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity

LYL5

Sheet 1 of 1

OPERABLE UNIT 3
REMEDIAL DESIGN/REMEDIAL ACTION
SCHEDULE OF DELIVERABLES

Fernald Env. Restoration Management Corporation

Date	Revision	Checked	Approved

FIGURE 6-2 RD/RA Planning Schedule for the OU3 Interim Remedial Action (Cont'd)

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to expedite remediation of OU3, DOE is anticipating proceeding with field activities prior to the final approval of the OU3 RD/RA Work Plan.

The OU3 Remedial Design Prioritization and Sequencing Report and Material Balance Model are currently planned to be submitted together six months after the initial submittal of this OU3 RD/RA Work Plan to the regulatory agencies. The OU3 Remedial Design Prioritization and Sequencing Report fulfills the requirements set forth in the ACA for inclusion of a schedule for remedial design activities in the remedial design work plan.

6.3 Remediation Schedules

Section 3.2 presented the methodology for prioritizing and sequencing the complexes for decontamination and dismantlement activities. Within six months of the submittal of the draft OU3 RD/RA Work Plan to the regulatory agencies, DOE will submit the sequencing and scheduling results in a document referred to as the OU3 Remedial Design Prioritization and Sequencing Report. This report will constitute the first RD submittal under the terms of the ACA and will include: prioritization of complexes for decontamination and dismantlement; the initial base schedule for the surface decontamination and dismantlement of above-grade structures; an integrated OU3/OU5 schedule for at- and below-grade remediation within the former production area based on on-going planning related to the preferred alternative for OU5; and the first five-year schedule based on baseline funding levels. The initial base schedule will identify all milestones as tentative and subject to the availability of funding clause of the ACA. The first five-year schedule will provide the initial set of milestones, with a commitment to review, update, and modify the schedule and milestones annually based on factors such as funding levels. The major milestones, as discussed in Section 6.1, are the submittals of the implementation plans for each complex or a portion thereof, status updates, and remedial action reports.

The rationale for submitting the OU3 Remedial Design Prioritization and Sequencing Report to the agencies subsequent to the OU3 RD/RA Work Plan consists of the following reasons:

- it allows USEPA and OEPA the opportunity to review and comment on the prioritization and sequencing methodology early in the process;
- it allows DOE adequate time to evaluate and define the sequencing and prioritization methodology;
- it allows DOE and the regulatory agencies time to consider OU5 initiatives and impacts to OU3, based on the OU5 FS which was submitted to USEPA in November 1994;
- it allows DOE the opportunity to better incorporate lessons learned from the Plant 7 Dismantling project into the planning of the OU3 interim remedial action;
- it allows for well thought out, milestones consistent with projected funding levels;
- it allows for flexibility in the process; and

- it allows input from key stakeholders as it pertains to decontamination and dismantling, sequencing, and the potential location of an on-site disposal cell.

Section 7

7.0 PROJECT MANAGEMENT

This section describes the current overall management structure for implementation of the remedial design and remedial action activities defined throughout this Work Plan. The following organizations and their responsibilities are based on those established by the current DOE environmental management contractor (FERMCO) and are presented in a generalized manner which sets forth the basic roles and responsibilities necessary for implementing the OU3 interim remedial action. The RD/RA activities that are necessary to implement the interim remedial action have been established in the previous sections of this Work Plan and will not be repeated in this section. DOE responsibilities are highlighted in the introductory text for each subsection (7.1 and 7.2). DOE Fernald Field Office (DOE-FN) is the ultimate authority for ensuring that the remedial design and remedial action are performed in a manner that meet all project goals, standards, specifications, and requirements of the OU3 IROD and this Work Plan. Although DOE will perform direct oversight of the remedial design and remedial action, it will also be represented and actively involved in all DEC Team activities during all stages of project planning, design, and implementation.

The OU3 interim remedial action will require project management, coordination, and integration from the following:

- DOE-FN;
- RD/RA subcontractors; and
- other FEMP organizations supplying project management, technical compliance, and administrative support not within the scope of subcontractors.

Support organizations are formed into a project-specific group, referred to as the DEC Team. The main role of the project-specific DEC Team during both remedial design and remedial action is to provide for the integration and coordination of activities for each specific decontamination and dismantlement project. All technical, regulatory, and administrative input required for the project will be focused within this group, under the direction of the project manager, for that particular decontamination and dismantlement project.

The charter responsibilities for the DEC Team include the following:

- communicate clearly to the project manager all requirements within their area of designated technical representation;
- plan and arrange for delivery of technical support, including review of work products from the organizations they represent, as directed by the project manager;
- maintain an appropriate level of knowledge regarding project scope and status as it pertains to their designated technical organizations to ensure effective participation; and
- represent their respective organizations in all meetings and other project communications with the project manager.

7.1 Remedial Design Management and Organization

This section describes the management structure for the remedial design and the responsibilities of the organizations within that structure. The organizations included in this section are identified according to their current function. Figure 7-1 illustrates the relationship between the DEC Team, DOE, the Remedial Design Subcontractor, and the lead and primary organizations that support the remedial design effort. The DEC Team for remedial design is lead by the organization responsible for engineering at the FEMP, and supported by various multi-disciplinary organizations that provide input to the process that is necessary for providing all technical, regulatory, and administrative requirements for a project. DOE is an active participant in the DEC Team process for remedial design by assigning a program manager and one or more technical leads responsible for ensuring that DOE programmatic requirements, and engineering, quality assurance/quality control, and health and safety requirements are incorporated into the design. The three subsections which follow describe the primary responsibilities for organizations involved in the remedial design effort.

7.1.1 Engineering

The organization responsible for engineering activities for OU3 (Engineering) is responsible for leading the DEC Team in coordinating and managing remedial design efforts for the OU3 interim remedial action and for supporting the preparation of the remedial design documents by the remedial design subcontractor.

Upon initiation of a remedial design project, a project manager will be designated to manage the design project for a project-specific DEC Team within the approved funding baseline scope, schedule, and budget. The manager's responsibility also includes managing the remedial design subcontractor's activities needed to support the remedial design. Engineering is also responsible for performing the following: establishing design criteria and scope; identifying design activities; performing pre-design studies; determining waste disposition; identifying funding constraints; developing the SOW for the remedial design subcontractor; procuring the services of the remedial design subcontractor; overseeing remedial design subcontractor work: reviewing and approving the various design submittals developed by the subcontractor to ensure that the work product is performed in accordance with the SOW; providing assistance in the preparation of bid documents; coordinating the review and approval of any necessary engineering change proposals; providing support to the annual preparation of five-year implementation schedules; and obtaining and coordinating support, as needed, from the other organizations at the FEMP identified in Section 7.1.3. The work product resulting from Engineering's efforts will directly support the efforts by the organization responsible for construction activities for OU3 (Construction) to prepare for and implement remedial action. Both Engineering and Construction organizations will work closely during design to effect proper continuity between design and remediation.

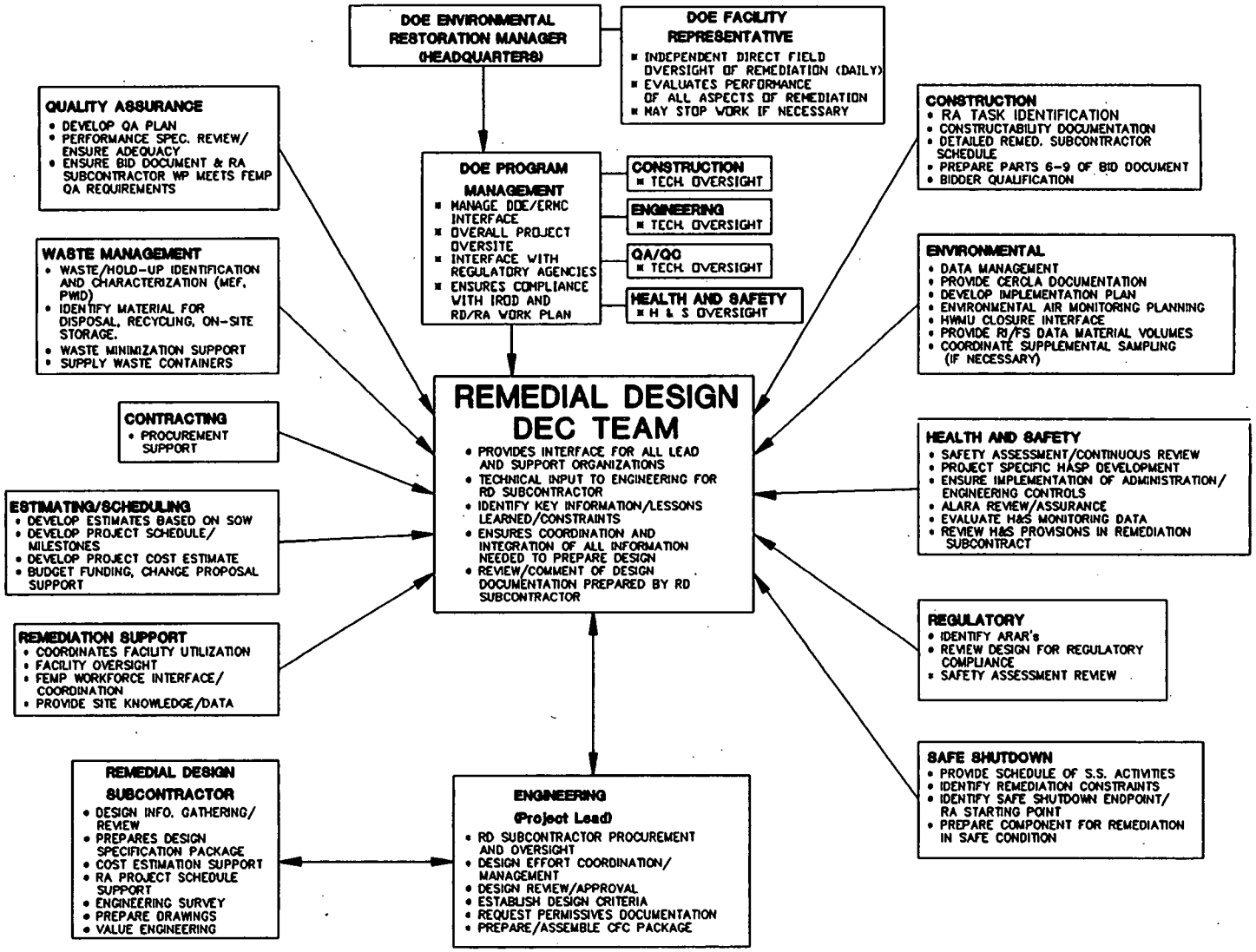

FIGURE 7-1 Remedial Design Conceptual Organization Drawing

7.1.2 Remedial Design Subcontractor

The remedial design subcontractor, will be responsible for preparation of remedial design packages in accordance with the remedial design requirements presented in Section 4.5 and in individual remedial design SOWs. The specific responsibilities of the remedial design subcontractor will be detailed in the SOW for each design package and, as a result is described in general terms in this section. The specific responsibilities include performing such activities as:

- information gathering and review;
- engineering survey;
- further development and establishment of remediation criteria;
- development of plans/documents, engineering designs, performance and procurement specifications, engineering drawings and photographs;
- coordinating and/or performing necessary pre-design studies;
- cost estimate support;
- remedial action project schedule support; and
- submittal of specific design deliverables (see Section 4.5 for identification of deliverables).

The remedial design subcontractor will prepare the majority of the plans and documents needed to support the design, with the exception of some supporting information such as project-specific HASPs, safety assessment, etc.

7.1.3 Other Support Organizations

This section identifies the FEMP organizations, other than Engineering, that will support the remedial design effort. For the preparation of each of the design packages, a DEC Team will be formed, consisting of a core group and support group. The core group will include those organizations that provide continual required input into the remedial design.

The functional organizations that will directly support the remedial design currently include Construction and other groups responsible for various aspects of project planning (Environmental), health and safety (Health and Safety), waste management (Waste Management), remediation support (Remediation Support), scheduling and cost estimation (Scheduling and Estimating), contracting (Contract Support), regulatory oversight (Regulatory), quality assurance (Quality Assurance), and coordinators from OU5 (OU5 coordinators). An overview of their responsibilities follows.

Construction will be primarily responsible for providing construction-related requirements for the design and constructability reviews of the preliminary, intermediate, pre-final, and final design documents. Construction will also support remedial design by imparting "lessons learned" into the design process, determining potential cost savings, reviewing value engineering assessments, identifying duration and logic for each project, and identifying temporary utilities required. Due to the likelihood that the multi-component design documents may be divided into two or more separate bid packages, Construction will closely coordinate preparation of bid documentation with each design.

For each design package, **Environmental** will be generally responsible for ensuring compliance with the OU3 IROD, and this Work Plan, ensuring that HWMU closure requirements are integrated into the design, developing implementation plans, and planning and coordinating sampling efforts to support the design, including the preparation of addenda to the SAP, as discussed in Volume 2 of this Work Plan. This effort will involve: assessment of available data against the data needs established in the SAP; preparation of SAP addenda; coordination of sampling and sampling analysis efforts; management of data; and evaluation and reporting of data. Environmental will also be responsible for participating, as needed, in the development of the design, assuring that the remedial design adheres to the strategies provided in this Work Plan and coordinating remedial design submittals to the regulatory agencies.

For each design package, the **Health and Safety** will be responsible for specifying the minimum health and safety requirements (federal, state, DOE, site-specific) that must be met during the implementation of the design. This effort will be provided through the development of Project-Specific HASPs as discussed in Volume 2 of this Work Plan. Health and Safety will also be responsible for performing a safety analysis of activities in the design.
Other organizations within and outside of OU3 will also be responsible for providing support to the remedial design effort. **Waste Management** will develop material management requirements for the design (including segregation, containerization, storage and disposition - detailed in Section 3.4) and be responsible for material characterization. **Remediation Support** will identify remediation requirements associated with issues such as the integration and coordination of safe shutdown activities and any action-specific operation and maintenance requirements, as discussed in Volume 2 of this Work Plan. **Scheduling and Estimating** organization assigned to OU3 will provide support in scheduling, reviewing proposed schedules, and reviewing cost estimates by the remedial design subcontractor. **Contract Support** for OU3 will provide procurement support, both for the remedial design subcontractor and for the development, submittal, and tracking of contract documents necessary for implementing the remedial action. **Regulatory** will provide information concerning ARARs and TBCs, permits, and environmental monitoring requirements for the remedial action. Based on the Construction Quality Assurance Plan (CQAP) contained in Volume 2 of this Work Plan, the **Quality Assurance** organization will develop package-specific quality assurance criteria that must be met by the remediation subcontractor's quality assurance plan. During the design of below-grade remediation, **OU5 coordinators** will be involved in specifying dismantlement, control, and logistical requirements.

7.2 Remedial Action Management and Organization

This section describes the management structure for the OU3 interim remedial action and the responsibilities of the organizations within that structure that will be responsible for various

aspects of the remedial action. Figure 7-2 illustrates the relationship between the DOE, the DEC Team, remediation subcontractor, and the primary organizations that support the remedial action effort. The DEC Team for remedial action is lead by the organization responsible for construction at the FEMP, and supported by various multi-disciplinary organizations that provide continual technical and administrative support to the remediation process.

DOE will be ultimately responsible for ensuring that the performance of the remedial action is in accordance with all regulatory and programmatic requirements, including the requirements specified by the IROD and the Work Plan. DOE will provide direct oversight of remedial action in two ways, both of which become a concerted effort that ensure performance of remedial activities in adherence to specifications and other requirements for each project. The Office of Safety Assessment of DOE-FN will assign an individual from DOE Facilities Representatives Department that will perform independent field oversight of all remedial activities performed under this project. This individual will be experienced/knowledgeable in the areas of engineering, construction, quality assurance/quality control, and health and safety; and will be responsible for daily inspections of all field activities and necessary reporting to the DOE Program Manager at the Fernald Field Office. The Facilities Representative will have the authority to stop work if conditions warrant such action.

DOE-FN will also conduct field oversight through technical leads responsible for construction, engineering, quality assurance and quality control, and health and safety. The DOE Facilities Representative and technical leads will immediately notify the DOE Program Manager of any issues or problems that arise in an effort to seek prompt resolution.

The DOE Program Manager will oversee the remedial action through its participation in the DEC Team review and approval process and by performing the following functions:

- assuring the selection of qualified subcontractor(s) that meet prequalification criteria, including safety record, similar work experience, etc.;
- assuring that the apparent low bidder is responsive and responsible;
- reviewing, commenting, and approving of remediation subcontractor work plans;
- conduct an alignment meeting, pre-construction meetings, and weekly coordination meetings with the remediation subcontractor to address all concerns, schedule status, planning, progress, deviations;
- performing quality assurance of all remediation tasks to determine adherence to performance specifications by conducting inspections of the remedial activities performed by the remediation subcontractor and those performed by FEMP workforces/labor support contractors in support of the remedial action; and
- performing pre-final and final inspections.

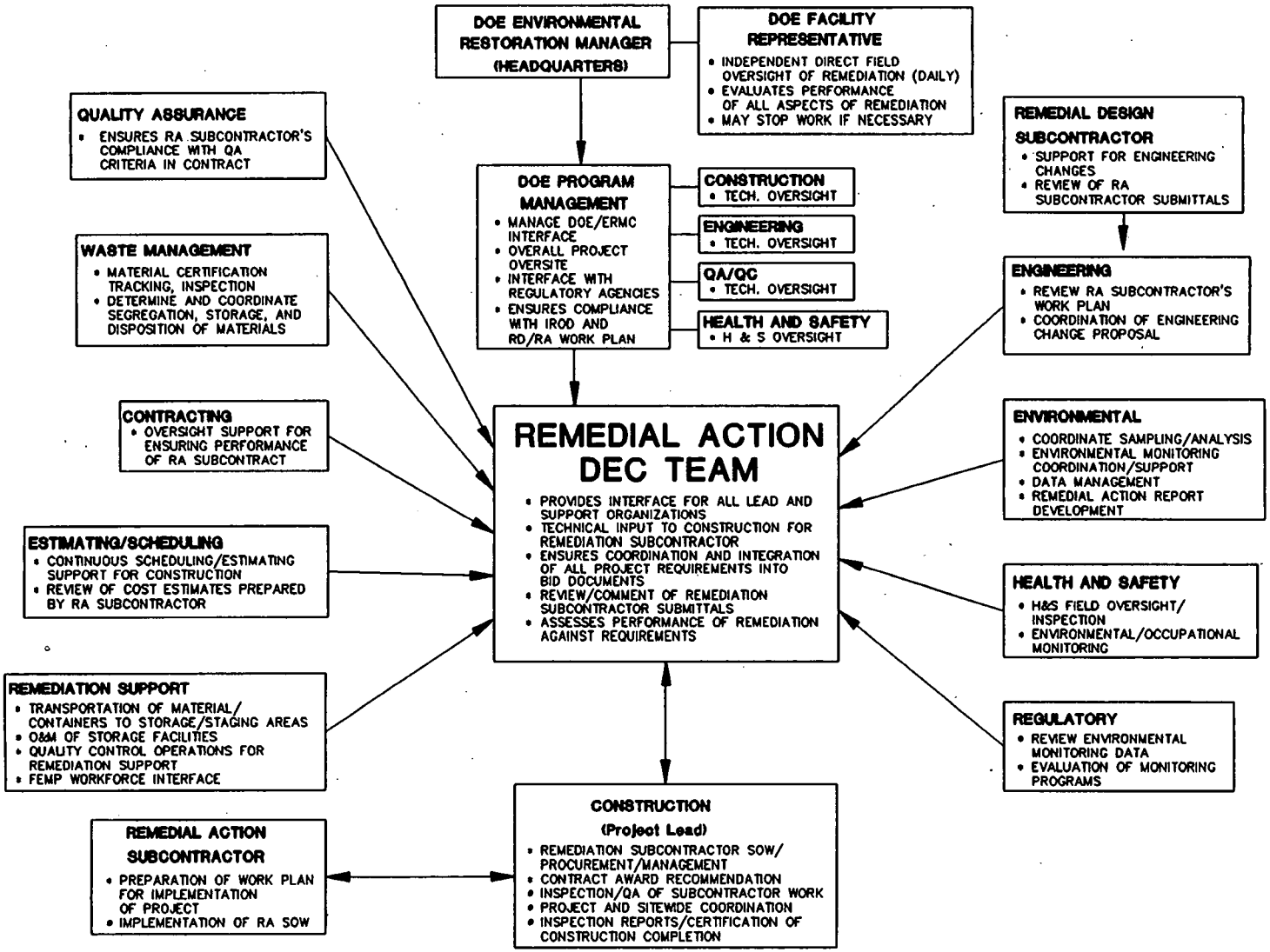

FIGURE 7-2 Remedial Action Conceptual Organization Drawing

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The three subsections that follow describe the primary FEMP organizations, other than DOE that are responsible for implementing or supporting the implementation of the remedial action and purposely does not include many of the administrative organizations that support the organizations identified.

7.2.1 Construction

Construction is responsible for managing the implementation of the remedial action. Construction will also be the lead organization for the DEC Team during remedial action by coordinating support among the organizations identified in Section 7.2.3. Construction will be responsible for the following activities: directing all organizations involved in the DEC Team during remedial action; remediation subcontract SOW development; phasing/assignment of work for the remediation subcontractor; bid package development; pre-qualifying prospective subcontractors; contract award recommendation; inspections of all remedial action activities; remedial action documentation and certification; overall project coordination on both package- and site-wide levels; review/approval of various contract-required submittals from the remediation sub-contractor during remedial action; and procuring and coordinating support outside of OU3. Construction is also responsible for implementation of a QA/QC program. In this regard, the CQAP (included in Volume 2 of this Work Plan) has been prepared to describe the policies and practices that Construction will follow to ensure that construction activities meet or exceed FEMP quality standards. It should be noted that all activities which lead up to and include bid package development will probably occur concurrent with the development of the design for each discrete remedial project. During the execution of work, Construction will manage the remediation subcontract and all construction activities undertaken in support of the OU3 interim remedial action, including direct oversight of remedial activities, preparation of pre-final and final inspection reports, and conducting inspections, and coordination meetings identified in Section 4.6. Upon completion of the remedial activities covered by a bid package, Construction will certify that the remediation is complete by approving the remediation subcontractor's checklist and issuing a Certification of Construction Completion.

7.2.2 Remediation Subcontractor

The remediation subcontractor will be responsible for implementing the remedial activities identified in the remedial action SOW for a specific bid package. Prior to commencing remedial activities, the remediation subcontractor will be responsible for developing work plans that detail the approach to be used to meet the requirements specified in the bid package. Project-specific remediation subcontractor responsibilities will be identified in the bid package and by the methodologies, procedures, etc., specified in the remediation subcontractor's work plans.

7.2.3 Other Support Organizations

This section identifies the FEMP organizations by their function, other than Construction and the remediation subcontractor, that will support the remedial action effort. Established during the design effort, the organizations that make up the DEC Team also have a role during the planning and implementation of the remedial action under the direction of the project manager. For the remedial action, the DEC Team will consist of a core group and a support group. The core group will include only organizations (of those identified below) that provide continual

active support for the management of remedial activities. These organizations currently include the remedial design subcontractor and the following: Waste Management; Remediation Support; Engineering; Environmental; Health and Safety; Scheduling and Estimating; Contract Support; Regulatory Support; Quality Assurance; and OU5 coordinators. An overview of their responsibilities is described below.

The remediation subcontractor's activities will be performed in conjunction with those of Remediation Support. Remediation Support, under the direction of OU3 management, will perform various remedial support activities required for implementation of the remedial action, including some surface decontamination activities, material or debris transport within the site, operation of a secondary size reduction/segregation facility, maintenance of interim storage facilities required for dismantled materials, and quality control operations. Remediation Support's specific responsibilities will vary from package to package, depending on the particular remediation needs of each OU3 component.

Waste Management will be responsible for coordination and support for all material management operations, including handling of materials after relocation from the jobsite, storage of materials, certification of material content/type, material tracking, inspections of containers and storage areas, and disposition of materials.

Engineering, in addition to Construction, will be responsible for reviewing the remediation subcontractor's work plans to determine whether or not the approach completely and adequately addresses all design requirements. Engineering will be responsible for performing field inspections during remediation, assessing and coordinating any proposed changes to the design, and compilation of necessary data for the project-specific Remedial Action Report. The remedial design subcontractor, directly reportable to Engineering, will be responsible for support of engineering design changes and may be used for reviewing remediation subcontractor submittals, if necessary.

Environmental will be responsible for: coordination of sampling and analysis required during the remedial action; data management; modifying the SAP or SAP Addenda if necessary, to meet new or changing data needs; assessing compliance with the requirements of the IROD and this Work Plan; and remedial action reporting.

Health and Safety will be responsible for reviewing the remediation subcontractor's HASP and ensuring that the remedial action is performed in compliance with package-specific health and safety requirements and the remediation subcontractor's HASP. Health and Safety will also provide support during the remedial action by performing necessary environmental and worker safety monitoring.

Scheduling and Estimating will provide support in scheduling, reviewing proposed schedules, and reviewing cost estimates by the remediation subcontractor. Contract Support will provide support for overseeing the remediation subcontractor's performance of contract requirements, including review of any potential modifications to the contract (e.g., contract price).

Regulatory Support will support the remediation efforts through continuous review of environmental monitoring data and the monitoring programs to ensure that those programs are providing adequate data.

Quality Assurance will determine the remediation subcontractor's compliance with the quality assurance criteria specified in the bid documents.

During remediation of below-grade structures, OU5 coordinators/project managers will be responsible for phasing the OU3 activities to coincide with OU5's capacity for handling and remediating soils.

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Appendix A

APPENDIX A

MATERIALS SEGREGATION AND CONTAINERIZATION GUIDANCE

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APPENDIX A

MATERIALS SEGREGATION AND CONTAINERIZATION GUIDANCE

This appendix provides the specifics of the materials management strategies that were introduced in Section 3.4 of the OU3 RD/RA Work Plan. For continuity, the information within this appendix references the related subsection within Section 3.4. As noted in Section 3.4, it is emphasized here that the strategies presented herein are for the interval period and the strategies to be presented in the OU3 Feasibility Study (FS) will supersede them.

Section 3.4.1.1 introduced the general concept of materials segregation criteria. The information provided in Table A-1 constitutes the basic strategy for material segregation during the interval period while providing a material management framework that is consistent with the OU3 final remedial action. Table A-1 first establishes four general disposition routes for materials which will be generated (Off-Site Disposal; Off-Site Processing/Disposition; On-Site Interim Storage; and On-Site Treatment). Then, materials are classified as either low-level radiologically contaminated whereby they are categorized by physical trait or by contaminant classification. These categories are then placed into one of the disposition groupings. The reason that low-level radioactive materials contain all of the physical material types in Table A-1 is due to the assumption that approximately 98 percent of all OU3 materials are classified as only low-level radiologically contaminated. Although the primary criteria for segregation is by contaminant type (low-level radiologically contaminated, asbestos-contaminated, hazardous/mixed waste, or PCB-contaminated) there is a practical need to subdivide the category that constitutes the majority of materials into disposal, recycling/reuse, on-site interim storage, or on-site treatment. It should be emphasized that these material categories were defined based on current and potential future disposition alternatives. As a result, these categories may be revised at any time leading up to, and after, the completion of the OU3 FS.

Material segregation requirements are based on the likelihood of certain material meeting material acceptance criteria for each disposition option. Listed below are the primary material acceptance criteria for the currently identified material disposition options. These material acceptance criteria have been evaluated in the development of this guidance document. The OU3 RD/RA SAP has been developed to incorporate sampling and analytical requirements to meet these criteria.

- Nevada Test Site Certified, stabilized low-level radioactive waste that has a transuranic concentration of less that 100 nCi/g does not contain hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA), asbestos, free-liquids, gas containers under pressure, disease-causing or infectious agents, corrosive material, or explosives; characterized, containerized, and transported pursuant to an NTS-approved waste management program. Waste acceptance criteria for NTS is specified within Nevada Test Site Waste Acceptance Criteria, Certification, and Transfer Requirements, NVO-325 which includes requirements for characterization, containerization, RCRA determination, certification, and shipping.

- Envirocare of Utah, Inc. Facility in Clive, Utah (Envirocare) Certified, mixed waste that meets waste acceptance criteria specified by Enviro-

TABLE A-1 Material Segregation Categories

OFF-SITE DISPOSAL(1)	OFF-SITE PROCESSING/ DISPOSITION(1) - UNRESTRICTED USE - RESTRICTED USE	ON-SITE INTERIM STORAGE(1,2)	ON-SITE TREATMENT
Non-regulated/ non-friable ACM a) floor tile b) fire brick c) gasket material d) feeder cable	**Specialty metal** (3) a) nickel b) copper c) inconel d) monel e)stainless f)lead flashing	**Regulated/friable ACM** a) thermal system insulation (TSI)	**Wash waters**
Construction debris a) refuse metal b) ceiling demo. c) built-up roofing/ substrate d) doors e) windows f) HEPA filters g) wood	**Restricted use** a) equipment b) roll-up/overhead doors c) misc. electrical components d) metal wall panels e) metal roof panels f) louvers g) insulated wire with conduit(4)	**Listed hazardous waste/debris (5), including mixed waste**	
Compactible waste (6) a) PPE b) fiberglass insulation	**Process Piping**	**Characteristic hazardous waste/debris (5), including mixed waste**	
Transite a) wall panels b) roof panels	**Non-Process Piping**	**PCB non-liquid regulated waste**	
Residues, hold-up material, sludges	**Ductwork**	**Soil**	
Concrete, asphalt, masonry(7)	**Unrestricted use metals** a) structural steel b) decking		
Acid brick (7)	**Salvageable** a) equipment (4)		

Assumptions:

- Off-Site Disposal, Processing/Disposition, and On-Site Interim Storage may be changed according to what is specified in the OU3 final remedial action ROD.
- Subcategories are used to correlate main categories with material quantities found in "OU3 Material Quantities Waste Inventory Report, Rev. D, 4/94".
- All materials are considered to be low-level radiologically contaminated.

Footnotes:

(1) Material must be further segregated by radionuclide
(2) Awaiting treatment and/or Final ROD for OU3
(3) Material must be further segregated by metal type
(4) Identified equipment for restricted use (salvage/resale)
(5) Material must be further segregated by waste/treatment type
(6) Can be added to construction debris as filler
(7) Inadequate storage capacity at this time, may be moved to on-site interim storage as storage limitations are resolved

care's Material Acceptance Process Manual, including the requirements for providing representative pre-shipment samples, analytical results from a Utah-certified laboratory to complete required documentation, Mixed Waste Profile Record, Physical Properties Evaluation, Radiological Evaluation forms, Uniform Hazardous Waste Manifest, Land Disposal Restriction Notice/Certification, Weigh Bill, packaging, and shipment. In addition to the requirements of the Material Acceptance Process Manual, all DOE-generated mixed waste must be prepared and shipped in accordance with the DOE Oak Ridge Office contract with Envirocare (March 17, 1994), Envirocare licenses and permits.

- Municipal Solid Waste Landfill Unrestricted (free-release) waste that meets DOE Order 5400.5, FEMP Material Release Policy, and waste acceptance criteria of the receiving facility. Currently, meeting the DOE and FEMP restrictions on free-release of material adequately qualify waste for disposal at the Rumpke landfills that is currently being use by the FEMP.

- On-site Interim Storage Material awaiting disposition to the facilities identified above and for potential disposition determinations that will be made by the OU3 final remedial action ROD. Table A-1 lists the segregation requirements that were determined to be necessary for meeting the disposal requirements of facilities mentioned above as well as for interim storage.

Section 3.4.1 identified the Materials Segregation and Containerization Criteria (MSCC) form as one of the principle documents to be used during the management of the primary materials generated from decontamination and dismantlement activities. The MSCC form will be derived from the material segregation and containerization guidance found in Table A-2 located at the end of this appendix. Table A-2, serves as a guide to initially segregate and containerize the majority of materials during the interval period in order to meet material acceptance criteria. The table is organized to correspond to distinct remedial activities in which the materials will be generated. A project-specific application of this table will be included in the performance specifications for each project under Appendix A of the title, Waste Handling Criteria (Section 01120).

Off-Site Disposal

Nevada Test Site

Current off-site disposal of low-level waste at the FEMP consists of characterization, containerization, transportation, and burial of approved waste streams at NTS. The two most limiting criteria for off-site disposal are as follows:

- approved NTS waste streams must be packaged in separate containers (a single container must not contain more than one approved waste stream); and

- all waste must conform to the descriptions and requirements of the FEMP application for shipment of waste to NTS and NVO-325.

The current approved FEMP waste streams for NTS are described below and listed according to their reference code:

Contaminated Process Area Scrap Wastes (ONLO000000001): This waste is generated in the dismantling of equipment and disposal of waste that has been stockpiled during FEMP operations. This remediation process generates scrap metal, scrap wood, and scrap vehicles.

Contaminated Construction/Removal Action Wastes (ONLO000000002): This waste is generated during the dismantling or excavation phase of construction, maintenance, and removal action projects, and consists of materials such as crushed concrete, soil, broken pieces of wood, and non-regulated, non-friable ACM.

Low-/High-Grade Residues (ONLO000000006): Low-grade residues generally contain between 0.1 percent to 20 percent ^{238}U by weight and 0.2 percent to 2.0 percent ^{235}U relative to total uranium. These residues consist of uranium oxides and fluoride mixed with a wide variety of other materials and comprise approximately 70 percent of this waste stream. High grade residues generally contain between 20 percent to 88 percent ^{238}U by weight and 0.2 percent to 2.0 percent ^{235}U relative to total uranium. These residues contain impurities or are mixtures of several uranium compounds.

Contaminated Trash (ONLO000000001): This material is generated in daily office, material unpackaging, and light clean-up operations. The waste is size reduced in a compactor.

Low-/High-Grade Residues - Subcontracted (ONLO000000008): These are materials similar to ONLO000000006 that would be amenable to compaction at a subcontractor's facility.

Radioactively Contaminated, Regulated Asbestos-Containing Material (ONLO000000010) (* Not Yet Approved): Radioactively contaminated, asbestos-containing materials are generated at the FEMP during renovation, demolition, and remediation activities.

Thorium Residues and Wastes Not Amenable to Sampling (ONLO000000011): The sources of this waste are the thorium production processes and the remediation activities of those processes. This material is not amenable to sampling.

Thorium Residues (ONLO000000012): This waste stream contains homogeneous thorium products and includes approximately one-third of the thorium inventory stored at the FEMP.

Depleted Uranium Metal (ONLO000000013): This waste stream consists of classified depleted uranium metal shapes from the U.S. Army Depleted Uranium Armor and Munitions Program.

<u>Envirocare of Utah, Inc. (USEPA Part B Permit Certificate ID #UTD982598898)</u>
DOE (Oak Ridge Office) contracted with Envirocare of Utah, Inc. on March 17, 1994 to dispose of any mixed waste from DOE facilities located nationwide that meets Envirocare of Utah's licenses, permits, and pre-qualification and shipment requirements specified by Envirocare of Utah's Material Acceptance Process Manual. The manual specifies required pre-shipment samples and analyses, completion of necessary forms, and packaging and shipping guidelines. Materials that are anticipated to be handled as mixed waste for potential disposal to Envirocare of Utah (subject to applicable land disposal restrictions that specify pre-treatment requirements per 40 CFR 268.38) include fluorescent bulbs, lead paint chips, paint remover, hydraulic fluids, oils, and greases.

Off-Site Processing/Disposition

Unrestricted Recycling

This disposition option is applicable to structural steel and decking material, and consists of decontamination (at the FEMP or at vendor) and unrestricted release in compliance with applicable state and federal regulations, as well as with DOE Orders and site policies. The released material will be made available to the private sector for scrap metal recycling without restriction.

The key properties or characteristics of this material are that the material has a low surface area relative to its mass and that all potentially contaminated surfaces are accessible to comprehensive direct survey techniques. The levels and types of contamination (including isotopic determinations) are not limiting factors with this option if the waste conforms to the previously stated assumptions. Isotopic identification and the contamination level must be documented for processing and transportation, regardless of the destination.

This option is not applicable to metal which has:

- inaccessible contamination;
- excessive surface area in relation to mass; or
- other regulated constituents (e.g., RCRA-listed waste).

Restricted or Controlled Recycling

This disposition option is available to most of the metal materials that are not eligible for unrestricted release. Examples of this material include equipment, ductwork, and piping. Disposition includes characterization, transportation, processing via metal melt at a licensed facility, and re-use in a restricted or controlled application such as shield blocks or the production of approved U.S. Department of Transportation (DOT) shipping containers for other DOE programs.

The key properties and characteristics of this material are that the materials are mostly metal and that they do not contain hold-up residuals or other hazards (i.e., TSCA, RCRA listed, or a significant amount of regulated asbestos). The types and levels of radioactive contamination are not limiting factors for this category; however, they must be documented to ensure compliance with DOT regulations and the processor's radioactive material license. Additionally, the presence of dissimilar metals or metal alloys generally is not limiting.

This option is not applicable to:

- unrestricted release metal;
- RCRA-listed or TSCA waste;
- asbestos insulated piping; or
- bi-material wastes such as a foam-filled metal door.

Unrestricted Release - Material Release Facility

This disposition option is mainly for the unrestricted release of uncontaminated waste, unused materials, and vendor equipment. This option is implemented for items that are at the jobsite

that are either controlled or unlikely to become contaminated during use. Examples include office or support trailers, scaffolding, office trash, and equipment. Items to be managed under this category will be released without restriction following the appropriate radiological survey that show radiation levels are below those established by the FEMP Material Release Policy. This option is limited to those items that can be verified as uncontaminated through the use of administrative controls, routine surveys, and/or comprehensive release surveys in accordance with existing FEMP Environmental Safety and Health procedures.

On-Site Interim Storage

On-site interim storage consists of either containerized or bulk storage of waste that will be managed on-site pending the availability of treatment and disposal options or the issuance of the OU3 final remedial action ROD. Essentially, mixed waste, regulated/friable ACM, and PCB non-liquid regulated waste will be managed in this manner. In order to meet 40 CFR 761, waste contaminated with PCBs regulated under the Toxic Substances Control Act will be managed in accordance with Removal No. 17, pursuant to the guidelines set forth in USEPA's Guidance on Remedial Actions at Superfund Sites with PCB Contamination. Hazardous/mixed waste will be characterized, accumulated, and transferred to the FEMP Waste Management for proper storage and ultimate treatment and disposal, in accordance with the Solid Waste Disposal Act (40 CFR 262, 264, and 265) and the Ohio Hazardous Waste Management Regulations (OAC 3745-54, -55, and -56). These requirements include specifics on the design, use, and management of storage containers and waste piles for hazardous wastes, as well as the design, use, and management of container storage areas. The minimal amount of soil that may be generated (anticipated to be minimal quantities) will be managed in accordance with Removal No. 17.

On-Site Volume Reduction or Treatment

Some wastes may be amenable to on-site processing prior to final disposition. The primary techniques are compaction and waste water treatment. Wastes such as personal protective clothing, trash, or small miscellaneous items will be compacted and packaged by FEMP personnel prior to final disposal. Wastewater will be transferred to the Advance Wastewater Treatment Facility.

It is anticipated that the majority of the primary segregation activities will occur during the actual dismantlement and will be size-reduced and containerized at that time. If segregation and size reduction for certain materials are not feasible at the project site, other locations will have to be established for these activities. Refer to Section 3.4.1.2 for a discussion on size reduction and segregation.

TABLE A-2 MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA

			PREFERRED CONTAINERS						
			TOP LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX/ DUMPSTER	NO CONTAINERS	SIZE CRITERIA
Site Preparation &	Cardboard, Paper						I		
Mobilization	Plastic						I		
	Wood						I		
	Soil							J	
	Asphalt Dust			E1					
	Concrete Dust			E2					
	Strapping						I		
Asbestos Removal	Pipe Insulation (including piping)						H		
	Equipment Insulation						H		
	Floor Tile						G1		
	Refractory						G1		
	PPE (Asbestos)						H		
	HEPA Filters (Asbestos)						H		
	HWMU Debris				K?				
Demolition Debris Removal	Refractory (Non-Asbestos)						I		
	Light Fixtures						B		1
	Ductwork						D		2
	Plumbing Fixtures						I		

CATEGORIES:

A - Accessible Metals
B - Inaccessible Metals
C - Process-Related Metal
D - Painted Light Gauge Metal
E1 - Asphalt
E2 - Concrete
F - Acid Brick
G1 - Non-Regulated ACM
G2 - Transite
H - Regulated ACM
I - Misc. Materials
J - Soil
K - Hazardous
L - Washwater
M - Sludges/Residues
N - TSCA Regulated

CUTTING CRITERIA FOR CATEGORIES F, H, I

(1) maximum size 10' long X 4' wide X 1' high
(2) maximum size 10' long with 1' projection
(3) maximum size 6' long X 4' wide X 2' high

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TABLE A-2 MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA (Cont'd)

			PREFERRED CONTAINERS						
			TOP LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX/ DUMPSTER	NO CONTAINERS	SIZE CRITERIA
Demolition Debris Removal	Lab Cabinets						B		
(cont'd.)	Cable Trays						B		2
	Metal Fume Hoods						B		1
	Valves, Fittings		C						1
	Gasket Material						G1		
	Eye & Safety Showers						I		1
	FLEX Connections						I		
	Process Piping		C						2
	Non-Process Piping						B		2
	PVC Piping						I		
	Acoustic Ceiling						I		
	Gypsum Material						I		
	Junction Boxes						B		
	Partitions						I		
	Conduit and Wire						B		2
	Instrumentation						B		
	Panels	Elect.					B		1
	Fluorescent Bulbs			K					

CATEGORIES:
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I - Misc. Materials
J - Soil
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L - Washwater
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CUTTING CRITERIA FOR CATEGORIES F, H, I
(1) maximum size 10' long X 4' wide X 1' high
(2) maximum size 10' long with 1' projection
(3) maximum size 6' long X 4' wide X 2' high

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TABLE A-2 MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA (Cont'd)

			PREFERRED CONTAINERS						
			TOP LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX/ DUMPSTER	NO CONTAINERS	SIZE CRITERIA
Demolition Debris Removal	Ballasts	Elect.				N			
(cont'd)	Bulbs-Incandescent						I?		
	Motors	Elect.					B		1
	Feeder Cable						G1		
Equipment Removal	Conveyors						B		1
	Dust Collectors						B		1
	Refrigeration Units		C						1
	Furnaces w/o refractory		C						1
	Furnaces w/refractory		C						
	Condensers						B		1
	Vaporizers						B		1
	Pumps		C				B		1
	Reactors		C						1
	Tanks						B		1
	Autoclaves						B		1
	Absorber		C						1
	Fans						B		1
	Air Dryer						B		1

CATEGORIES:
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CUTTING CRITERIA FOR CATEGORIES F, H, I
(1) maximum size 10' long X 4' wide X 1' high
(2) maximum size 10' long with 1' projection
(3) maximum size 6' long X 4' wide X 2' high

TABLE A-2 MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA (Cont'd)

			PREFERRED CONTAINERS						
			TOP LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX/ DUMPSTER	NO CONTAINERS	SIZE CRITERIA
Equipment Removal	Scales						B		1
(cont'd)	Agitators						B		1
	Exhaust fans						B		1
	Gear Reducers						B		1
	Depressurized Storage Cylinder						B		1
	Compressors						B		1
	Filters	Metal					B		
		Gas	C						
	Separators						B		1
	Scrubbers						B		1
	Columns	Pyrex					I		
	Dissociators						B		
	Cooling Coils						B		1
	Carbon Traps						B		
	Preheaters						B		1
	Product Mills		C						1
	Drying Oven						B		

CATEGORIES:
A - Accessible Metals
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I - Misc. Materials
J - Soil
K - Hazardous
L - Washwater
M - Sludges/Residues
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CUTTING CRITERIA FOR CATEGORIES F, H, I
(1) maximum size 10' long X 4' wide X 1' high
(2) maximum size 10' long with 1' projection
(3) maximum size 6' long X 4' wide X 2' high

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TABLE A-2 MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA (Cont'd)

			PREFERRED CONTAINERS						
			TOP LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX/ DUMPSTER	NO CONTAINERS	SIZE CRITERIA
Equipment Removal	Packaging Stations						B		1
(cont'd)	Chillers						B		1
	Plasma Sprayer						B		1
	Heat Exchangers						B		1
	Controllers						B		1
	Transformers						C		
	Hoists						B		1
	Vibrators						B		1
	Roll-up Doors						B		1
	Heaters						B		1
	Control Centers						B		1
	Drinking Fountains						B		1
	Vacuum Systems						B		1
	Settling Tank						B		1
	Vaults						E2		1
	Bucket Elevator						B		1
	Water/Air Tanks						B		1
	Platforms						B		1

CATEGORIES:
A - Accessible Metals
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I - Misc. Materials
J - Soil
K - Hazardous
L - Washwater
M - Sludges/Residues
N - TSCA Regulated

CUTTING CRITERIA FOR CATEGORIES F, H, I
(1) maximum size 10' long X 4' wide X 1' high
(2) maximum size 10' long with 1' projection
(3) maximum size 6' long X 4' wide X 2' high

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TABLE A-2 MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA (Cont'd)

			PREFERRED CONTAINERS						
			TOP LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX/ DUMPSTER	NO CONTAINERS	SIZE CRITERIA
Equipment Removal	Pulverizers						B		1
(cont'd)	Pulsate Collectors						B		1
	Drum Dumper/Filler						B		1
	Fitzmill						B		
	Augers						B		1
	Feed/Weigh Hoppers						B		1
	Reducers						B		1
	Filter Units						B		1
	Blowers						B		1
	Crusher Mills						B		1
	Dumping & Pack. Systems						B		1
	Burners						B		1
	Blenders						B		1
	Cyclones						B		1
	Chutes						B		1
	Mixing Boxes						B		1
	Miscellaneous Tanks						B		1
	Drum Lifts/Handler						B		1

CATEGORIES:
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CUTTING CRITERIA FOR CATEGORIES F, H, I
(1) maximum size 10' long X 4' wide X 1' high
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(3) maximum size 6' long X 4' wide X 2' high

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TABLE A-2 MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA (Cont'd)

			PREFERRED CONTAINERS						
			TOP LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX/ DUMPSTER	NO CONTAINERS	SIZE CRITERIA
Equipment Removal	Drum Crusher						B		1
(cont'd)	Surge Hoppers						B		1
	Air Handling Units						B		1
	Miscellaneous Equipment						B		1
	Bridge Crane						B		1
	Substation						B		1
Interior Transite	Transite Panels						G2		
	Metal Wall Studs						B		1
	Interior Doors						I		
	Batt Insulation						I		
	Lead Fasteners						D		
Clean Building	Washwater							L	
	Sludge					M			
	Floor Debris					M			
	Sludge Filters					M			
Exterior Transite	Transite Panels						G2		
	Window Panes/Glass						I		
	Exterior Doors						B		

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CUTTING CRITERIA FOR CATEGORIES F, H, I
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TABLE A-2 MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA (Cont'd)

			PREFERRED CONTAINERS						
			TOP LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX/ DUMPSTER	NO CONTAINERS	SIZE CRITERIA
Exterior Transite	Metal Vent Stacks						B		1
(cont'd)	Metal Louvers						D		1
	Lead Flashing						D		
	Gutter Cleanout						H?		
	Lead Gutters						D		
	Downspouts						D		1
	Lead Downspout Joints						D		
Structural Steel	Main Frame Members						A		2
	Stairs and Ladders						B		1
	Floor Decking						A		1
	Handrail						B		1
	Metal Angle						A		2
	Lead Paint Chips					K			
	Bar Joists						B		2
	Metal Roof Panels						D		1
	Grating						B		1

CATEGORIES:

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J - Soil
K - Hazardous
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M - Sludges/Residues
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CUTTING CRITERIA FOR CATEGORIES F, H, I

(1) maximum size 10' long X 4' wide X 1' high
(2) maximum size 10' long with 1' projection
(3) maximum size 6' long X 4' wide X 2' high

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TABLE A-2 MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA (Cont'd)

			PREFERRED CONTAINERS						
			TOP LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX/ DUMPSTER	NO CONTAINERS	SIZE CRITERIA
Concrete Removal	Concrete						E2		3
	Masonry Units						E2		
	Acid Brick						F		
	Cinderblock Walls						E2		
	Built-up roofing						I		3
Demobilize	Polyethylene						I		
	PPE - non-asbestos						I		
	Pre-filter HEPA - non-asbestos						I		
	Empty Material Containers						I		
	Aerosol Cans (punctured)						B		
	Water filters - non-asbestos						I		
	Water filters - asbestos						H		

CATEGORIES:

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G2 - Transite
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M - Sludges/Residues
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CUTTING CRITERIA FOR CATEGORIES F, H, I

(1) maximum size 10' long X 4' wide X 1' high
(2) maximum size 10' long with 1' projection
(3) maximum size 6' long X 4' wide X 2' high

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Appendix B

APPENDIX B

OPERABLE UNIT 3
INTERIM REMEDIAL ACTION
ARARS ATTAINMENT TABLES

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APPENDIX B

ARARs ATTAINMENT TABLES

Appendix B identifies the ARARs identified in the OU3 IROD and other requirements for the OU3 interim remedial action. Tables B-1 through B-4 (referred to in Section 3.6.4) present the chemical-specific, location-specific, action-specific, and other requirements, respectively. These tables also provide a brief summary of the site compliance strategy for each of these requirements within the remedial design and remedial action, and/or reference sections of this work plan that provide such detail.

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TABLE B-1 Chemical-Specific Requirements

Applicable Requirements	Attainment
(1) **Ohio Air Pollution Lead Control Regulations**, OAC 3745-71-02, Lead Emissions Limits *Sets the ambient air quality standards for lead, to be applicable throughout the State of Ohio, at a maximum arithmetic mean of 1.5 micrograms per cubic meter during any calendar quarter.*	Lead emissions associated with the OU3 interim remedial action are not expected to occur in sufficient volume to cause a violation of the ambient air quality standard for lead. The majority of lead contained within OU3 is in a solid form (i.e., shielding, bolt covers, etc...) and therefore, would not lend itself to be readily emitted as particulate matter. Minimal lead emissions may occur during cutting operations. These emissions, however, will not be of sufficient quantity to cause a violation of the standard. Lead emissions will be monitored from a worker's health and safety prospective under the ongoing site Health and Safety Program. In the event lead emissions reach the level mandated by the standard, monitoring will be conducted in accordance with the requirements of OAC 3745-71-05, "Emissions Test Methods and Procedures for New and Existing Sources."
(2) **Ohio Air Pollution Regulations**, OAC 3745-20-02, -03, -04 and -05, Demolition and Renovation Procedures for Asbestos Emission Control *Requires removal of friable asbestos materials from a facility being demolished or renovated before any wrecking or dismantling that would break up materials or preclude access to the materials for subsequent removal. Wet and encase friable materials with a suitable leak-tight container.*	These regulations are applicable to the demolition or renovation of any building in which friable asbestos is present. Removal of friable asbestos associated with the OU3 interim remedial action will be conducted in accordance with the substantive requirements of these regulations. In addition, asbestos removal work performed by a subcontractor would be done by a qualified subcontractor in accordance with an approved asbestos abatement work plan. The site currently complies with this regulation in its asbestos programs, under Removal No. 26 - Asbestos Removals, which would continue into the interim action. Section 3.3.4 of this work plan provides additional details.

TABLE B-1 Chemical-Specific Requirements (cont'd)

Applicable Requirements	Attainment
(3) **National Emission Standards for Hazardous Air Pollutants** (40 CFR 61), Subpart H, National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities *Emissions of radionuclides to the ambient air from DOE facilities shall not exceed those amounts that would cause any member of the public to receive an effective dose equivalent of 10 mrem/yr or more in any one year.* *Stacks/vents (i.e., point sources) which have the potential, under normal operating conditions but without emission control devices, to release radionuclides in sufficient quantities to cause an effective dose equivalent of 0.1 mrem/yr to any member of the general public shall have a continuous stack sampler or monitor.*	Emission estimates will be prepared for fugitive and point source air emissions to demonstrate that no off-site member of the general public receives an annual effective dose equivalent in excess of the 10 mrem/year standard via the air pathway. Point source emissions will be evaluated prior placement into the service to ensure compliance with the 0.1 mrem/yr standard and continuous monitoring will be conducted as required, as discussed in Section 3.7.3 of this work plan.
(4) **National Emissions Standard for Hazardous Air Pollutants** (40 CFR 61, Subpart M, Sections 145, 149, 150 and 153), National Emissions Standard for Asbestos *Requires removal of friable asbestos materials from a facility being demolished or renovated before any wrecking or dismantling that would break up materials or preclude access to the materials for subsequent removal. Wet and encase friable materials with a suitable leak-tight container.*	These regulations are applicable to the demolition or renovation of any building in which friable asbestos is present. Removal of friable asbestos associated with the OU3 interim remedial action will be conducted in accordance with the substantive requirements of these regulations. In addition, asbestos removal work performed by a subcontractor would be done by a qualified subcontractor and would be done in accordance with an approved asbestos abatement work plan. The site currently complies with this regulation in its asbestos programs, under Removal No. 26 - Asbestos Removals, which would continue into the interim action. Section 3.3.4 of this work plan provides additional details.
(5) **Ohio Water Quality Standards**, OAC 3745-1-01, -04, -07, and -21; Ohio NPDES Permits, OAC 3745-33 *Establishes general water quality standards and numerical and narrative water quality standards for aquatic life, water supply, and recreational use designations for the Great Miami River and Paddy's Run Creek (waters of the State of Ohio).* *Numerical and narrative water quality use designations and their corresponding chemical-specific criteria are presented in Tables 7-1 through 7-16 of the Ohio Water Quality Standard regulations. The criteria may be applicable to discharges outside and inside the mixing zone of the affected water body.*	OU3 interim remedial action will not result in the direct discharge of wastewater to a water of the State. All wastewater associated with the interim remedial action will be discharged to the FEMP wastewater treatment system where it will be combined with other wastewaters for treatment. Discharges of combined final effluent will be conducted in accordance with Ohio NPDES Permit No. 1IO00004*DD.

TABLE B-1 Chemical-Specific Requirements (cont'd)

Relevant and Appropriate Requirements	Attainment
(6) **Ohio Air Pollution Control Regulations**, OAC 3745-17-08, Restriction of Emission of Fugitive Dust *No person shall cause or permit any fugitive dust source to be operated, or any materials to be handled, transported or stored, or a building or its appurtenances or a road to be used, constructed, altered, repaired or demolished without taking or installing reasonably available control measures to prevent fugitive dust from becoming airborne.*	Fugitive dust emissions will be controlled to the maximum extent practicable using reasonably available control measures such as water or other suitable dust suppressants. Other engineering controls and best management practices such as forced negative air will also be utilized during demolition to control fugitive dust emissions.
(7) **Safe Drinking Water Act** (42 USC 300G; Public Law (PL) 93-523), National Primary Drinking Water Regulations (40 CFR 141), Subpart B, Maximum Contaminant Levels (40 CFR 141.11 through .16); Subpart F, Maximum Contaminant Level Goals, (40 CFR 141.50 through .52); Subpart G, National Revised Primary Drinking Water Regulations (40 CFR 141.60 through .63); Ohio Drinking Water Regulations, Public Water System Primary Contaminant Control, OAC 3745-81 *Sets maximum contaminant levels (MCLs) and non-zero maximum contaminant level goals (MCLGs) for inorganic and organic contaminants in drinking water.*	Promulgated standards are relevant and appropriate to remedial actions because these activities may cause contaminants to migrate or leach into the underlying aquifer. While not relevant and appropriate, proposed standards may be considered if water impacted by the site would be used directly as a drinking water supply. Engineering controls and best management practices will be utilized to mitigate the potential discharge of contaminated wastewater to the underlying aquifer. These controls and best management practices will include covering and containerizing stored debris and wash waters to ensure potential impacts to the underlying aquifer are minimized. See Section 3.7.1 of this work plan for a discussion on the use of the FEMP existing Groundwater Monitoring Program as a tool for ascertaining the effectiveness of these controls/ practices.

TABLE B-1 Chemical-Specific Requirements (cont'd)

Requirements To Be Considered	Attainment
(8) **Toxic Substances Control Act**, as amended (15 USC 2607-2629; PL 94-469 et seq.), PCB Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions (40 CFR 761), Subpart G, PCB Spill Cleanup Policy *Sets cleanup standards for PCB contaminated materials.*	Since the OU3 interim remedial action does not address the treatment of contaminated materials, attainment of this requirement will focus on the management of PCB-contaminated materials. Waste contaminated with PCBs regulated under TSCA will be managed in accordance with Removal No. 9 - Removal of Waste Inventories and Removal No. 17 - Improved Storage of Soil and Debris, which have been developed in accordance with the guidelines set forth in EPA's Guidance on Remedial Actions for Superfund Sites with PCB Contamination. This action will apply to materials which are identified as PCB contaminated based on field screening and chemical analysis.
(9) **Radiation Protection of the Public and the Environment** (DOE Order 5400.5, especially Chapter III) *Sets limitations for residual concentrations of radionuclides in air in uncontrolled areas.*	It is unlikely that residual concentrations of radionuclides in air in uncontrolled areas will exceed the levels identified in this order during the OU3 interim remedial action. Contamination control measures will be undertaken to minimize the spread of radiological and non-radiological contaminants from the work area in OU3 and to protect the safety and health of site workers and the general public, as promulgated in 40 CFR 61, NESHAPs, Subpart H. These measures may include construction of localized containment structures, use of sealants over surfaces of contaminated material, and installation and use of air filtration equipment. Administrative controls will be implemented to ensure adequate staging, adequate placement of monitoring devices, proper operation of countermeasures staffing and implementation. A project-specific air monitoring program will be developed and implemented based on the factors identified in Section 3.7.3 of this work plan. Best Management Practices (BMPs) will be used to minimize, monitor and, if necessary, mitigate any such potential releases.

TABLE B-1 Chemical-Specific Requirements (cont'd)

Requirements To Be Considered	Attainment
(10) **National Primary Drinking Water Standards**, Maximum Contaminant Levels for Radium-226, Radium-228, and Gross Alpha Particle Radioactivity in Community Water Systems (40 CFR 141.15) and Ohio Drinking Water Regulations, Maximum Contaminant Levels for Radium-226, Radium-228, and Gross Alpha Particle Radioactivity in Community Water Systems (OAC 3745-81-15); National Primary Drinking Water Standards, Maximum Contaminant Levels for Beta Particulate and Photoradioactivity from Man-made Radionuclides in Community Water Systems (40 CFR 141.16) and Ohio Drinking Water Regulation, Maximum Contaminant Levels (OAC 3745-81-16) *Sets MCLs for radionuclides for radioactivity in community water.*	Engineering controls and best management practices will be utilized to mitigate the potential discharge of contaminated wastewater to the underlying aquifer. These controls and best management practices will include covering and containerizing stored debris and wash waters to ensure potential impacts to the underlying aquifer are minimized. See Section 3.7.1 of this work plan for a discussion on the use of the FEMP existing Groundwater Monitoring Program as a tool for ascertaining the effectiveness of these controls/practices.
(11) **Federal Water Pollution Control Act**, Clean Water Act (33 USC 1251-1376), Water Quality Criteria (40 CFR 122) *Sets limits on the concentration of contaminants in surface water for the protection of human health and aquatic life. Federal water quality criteria are nonenforceable guidelines used by states to set water quality standards for surface water. These criteria may be considered if the decontamination and dismantling activities impact surface waters.*	Federal water quality criteria are nonenforceable guidelines used by states to set water quality standards for surface water. If a state has promulgated a numerical water quality standard for a given contaminant, the state standard would be relevant and appropriate rather than the Federal water quality criteria. All areas such as waste piles, container storage areas, and container storage buildings, used during the OU3 interim remedial action, will be designed to contain not only the waste but also any drainage that may result from spills, leaks, and runoff from rainfall events. (Refer to discussion in ARAR #18, Container Storage Areas.) All strategic planning and BMPs will be developed to prevent leaks and spills that may impact surface water from areas outside of the container storage areas.

TABLE B-2 Location-Specific Requirements

Applicable Requirements	Attainment
(12) **Protection of Wetlands** (Executive Order 11990, 10 CFR 1022, 40 CFR 6) *Federal agencies must avoid, to the extent possible, any adverse impacts associated with the destruction or loss of wetlands and avoid support of new construction in wetlands if a practicable alternative exists.*	Approximately 1.2 acres of jurisdictional wetlands will be impacted as a result of OU3 interim remedial action. DOE will take steps to avoid and minimize wetland impacts to the maximum practicable extent during conduct of remedial activities. Mitigatory requirements will be determined on a site-wide basis in consultation with USEPA, OEPA, and ACOE and will prescribe to the requirements mandated under the Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged and Fill Material (40 CFR 230).
(13) **Nationwide Permit (NWP) Program** (33 CFR 330) *The ACOE has authorized certain categories of activities involving the discharge of dredge and fill material into wetlands and waters of the United States under its Nationwide Permit Program. Discharges of dredged and fill material must be conducted in accordance with the substantive requirements of the NWPs when applicable. Discharges of dredged and fill material which can not be authorized under a NWP permit must meet the substantive requirements of 33 CFR 323 and 40 CFR 230.*	Approximately 1.2 acres of jurisdictional wetlands will be impacted as a result of the OU3 interim remedial action. Discharges of dredged and fill material will be conducted in accordance with the substantive requirements of applicable NWPs and their corresponding Section 401 State Water Quality Certifications (OAC 3745-32). In the event discharges cannot be authorized under the NWP program, discharges will be conducted in accordance with the substantive requirements of 33 CFR 323, 40 CFR 230 and OAC 3745-32. Mitigatory requirements will be determined on a site-wide basis in consultation with USEPA, OEPA, and ACOE and will prescribe to the requirements mandated under the Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged and Fill Material (40 CFR 230). Nationwide Permit #38 authorizes dredged and fill operations associated with the cleanup of hazardous and toxic wastes and will be utilized to authorize proposed actions where applicable.

Relevant and Appropriate Requirements	Attainment
None	N/A

To Be Considered	Attainment
None	N/A

TABLE B-3 Action-Specific Requirements

Applicable Requirements	Attainment
(14) **Noise Control Act**, as amended (42 USC 4901, et seq.); Noise Pollution and Abatement Act (40 USC 7641, et seq.) *The general public must be protected from noises that jeopardize health and welfare.*	Because equipment and vehicles would be involved in certain aspects of the interim remedial action, all pertinent requirements of the act would be followed. Given the relatively remote location of the OU3 area with respect to off-site members of the general public, noise abatement is not anticipated to require a major focus. However, appropriate engineering controls and BMPs will be implemented to reduce nuisance noise to the maximum practicable extent during conduct of the interim remedial action.
(15) **Solid Waste Disposal Act**, as amended (42 USC 6901, et seq.), Solid Wastes (40 CFR 262.11); Ohio Hazardous Waste Management Regulations, OAC 3745-52-11 *Wastes must be evaluated (characterized) to determine if it is a hazardous waste, either listed or characteristic.*	All wastes from Solid Waste Management Units (SWMUs) within OU3 will be evaluated, categorized, and staged as either hazardous or non-hazardous. Non-hazardous wastes will be exempt from the criteria specified for hazardous waste and may be placed in interim storage and/or disposed without further treatment. Hazardous wastes will be further categorized and staged as either listed or characteristic wastes. Treatment technologies for these wastes will comply with the substantive requirements of the land disposal requirements specified in 40 CFR 268, Subparts C and D, and OAC 3745-59-30 through -35, and OAC 3745-59-40 through -44 (listed waste), and 40 CFR 262.11 and OAC 3745-52-11 (characteristic waste), as appropriate.

TABLE B-3 Action-Specific Requirements (cont'd)

Applicable Requirements	Attainment
(16) **Solid Waste Disposal Act**, as amended (42 USC 6901, et seq.), Solid Wastes (40 CFR 264), Subpart B, General Facility Standards (Ohio Hazardous Waste Management Regulations, OAC 3745-54-10 through -18), Subpart C, Preparedness and Prevention (OAC 3745-54-30 through -37); Subpart D, Contingency Plan and Emergency Procedures (OAC 3745-54-50 through -56); Subpart E, Manifest System, Record keeping and Reporting (OAC 3745-54-70 through -77) *Establishes general requirements for storage and treatment facility location, design and inspection, waste compatibility determination, emergency contingency plans, preparedness plans, and worker training.*	All chemical and physical information required to treat, store, and dispose of all hazardous waste in OU3 (including existing data required under 40 CFR 264.113 (d) and OAC 3745-55-13 (D) and additional data generated during the interim remedial action) will be available until closure of the facility. Surveillance of OU3 will be integrated with sitewide procedures and conducted at least once every 24 hours for security, as specified in 40 CFR 264.14 and OAC 3745-54-14. Training for all personnel that will be working in the remedial zone will be through the ongoing Health and Safety program. Training records will be maintained at the site until final closure of the facility. Preparedness and prevention equipment, as specified in 40 CFR 264.32 and in OAC 3745-54-32, including internal and external communications equipment, portable fire, spill prevention, emergency response, and decontamination equipment will be on-site, available, and in operating condition throughout the duration of interim remedial activities. Backup equipment will be provided as deemed appropriate. All hazardous waste shipped off site will be manifested, using EPA Form 8700-22 (Uniform Hazardous Waste Manifest), or reasonable facsimile, as required under 40 CFR 264.71 - 264.76 and OAC 3745-54-71 through -76. All records and summaries of emergency response incidents will be stored on site for the duration of interim remedial activities.
(17) **Solid Waste Disposal Act**, as amended (42 USC 6901, et seq.), Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (40 CFR 264); Ohio Hazardous Waste Management Regulations, OAC 3745-57 **Solid Waste Disposal Act**, as amended (42 USC 6901, et seq.), Standards for Owners and Operators of Interim Status Hazardous Waste Treatment, Storage and Disposal Facilities (40 CFR 265), Subpart G, Closure and Post-Closure; Ohio Hazardous Waste Management Regulations, OAC 3745-66 *Sets environmental performance standards and post closure requirements for HWMUs.*	All units in OU3 identified as HWMUs will be operated and closed in accordance with the requirements codified in 40 CFR 264 and OAC 3745-57-91 through -93. The monitoring and inspection requirements specified in 40 CFR 264.602 and OAC 3745-57-92 will continue as long as the unit is in operation. Since the intent is to clean close all HWMUs, no post closure care will be required.

TABLE B-3 Action-Specific Requirements (cont'd)

Applicable Requirements	Attainment
(18) **Solid Waste Disposal Act**, as amended (42 USC 6901, et seq.); Solid Wastes (40 CFR 264), Subpart I, Use and Management of Containers (Ohio Hazardous Waste Management Regulations, OAC 3745-55-70); Subpart J, Tank Systems (OAC 3745-55-90); Subpart L, Waste Piles (OAC 3745-56-50 through -60) *Containers used to store hazardous waste must be closed and in good condition. Tank systems for hazardous waste must be adequately designed and have sufficient structural strength and compatibility with the wastes to be stored or treated to ensure that it will not collapse, rupture, or fail, including secondary containment. Hazardous waste piles must be designed to prevent any migration of wastes out of the pile into adjacent subsurface soil or groundwater or surface water at any time during its active life.*	All containers used for interim storage and final disposition of hazardous wastes generated in OU3 will meet the substantive requirement of 40 CFR 264.170 through 178 and OAC 3745-55-70 through 3745-55-78, namely that all containers will be free of structural defects, deterioration, and otherwise, in good working condition. Compatibility, holding, and reuse requirements will be adhered to. Containers used for interim storage will be classified and separated according to waste description and intrinsic hazard prior to storage. Inspection of the container storage area will be conducted on no less than a weekly basis. Appropriate action will be implemented for all containers found with leaks or other structural deterioration, according to the standards codified in 40 CFR 264.15 (c) and 264.171 and OAC 3745-54-15(C) and 3745-55-71. Container storage areas will have a base free of cracks and gaps and will be sufficiently impervious to retain all material accumulated from leaks, spills, and rain fall events. The management of the containers will be in accordance with the substantive requirements of 40 CFR 262, Subpart I, and 40 CFR 264. Specifically, secondary containment will be sufficient to retain at least 10% of the total liquid volume managed in the storage area or the total volume of the largest container, whichever is greater. The base of the storage area will be sloped to a sump. Accumulated waste in the sump will be removed on a regular basis and managed as part of the waste in the storage area. The management of tanks used for interim storage of hazardous waste will be in accordance with the substantive requirements of 40 CFR 265, Subpart J and OAC 3745-55-90 through 3745-55-99. Specifically, the design criteria will include proof that the tank system is structurally sound, compatible with the waste, corrosion resistant (according to the standards established through the National Association of Corrosion Engineers and the American Petroleum Institute, where applicable), has sufficient secondary containment to prevent run-on and retain enough freeboard capacity to retain the contents of the largest tank in the system and precipitation from a 25-year, 24-hour rainfall event. All waste piles will include a liner, designed to prevent migration of waste beyond the vertical and horizontal boundary of the pile, to withstand pressure gradients, uplift, static head, climatic conditions, and the stress of daily operation, in addition to all other substantive requirements codified in 40 CFR 264.251 - 259 and OAC 3745-56-51 through 58. Management of the waste pile will include total removal of all waste and decontamination of ancillary equipment and infrastructure.

TABLE B-3 Action-Specific Requirements (cont'd)

Applicable Requirements	Attainment
(19) **Solid Waste Disposal Act**, as amended (42 USC 6901, et seq.), Standards for Hazardous Waste Generators (40 CFR 262) and Standards for Hazardous Waste Transporters (40 CFR 263); Ohio Solid Waste Management Regulations, OAC 3745-52 and -53, respectively *General requirements for packaging, labelling, and marking hazardous wastes for temporary storage and transportation.*	All standards for identifying, evaluating, and characterizing wastes listed in 40 CFR 262 and OAC 3745-52 will be adhered to throughout remediation. Applicable packaging, labeling, and transportation requirements listed in 40 CFR 263 and OAC 3745-53 will be addressed through BMPs and sitewide integration efforts. All hazardous waste shipped offsite will be manifested, using EPA Form 8700-22 (Uniform Hazardous Waste Manifest), or reasonable facsimile, as required under 40 CFR 264.71 - 264.76 and OAC 3745-54-71 through -76.
(20) **Solid Waste Disposal Act**, as amended (42 USC 6901, et seq.), Containment Buildings, (40 CFR 264), Subpart DD *Hazardous waste and debris may be placed in units known as containment buildings for the purpose of interim storage or treatment.*	Containment buildings erected or utilized for interim storage of hazardous wastes in OU3 will be designed and constructed according to the requirements specified in 40 CFR 264 Subpart DD. Design criteria will be developed as codified in 40 CFR 264.1101. Engineering standards will include ASTM, API, and ACI. In brief, the unit will be completely enclosed and self supporting. Structural integrity criteria will include the ability to withstand frost-heave, uplift, pressure gradients from waste storage, and heavy equipment used inside the unit. Containment structures used for liquid waste management will additionally include a secondary containment and a leachate collection system. All surfaces within the unit that will be in direct contact with hazardous wastes will be chemically compatible with the wastes. Releases of hazardous waste and particulates will be recorded in the facility operating record using the standards listed in 40 CFR 264.1101 (c) (3). Closure of the containment building will be conducted as described in ARAR #17.

TABLE B-3 Action-Specific Requirements (cont'd)

Relevant and Appropriate Requirements	Attainment
(21) **Toxic Substances Control Act**, as amended (15 USC 2607 et seq., PL 94-469 et seq.), PCB Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions (40 CFR 761, Subpart A), General *Inspection and testing are required for material contaminated with PCBs.*	Waste contaminated with PCBs regulated under TSCA will be managed in accordance with Removal No. 9 - Removal of Waste Inventories and Removal No. 17 - Improved Storage of Soil and Debris, which have been developed in accordance with the guidelines set forth in EPA's Guidance on Remedial Actions for Superfund Sites with PCB Contamination.
(22) **Solid Waste Disposal Act**, as amended (42 USC 6901, et seq.), Solid Wastes (40 CFR 264 Subpart S), Corrective Action Management Unit (CAMU) *Allows remediation waste treatment, storage and disposal within a CAMU which can encompass one or more units or areas where contaminants are found.*	Corresponding CERCLA standards may be implemented during OU3 remediation in lieu of corrective action requirements promulgated under Section 3004 (u) of the Hazardous and Solid Waste Amendments to RCRA (1984) and further codified in 40 CFR 264, Subpart S. A demonstration of equivalence will ensure compliance with all substantive and procedural requirements of 40 CFR 264.552 and 553, in addition to those listed in 40 CFR 264.101. In brief, a CAMU may be designated to facilitate the consolidation of wastes within a specified area of concern and to otherwise enhance implementation of effective, protective, and reliable remedial actions. Subparts F, G, and H requirements and all other unit specific requirements, with the exception of minimum technology requirements, as listed in 40 CFR 264.552(a)(1) and (2), will maintain applicability during the active life of the CAMU. Temporary units such as tanks, container storage areas, and container storage buildings may be erected for treatment and interim storage of hazardous remediation waste, either inside or outside the designated boundary of the CAMU. Equivalency with all design, operating, reporting, inspection, and closure requirements listed in RCRA will be demonstrated throughout the active life of the unit, as specified in 40 CFR 264.553 (a) and (b).

TABLE B-3 Action-Specific Requirements (cont'd)

Requirements To Be Considered	Attainment
(23) **Radiation Protection of the Public and the Environment** (DOE Order 5400.5, Chapter II, 5; incorporates by reference CERCLA Section 120 and the Uranium Mill Tailing Remedial Action, Title I *Structural debris that is released from DOE facilities for reuse without radiological restrictions shall meet specified levels.*	Much of the materials and equipment to be decontaminated and dismantled during the OU3 interim remedial action are considered to have potential for contamination because they have been used or stored in radiation areas that could contain unconfined radioactive material. Prior to being released, surfaces of potentially contaminated property shall be surveyed as required to determine whether both removable and total surface contamination (including contamination present on and under any coating) are in compliance with levels identified in this order. Records of released property shall be kept. Release of materials and equipment with inaccessible areas where potentially contaminated surfaces are not accessible for measurement (such as in pipes or drains) will be handled case by case and may not be eligible for release consideration.
(24) **Radioactive Waste Management** (DOE Order 5820.2A, Chapter III) *DOE low-level waste operations: Management of low-level radiological and non-radiological wastes on a systematic basis using the most appropriate combination of minimization, segregation, treatment, and disposal; to the extent that human health and the environment are preserved.*	All waste minimization, segregation, treatment, and disposal that will occur during the OU3 interim remedial action will conform to all applicable EPA, OEPA, and DOE requirements. (Reference #17 & 19, Solid Waste Disposal Act [SWDA].) Minimization: BMPs and sitewide integration will be invoked as discussed in Section 3.4.3 of this work plan to minimize waste generation during dismantlement and demolition activities. Segregation: Containers used for interim storage will be classified and separated according to waste description and intrinsic hazard prior to storage (reference #18, SWDA). All hazardous waste shipped off-site will be manifested using EPA Form 8700-22 (Uniform Hazardous Waste Manifest), or reasonable facsimile as required under 40 CFR 264.71-76. Treatment: Waste treatment will be executed on a sitewide basis and will conform with all requirements as listed in DOE Order 5280.2A, Chapter III, and applicable CERCLA and RCRA requirements. Disposal: Disposal of waste generated during the OU3 interim remedial action is discussed in Section 3.4 of this work plan. The final action ROD will address disposal of all wastes.

TABLE B-3 Action-Specific Requirements (cont'd)

Requirements To Be Considered	Attainment
(25) **Radiation Protection of the Public and the Environment** (DOE Order 5400.5, Chapter IV, Section 6) *Sets interim and long-term standards for storage facility for waste containing uranium, thorium, and their decay products.*	Interim storage requirements must be met because the OU3 interim remedial action includes decontamination and dismantlement of OU3 structures and facilities prior to any decision regarding final disposal. Long-term storage requirements do not need to be considered. Any materials resulting from the OU3 interim remedial action that require interim storage will be stored in a facility with a life span of 25-50 years, with administrative and physical controls for 25 years, and with BMPs to comply with applicable federal standards regarding concentrations of radionuclides in groundwater and quantities of residual radioactive material. Long-term management of any materials with uranium, thorium, and their decay products falls within the scope of the final remedial action.
(26) **Effluent Control and Monitoring** (DOE Order 6430.1A, Section 1324-7) *Exhaust outlets that may contain fission products shall be provided with two monitoring systems.*	Airborne radioactive wastes from remedial activities in OU3 include but are not limited to airborne effluent from process system vents, fission product gases, and particulate release from ongoing demolition and dismantlement activities. Design of any effluent system(s) required during OU3 remedial activities shall ensure the holdup or collection of fission material and other material capable of sustaining a chain reaction, based on system design criteria. Nuclear criticality safety shall be considered in the design. Exhaust outlets that may contain transuranics or fission products will be provided with at least two monitoring systems, in compliance with DOE Order 1589-99.0.1, Radioactive Airborne Effluent.
(27) **Solid Waste Disposal Act**, as amended (42 USC 6901, et seq.), Solid Waste, (40 CFR 264 subpart S), Corrective Action Rule (proposed at 55 Federal Register (FR) 30797) *Establishes cleanup criteria for RCRA solid waste management units.*	All cleanup criteria established under CERCLA for those units listed as SWMUs in OU3 will be equivalent to standards specified under RCRA, in accordance with the language of 55 FR 30852, section VII, part A.

TABLE B-4 Other Requirements

These requirements are not considered ARARs by EPA, but are requirements that apply to the performance of the interim action at this site.

Citation	Attainment
(28) **Radiation Protection for Occupational Workers** (DOE Order 5480.11, Chapter 9) *This requirement establishes DOE radiation protection standards to ensure protection of the worker from ionizing radiation. The requirements set forth in this order require the establishment of an ALARA policy, radiation protection standards for internal and external exposure for occupational workers, planned special exposure, radiation protection standards for internal and external exposure to minors and students, radiation protection standards for public entering a controlled area, and various procedural requirements.*	This requirement will be attained through the continuation of the existing Health and Safety program in accordance with this DOE Order and the Radiological Control Manual. The requirements of the sitewide Health and Safety Plan will be enforced for implementation of the interim action. In addition, the performance of the work, as designed, will utilize engineering and administrative controls to minimize worker exposure and emphasize the ALARA principle.
(29) **Radiation Protection Rules**, OAC 3701-38: General Radiation Protection Standards; Rules 3701-38-13, 3701-38-15 and 3701-38-16 *Individuals in restricted areas may not be exposed to airborne radioactive material in average concentrations in excess of those listed.*	The existing Health and Safety Plan addresses air monitoring within work zones and sets standards for worker safety in accordance with this requirement.
(30) **Occupational Safety and Health Administration Standards** (29 CFR 1910; 1910.1000), Subpart Z, Toxic and Hazardous Substances; 1910.1025, Lead; 1910.1028, Benzene; 1910.1101, Asbestos; 1910.1018, Inorganic arsenic *Sets worker exposure limits to toxic and hazardous substances and prescribes the methods for determinations of concentrations.*	This requirement will be attained through the ongoing Health and Safety program.
(31) **Occupational Safety and Health Administration Standards; Occupational Health and Environmental Control** (29 CFR 1910; 1910.95), Subpart G, Occupational Noise Exposure *Sets limits of worker exposure to noises during the performance of their duties.*	This requirement will be attained through the ongoing Health and Safety program.
(32) **Hazardous Material Transportation Act**, as amended (49 USC 1801-1812); Solid Wastes (40 CFR 263), Standards Applicable to Transportation of Hazardous Waste *Adopts certain DOT standards and requires compliance with the manifest system for hazardous wastes.*	All materials transported off-site will be performed in accordance with DOT standards and this act, including labelling and manifesting requirements.

TABLE B-4 Other Requirements (Cont'd)

Citation	Attainment
(33) **Hazardous Materials Regulations**; Shippers -- General Requirements for Shipments and Packaging (49 CFR 173), Subpart I, Radioactive Materials *Establishes requirements for the type and strength of various packaging used for the shipment of hazardous and radioactive materials.*	Existing Waste Management programs currently operate under the requirements of these regulations. All materials meeting these criteria to be transported off-site will be handled in accordance with these regulations.
(34) **Occupational Safety and Health Administration Standards for Hazardous Waste Operations and Emergency Response** (29 CFR 1910.120) *Sets the training standards for workers conducting hazardous waste operations and emergency response.*	This requirement will be attained through the ongoing Health and Safety program.

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Appendix C

APPENDIX C

PERFORMANCE SPECIFICATIONS
FOR THE
BUILDING 4A DECONTAMINATION AND DISMANTLEMENT PROJECT

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Decontamination and Dismantling Design for CRU-3 Performance Specifications Plant 4 Complex

Operable Unit 3
Project Order 121
WBS No. 1.1.1.1.3.3.1
November 1994
Revision 3

Environmental Remedial Action Project
Fernald Environmental Management Project
Fernald, Ohio
FERMCO Subcontract No. 2-21487

PARSONS

Fairfield Executive Center
6120 South Gilmore Road
Fairfield, Ohio 45014

000179

Specification Revision Record Sheet

Project Order 121

Record Sheet 1 of 1
Decontamination and Dismantling Design for CRU-3 Plant 4 Complex

Rev. No.	Description	Prepared By	CRU-3 Manager
3	Changed "staging area" to "queuing area."	MB	

Note: Shaded areas in specification indicate revision.

U.S DEPARTMENT OF ENERGY

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

FERMCO Subcontract No. 2-21487

DECONTAMINATION AND DISMANTLING DESIGN FOR CRU-3 PERFORMANCE SPECIFICATION

PARSONS

Approved by: _____

M. Boland, CRU-3 Project Manager Date, Rev. 3

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION

Approved by: _____

K. A. Solomon, CRU-3 Engineering Manager Date, Rev. 3

U.S. DEPARTMENT OF ENERGY

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

FERMCO SUBCONTRACT NO. 2-21487

PROJECT ORDER 121

WBS NO. 1.1.1.1.3.3.1

PERFORMANCE SPECIFICATIONS

SECTION 00003

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END OF SECTION

SECTION 01120
WASTE HANDLING CRITERIA

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This section provides the requirements for handling and containerization of waste materials generated during the dismantlement of processing and support facilities. These materials will be segregated into established waste categories and containerized accordingly. This includes, but is not limited to, the following:

1. Segregation of waste materials.
2. Packaging of waste containers.
3. Preparation of waste containers.
4. Movement of waste containers within the construction zone.
5. Documentation.
6. Weighing and tagging of waste containers.

1.2 RELATED SECTIONS

A. Section 01515 - Mobilization and Demobilization.
B. Section 01516 - Asbestos Abatement.
C. Section 01517 - Removing/Fixing Radiological contamination.
D. Section 03315 - Concrete Removal.
E. Section 05126 - Structural Steel Dismantlement.
F. Section 07415 - Transite Removal.
G. Section 14955 - Lifting and Rigging.
H. Section 15065 - Equipment Dismantlement.
I. Section 15066 - Interior Dismantlement.
J. Section 15067 - Ventilation and Containment.

1.3 REFERENCE MATERIALS

A. See Part 7 of the Invitation for Bid (IFB) for the following:

1. Index of Drawings.
2. Photographs.
3. Existing Drawings.
4. Videos.

1.4 REFERENCES, CODES, AND STANDARDS

A. United States Department of Energy (DOE):

1. DOE 5480.2 Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances, and Hazardous Waste.
2. DOE 5400.5 Radiation Protection of the Public and the Environment.

1.5 SUBMITTALS

A. The Subcontractor shall submit the following for approval by the FERMCO Construction Manager:

1. Prior to mobilization, the Subcontractor shall submit a detailed waste handling work plan for approval by the FERMCO Construction Manager, including equipment for loading and handling waste containers and verifying weight capacity of container is not exceeded.
2. Information on method for weighing waste containers, including:
   a. Catalog cut sheets or drawings.
   b. Certificate of conformance stating that method meets accuracy requirement of this section.
   c. Calibration and maintenance schedule.

B. For additional submittal requirements, see Part 6 of the Invitation for Bid.

1.6 PROJECT CONDITIONS

A. Facility dismantlement will produce categories of waste as indicated in Appendix A, "Material Segregation and Containerization Criteria (MSCC)."

B. Generation of additional waste shall be minimized by unpacking equipment and material prior to entering the Controlled Area whenever possible. The minimum number of tools and equipment needed to complete the job should be brought into the Controlled Area. The Subcontractor shall not bring any hazardous material to the construction zone unless prior approval is received from the FERMCO Construction Manager. Alternatives to hazardous materials shall be used whenever possible.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. Subcontractor shall supply all equipment required to move containers between and within the container queuing area and construction zone, as well as all equipment to prepare and fill containers.

2.2 MATERIALS

A. The FERMCO Construction Manager will provide appropriate containers for waste categories as identified on the Material Segregation and Containerization Criteria, except liquid storage tanks as noted in Section 01517 of this specification package. These containers include, but are not limited to, the following:

Container Designation	Nominal Exterior Dimensions (HxWxL)	Maximum Gross Weight (lbs)
Large metal box (top load)	8'x8'x20'	42,000
ISO container (end load)	8'x8'x20'	42,000
Small metal box	3'x4'x6'	8,000
55-gallon drum with lid	---	882
Roll-off boxes	6'x8'x22'	42,000

PART 3 EXECUTION

3.1 PREPARATION

A. The Subcontractor shall establish a container queuing area in the location indicated on referenced drawings and provide a controlled boundary to define this area.

B. FERMCO will deliver empty containers, pallets (possibly radiologically contaminated), and container preparation materials to the container queuing area. The FERMCO Construction Manager will disposition full containers placed in this area by the Subcontractor.

C. The Subcontractor shall identify a satellite accumulation area and a 90-day storage area where all generated/removed hazardous waste shall be taken once a day by Subcontractor personnel. These areas will be controlled by FERMCO personnel and shall be located to minimize disruption to construction activities. Areas shall be secured to prevent unauthorized entry. Size and location of the accumulation and storage areas shall be coordinated with the FERMCO Construction Manager.

D. The Subcontractor shall provide labor and equipment required to prepare top-loading metal boxes as follows:

1. Remove lid and place in designated location to prevent damage.
2. Remove any freestanding water.
3. Place one layer of pallets (possibly radiologically contaminated) in the bottom of the box.
4. Place absorbent material in the box.

5. Place lid on the box and secure.

E. The FERMCO Construction Manager will provide labor and materials for preparation of (end load) ISO containers. The Subcontractor shall give the FERMCO Construction Manager 24 hours notice prior to the need of an ISO container.

F. For containers designated for containerization of Asbestos Containing Materials (ACM), container preparation will include lining the container with one layer of 6-mil polyethylene sheeting. Allow enough excess material to permit wrapping around ACM material after loading the container.

3.2 APPLICATION

A. The Subcontractor shall be responsible for retrieving empty containers from the construction zone queuing area; preparing containers, except ISO containers, for containerization; segregating waste materials; loading, weighing, inspecting, and sealing containers; tagging for on-site movement; and moving containers back to the construction zone queuing area. The Subcontractor will use the MSCC as the basis of all containerizing activities and will be responsible for minimizing waste generation by limiting the amount of waste material brought on site.

B. Waste materials to be containerized into waste containers and sealed within a local containment area or building enclosure will not require decontamination per Section 01517 of this specification package.

C. Waste material requiring movement outside to be containerized into waste containers will be required to meet the requirements of Section 01517 of this specification package. If the requirements cannot be attained, the material may be wrapped in 6-mil polyethylene sheeting and sealed prior to movement to prevent the migration of radioactive contamination during movement.

3.3 LOADING OF CONTAINERS

A. The Subcontractor shall:

1. Provide a waste handling supervisor to supervise all packing operations.
2. Ensure that personnel package waste for containerization in accordance with this specification.
3. Segregate and containerize all waste according to the categories defined in the MSCC.
4. Select appropriate container for waste stream by use of information on the MSCC (Appendix A). This form identifies all anticipated waste streams that will be encountered. Should a waste stream be discovered that is not on the MSCC, then work on the handling of this waste will stop. Contact the FERMCO Construction Manager for direction on how to containerize the waste while characterization is completed.

5. Fill containers, boxes, and drums such that the interior volume is as efficiently and compactly loaded as practical up to the maximum gross weight limit of the container or until full. Any container exceeding maximum allowable gross weight shall have contents removed, as required, to lower the weight to an acceptable range. Containers shall be prepared for containerization so as to minimize load shifting or damage during movement.
6. Ensure that waste to be containerized is not on the following "Prohibited Materials List." This list shall be displayed in the containerization area or on each container. Notify the FERMCO Construction Manager if any of the prohibited materials are identified.

PROHIBITED MATERIALS LIST

1. Compressed gases (i.e., unpunctured aerosol cans)
2. Explosives
3. Free liquids
4. Fine particulates (respirable fines)
5. Hazardous waste
6. Corrosive materials
7. Etiologic agents

7. Notify the FERMCO Construction Manager at least 24 hours in advance of loading containers.
8. Visually check waste for free liquid prior to loading. If free liquid is present, notify the FERMCO Construction Manager. The Subcontractor will be required to take appropriate action to remove or absorb free liquid.
9. The Subcontractor shall provide and install weatherproof removable tags on each waste container prior to moving to the queuing area. Tag shall identify container contents by waste category specified in the MSCC, and the waste's building of origin.

3.4 SECURITY AND MOVEMENT OF CONTAINERS

A. The Subcontractor shall:

1. Move containers to the specific task location from the queuing area.
2. Ensure that the lid, doors, or tarps on unfilled waste containers are secured when no containerization is in progress to prevent addition of unknown materials. Containers must be weather protected, when lid is not secured, to prevent entry of snow and rain.

3. Secure full containers.
   a. ISO containers will be secured as follows using FERMCO-supplied material:
      1) Roll absorbent pads (double-thick) together and place pads evenly along the lowest point of the opening (maintaining continuous contact with floor) in front of the plywood sheets.
      2) Close and latch doors, ensuring that all latching mechanisms are engaged.
   b. Drums will be secured as follows:
      1) Place lid on drum, ensuring that gasket is seated to maintain a tight seal.
      2) Install bolt-type lock ring on lid and torque to 45 ± 5 foot pounds.
      3) Drums shall be secured to pallets.
   c. Metal boxes (large and small) will be secured as follows:
      1) Inspect gasket for damage and repair if required.
      2) Place gasket and lid on the box and secure.
   d. Ensure that containers have not been damaged during loading.
   e. Return full, secure containers to the queuing area.
4. Secure full ACM containers as follows:
   a. Label all containers that have ACM within them prior to on-site movement. These labels shall identify that ACM is present and the labels shall be placed as specified by the FERMCO Construction Manager.
   b. Prior to securing lid on ACM containers, fold polyethylene over ACM and seal with tape.
   c. Inspect all containers, double bagged materials, drums, boxes, or double wrapped components for exterior contamination and damage before removing them from the work area.
   d. Return full, secure container to the queuing area.

3.5 FIELD QUALITY ASSURANCE

A. The Subcontractor shall inspect filled containers upon their return to the queuing area to verify that no damage has occurred during the filling of the container. Repair or replace damaged containers as directed by the FERMCO Construction Manager.

END OF SECTION

APPENDIX A

MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA

			PREFERRED CONTAINERS						
			TOP-LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX DUMPSTER	NO CONTAINERS	SIZE CRITERIA
Site Preparation &	Cardboard, Paper						C		
Mobilization	Plastic						C		
	Wood						B		
	Soil							P	
	Asphalt Dust			B					
	Concrete Dust			B					
	Strapping			B					
Asbestos Removal	Pipe Insulation (including piping)				K				
	Equipment Insulation				K				
	Floor Tile			A					
	Refractory				K				
	PPE (Asbestos)				K				
	HEPA Filters (Asbestos)				K				
	HWMU Debris			L					
Demolition Debris	Refractory (Non-Asbestos)						B		
Removal	Light Fixtures						H		1
	Ductwork						H-3		2
	Plumbing Fixtures						B		

CATEGORIES:

A - Non-Regulated/Non-Friable ACM
E - Residues
H - Restricted Use Metal
I - Unrestricted Use Metal
M - Characteristic Hazardous Waste
B - Construction Debris
F - Masonry/Concrete/Brick
H-1 Process Piping
J - Not Assigned
N - PCB Non-Liquid
C - Compactable Waste
F-1 - Acid Brick
H-1 - Process Piping
K - Friable ACM
O - Wash Water
D - Transite
G - Specialty Metals
H-2 - Non -Process Piping
L - Listed Hazardous Waste
P - Soil

CUTTING CRITERIA FOR CATEGORIES F, H, I

(1) maximum size 10' long X 4' wide X 1" high
(2) maximum size 10' long with 1' projection
(3) maximum 6' long X 4' wide X 2' high

NOTE:

Like categories can be combined in like containers. The ISO container is equivalent to an End-Load container.

MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA

			PREFERRED CONTAINERS						
			TOP-LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX/ DUMPSTER	NO CONTAINERS	SIZE CRITERIA
Demolition Debris Removal	Lab Cabinets						B		
(cont'd.)	Cable Trays						H		2
	Metal Fume Hoods						H		1
	Valves, Fittings						H		1
	Gasket Material			A					
	Eye & Safety Showers						H		1
	FLEX Connections						B		
	Process Piping						H-1		2
	Non-Process Piping						H-2		2
	PVC Piping						B		
	Acoustic Ceiling						B		
	Gypsum Material						B		
	Junction Boxes						H		
	Partitions						B		
	Conduit and Wire						H		2
	Instrumentation						B		
	Panels	Elect.					B		1
	Fluorescent Bulbs					M			

CATEGORIES:

A - Non-Regulated/Non-Friable ACM
B - Construction Debris
C - Compactable Waste
D - Transite
E - Residues
F - Masonry/Concrete/Brick
F-1 - Acid Brick
G - Specialty Metals
H - Restricted Use Metal
H-1 Process Piping
H-1 - Process Piping
H-2 - Non -Process Piping
I - Unrestricted Use Metal
J - Not Assigned
K - Friable ACM
L - Listed Hazardous Waste
M - Characteristic Hazardous Waste
N - PCB Non-Liquid
O - Wash Water
P - Soil

CUTTING CRITERIA FOR CATEGORIES F, H, I
(1) maximum size 10' long X 4' wide X 1" high
(2) maximum size 10' long with 1' projection
(3) maximum 6' long X 4' wide X 2' high

NOTE: Like categories can be combined in like containers. The ISO container is equivalent to an End-Load container.

000243

MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA

			PREFERRED CONTAINERS						
			TOP-LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX/ DUMPSTER	NO CONTAINERS	SIZE CRITERIA
Demolition Debris Removal	Ballasts	Elect.				N			
(cont'd)	Bulbs-Incandescent					B			
	Motors	Elect.					H		1
	Feeder Cable			A					
Equipment Removal	Conveyors						H		1
	Dust Collectors						H		1
	Refrigeration Units						H		1
	Furnaces w/o refractory						H		1
	Furnaces w/refractory						B		
	Condensers						H		1
	Vaporizers						H		1
	Pumps						H		1
	Reactors						H		1
	Tanks						H		1
	Autoclaves						H		1
	Absorber						H		1
	Fans						H		1
	Air Dryer						H		1

CATEGORIES:

A - Non-Regulated/Non-Friable ACM
B - Construction Debris
C - Compactable Waste
D - Transite
E - Residues
F - Masonry/Concrete/Brick
F-1 - Acid Brick
G - Specialty Metals
H - Restricted Use Metal
H-1 Process Piping
H-1 - Process Piping
H-2 - Non -Process Piping
I - Unrestricted Use Metal
J - Not Assigned
K - Friable ACM
L - Listed Hazardous Waste
M - Characteristic Hazardous Waste
N - PCB Non-Liquid
O - Wash Water
P - Soil

CUTTING CRITERIA FOR CATEGORIES F, H, I
(1) maximum size 10' long X 4' wide X 1" high
(2) maximum size 10' long with 1' projection
(3) maximum 6' long X 4' wide X 2' high

NOTE: Like categories can be combined in like containers. The ISO container is equivalent to an End-Load container.

0129

MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA

			PREFERRED CONTAINERS						
			TOP-LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX/ DUMPSTER	NO CONTAINERS	SIZE CRITERIA
Equipment Removal	Scales						H		1
(cont'd)	Agitators						H		1
	Exhaust fans						H		1
	Gear Reducers						H		1
	Depressurized Storage Cylinder						H		1
	Compressors						H		1
	Filters	Metal					B		
		Gas					B		
	Separators						H		1
	Scrubbers						H		1
	Columns	Pyrex					B		
	Dissociators						B		
	Cooling Coils						H		1
	Carbon Traps						B		
	Preheaters						H		1
	Product Mills						H		1
	Drying Oven						B		

CATEGORIES:

A - Non-Regulated/Non-Friable ACM
B - Construction Debris
C - Compactable Waste
D - Transite
E - Residues
F - Masonry/Concrete/Brick
F-1 - Acid Brick
G - Specialty Metals
H - Restricted Use Metal
H-1 Process Piping
H-1 - Process Piping
H-2 - Non -Process Piping
I - Unrestricted Use Metal
J - Not Assigned
K - Friable ACM
L - Listed Hazardous Waste
M - Characteristic Hazardous Waste
N - PCB Non-Liquid
O - Wash Water
P - Soil

CUTTING CRITERIA FOR CATEGORIES F, H, I

(1) maximum size 10' long X 4' wide X 1" high
(2) maximum size 10' long with 1' projection
(3) maximum 6' long X 4' wide X 2' high

NOTE:

Like categories can be combined in like containers. The ISO container is equivalent to an End-Load container.

000055

MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA

			PREFERRED CONTAINERS						
			TOP-LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX/ DUMPSTER	NO CONTAINERS	SIZE CRITERIA
Equipment Removal	Packaging Stations						H		1
(cont'd)	Chillers						H		1
	Plasma Sprayer						H		1
	Heat Exchangers						H		1
	Controllers						H		1
	Transformers						B		
	Hoists						H		1
	Vibrators						H		1
	Roll-up Doors						H		1
	Heaters						H		1
	Control Centers						H		1
	Drinking Fountains						H		1
	Vacuum Systems						H		1
	Settling Tank						H		1
	Vaults						H		1
	Bucket Elevator						H		1
	Water/Air Tanks						H		1
	Platforms						H		1

CATEGORIES:

A - Non-Regulated/Non-Friable ACM
B - Construction Debris
C - Compactable Waste
D - Transite
E - Residues
F - Masonry/Concrete/Brick
F-1 - Acid Brick
G - Specialty Metals
H - Restricted Use Metal
H-1 Process Piping
H-1 - Process Piping
H-2 - Non -Process Piping
I - Unrestricted Use Metal
J - Not Assigned
K - Friable ACM
L - Listed Hazardous Waste
M - Characteristic Hazardous Waste
N - PCB Non-Liquid
O - Wash Water
P - Soil

CUTTING CRITERIA FOR CATEGORIES F, H, I

(1) maximum size 10' long X 4' wide X 1" high
(2) maximum size 10' long with 1' projection
(3) maximum 6' long X 4' wide X 2' high

NOTE: Like categories can be combined in like containers. The ISO container is equivalent to an End-Load container.

MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA

			PREFERRED CONTAINERS						
			TOP-LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX/ DUMPSTER	NO CONTAINERS	SIZE CRITERIA
Equipment Removal	Pulverizers						H		1
(cont'd)	Pulsate Collectors						H		1
	Drum Dumper/Filler						H		1
	Fitzmill						B		
	Augers						H		1
	Feed/Weigh Hoppers						H		1
	Reducers						H		1
	Filter Units						H		1
	Blowers						H		1
	Crusher Mills						H		1
	Dumping & Pack. Systems						H		1
	Burners						H		1
	Blenders						H		1
	Cyclones						H		1
	Chutes						H		1
	Mixing Boxes						H		1
	Miscellaneous Tanks						H		1
	Drum Lifts/Handler						H		1

CATEGORIES:

A - Non-Regulated/Non-Friable ACM
B - Construction Debris
C - Compactable Waste
D - Transite
E - Residues
F - Masonry/Concrete/Brick
F-1 - Acid Brick
G - Specialty Metals
H - Restricted Use Metal
H-1 Process Piping
H-1 - Process Piping
H-2 - Non -Process Piping
I - Unrestricted Use Metal
J - Not Assigned
K - Friable ACM
L - Listed Hazardous Waste
M - Characteristic Hazardous Waste
N - PCB Non-Liquid
Q - Wash Water
P - Soil

CUTTING CRITERIA FOR CATEGORIES F, H, I

(1) maximum size 10' long X 4' wide X 1" high
(2) maximum size 10' long with 1' projection
(3) maximum 6' long X 4' wide X 2' high

NOTE: Like categories can be combined in like containers. The ISO container is equivalent to an End-Load container.

000277

MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA

			PREFERRED CONTAINERS						
			TOP-LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX/ DUMPSTER	NO CONTAINERS [1]	SIZE CRITERIA
Equipment Removal	Drum Crusher						H		1
(cont'd)	Surge Hoppers						H		1
	Air Handling Units						H		1
	Miscellaneous Equipment						H		1
	Bridge Crane						H		1
	Substation						H		1
Interior Transite	Transite Panels						D		
	Metal Wall Studs						H		1
	Interior Doors						B		
	Batt Insulation						C		
	Lead Fasteners			G					
Clean Building	Washwater							O	
	Sludge					E			
	Floor Debris					E			
	Sludge Filters						B		
Exterior Transite	Transite Panels						D		
	Window Panes/Glass						B		
	Exterior Doors						B		

CATEGORIES:

A - Non-Regulated/Non-Friable ACM
E - Residues
H - Restricted Use Metal
I - Unrestricted Use Metal
M - Characteristic Hazardous Waste

B - Construction Debris
F - Masonry/Concrete/Brick
H-1 Process Piping
J - Not Assigned
N - PCB Non-Liquid

C - Compactable Waste
F-1 - Acid Brick
H-1 - Process Piping
K - Friable ACM
O - Wash Water

D - Transite
G - Specialty Metals
H-2 - Non -Process Piping
L - Listed Hazardous Waste
P - Soil

CUTTING CRITERIA FOR CATEGORIES F, H, I
(1) maximum size 10' long X 4' wide X 1" high
(2) maximum size 10' long with 1' projection
(3) maximum 6' long X 4' wide X 2' high

NOTE:
1. Reference Specification Section No. 01517
Like categories can be combined in like containers. The ISO container is equivalent to an End-Load container.

MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA

TABLE A-2 MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA (Cont'd)

			PREFERRED CONTAINERS						
			TOP-LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX/ DUMPSTER	NO CONTAINERS	SIZE CRITERIA
Exterior Transite	Metal Vent Stacks						H		1
(cont'd)	Metal Louvers						H		1
	Lead Flashing			G					
	Gutter Cleanout				K				
	Lead Gutters			G					
	Downspouts						H		1
	Lead Downspout Joints			G					
Structural Steel	Main Frame Members						I		2
	Stairs and Ladders						H		1
	Floor Decking						I		1
	Handrail						H		1
	Metal Angle						H		2
	Lead Paint Chips					M			
	Paint Remover					M			
	Bar Joists						H		2
	Metal Roof Panels						H		1
	Grating						H		1

CATEGORIES:

A - Non-Regulated/Non-Friable ACM
B - Construction Debris
C - Compactable Waste
D - Transite
E - Residues
F - Masonry/Concrete/Brick
F-1 - Acid Brick
G - Specialty Metals
H - Restricted Use Metal
H-1 Process Piping
H-1 - Process Piping
H-2 - Non -Process Piping
I - Unrestricted Use Metal
J - Not Assigned
K - Friable ACM
L - Listed Hazardous Waste
M - Characteristic Hazardous Waste
N - PCB Non-Liquid
O - Wash Water
P - Soil

CUTTING CRITERIA FOR CATEGORIES F, H, I

(1) maximum size 10' long X 4' wide X 1" high
(2) maximum size 10' long with 1' projection
(3) maximum 6' long X 4' wide X 2' high

NOTE:

Like categories can be combined in like containers. The ISO container is equivalent to an End-Load container.

000179

MATERIAL SEGREGATION AND CONTAINERIZATION CRITERIA

			PREFERRED CONTAINERS						
			TOP-LOAD						
TASK	WASTE STREAM	TYPE	LARGE METAL BOX	SMALL METAL BOX	ISO	DRUM	ROLL-OFF BOX/ DUMPSTER	NO CONTAINERS	SIZE CRITERIA
Concrete Removal	Concrete						F		3
	Masonry Units						F		
	Acid Brick			F-1					
	Cinderblock Walls						F		
	Built-up roofing						F		3
Demobilize	Polyethylene						C		
	Hydraulic Fluid/Oil/Grease					M			
	PPE - non-asbestos						C		
	Pre-filter HEPA - non-asbestos						C		
	Empty Material Containers						C		
	Aerosol Cans (punctured)						H		
	Water filters - non-asbestos						B		
	Water filters - asbestos				K				

CATEGORIES:

A - Non-Regulated/Non-Friable ACM
B - Construction Debris
C - Compactable Waste
D - Transite
E - Residues
F - Masonry/Concrete/Brick
F-1 - Acid Brick
G - Specialty Metals
H - Restricted Use Metal
H-1 Process Piping
H-1 - Process Piping
H-2 - Non -Process Piping
I - Unrestricted Use Metal
J - Not Assigned
K - Friable ACM
L - Listed Hazardous Waste
M - Characteristic Hazardous Waste
N - PCB Non-Liquid
O - Wash Water
P - Soil

CUTTING CRITERIA FOR CATEGORIES F, H, I
(1) maximum size 10' long X 4' wide X 1" high
(2) maximum size 10' long with 1' projection
(3) maximum 6' long X 4' wide X 2' high

NOTE:
Like categories can be combined in like containers. The ISO container is equivalent to an End-Load container.

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SECTION 01515
MOBILIZATION AND DEMOBILIZATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This section consists of the work related to Subcontractor mobilization and demobilization. The principal items included in this section are:

1. Site access.
2. Sealing and patching building slab.
3. Construction utilities.
4. Signs and barriers.
5. Potential use of existing overhead bridge cranes.
6. Grading and compaction of gravel pads for access and queuing areas.
7. Establishing laydown, cutting, storage, and queuing areas.
8. Protecting adjacent facilities and components.
9. Debris chutes.

1.2 RELATED SECTIONS

A. Section 01120 - Waste Handling Criteria.
B. Section 03315 - Concrete Removal.
C. Section 03900 - Foundations.
D. Section 05125 - New Structural Steel.
E. Section 05126 - Structural Steel Dismantlement.
F. Section 07415 - Transite Removal.
G. Section 14955 - Lifting and Rigging.
H. Section 15065 - Equipment Dismantlement
I. Section 15066 - Interior Dismantlement
J. Section 15067 - Ventilation and Containment.

1.3 REFERENCE MATERIALS

A. See Part 7 of the Invitation for Bid Package (IFB) for the following:

1. Index of Drawings.
2. Photographs.
3. Existing Drawings.
4. Videos.

B. See Part 6 of the IFB for the following:

1. Engineering Survey per 29 Code of Federal Regulations (CFR) 1926.850.

1.4 REFERENCES, CODES, AND STANDARDS

A. Except as supplemented or otherwise specifically modified herein and/or otherwise shown on the drawings, the entire work under this section shall be in compliance with the provisions of the following.

1. Department Of Energy (DOE):
   - a. 6430.1A — General Design Criteria Divisions 2 and 15.
2. American Society of Testing and Materials (ASTM):
   - a. ASTM C109-93 — Standard Test Method for Compressive Strength of Hydraulic Cement Mortars.
   - b. ASTM C1042-91 — Standard Test Method for Bond Strength of Latex Systems Used With Concrete by Slant Shear.
3. National Fire Protection Association (NFPA):
   - a. NFPA 70-93 — National Electric Code.
   - b. NFPA 101-94 — Life Safety Code.
4. American National Standards Institute (ANSI):
   - a. ANSI C2-93 — National Electrical Safety Code.

1.5 SUBMITTALS

A. The Subcontractor shall submit the following for approval by the FERMCO Construction Manager:

1. Drawings and Data
   - a. The Subcontractor shall provide detail and layout drawings showing locations of any additional barriers and/or fencing the Subcontractor will use for construction zone and radiological control boundaries as well as for protection of adjacent structures.
   - b. Layout of temporary access and roadways required during mobilization of major equipment components (i.e., cranes, field offices, tool and equipment storage, laydown areas, chutes within the stated limits of the construction zone).
   - c. Layout, details, and applicable equipment, or plans the Subcontractor will employ to control stormwater runoff, migration of wash water, and erosion control.
   - d. Provide detail and layout drawings that show laydown areas, building vestibule sizes and locations, cutting areas, and container queuing areas.
   - e. Provide shop drawings for all debris chutes to be used.
     - 1) Provide manufacturer's data or calculations to verify that the chute, its support system, and the existing structure (if

the debris chute is attached) can withstand all dynamic impact loads they will be subjected to during dismantlement operations.

2) Debris Chute drawings and calculations submitted must bear the stamp of a Registered Professional Engineer.

2. The Subcontractor shall submit a plan for providing temporary power from the point source location identified on the reference drawing in Part 7 of the IFB.
3. The Subcontractor shall comply with DOE Order 6430.1A and submit provisions for erosion control and soil stabilization in ditches, fill slopes, embankments, and denuded areas, and for restoration of areas disturbed by the project to original or improved conditions.
4. The Subcontractor shall submit verification that the patching grout compressive and bond strengths are in accordance with ASTM C109 and ASTM C1042, respectively.
5. If any building or part of a building to be dismantled is identified in the Engineering Survey as being structurally deficient, the Subcontractor shall submit a plan to shore the structure so that safety of the workers is maintained.
6. Methods to be utilized for control of fugitive emissions.
7. Submit type of concrete sealant and manufacturers' instructions on the application of concrete sealant to be used.
8. Means of controlling migration of liquids, if used.

B. For additional submittal requirements see Part 6 of the IFB.

1.6 DELIVERY, STORAGE, AND HANDLING

A. The Subcontractor shall identify any special requirements for storing material or equipment.

B. To minimize the generation of waste products by the Subcontractor, all equipment requiring periodic oil and filter changes shall have this maintenance performed just prior to arrival on site.

C. The Subcontractor shall minimize and control the spread of contamination during mobilization and demobilization operations.

PART 2 PRODUCTS

2.1 MATERIALS

A. Patching Grout: Premixed compound consisting of non-metallic aggregate; cement; water reducing and plasticizing agent; capable of developing minimum compressive strength of 5,000 psi in 28 days; capable of developing a bond strength of 1,200 psi in 28 days.

B. Slab Sealant: Shall be an acrylic resurfacer. Manufacturers are:

1. Neyra Industries,
2. California Products, or
3. an approved equal.

C. Construction Zone Fencing: Shall be red or orange plastic construction fencing. Gates shall be plastic yellow chain fixed to stanchions. Stanchions shall be located on grade.

D. All debris chutes and other steel used must be designed, fabricated, and erected in accordance with the requirements of Section 05125 of this specification package.

E. The Subcontractor shall ensure that granular fill material is used to fill large openings in the base slab, including pits, large sumps, etc. This material will be supplied by the Subcontractor.

PART 3 EXECUTION

3.1 EXAMINATION

A. Utilities: All electric, gas, water, steam, sewer, and/or other service lines to the building have been disconnected and/or capped. The Subcontractor shall conduct a survey to verify that all utilities are capped and/or controlled to the Subcontractor's satisfaction, and notify the FERMCO Construction Manager in writing of the acceptability of the utilities isolation.

B. The Subcontractor shall determine whether utilities provided by FERMCO are adequate. If not adequate, the Subcontractor shall supply any additional needed utilities.

3.2 PREPARATION

A. Access and traffic flow, pedestrian as well as equipment, within the construction zone of the plant will be directed through the designated radiological control points. The Subcontractor shall take necessary steps to ensure that:

1. Provisions shall be made for emergency vehicles to enter the construction zone at all times.

2. Provide for protecting the railroad tracks, manholes, catch basins, valve pits, underground utilities, pipe racks and drains, adjacent structures, and groundwater monitoring wells from damage during the work.
3. Survey monuments: The Subcontractor shall protect all existing exterior benchmarks during the course of the work. If displaced or lost, the Subcontractor shall re-install.
4. Remove all existing chain link fencing as noted on the reference drawings and install construction zone fencing outlining construction boundary.

B. Patching Grout:
1. To ensure proper bond to concrete, all grease, oil, dirt, and other deleterious materials shall be completely removed and handled in accordance with Section 01120 of this specification package.
2. Roughen the surfaces to assure bond to the existing concrete. Loose or broken concrete shall be removed and handled in accordance with Section 01120 of this specification package.

C. Vestibules:
1. The Subcontractor can install a vestibule on the entry/exit building access to accommodate cutting, containerization, and decontamination. If a vestibule is used, its material of construction and performance characteristics shall be in compliance with Section 15067 of this specification package.

D. Slab Sealant:
1. To ensure proper sealing of concrete, all grease, oil, dirt, and other deleterious materials shall be completely removed and handled in accordance with Section 01120 of this specification package. All openings in the base slabs shall be filled before sealant is applied.

3.3 ERECTION/INSTALLATION/APPLICATION

A. The Subcontractor shall supply construction safety signs, such as "Hard Hat Area" and "Danger-Demolition Ongoing," and barriers as necessary to protect the operations and adjacent structures. The FERMCO Construction Manager shall supply signs, barriers, and tape indicating radiological control zones.

B. The Subcontractor shall ensure that catch platforms, chutes, or other means of handling debris are properly isolated by gates or barriers designed and constructed to eliminate impact hazards and to control the flow of material to its final destination.

C. The Subcontractor shall be responsible for the distribution of electrical power and water from a FERMCO-designated control point. FERMCO will provide electrical power and water to the control point; locations are indicated on a

reference drawing listed in Part 7 of the IFB. Capacities for water and power provisions shall be listed in Part 6 of the IFB. All penetrations made through transite for temporary power lines shall be accomplished in accordance with Section 07415 of this specification package. All equipment used for temporary power shall be in compliance with DOE Orders, codes, and standards as listed in Article 1.4 of this section.

D. The Subcontractor shall remove all slab penetrations to grade level. Conduit shall then be plugged and covered with grout to grade level.

E. The Subcontractor shall remove all grounding conductors to grade level.

F. The Subcontractor shall follow all manufacturer's recommendations for the application of patching grout.

1. Fill in damaged areas of base slab and small openings including drains, chases, small sumps, etc., with a patching grout to create a surface level with surrounding slab. Maximum allowable depression not requiring repair is 1 inch in depth.

G. The Subcontractor shall ensure that large openings in the base slab including pits, large sumps, etc. shall be free of water and loose debris prior to filling with granular fill material supplied by the Subcontractor. Areas shall be filled flush with grade.

H. The Subcontractor shall follow the recommendation of the FERMCO-approved manufacturer for the application of concrete sealant. The sealant shall be applied after all debris has been removed and after the base slab has had all repairs made and openings filled in.

I. Any required protective barriers shall be fabricated and erected in accordance with Sections 05125 and 03900 of this specification package.

3.4 FIELD QUALITY ASSURANCE

A. Final project site acceptance shall be conducted by the FERMCO Construction Manager and will consist of verification of the following:

1. All work activities relating to the work scope have been inspected and signed off by the FERMCO Construction Manager.

END OF SECTION

SECTION 01516
ASBESTOS ABATEMENT

PART 1 GENERAL

1.1 SUMMARY

This section specifies the methods to be used for removal, transportation, and full disposition on site of asbestos-containing material (ACM) and other materials contaminated with asbestos. This section does not cover transite.

1.2 RELATED SECTIONS

A. Section 01120 - Waste Handling Criteria.
B. Section 01517 - Removing/Fixing Radiological Contamination.
C. Section 07415 - Transite Removal.
D. Section 15067 - Ventilation and Containment.

1.3 REFERENCE MATERIALS

A. See Part 7 of the Invitation for Bid (IFB) Package for the following:
   1. Index of Drawings.
   2. Photographs.
   3. Existing Drawings.
   4. Videos.

1.4 REFERENCES, CODES, AND STANDARDS

A. FERMCO shall notify governmental EPA agencies before start of work. The Subcontractor shall notify all other applicable governmental agencies.
B. The Subcontractor shall be responsible for:
   1. Adherence and compliance to work practices and procedures set forth in all applicable federal, state and local codes, regulations, and standards.
   2. Obtaining certifications and licenses.
C. For ACM information on site, refer to Diagnostic Engineering Inc. (DEI) Report on ACM in Part 6 of the Information for Bid Package of these specifications.

1.5 SUBMITTALS

A. The subcontractor shall submit the following for approval:
   1. An asbestos abatement plan with the following information:
      a. A physical description of the work area.
      b. A description of the approximate amount of material to be removed.

c. A schedule for turning off and sealing existing ventilation systems.

d. Personnel hygiene procedures. Include sufficient room on the dirty side of the hygiene facility to accommodate a full-body personal contamination monitor (PCM) for radiological monitoring **(PCM to be supplied by FERMCO).**

e. Labeling procedures.

f. A description of personal protective equipment and clothing to be worn by employees.

g. A description of the local exhaust ventilation systems to be used.

h. A description of work practices to be observed by employees.

i. A description of the methods to be used to remove the asbestos-containing material.

j. The wetting agent to be used.

k. A description of the sealant to be used at the end of the project.

l. An air monitoring plan.

2. Prior to initiation of the work, the Subcontractor shall submit the following items to the FERMCO Construction Manager:

a. OSHA-required documentation for Asbestos Removal Contractors.

b. State of Ohio certificates and licenses for the Subcontractor.

c. State of Ohio certification for all personnel as required by law.

3. Prior to submittal of notification to government agencies, the Subcontractor shall provide a copy to the FERMCO Construction Manager for concurrence.

4. Product Data: The Subcontractor shall submit manufacturer's technical information including application instructions for each material proposed for use.

B. For additional requirements see Part 6 of IFB.

1.6 DELIVERY, STORAGE AND HANDLING

A. The Subcontractor shall:

1. Take precautions to prevent creation of friable ACM during handling.

2. Materials shall be in original, new, and unopened containers bearing manufacturer's name, label, and the following information:

a. Name or title of material

b. Manufacturer's stock number and date of manufacture

c. Manufacturer's name

d. Thinning instructions

e. Application instructions

PART 2 PRODUCTS

2.1 MATERIALS

A. Polyethylene sheeting shall be a minimum of 6 mils thick.

1. Fire retardant polyethylene shall be used where sparks, slag, or open flame is likely.
2. All outside containments shall be constructed of reinforced polyethylene.

B. Surfactant (wetting agent) shall be mixed in a proportion specified by manufacturer.

1. Surfactants:
   a. Childers CP-225 CHIL-SORB.
   b. Certech.
   c. Expert Environmental Products.
   d. International Protective Coatings Corp.
2. Equivalent products may be acceptable.

2.2 EQUIPMENT

A. Negative pressure ventilation units equipped with HEPA filtration and operated in accordance with ANSI Z9.2-79.

B. All containments used for asbestos abatement operations shall be capable of maintaining negative 0.02 inches water gauge (w.g.) of negative pressure within their structure. The ventilation system for this type of operation shall provide a minimum of four air changes per hour.

C. For mini-enclosures and glovebags, a HEPA filtered vacuum system may be substituted to provide negative air pressure.

PART 3 EXECUTION

3.1 PREPARATION

A. To prepare work for removal:

1. Isolate the work area.
2. Install primary containment barriers.
3. Cover the floor with two layers of sheeting.
4. Size plastic to minimize seams.
5. Cover walls in any contained work area with polyethylene sheeting.
6. Provide load out facility and emergency exits.

3.2 APPLICATION

A. Use following removal procedures:

1. Wet all ACM with an amended water solution.
2. Saturated ACM shall be removed in manageable sections.
3. Material removed from building structures or components shall not be dropped or thrown to the floor.
4. Large components removed intact may be wrapped in two layers of 6-mil polyethylene sheeting, secured with tape and properly labeled.
5. Asbestos-containing material with sharp-edged components (e.g., nails, screws, metal lath, tin sheeting) which will tear the polyethylene bags and sheeting shall be placed into Subcontractor- supplied, properly labeled containers and subsequently bagged for disposal.
6. After completion of all stripping work, surfaces from which ACM has been removed shall be wetbrushed and sponged or cleaned by some equivalent method to remove all visible ACM residue.

B. Use the following cleanup procedures:

1. Remove and containerize all visible accumulations of ACM and asbestos-contaminated material.
2. Wet clean all surfaces in the work area.
3. After cleaning the work area, wait at least 24 hours to allow fibers to settle, and HEPA vacuum and wet clean objects and surfaces in the work area again.
4. Inspect the work area for visible residue.
5. The work area shall be cleaned until visual inspection reveals no evidence of any ACM as determined by FERMCO Construction Manager.
6. Apply lockdown to all surfaces in the work area.
7. Upon successful completion of clearance testing by FERMCO, the Subcontractor shall remove containment and dispose of it as ACM waste per Section 01120 of this specification package.

C. ACM Insulated Piping:

1. All piping insulated with ACM may be removed with ACM in place. Before cutting pipe, remove ACM from area of cut utilizing glovebags as containment. Then cut pipe and containerize according to Section 01120 of this specification package.

D. Wrap and cut procedures:

1. All areas designated for wrap and cut procedure will require secondary containment and the use of negative air machines; all to be inspected and approved by FERMCO Construction Manager prior to commencing work.

END OF SECTION

SECTION 01517
REMOVING/FIXING RADIOLOGICAL CONTAMINATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Decontamination of structures and equipment to the level that permits removal of local containment or enclosure. This includes, but is not limited to, the following:

1. Removing contamination.
2. Fixing contamination.
3. Controlling and transporting effluent produced during the removal and fixing of contamination.

1.2 RELATED SECTIONS

A. Section 01120 - Waste Handling Criteria.
B. Section 03315 - Concrete Removal.
C. Section 05126 - Structural Steel Dismantlement.
D. Section 07415 - Transite Removal.
E. Section 15065 - Equipment Dismantlement.
F. Section 15066 - Interior Dismantlement.
G. Section 15067 - Ventilation and Containment.

1.3 REFERENCE MATERIALS

A. See Part 7 of the Invitation for Bid Package for the following:

1. Index of Drawings.
2. Photographs.
3. Existing Drawings.
4. Videos.

1.4 REFERENCES, CODES, and STANDARDS

A. United States Department of Energy (DOE):

1.	DOE 5400.5	Radiation Protection of the Public and the Environment.
2.	DOE 5480.11	Radiation Protection for Occupational Workers.
3.	DOE/EH-0256T	Radiological Control Manual, April 1994.
4.	DOE/EM-0142P	Decommissioning Handbook, Chapter 9, March 1994.

1.5 SUBMITTALS

A. Before start of decontamination work, the Subcontractor shall submit for approval a work plan describing the system design for removing or fixing contamination, including the methods and equipment for removing contamination; fixing contamination; and controlling, filtering, and transporting effluent produced during removal and fixing activities.

B. Product Data: The Subcontractor shall submit manufacturer's technical information including the material to be used, its intended use, and its application instructions.

C. See Part 6 of the Invitation for Bid for additional submittal requirements.

1.6 QUALITY ASSURANCE

A. Prior to commencement of work, the Subcontractor shall demonstrate the methods for removing and fixing contamination on a sample area of the structure or equipment selected by the FERMCO Construction Manager.

1.7 DELIVERY, STORAGE, AND HANDLING

A. The Subcontractor shall deliver materials in original, new, and unopened containers bearing the manufacturer's name, label, and the following information:

1. Name or title of material.
2. Manufacturer's stock number and date of manufacture.
3. Manufacturer's name.
4. Application instructions.

1.8 PROJECT CONDITIONS

A. Radiological standards for contamination are found in Table 2-2, Summary of Contamination Values, of the DOE Radiological Control Manual, attached as Appendix A. For the purpose of removal from local containment or enclosure, surface shall be considered contaminated if the level of removable contamination exceeds the values in Appendix A or if the level of total contamination exceeds 10 times the values in Appendix A.

B. The most recent contamination and radiation survey data is provided in Part 6 of the Invitation for Bid.

PART 2 PRODUCTS

2.1 MANUFACTURERS/EQUIPMENT

A. The Subcontractor shall supply all equipment required to remove or fix contamination.

B. The Subcontractor shall supply all equipment required to control, filter, and transport effluent produced during removal and fixing contamination.
   1. The filter system shall consist of a 20 micron pre-filter and 5 micron filter.
   2. The Subcontractor shall supply storage tanks and secondary containment with a minimum liquid effluent storage capacity to allow 20 days storage without impacting the Subcontractor operations. FERMCO will perform effluent testing. After approval from the FERMCO Construction Manager, the Subcontractor shall transport the liquid effluent to Plant 8 and pump the liquid effluent into the Plant 8 sump.

C. If stabilizer coatings are used, they shall be Carboline D3358 or approved equal. Vendors may include, but are not limited to, the following:
   1. Tnemec Series 6 - Tnemec-Cryl.
   2. Sherwin-Williams.
   3. International Protective Coatings Corp.

D. Non-strippable coating:
   1. Polymeric Barrier System (PBS) by Bartlett Services, Inc.
   2. An approved equal.

PART 3 EXECUTION

3.1 PREPARATION

A. The Subcontractor shall maintain the integrity of the local containment or building enclosure until contamination has been removed or fixed.

B. The Subcontractor shall remove visible contamination, oil, scale, rust, and dirt and manage in accordance with Section 01120 of this specification package before fixing remaining contamination.

3.2 APPLICATION

A. The Subcontractor shall remove or remove and fix contamination on the facility structure or equipment until the detected radioactivity levels are below the values for removable contamination and below 10 times the values for total contamination listed in Appendix A. All decontamination activities shall be performed in accordance with DOE Orders 5400.5 and 5480.11.

B. As outlined in Chapter 9 of the DOE Decommissioning Handbook, acceptable methods for removing contamination include, but are not limited to:
   1. Hydro-cleaning.
   2. HEPA vacuuming.

   Methods that generate excessive secondary waste are prohibited.

C. As outlined in Chapter 9 of the DOE Decommissioning Handbook, acceptable methods for fixing contamination include, but are not limited to:
   1. Stabilizer coating.
   2. Encapsulation.

D. The Subcontractor shall control effluent generated while removing and fixing contamination. These effluents may include, but are not limited to:
   1. Hydro-cleaning water.
   2. Dust and debris.

E. If hydro-cleaning is used, the Subcontractor shall:
   1. Seal the floor cracks/seams and building cracks using non-strippable coating to protect the environment from hydro-cleaning effluent.
   2. Contain hydro-cleaning effluent to the building interior.
   3. Provide secondary containment outside the building.

F. The Subcontractor may use the building floor collection sump (if present) for effluent collection.

G. The Subcontractor shall collect all waste and effluent generated while removing and fixing contamination. Waste and effluent shall be containerized in accordance with the requirements in Section 01120 of this specification package.

H. Once contamination has been removed, the Subcontractor shall take precautions to prevent the spread of contamination to the facility structure or equipment.

I. The Subcontractor shall take precautions to prevent the breaching of stabilizer coatings applied to the facility structure or equipment.

3.3 FIELD QUALITY ASSURANCE

A. After removing or removing and fixing contamination, the Subcontractor shall notify the FERMCO Construction Manager to arrange for a re-survey of the facility structure and equipment to ensure that surface contamination is below the values for removable contamination and below 10 times the values for total contamination listed in Appendix A prior to removing containment.

END OF SECTION

APPENDIX A

DOE RADIOLOGICAL CONTROL MANUAL
TABLE 2-2

SECTION 03315
CONCRETE REMOVAL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Dismantling of all above-grade concrete, including:
   1. Elevated floor and roof slabs.
   2. Cast-in-place walls.
   3. Precast concrete components.
   4. Foundations, piers, and curbs projecting above grade.
   5. Concrete encasement (e.g., fireproofing).
   6. All other miscellaneous above-grade concrete.
   7. Built-up roofing, gypsum roof panels, and insulation.
   8. Control of fugitive emissions.

1.2 RELATED SECTIONS

A. Section 01120 - Waste Handling Criteria.
B. Section 01515 - Mobilization and Demobilization.
C. Section 01517 - Removing/Fixing Radiological Contamination.
D. Section 05125 - New Structural Steel.
E. Section 05126 - Structural Steel Dismantlement.
F. Section 14955 - Lifting and Rigging.
G. Section 15067 - Ventilation and Containment.

1.3 REFERENCE MATERIALS

A. See Part 7 of the Invitation for Bid Package for the following:
   1. Index of Drawings.
   2. Photographs.
   3. Existing Drawings.
   4. Videos.

1.4 REFERENCES, CODES, AND STANDARDS

A. American National Standards Institute (ANSI):

1.	ANSI A10.6-90	Demolition Operations - Safety Requirements.
2.	ANSI A10.8-88	Construction and Demolition Operations - Scaffolding - Safety Requirements.
3.	ANSI A10.9-83	Construction and Demolition Operations - Concrete and Masonry Work - Safety Requirements.

B. National Fire Protection Association (NFPA):

1. NFPA 101-94 Life Safety Code.
2. NFPA 241-93 Safeguarding Construction, Alteration, and Dismantlement Operations.

C. United States Department of Energy (DOE):

1. DOE 5400.5 Radiation Protection of the Public and the Environment.
2. DOE 5480.11 Radiation Protection for Occupational Workers.

D. Ohio Administrative Code (OAC):

1. 3745-17-08 Restriction of Emission of Fugitive Dust.

1.5 SUBMITTALS

A. The Subcontractor shall submit for approval a concrete removal work plan that contains the following information:

1. Detailed method and sequence of dismantlement, including equipment to be used.
2. Methods for control of contaminants, including control of fugitive emissions during cutting activities.
3. Controlled explosive methods may only be used on building structures that are constructed of precast columns and roof beams. A detailed work plan containing the following information shall be prepared:
   a. Methods and materials to be used.
   b. Means to protect adjacent structures, equipment, material, and underground utilities from damage, including protection from projectiles.
   c. Methods and materials to control fugitive emissions.
   d. Contingency plan for detonation failure.
   e. Proof of Ohio blasters license.
   f. Evidence of previous work experience using controlled explosives to take down multi-story structures near other structures within the last 5 years. Provide project locations and contacts for verification.
4. Methods of cutting, including equipment to be used.
5. Calculations to verify structural adequacy of partially dismantled structure, as applicable.
6. If dismantlement method requires personnel on the roof, the Subcontractor shall provide calculations verifying the structural adequacy of the roof to support personnel and equipment. These calculations shall be stamped by a Registered Professional Engineer.

B. For additional submittal requirements see Part 6 of the Invitation for Bid.

1.6 QUALITY ASSURANCE

A. Calculations to verify the structural integrity of the partially dismantled structure must bear the stamp of a Registered Professional Engineer.

PART 2 PRODUCTS

2.1 PRODUCTS/EQUIPMENT

A. Non-woven Geotextile Fabric:
   1. Trevira Spunbond 1120 by Hoechst Celanese Corp.
   2. Mirafi 160N by Mirafi, Inc.
   3. ADS 600 by Advanced Drainage Systems, Inc.
   4. Equal products manufactured by others will be acceptable.

B. Surfactant used in amended water.

PART 3 EXECUTION

3.1 PREPARATION

A. The Subcontractor shall ensure that adequate laydown space has been cleared and barriers have been established.

B. If controlled explosive methods are used, the Subcontractor shall take the following precautions to control fugitive emissions:
   1. A wet dust suppression system shall be used. This system will utilize the following:
      a. Amended water (with surfactant).
      b. Finely atomized water spray.
      c. The system shall continuously provide a hydraulic (mist) envelope over the entire structure and the footprint of the fall area of the structure.
      d. The system shall be designed to provide this envelope only during the felling operation.
   2. The wet dust suppression system should be located at a distance great enough to prevent breach of the water spray due to air pressure developed during the felling operation.
   3. The non-woven geotextile fabric should be wetted and placed on the grade slab and extend beyond the perimeter of the building a distance equal to the building height to prevent exterior debris from becoming airborne due to air pressure developed during the felling operation.

4. If required, the wetted geotextile fabric should be draped over the structure. If multiple sections of the fabric are used, then the sections should be laced securely together.

3.2 APPLICATION

A. Concrete shall have contamination fixed or removed prior to leaving local containment or building enclosure, in accordance with Section 01517 of this specification package.

B. All bituminous roofs felled through the use of explosives are to be dropped in a single unit and impact the ground in a horizontal plane.

C. All dismantlement activities shall be performed in accordance with the references listed in Article 1.4 of this section.

1. Activities to fell concrete structures outside their own footprint require prior approval.

D. Controls shall be maintained at all times during this removal work to minimize fugitive emissions.

E. The Subcontractor shall prevent damage to adjacent structures, materials, and equipment including underground utilities during dismantlement activities.

1. Steel barriers to protect adjacent structures or underground utilities shall conform to the requirements of Section 05125 of this specification package.

F. All lifting and rigging required shall be in accordance with Section 14955 of this specification package.

G. All temporary bracing and rigging frames required shall be fabricated and erected in accordance with Section 05125 of this specification package.

H. Removal of Above-Grade Concrete Projections:

1. Remove concrete piers, building curb, walls, and miscellaneous equipment foundations and projections above existing grade slab.
2. Remove equipment, column, and other miscellaneous foundation piers and walls flush with existing grade.

I. Cutting:

1. All material shall be cut as required for containerization in accordance with Section 01120 of this specification package.
2. Embedded steel reinforcing is considered part of concrete.
3. Because of contamination levels, some concrete may require local containment for cutting activities in accordance with Section 15067 of this specification package. These areas are identified in Part 6 of the Invitation for Bid.

J. Interior concrete/CMU walls shall be removed using non-explosive methods prior to opening the shell of the structure. A water spray shall be used to minimize fugitive emissions.

K. Interior concrete slabs can be removed using methods similar to the interior wall removal. A second option is to remove interior slabs with the felling of the structure. This will require encapsulation of the slab or wrapping the slab with geotextile fabric that is wetted down with amended water prior to felling activities.

3.3 SPECIAL INSTRUCTIONS

A. The following items are also included (where applicable) in the sequence of concrete removal:

1. Doors, Windows, and Frames:
   a. The Subcontractor shall remove all windows in one piece and place them in appropriate containers.
   b. The Subcontractor shall remove all doors (wood and/or steel) and place them in appropriate containers.
2. Lead Materials:
   a. The Subcontractor shall segregate all lead materials (i.e., flashings, vent stacks, etc.) and containerize.
3. Wall and Roof Louvers:
   a. The Subcontractor shall ensure that louvers and roof vents are removed during exterior concrete removal and placed in appropriate containers.

B. All material will be placed in containers as per the requirements of Section 01120 of this specification package.

END OF SECTION

SECTION 03900
FOUNDATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Crane foundations, if required.

B. Protective barrier foundations, if required.

1.2 RELATED SECTIONS

A. Section 01120 - Waste Handling Criteria.

B. Section 01515 - Mobilization and Demobilization.

C. Section 05125 - New Structural Steel.

D. Section 14955 - Lifting and Rigging.

1.3 REFERENCE MATERIALS

A. See Part 7 of the Invitation for Bid Package (IFB) Package for the following:

1. Index of Drawings
2. Photographs
3. Existing Drawings
4. Videos

1.4 REFERENCES, CODES, AND STANDARDS

A. American Concrete Institute (ACI):

1.	ACI 301-89	Specifications for Structural Concrete for Buildings.
2.	ACI 305-91	Hot Weather Concreting.
3.	ACI 306.1-90	Standard Specification for Cold Weather Concreting.
4.	ACI 318/318R-92	Building Code Requirements for Reinforced Concrete.
5.	ACI SP-66-88	ACI Detailing Manual.

B. American Society for Testing and Materials (ASTM):

1.	ASTM A615/ A615M-92	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
2.	ASTM C31-91	Standard Practice for Making and Curing Concrete Test Specimens in the Field.
3.	ASTM C39-86	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
4.	ASTM C94-92	Ready-Mixed Concrete.

5.	ASTM C143-90	Standard Test Method for Slump of Hydraulic Cement Concrete.
6.	ASTM C109-92	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars.
7.	ASTM C150-92	Portland Cement.
8.	ASTM C231-91	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
9.	ASTM C309-91	Liquid Membrane Forming Compounds for Curing Concrete.
10.	ASTM C827-87	Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures.

1.5 SUBMITTALS

A. The Subcontractor shall submit the following for approval by the FERMCO Construction Manager.

1. Calculations: Indicate design loads.
2. Shop Drawings: Indicate reinforcing, sizes, spacings, locations, and quantities; bending and cutting schedules; and supporting and spacing devices. Detail in accordance with ACI SP-66.
3. Product Data: Concrete mix designs.
4. Concrete Supplier: Name and address of the transit-mix concrete supplier. Supply typical batch ticket and history per ACI 318.
5. Placement Records: Record of time, dates, and locations of concrete placing operations upon completion of work.
6. Test Reports: Test reports for all tests required under Field Quality Assurance.

B. For additional submittal requirements see Part 6 of the Invitation for Bid.

1.6 QUALITY ASSURANCE

A. Calculations and shop drawings must bear the stamp of a Registered Professional Engineer.

PART 2 PRODUCTS

2.1 MATERIALS

A. Reinforcing Steel: ASTM A615, 60 ksi yield grade; deformed billet steel bars; plain finish.

B. Chairs, bolsters, bar supports, spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions.

C. Portland Cement: ASTM C150.

2.2 ACCESSORIES

A. Patching Grout: Premixed compound consisting of non-metallic aggregate; cement; water reducing and plasticizing agent; capable of developing minimum compressive strength of 5,000 psi in 28 days; conforming to ASTM C109 and ASTM C827.

B. Curing Compound: Conforming to the requirements of ASTM C309, clear; must not impair natural bonding characteristics of subsequent coatings.

2.3 FABRICATION

A. Concrete - General: All concrete used in the work shall be composed of portland cement, fine and coarse aggregate, and the specified admixtures. Design mixes shall be submitted to the FERMCO Construction Manager for approval before any concrete is placed. Concrete for every part of the work shall be of homogenous structure which, when hardened, will have the required strength and resistance to weathering. The proportions for all concrete shall be such as to produce a mixture which will work readily into any required forms and around reinforcement with the method of placing employed on the work, but without permitting the materials to segregate.

B. Concrete Mix Minimum Requirements:

1. All concrete used in the work shall have a minimum compressive strength of 3,000 psi at 28 days.
2. The water/cement ratio shall be determined by consideration of the specified strength, the water reducing admixtures, the slump required for proper placement, air entraining requirements, the maximum allowable aggregate size and its specific gravity, the fineness modulus of the fine aggregate and its specific gravity, and the amount of water carried on the aggregates. The mix designs shall be proportioned in accordance with ACI 318, Section 5.3 or Section 5.4.
3. The proportions of all materials in the concrete shall be subject to review by the FERMCO Construction Manager. The Subcontractor shall provide all plant and equipment necessary to determine and control the actual proportions of materials entering the batch. Slumps shall be recorded for each trial batch.

C. Mixing and Delivery: Mixing and delivery of concrete shall be scheduled so that all concrete placing operations can be completed within 1-1/2 hours after introduction of mixing water to cement and aggregates, in accordance with Section 11 of ASTM C94. No water shall be added to the batch after the 1-1/2 hour time limit has been reached. The maximum and minimum temperatures of

the concrete batch during production, delivery, and placement shall not exceed the recommendations of ACI 305 and 306.

PART 3 EXECUTION

3.1 PREPARATION

A. If grouting is used:

1. To ensure proper bond to concrete, all grease, oil, dirt, and other deleterious materials shall be completely removed and managed in accordance with Section 01120 of this specification package.
2. Roughen the surfaces to assure bond of the grout to the existing concrete. Loose or broken concrete shall be removed and managed in accordance with Section 01120 of this specification package.

3.2 INSTALLATION

A. If concrete is used:

1. Place, support, and secure reinforcement against displacement. Do not deviate from required position.
2. Maintain concrete cover around reinforcing according to the requirements of Chapter 5 of ACI 301 and Chapter 7 of ACI 318.
3. Provide formed openings where required for work to be embedded in concrete.
4. Install concrete accessories straight, level, and plumb.
5. Place concrete continuously between any required forms or other limits.
   a. Place concrete in accordance with Chapter 8 of ACI 301 and Chapter 5 of ACI 318.
   b. Notify the FERMCO Construction Manager a minimum of 24 hours prior to commencement of operations.
   c. Ensure that reinforcement and forms are not disturbed during concrete placement.
6. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
7. Carefully follow the manufacturer's instructions for mixing, placing, and curing of grout.

3.3 FIELD QUALITY ASSURANCE

A. Concrete Testing: The Subcontractor shall pay for and provide for services of an independent testing agency. The Subcontractor shall deliver test specimens to the testing agency. The agency shall perform field tests and shall perform laboratory tests on the specimens. Concrete testing shall be performed in accordance with Chapter 16 of ACI 301 for each 50 cubic yards, or fraction thereof, of each mix design placed in any one day.

1. Slump Tests: ASTM C143. One sample for each strength test.
2. Air Content Tests: ASTM C231. One sample for each strength test.
3. Test Cylinders: ASTM C31. One set of three cylinders for above quantities.
4. Compressive Strength: ASTM C39. One specimen tested at 7 days and two specimens tested at 28 days.

END OF SECTION

SECTION 05125
NEW STRUCTURAL STEEL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Design, fabrication, and erection of miscellaneous metal items for protective barriers, lifting assemblies, rigging, and temporary bracing and supports.

1.2 RELATED SECTIONS

A. Section 01120 - Waste Handling Criteria.
B. Section 03900 - Foundations.
C. Section 05126 - Structural Steel Dismantlement.
D. Section 14955 - Lifting and Rigging.

1.3 REFERENCE MATERIALS

A. See Part 7 of the Invitation for Bid (IFB) for the following:
   1. Index of Drawings
   2. Photographs
   3. Existing Drawings
   4. Videos

1.4 REFERENCES, CODES, AND STANDARDS

A. American Society for Testing and Materials (ASTM):
   1. ASTM A36/A36M-93 Structural Steel.
   2. ASTM A307-Rev A-93 Carbon Steel Bolts and Studs.
   3. ASTM A325-93 High-Strength Bolts for Structural Steel Joints.

B. American Welding Society (AWS):
   1. AWS A2.4-93 Standard Symbols for Welding, Brazing, and Nondestructive Examination.
   2. AWS D1.1-94 Structural Welding Code.

C. American Institute of Steel Construction (AISC):
   1. AISC Steel Construction Manual - Allowable Stress Design (ASD), 9th Edition.

D. American National Standards Institute (ANSI):
   1. ANSI A10.13-89 Construction and Demolition Operations - Steel Erection - Safety Requirements.

E. United States Department of Energy (DOE):

1. DOE 6430.1A General Design Criteria.

1.5 SUBMITTALS

A. The Subcontractor shall submit the following for approval by the FERMCO Construction Manager.

1. Calculations: Indicate design loads, member forces, moments and stresses, and connection forces.
2. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
3. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths. Submit copies of welder's certifications with shop drawings.
4. Plan for conducting and documenting field quality testing and inspection including test methods and reports required under Field Quality Assurance.

B. For additional submittal requirements see Part 6 of the Invitation for Bid.

1.6 QUALITY ASSURANCE

A. Calculations and shop drawings must bear the stamp of a Registered Professional Engineer.

1.7 DELIVERY, STORAGE, AND HANDLING.

A. ASTM A325 high strength bolts shall be delivered to the site in the original labeled containers and once on site shall not be transferred into unlabeled containers. The label information shall include the type of bolt, purchase order number, and the name of the supplier.

PART 2 PRODUCTS

2.1 MATERIALS

A. Steel Sections: ASTM A36.

B. Threaded Fasteners: Heavy hexagon bolts, nuts, and hardened washer shall be ASTM A325 or ASTM A307.

1. Bolts connecting primary members shall be A325.

C. Expansion Anchors: Expansion bolts used for securing steel to concrete shall be one of the following:
   1. "Parabolt" as manufactured by Molly Fastener Group of Emhard, Temple, PA 19560.
   2. "Wedge Anchors" as manufactured by ITT Phillips Drill Division, Michigan City, IN 46360.
   3. "Kwik Bolt" as manufactured by Hilti, Inc., Stamford, CT 06405.

D. Welding Materials: AWS D1.1 - Structural Welding Code.

2.2 FABRICATION

A. For delivery to site, fit and shop assemble in largest practical sections.

B. Supply components required for anchorage of fabricated structural assemblies. Provide anchors and related components of same material and finish.

C. All welding procedures, welder's certification, and visual acceptance criteria must be in accordance with AWS D1.1, Chapter 5.

D. Clean surfaces of rust, scale, grease, and foreign matter prior to applying shop primer.

E. Shop prime with one coat of rust-resistant red oxide primer.

F. Do not prime surfaces in direct contact with concrete or where field welding shall be required.

PART 3 EXECUTION

3.1 PREPARATION

A. Verify that field conditions are acceptable to receive work.

B. Verify opening sizes and dimensional tolerances shall be acceptable.

3.2 INSTALLATION - GENERAL

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Allow for erection loads and provide temporary bracing to maintain true alignment until completion of erection.

C. Field weld components as indicated on the approved drawings. Field welding shall be in accordance with AWS D1.1, Chapter 3.

D. Fasteners shall be tightened in properly aligned holes to snug tight condition.

E. Obtain FERMCO Construction Manager's approval prior to site cutting.

F. After erection, prime field welds and abrasions, except surfaces to be in contact with concrete.

G. All steel shall be fabricated and erected in accordance with the codes and standards referenced in Article 1.4 of this section.

H. After use, all steel shall be dismantled and cut for containerization in accordance with Section 01120 and Section 05126 of this specification package.

3.3 FIELD QUALITY ASSURANCE

A. The Subcontractor shall inspect high-strength bolted connections for all shop-fabricated steel, perform tests and prepare test reports in accordance with the AISC specifications. All test results shall be submitted to the FERMCO Construction Manager.

B. The Subcontractor shall conduct and interpret tests, shall state in each report whether test specimens comply with requirements, and shall specifically state any deviations. Deviations must be approved in writing by the FERMCO Construction Manager.

C. Shop and Field Welding: The Subcontractor shall:

1. Inspect and test, during fabrication and erection of structural steel assemblies in accordance with AWS Structural Welding Code and as follows:
   a. Conduct inspections and tests as required. Record types and locations of all defects found in the work. Record work required and performed to correct deficiencies. All test results to be submitted to the FERMCO Construction Manager.
   b. Perform visual inspection of all welds.
   c. Perform nondestructive tests of welds per Subcontractor submitted plan. Visual inspection alone is not acceptable. A minimum of 50 percent of the welds shall be Non-Destructive Test (NDT) inspected.
   d. All welds that fail shall be repaired per approved Subcontractor repair plan.
   e. Perform additional tests to reconfirm any noncompliance of the original work and as may be necessary to show compliance of corrected work.
2. Welded connections on structural steel rigging frame shall be 100 percent radiograph tested by an independent certified testing lab. Results shall be submitted to the FERMCO Construction Manager for approval.
   a. All welds that fail shall be repaired per approved Subcontractor repair plan.
   b. Perform additional tests to reconfirm any noncompliance of the original work and as may be necessary to show compliance of corrected work.

D. Correction of Substandard Work:

1. The Subcontractor shall correct deficiencies in structural steel work which inspections and laboratory test reports have indicated to be not in compliance with requirements and at no additional expense to the FERMCO Construction Manager.

END OF SECTION

SECTION 05126
STRUCTURAL STEEL DISMANTLEMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Dismantling and containerization of structural steel, miscellaneous steel, and metal siding/roofing:
   1. Structural steel.
   2. Bar joists.
   3. Floor plate/decking.
   4. Grating.
   5. Stairs, ladders, and handrail.
   6. Metal siding and roofing, including doors, louvers, and windows.
   7. All other miscellaneous steel.
   8. Control of fugitive emissions.

1.2 RELATED SECTIONS

A. Section 01120 - Waste Handling Criteria.
B. Section 01517 - Removing/Fixing Radiological Contamination.
C. Section 03315 - Concrete Removal.
D. Section 05125 - New Structural Steel.
E. Section 14955 - Lifting and Rigging.

1.3 REFERENCE MATERIALS

A. See Part 7 of the Invitation for Bid Package for the following:
   1. Index of Drawings.
   2. Photographs.
   3. Existing Drawings.
   4. Videos.

1.4 REFERENCES, CODES, AND STANDARDS

A. American National Standards Institute (ANSI):

1.	ANSI A10.6-90	Demolition Operations - Safety Requirements.
2.	ANSI A10.8-88	Construction and Demolition Operations - Scaffolding - Safety Requirements.
3.	ANSI A10.13-89	Construction and Demolition Operations - Steel Erection.

B. National Fire Protection Association (NFPA):

1. NFPA 241-93 Safeguarding Construction, Alteration, and Dismantlement Operations.

1.5 SUBMITTALS

A. The Subcontractor shall submit to the FERMCO Construction Manager for approval a structural steel removal work plan that contains the following information:

1. Detailed sequence of dismantlement, including equipment to be used.
2. Methods for contaminant control, including fugitive emissions during cutting.
3. If controlled explosive methods are used for structural steel dismantlement, a detailed work plan containing the following information shall be prepared:
   a. Methods and materials to be used.
   b. Means to protect adjacent structures, equipment, material, and underground utilities from damage, including protection from projectiles.
   c. Methods and materials to control fugitive emissions.
   d. Contingency plan for detonation failure.
   e. Proof of Ohio blasters license.
   f. Evidence of previous work experience using controlled explosives to take down multi-story structures near other structures within the last 5 years. Provide project locations and contacts for verification.
   g. If interior concrete/CMU walls and slabs are removed, refer to concrete removal method in Section 03315 of this specification package for methods.
4. Methods of cutting,including equipment to be used.
5. Detailed plan for protecting laydown and cutting areas from contamination by lead paint chips.
6. Methods and materials used for cutting lead-painted steel.
7. Calculations to verify structural integrity of partially dismantled structure, as applicable.
8. If dismantlement method requires personnel on the roof, the Subcontractor shall provide calculations verifying the structural adequacy of the roof to support personnel and equipment. These calculations shall be stamped by a Registered Professional Engineer.

B. For additional submittal requirements, see Part 6 of the Invitation for Bid.

1.6 QUALITY ASSURANCE

A. Dismantlement will not be permitted unless calculations to verify the structural integrity of the partially dismantled structure bear the stamp of a Registered Professional Engineer.

PART 2 PRODUCTS

2.1 PRODUCTS/EQUIPMENT

A. Non-woven Geotextile Fabric:

1. Trevira Spunbond 1120 by Hoechst Celanese Corp.
2. Mirafi 160N by Mirafi Inc.
3. ADS 600 by Advanced Drainage Systems, Inc.
4. Equal products manufactured by others will be acceptable.

B. Surfactant used in amended water.

PART 3 EXECUTION

3.1 PREPARATION

A. The Subcontractor shall ensure that adequate laydown space has been cleared and barriers have been established.

B. Steel and siding shall have contamination fixed or removed prior to leaving containment, in accordance with Section 01517 of this specification package.

C. If controlled explosive methods are used, the Subcontractor shall take the following precautions to control fugitive emissions:

1. The non-woven geotextile fabric should be wetted and placed on the grade slab and will extend beyond the perimeter of the building a distance equal to the building height to prevent exterior debris from becoming airborne due to air pressure developed during the felling operation.
2. If required, wetted geotextile fabric should be draped over any elevated concrete slabs. If multiple sections of the fabric are used, then the sections should be laced securely together.

3.2 APPLICATION

A. All dismantlement activities shall be performed in accordance with the standards listed in Article 1.4 of this section.

B. Control of fugitive emissions shall be maintained at all times during this removal work to minimize visible dust.

C. Do not remove main steel members before all equipment and miscellaneous steel have been removed.

1. If steel is removed in sections, verify the structural adequacy of the remaining structure.

D. The Subcontractor is responsible for avoiding damage to adjacent structures, material, and equipment including underground utilities during dismantlement activities.

E. All lifting and rigging required shall be in accordance with Section 14955 of this specification package.

F. All temporary bracing and rigging frames required shall be in accordance with Section 05125 of this specification package.

G. All material shall be cut as required for containerization in accordance with Section 01120 of this specification package.

H. All steel columns, anchors, and other projections shall be removed flush with the floor slab or existing grade.

I. Lead-based paint chips and debris, released during structural steel dismantlement, shall be collected and managed in accordance with Section 01120 of this specification package.

3.3 SPECIAL INSTRUCTIONS

A. The following items are also included (where applicable) in the sequence of structural steel dismantlement:

1. Doors, Windows, and Frames:
   a. The Subcontractor shall remove all windows in one piece and place them in appropriate containers.
   b. The Subcontractor shall remove all doors (wood and/or steel) and place them in appropriate containers.
2. Lead Materials:
   a. The Subcontractor shall segregate all lead materials (i.e., flashings, vent stacks, etc.) and containerize.
3. Gutters, and Wall and Roof Louvers:
   a. The Subcontractor shall ensure that louvers, gutters, and roof vents are removed during structural steel dismantlement and placed in appropriate containers.

B. All material will be placed in containers as per the requirements of Section 01120 of this specification package.

END OF SECTION

SECTION 07415
TRANSITE REMOVAL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. The work includes:
   1. Removal of all interior and exterior transite panels (ACM).
   2. Use of an encapsulant and/or surfactant on the transite panels before removal to reduce dispersion of airborne asbestos fibers.

1.2 RELATED SECTIONS

A. Section 01120 - Waste Handling Criteria.
B. Section 01516 - Asbestos Abatement.
C. Section 01517 - Removing/Fixing Radiological Contamination.
D. Section 14955 - Lifting and Rigging.
E. Section 15066 - Interior Dismantlement.
F. Section 15067 - Ventilation and Containment.

1.3 REFERENCE MATERIALS

A. See Part 7 of the Invitation for Bid for the following:
   1. Index of Drawings.
   2. Photographs.
   3. Existing Drawings.
   4. Videos.

1.4 REFERENCES, CODES, AND STANDARDS

A. FERMCO will notify governmental EPA agencies before start of work. The Subcontractor shall notify all other applicable governmental agencies.
B. Subcontractor shall be responsible for:
   1. Adherence and compliance to work practices and procedures set forth in applicable Federal, State, and local codes, regulations, and standards.
   2. Obtaining certifications and licenses.

1.5 SUBMITTALS

A. Plan of Action:
   1. Submit a detailed work plan of the procedures proposed for use in complying with the requirements of this specification.

2. Include in the plan:
   a. The location and layout of storage and queuing areas.
   b. The method of applying encapsulant and/or lockdown.
   c. The methods and sequencing of interior and exterior panel removal.
   d. The interface of trades involved in the performance of work.
   e. A detailed description of the methods to be employed to prohibit visible emissions in the work area.
3. Describe the use of a portable HEPA ventilation system, the containerization of removed asbestos debris, the method of treating broken and/or damaged panels, and the method of protecting adjacent structures.
4. The plan must be approved by FERMCO Construction Manager prior to commencement of work.
5. If dismantlement method requires personnel on the roof, the Subcontractor shall provide calculations verifying the structural adequacy of the roof to support personnel and equipment. These calculations shall be stamped by a Registered Professional Engineer.

B. Prior to initiation of the work, the Subcontractor shall submit the following items to the FERMCO Construction Manager:
   1. OSHA-required documentation for Asbestos Removal Contractors.
   2. State of Ohio certificates and licenses for the Subcontractor.
   3. State of Ohio certification for all personnel as required by law.

C. Prior to submittal of notification to government agencies, the Subcontractor shall provide a copy to the FERMCO Construction Manager for concurrence.

D. Product Data: The Subcontractor shall submit for approval manufacturer's technical information, including application instructions for each material proposed for use.

E. For additional submittal requirements, see Part 6 of the Invitation for Bid.

1.6 QUALITY ASSURANCE

A. Prior to commencement of work, the Subcontractor shall provide a FERMCO-selected sample area of transite for approval, 10 feet by 10 feet in size, for the lockdown, encapsulant, and surfactant. The approved mock-up shall serve as a standard for the balance of the work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. The Subcontractor shall:
   1. Take precautions to prevent breakage of transite panels during handling.

2. Deliver materials in original, new, and unopened containers bearing manufacturer's name, label, and the following information:
   a. Name or title of material
   b. Manufacturer's stock number and date of manufacture
   c. Manufacturer's name
   d. Thinning and application instructions

1.8 PROJECT CONDITIONS

A. Of particular concern is the accidental dropping of the transite panels as they are removed from the upper stories of the building. The Subcontractor shall provide protection to prevent transite from hitting other buildings and surrounding utilities and structures, thus causing structural damage.

B. Subcontractor shall apply encapsulants, lockdown, or surfactants only when environmental conditions in the work area are as required by the manufacturer's instructions.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Encapsulants:
   1. Certane 2050 Certified Technologies.
   2. Expert Environmental Products - Eppco #1.
   3. International Protective Coatings - Serpiloc.

B. Surfactants:
   1. Childers CP-225 CHIL-SORB.
   2. Certech.
   3. Expert Environmental Products.
   4. International Protective Coatings Corp.

C. Lockdowns:
   1. 1050-Clearcoat by Certane.
   2. Fiber-Seal by Eppert.
   3. Serploc by IPCC.

D. Equal products manufactured by others will be acceptable.

PART 3 EXECUTION

3.1 PREPARATION

A. Subcontractor shall maintain the integrity of the exterior of the building until the interior transite and insulation has been removed and encapsulant, lockdown, or surfactant has been applied to the interior surface of exterior panels.

3.2 APPLICATION

A. For exterior transite, the Subcontractor shall:

1. Apply the encapsulant or lockdown to the interior surface of the exterior panels prior to removal. Encapsulant or lockdown shall be applied to provide visible coverage.

B. Apply surfactant to areas around fasteners of transite panels before removal of fasteners. If original application becomes dried out before or during removal or handling, apply a second application.

C. In the event a transite panel is broken, the Subcontractor shall encapsulate the broken edges.

3.3 SPECIAL INSTRUCTIONS

A. The following items are also included (where applicable) in the sequence of transite removal:

1. Gutters:
   a. The Subcontractor shall remove and collect all ACM from gutters, apply an encapsulant or lockdown to the gutters before their removal, and place materials in appropriate containers.
2. Insulation:
   a. The Subcontractor shall remove and containerize the insulation between the transite panels and/or other materials.
3. Doors, Windows, and Frames:
   a. The Subcontractor shall remove all windows in one piece and place them in appropriate containers.
   b. The Subcontractor shall remove all doors (wood and/or steel) and place them in appropriate containers.
4. Lead Materials:
   a. The Subcontractor shall segregate all lead materials (i.e., flashings, transite fasteners, vent stacks, etc.) and containerize.
5. Wall and Roof Louvers:
   a. The Subcontractor shall ensure that louvers and roof vents are removed during exterior transite removal and placed in appropriate containers.

B. All material will be placed in containers as per the requirements of Section 01120 of this specification package.

END OF SECTION

SECTION 14955
LIFTING AND RIGGING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Lifting and rigging requirements for all hoisting and lifting equipment.

B. Use of existing structure for lift support.

1.2 RELATED SECTIONS

A. Section 03315 - Concrete Removal.

B Section 03900 - Foundations.

C. Section 05125 - New Structural Steel.

D. Section 05126 - Structural Steel Dismantlement.

E. Section 07415 - Transite Removal.

F. Section 15065 - Equipment Dismantlement.

G. Section 15066 - Interior Dismantlement.

1.3 REFERENCE MATERIALS

A. See Part 7 of the Invitation for Bid Package for the following:

1. Index of Drawings
2. Photographs
3. Existing Drawings
4. Videos

1.4 REFERENCES, CODES, AND STANDARDS

A. American National Standards Institute (ANSI):

1.	ANSI A10.11-89	Safety Nets Used During Construction, Repair, and Demolition Operations.
2.	ANSI A10.4-90	Safety Requirements for Personnel Hoists and Employee Elevators for Construction and Demolition Operations.
3.	ANSI A10.6-90	Demolition Operations-Safety Regulations.
4.	ANSI A10.14-91	Safety Belts, Harnesses, Lanyards, Lifelines, and Droplines for Construction and Industrial Use.
5.	ANSI A10.18-83	Temporary Floor and Wall Openings, Flat Roofs, Stairs, Railings, and Toe Boards.
6.	ANSI B30.2-90	Overhead and Gantry Cranes.
7.	ANSI B30.5-89	Mobile and Locomotive Cranes.

8. ANSI B30.9--90 Slings.
9. ANSI B30.10-93 Hooks.
10. ANSI B30.16-93 Overhead Hoists.

B. National Fire Protection Association (NFPA):
1. NFPA 241-93 Construction, Alteration, and Dismantlement Operations.

C. United States Department of Energy (DOE):
1. DOE/ID-10500-93 Hoisting and Rigging Manual.

1.5 SUBMITTALS

A. The Subcontractor shall submit the following for approval by the FERMCO Construction Manager.
1. For each crane to be used:
   a. Certification that each operator is qualified by education and experience for the type of crane he/she will be operating in accordance with Chapter 2 of the DOE Hoisting and Rigging Manual and written support documentation.
   b. Design lifting capacities at all critical boom lengths and angles, and safety factor used.
   c. Crane log, maintenance, and inspection records.
   d. General arrangement drawings which clearly show proposed crane type, outrigger locations and loads, cribbing/foundation design, length of boom, load radius, and clearances.
2. For all lifts designated as "critical lifts" in Part 6 of the Invitation for Bid or by the FERMCO Construction Manager, submit a pre-job plan or procedure in accordance with the requirements of Chapter 12 of the DOE Hoisting and Rigging Manual.
3. Fill out and submit Critical Lifting Plan shown in Appendix A of this specification section to the FERMCO Construction Manager a minimum of 2 weeks before each lift.
4. For all ordinary lifts, the Subcontractor shall comply with all applicable sections of the DOE Hoisting and Rigging Manual.

B. For additional submittal requirements, see Part 6 of the Invitation for Bid.

1.6 QUALITY ASSURANCE

A. All personnel must be certified by the Subcontractor in accordance with the requirements of the DOE Hoisting and Rigging Manual prior to performing the work.

B. All equipment must meet the requirements of the DOE Hoisting and Rigging Manual.

C. All drawings and calculations submitted for critical lifts and structural integrity must bear the stamp of a Registered Professional Engineer.

1.7 PROJECT CONDITIONS

A. Subcontractor shall ensure that roads into and around the job site are not blocked at any time.

B. Subcontractor shall ensure that utilities which serve areas outside the job site are not interrupted at any time.

PART 2 PRODUCTS

2.1 MATERIALS

A. All lifting frames, spreader bars, and other steel used must be designed, fabricated, and erected in accordance with the requirements of Section 05125 of this specification package.

2.2 ACCESSORIES

A. All wire rope, slings, and other rigging accessories must meet the requirements of Chapter 8 of the DOE Hoisting and Rigging Manual.

B. All wire rope, slings, and other rigging accessories shall have a minimum safety factor of 5:1.

C. Each wire rope sling shall have a metal tag securely attached with the following information stamped or engraved on the tag:

1. Manufacturer's name.
2. ID number corresponding to proof test certificate.
3. Safe working load at a vertical 90 degree pull.
4. Sling length.
5. Rope diameter.
6. Number of legs.
7. Sling type (i.e., IWCRC - IPS or XPS)
   a. All slings purchased shall be of Independent Wire Rope Core (IWRC) construction and shall be made from Improved Plow Steel (IPS) grade or better.
8. End attachments (if applicable).

D. Each synthetic web sling shall have a tag securely attached with the following information permanently marked on the tag (Note: paper and cardboard tags are prohibited):

1. Manufacturer's name.
2. ID number corresponding to proof test certificate.
3. Safe working load in vertical, basket, and choker hitches.

4. Sling length.
5. Body size.
6. Type of sling material.
7. End attachments (if applicable).

E. Synthetic web type slings shall be purchased with a manufacturer-applied Ultra-Violet (UV) protective coating applied to the sling material.

F. Each steel chain sling shall be made of alloy steel only, and have a steel tag securely attached with the following information stamped, engraved, or relieved on the tag:
1. Manufacturer's name.
2. ID number corresponding to proof test certificate.
3. Safe Working Load for vertical, or the configuration ordered if it is a special order.
4. Sling length.
5. Link diameter.
6. Number of legs.
7. End attachments (if applicable).

G. All rigging hardware (i.e., shackles, rings, eyebolts, turnbuckles, etc.) shall be stamped with the following information:
1. Manufacturer's name.
2. Safe working load.
3. Size.

H. Each "Below the Hook" lifting device purchased for use at the FEMP shall have an ID or name plate securely attached to the device and shall be stamped, engraved, or otherwise permanently marked as per Chapter 9 of the DOE Hoisting and Rigging Manual.

I. Any multi-leg (three or more legs) sling shall have a Safe Working Load rating as if only two legs of the sling will support the entire load.

PART 3 EXECUTION

3.1 PREPARATION

A. The Subcontractor shall ensure that adequate laydown space has been provided, areas to be lifted or lowered over are clear of personnel and hazardous substances, and barriers have been established.
1. Loads shall not be lifted or lowered over permanent occupied structures or items noted to be protected as identified on referenced drawings.
2. Temporary structures may be lifted or lowered over only after all personnel have been evacuated.

B. The Subcontractor shall ensure that all cranes to be used are placed on solid ground, avoiding damage to underground utilities identified in the referenced drawings.

1. If the crane cribbing/foundation will require a bearing pressure greater than 1,500 psf, the FERMCO Construction Manager shall be notified a minimum of 2 weeks in advance of lift.

3.2 APPLICATION

A. All work must be performed in accordance with the references listed in Article 1.4 of this specification.

B. Subcontractor shall ensure that all loose materials are removed from or secured to any item to be lifted.

C. Subcontractor shall ensure that the existing structure is not subjected to excess loading during lifting operations.

1. Loads may be supported from structural steel or concrete beams only.
2. If more than 1,000 pounds is supported from a beam, calculations must be performed to verify the structural adequacy of the beam.

END OF SECTION

APPENDIX A

CRITICAL LIFTING PLAN

SECTION 15065
EQUIPMENT DISMANTLEMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This section includes the Subcontractor's responsibility for removal or dismantlement of equipment within the facility and support systems within or outside the facility, segregation of equipment and components into various waste streams, and preparation for containerizing.

1.2 RELATED SECTIONS

A. Section 01120 - Waste Handling Criteria.
B. Section 01515 - Mobilization and Demobilization.
C. Section 01517 - Removing/Fixing Radiological Contamination.
D. Section 14955 - Lifting and Rigging.
E. Section 15067 - Ventilation and Containment.

1.3 REFERENCE MATERIAL

A. See Part 7 of the Invitation for Bid (IFB) for the following:
   1. Index of Drawings.
   2. Photographs.
   3. Existing Drawings.
   4. Videos
B. See Part 6 of IFB for the following:
   1. Engineering Survey per 29 CFR 1926.850.

1.4 SUBMITTALS

A. The Subcontractor shall submit the following for approval.
   1. Detailed removal work plan including sequence, methods of removal and dismantlement, equipment required, catalog cut sheets, drawings and method and materials to control possible generation of airborne contaminants from cutting operations, methods to seal equipment openings for each equipment type and location of interim storage areas and allowable floor loads.
   2. Catalog cuts, proposed location, and method of installation of all hoisting equipment, and specialized construction equipment submitted for approval by the FERMCO Construction Manager with work plan.
B. For additional submittal requirements see Part 6 of the Invitation for Bid.

1.5 QUALITY ASSURANCE

A. Calculations submitted on maximum allowable floor loading must bear the stamp of a Registered Professional Engineer.

1.6 PROJECT CONDITIONS

A. All RCRA-listed and characteristic hazardous waste/debris has been removed from equipment to the maximum extent practical. Should any unidentified material be found or spilled, stop work in this area and contact the FERMCO Construction Manager for further instructions.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. The Subcontractor shall supply all tools, and equipment required for equipment dismantlement, removal, and transportation.

B. All lifting and hoisting equipment required shall be in compliance with Section 14955 of this specification package.

2.2 MATERIALS

A. The Subcontractor shall supply all materials required to seal equipment openings per requirements of this section.

PART 3 EXECUTION

3.1 APPLICATION

A. Equipment Dismantlement/Removal:

See Part 6 of the IFB for a listing of equipment that falls within the general equipment type categories.

1. Type RA Equipment: Equipment or equipment debris which is small enough to be handled by one or two individuals.
   a. This work consists of those pieces that one or two individuals can safely handle without lifting devices.
   b. All equipment and piping shall be dismantled, cut, and segregated per the requirements of section 01120 of this specification package.
   c. After cutting, remaining openings on the equipment shall be sealed. Sealing material shall be sufficiently durable to maintain its integrity during handling, containerization, and exposure to weather.

2. Type RB Equipment: Small equipment requiring a forklift, bobcat or crane to handle.
   a. The Subcontractor shall erect or use other necessary lifting equipment as required to remove type RB equipment.
   b. All equipment and piping shall be dismantled, cut, and segregated per the requirements of section 01120 of this specification package.
   c. After cutting, remaining openings on the equipment shall be sealed. Sealing material shall be sufficiently durable to maintain its integrity during handling, containerization, and exposure to weather.
3. Type RC Equipment: Equipment which must be significantly disassembled.
   a. The Subcontractor shall remove the various process and related support equipment which lends itself to disassembly into manageable parts for material handling and disposition movements.
   b. All equipment and piping shall be dismantled, cut, and segregated per the requirements of section 01120 of this specification package.
   c. After cutting, remaining openings on the equipment shall be sealed. Sealing material shall be sufficiently durable to maintain its integrity during handling, containerization, and exposure to weather.
   d. In some cases this equipment is elevated from the ground by the means of a structural platform. In these cases the equipment will be cut away or disconnected from the platform and lowered to the ground. The dismantlement of this equipment shall be accomplished by shearing and cutting whenever possible. If this is not possible, the equipment shall be dismantled at convenient assembly joints.
4. Type RD Equipment: Equipment which must be removed in one piece during dismantlement of the building.
   a. Prior to cleaning the building:
      1. All openings on the equipment shall be sealed weather tight. Sealing material shall be sufficiently durable to maintain its integrity during handling and containerizing.
      2. Where necessary, the equipment will have to be prepared as described in Section 01517 of this specification package. An alternative would be to double wrap the

equipment with 6-mil polyethylene, tape, and seal prior to opening the building.

b. If necessary, the equipment shall be rigged in accordance with Section 14955, segregated and containerized in accordance with Section 01120 of this specification package.

3.2 INTERIM MATERIAL STORAGE

A. Where removed materials are staged or stored within the facility, they shall be stored in designated floor storage areas. Floor loading shall not exceed 75 percent of the design loads as indicated on existing drawings. Where floor loads are not shown on these existing drawings, calculations shall be performed to determine maximum allowable floor loads and submitted to the FERMCO Construction Manager for approval.

B. Damaged areas within facilities identified by the Engineering Survey (see Part 6 of the Invitation for Bid) shall not be used for interim material storage.

END OF SECTION

SECTION 15066
INTERIOR DISMANTLEMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This section includes the Subcontractor's responsibility for the removal of demolition debris materials within the facility and support items within or outside the facility. Segregation of demolition debris into various waste streams and preparation for containerizing shall include, but not be limited to, the following:

1. Conduit.
2. Wire.
3. Electrical boxes (junction, switch).
4. Contactors.
5. Lighting fixtures.
6. Motor operated valves.
7. Lighting station.
8. Raceway and troughs.
9. Cable trays.
10. Piping.
11. Assorted valves, fittings, elbows, gauges, spool pieces, etc.
12. Ductwork, plenums, branches, etc.
13. Miscellaneous similar items.

1.2 RELATED SECTIONS

A. Section 01120 - Waste Handling Criteria.
B. Section 01515 - Mobilization and Demobilization.
C. Section 01516 - Asbestos Abatement.
D. Section 01517 - Removing/Fixing Radiological Contamination.
E. Section 14955 - Lifting and Rigging.
F. Section 15067 - Ventilation and Containment.

1.3 REFERENCE MATERIAL

A. See Part 7 of the Invitation for Bid (IFB) for the following:

1. Index of Drawings.
2. Photographs.
3. Existing Drawings.
4. Videos.

000230

1.4 SUBMITTALS

A. The Subcontractor shall submit the following for approval:

1. Detailed removal work plan, including sequence, ventilation methods, methods of removal and dismantlement, equipment required, calculations, catalog cut sheets, locations of interim storage, floor loadings, and any required drawings.
2. Catalog cuts, proposed location, method of installation of all hoisting equipment, and specialized construction equipment submitted for approval by the FERMCO Construction Manager with work plan.

B. For additional submittal requirements, see Part 6 of the Invitation for Bid.

1.5 QUALITY ASSURANCE

A. Calculations submitted on maximum allowable floor loading must bear the stamp of a Registered Professional Engineer.

1.6 PROJECT CONDITIONS

A. All RCRA-listed and characteristic hazardous waste/debris has been removed from the demolition debris to the maximum extent practical. Should any unidentified material be found or spilled, stop work in this area and contact the FERMCO Construction Manager for further instructions.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. Subcontractor shall supply all tools and equipment required for demolition debris material removal.

B. All lifting and hoisting equipment required shall be in compliance with Section 14955 of this specification package.

2.2 MATERIALS

A. The Subcontractor shall supply all materials required to seal openings per requirements of this section.

PART 3 EXECUTION

3.1 APPLICATION

A. The Subcontractor should remove the ductwork and piping and seal at both ends prior to movement to prevent spillage of any residual liquids or contamination. Sealing is not a requirement for conduit. These items and other

demolition debris shall be cut and segregated per the requirements of Section 01120 of this specification package.

B. For personnel safety, remote mechanical removal equipment should be used to the maximum extent practical.

C. Uncontrolled dropping of materials is not allowed.

D. Piping insulated with asbestos may be removed in its entirety per the requirements of Section 01516 of this specification package.

3.2 INTERIM MATERIAL STORAGE

A. Where removed materials are staged or stored within the facility, they shall be stored in designated floor storage areas. Floor loading shall not exceed 75 percent of the design loads as indicated on existing drawings. Where floor loads are not shown on existing drawings, calculations shall be performed to determine maximum allowable floor loads and submitted to the FERMCO Construction Manager for approval.

B. Damaged areas within facilities identified by the Engineering Survey (see Part 6 of the Invitation for Bid) shall not be used for interim material storage.

END OF SECTION

SECTION 15067
VENTILATION AND CONTAINMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This section consists of the work related to the Subcontractor-supplied ventilation and local containment that is required. The principal items included in this section are:

1. Local containment and vestibule design requirements.
2. Ventilation requirements.
3. Types of ventilation/local containment design.
4. Guidance on type of ventilation/local containment applicability.

B. Definitions:

1. Local Containment - is an enclosure that is designed to maintain 0.1-inch water gauge negative pressure within its structure to prevent airborne contaminated particulates from escaping to the outside environment.
2. Vestibule - is an enclosed entrance, a passage, or space that is between the outer door and the interior of the building. The space within the vestibule does not have to be under a negative pressure.
3. Enclosure - is the exterior wall of a sealed building.

1.2 RELATED SECTIONS

A. Section 01120 - Waste Handling Criteria.
B. Section 01515 - Mobilization and Demobilization.
C. Section 01517 - Removing/Fixing Radiological Contamination.
D. Section 03315 - Concrete Removal.
E. Section 04225 - Masonry Removal.
F. Section 05126 - Structural Steel Dismantlement.
G. Section 07415 - Transite Removal.
H. Section 15065 - Equipment Dismantlement.
I. Section 15066 - Interior Dismantlement.

1.3 REFERENCE MATERIALS

A. See Part 7 of the Invitation for Bid Package for the following:

1. Index of Drawings.
2. Photographs.

3. Existing Drawings.
4. Videos.

1.4 REFERENCES, CODES, AND STANDARDS

A. The entire work under this section shall be in compliance with the provisions of the following:

1. United States Department of Energy (DOE):
   a. DOE 6430.1A — General Design Criteria Division 15.
   b. DOE 5400.5 — Radiation Protection of the Public and the Environment.
2. Energy Research and Development Administration (ERDA):
   a. ERDA 76-21-79 — Nuclear Air Cleaning Handbook.
3. American Conference of Governmental Industrial Hygienists (ACGIH):
   a. ACGIH — Industrial Ventilation (latest edition).
4. American Society of Civil Engineers (ASCE):
   a. ASCE 7-93 — Minimum Design Loads for Buildings and Other Structures.

1.5 SUBMITTALS

A. The Subcontractor shall submit a work plan with the following information to the FERMCO Construction Manager for approval.

1. Drawings and Data:
   a. Indicate material of construction, sizes, locations, entrances, and egresses that do not allow for breach of the local containment or vestibule, and all other details of local containments and vestibules to be erected.
   b. Provide calculations and air flow diagrams for local containment and vestibule ventilation.
   c. Submit calculations indicating that a minimum negative pressure of 0.1 inch water gauge is maintained in all local containments when the ventilation system is in operation.
   d. All drawings and calculations shall bear the stamp of a Registered Professional Engineer.
2. Equipment:
   a. Submit vendor information on all accessory ventilation equipment that will be used.
3. Provide building-specific work plans on the use of portable HEPA units including replacement of HEPA filters and prefilters.

B. For additional submittal requirements, see Part 6 of the Invitation for Bid.

PART 2 PRODUCTS

2.1 MATERIALS

A. The Subcontractor shall provide air cleaning devices, HEPA, and prefilter elements, and all other ventilation accessory equipment for the completion of this project in accordance with Part 6 of the Invitation for Bid.

PART 3 EXECUTION

3.1 EXAMINATION

A. The Subcontractor shall determine which building access will be used for the vestibule location, and which interior and/or exterior structures and equipment will require local containment.

B. All vestibules, equipment, and/or structure containment material shall be noncombustible, or fire resistant and corrosion resistant.

C. Local containment structures shall be designed to be leak-tight and capable of maintaining a negative pressure of at least 0.1 inches water gauge. Typical design features on various local containments should include the following standardized features, where applicable:

1. Windows and mountings.
2. Glove ports.
3. Ease of cleaning.
4. Adequate interior illumination.
5. Connections for services lines, conduits, instrument leads, and ductwork.
6. Fire barriers.
7. Pressure differential readouts.
8. Attachments for interconnection of local containments.

D. Where practical, and without penetrating the local containment, all equipment components not functionally required to operate directly in the presence of radioactive materials shall be located outside the local containment. All HEPA and associated equipment that must be located within the local containment shall be designed to allow for in-place maintenance and/or replacement.

E. The local containment or vestibule structure external to the building shall be designed to withstand the effects of normal operating conditions and the environment. Structures shall be designed in accordance with reference documents in Article 1.4 of this specification section.

1. Design wind speed is 80 miles per hour; importance factor is equal to 1.07.

2. Ground snow load is 25 pounds per square foot.

3.2 PREPARATION

A. The Subcontractor shall ensure that all building exterior holes, gaps, or openings are adequately sealed to prevent exfiltration of airborne radioactive particulates.

B. The Subcontractor shall ensure that all ductwork used is free of dust or dirt before installing it in the ventilation system to prevent premature impingement loading of the prefilters and HEPA filters.

C. The Subcontractor shall ensure that all vestibules are large enough to support appropriate storage containers, material handling and dismantling equipment, and debris containerizing operations.

3.3 ERECTION/INSTALLATION/APPLICATION

A. The Subcontractor shall block, tie-down, or wheel lock all portable HEPA units.

B. The Subcontractor shall ensure HEPA filter and prefilter element replacements occur as indicated in Part 6 of the Invitation for Bid Package. All HEPA filter and prefilter element replacements shall be provided by the Subcontractor.

C. The following guidelines for localized ventilation and in-place cutting control measures shall be adhered to by the Subcontractor. The exhaust volume rate shall be at least 10 percent of the actual containment air volume per minute. This exhaust volume rate equates to six air changes per hour for any size space. The following criteria shall be met by the Subcontractor:

1. The Subcontractor shall ensure that ventilation air is provided in the quantities required to maintain OSHA air quality limits, all Personnel Exposure Limits (PELs), and all ACGIH Threshold Limit Values (TLVs).
2. For activities outside of enclosures, portable ventilation hoods shall be used as follows:
   a. Negative pressure shall be at least 0.1 inch water gauge between the cutting area in which the ventilation hood is installed and the corridor from which the cutting space is entered.
   b. Exhaust rate of the ventilation hood shall maintain sufficient airflow face velocity into the hood to prevent eduction of fumes from the hood to the room. A face velocity of 150 fpm is recommended for cutting operations.
   c. Each hood in the cutting area should be capable of being isolated by means of control dampers to prevent backflow through a hood when it is not in service.
   d. Each hood used for handling radioactive airborne particulates shall have a HEPA filter in its exhaust duct, located close to the duct entrance.

e. The hoods shall operate on a once-through mode with no recirculation to the room.

f. Where the use of hoods is impractical, the use of localized ventilation should be used to practice as low as reasonably achievable (ALARA) principles.

D. The Subcontractor shall ensure that all local containments can maintain negative pressures.

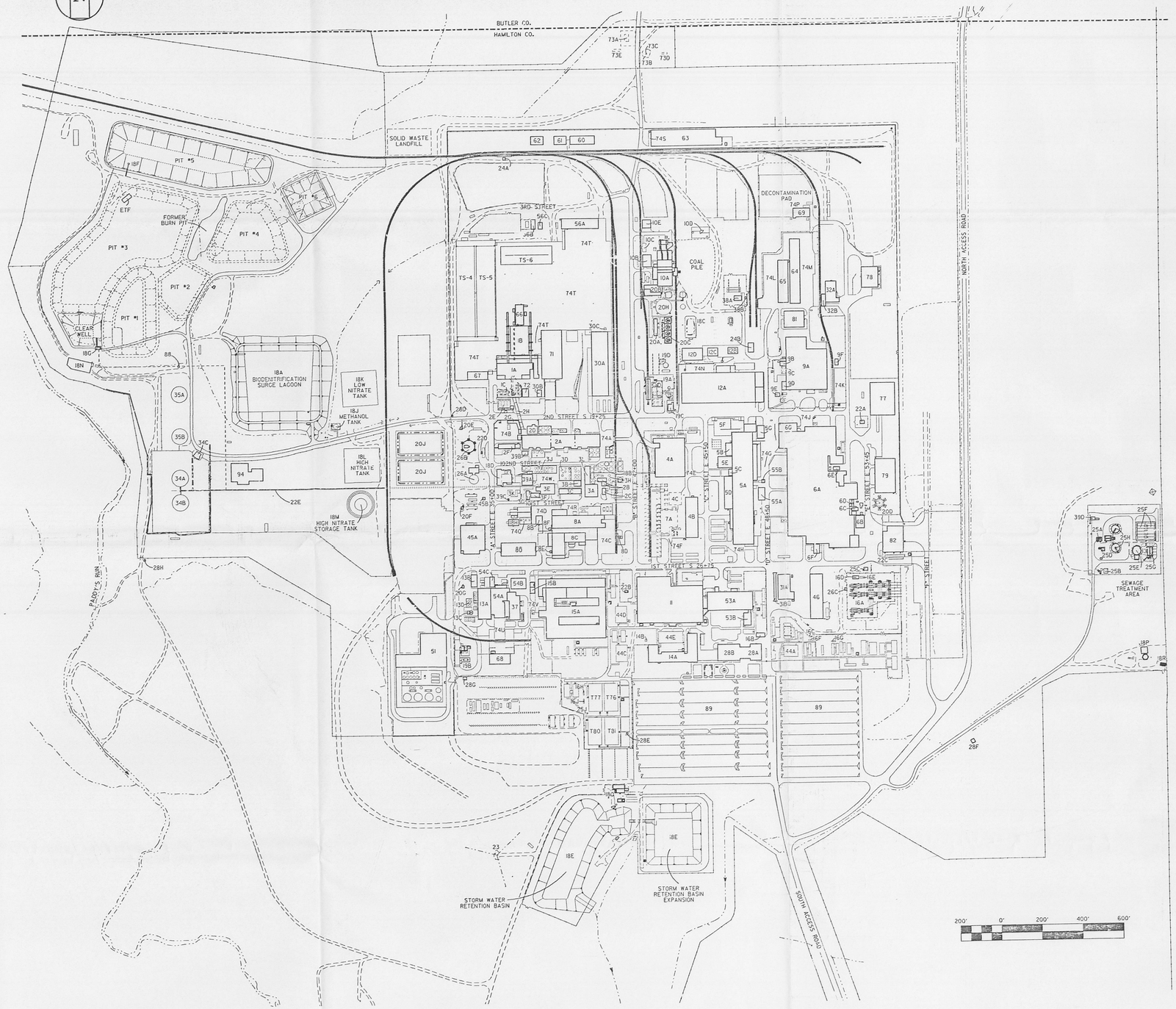
E. The Subcontractor shall comply with all other requirements for HEPA air filtration devices indicated in Part 6 of the Invitation for Bid.

F. Within an enclosure, the Subcontractor shall use local ventilation to maintain exposures ALARA.

3.4 FIELD QUALITY ASSURANCE

A. Final acceptance of local containments and vestibule structures shall be obtained from the FERMCO Construction Manager.

END OF SECTION



FEMP SITE IDENTIFICATION

TS-4 TENSION SUPPORT STRUCTURE *4
TS-5 TENSION SUPPORT STRUCTURE *5
TS-6 TENSION SUPPORT STRUCTURE *6
1A PREPARATION PLANT
1B PLANT 1 STORAGE BLDG.
1C PLANT 1 ORE SILOS (REMOVED)
2A ORE REFINERY PLANT
2B GENERAL/REFINERY SUMP CONTROL BLDG.
2C BULK LIME HANDLING BLDG.
2D METAL DISSOLVER BLDG.
2E NFS STORAGE & PUMP HOUSE
2F COLD SIDE ORE CONVEYOR
2G HOT SIDE ORE CONVEYOR
2H CONVEYOR TUNNEL (FROM PLANT 1)
3A MAINTENANCE BLDG.
3B OZONE BLDG.
3C NAR CONTROL HOUSE
3D NAR TOWERS
3E HOT RAFFINATE BLDG.
3F HARSHAW SYSTEM
3G REFRIGERATION BLDG.
3H REFINERY SUMP
3J COMBINED RAFFINATE TANKS
3K OLD COOLING WATER TOWER
3L ELECTRICAL POWER CENTER BLDG.
4A GREEN SALT PLANT
4B PLANT 4 WAREHOUSE
4C PLANT 4 MAINTENANCE BLDG. (REMOVED)
5A METALS PRODUCTION PLANT
5B PLANT 5 INGOT PICKLING
5C PLANT 5 ELECTRICAL SUBSTATION
5D WEST DERBY BREAKOUT/SLAG MILLING
5E PLANT 5 FILTER BLDG.
5F PLANT 5 COVERED STORAGE PAD
5G PLANT 5 INGOT STORAGE SHELTER
6A METALS FABRICATION PLANT
6B PLANT 6 COVERED STORAGE AREA
6C PLANT 6 ELECTROSTATIC PRECIPITATOR (SOUTH)
6D PLANT 6 ELECTROSTATIC PRECIPITATOR (CENTRAL)
6E PLANT 6 ELECTROSTATIC PRECIPITATOR (NORTH)
6F PLANT 6 SALT OIL HEAT TREAT BLDG.
6G PLANT 6 SUMP BLDG.
7A PLANT 7 (REMOVED)
7B PLANT 7 OVERHEAD CRANE (REMOVED)
8A RECOVERY PLANT
8B PLANT 8 MAINTENANCE BLDG.
8C ROTARY KILN/DRUM RECONDITIONING
8D PLANT 8 RAILROAD FILTER BLDG.
8E DRUM CONVEYOR SHELTER
8F PLANT 8 OLD DRUM WASHER
9A SPECIAL PRODUCTS PLANT
9B PLANT 9 SUMP TREATMENT FACILITY
9C PLANT 9 DUST COLLECTOR
9D PLANT 9 SUBSTATION
9E PLANT 9 CYLINDER SHED
9F PLANT 9 ELECTROSTATIC PRECIPITATOR
10A BOILER PLANT
10B BOILER PLANT MAINTENANCE BLDG.
10C WET SALT STORAGE BIN
10D CONTAMINATED OIL/GRAPHITE BURN PAD
10E UTILITIES HEAVY EQUIP. BLDG.
11 SERVICE BLDG.
12A MAIN MAINTENANCE BLDG.
12B CYLINDER STORAGE BLDG.
12C LUMBER STORAGE BLDG.
12D MAINTENANCE BLDG. WAREHOUSE
13A PILOT PLANT WET SIDE
13B PILOT PLANT MAINTENANCE BLDG.
13C SUMP PUMP HOUSE
13D PILOT PLANT THORIUM TANK FARM
14A ADMINISTRATION BLDG.
14B BLDG. 14 EOC GENERATOR SET
15A LABORATORY
15B LABORATORY CHEMICAL STORAGE BLDG.
16A MAIN ELECTRICAL STATION
16B ELECTRICAL SUBSTATION
16C ELECTRICAL PANELS & TRANSFORMER
16D MAIN ELECTRICAL SWITCH HOUSE
16E MAIN ELECTRICAL TRANSFORMERS
16F TRAILER SUBSTATION *1
16G TRAILER SUBSTATION *2
16H IQ PLEX3 NORTH SUBSTATION
16J IQ PLEX3 SOUTH SUBSTATION
18A BDN SURGE LAGOON
18B GENERAL SUMP
18C COAL PILE RUNOFF BASIN
18D BIODENITRIFICATION TOWERS
18E STORM WATER RETENTION BASINS
18F PIT #5 SLUICE GATE
18G CLEARWELL PUMP HOUSE *
18H BDN EFFLUENT TREATMENT FACILITY
18J METHANOL TANK
18K LOW NITRATE TANK
18L HIGH NITRATE TANK
18M HIGH NITRATE STORAGE TANK
18N WASTE PIT AREA STORM WATER RUNOFF CONTROL *
18P DISSOLVED OXYGEN BLDG.
18Q SOUTH PLUME INTERIM TREATMENT BLDG.
18R OUTFALL LINE PIT
18S RECOVERY WELL SYSTEM CONTROL BLDG.
19A MAIN TANK FARM
19B PILOT PLANT AMMONIA TANK FARM
19C TANK FARM CONTROL HOUSE
19D OLD NORTH TANK FARM
19E TANK FARM LIME SLUTTER BLDG.
20A PUMP STATION & POWER CENTER
20B WATER PLANT
20C COOLING TOWERS
20D ELEVATED POTABLE STORAGE TANK
20E WELL HOUSE *1
20F WELL HOUSE *2
20G WELL HOUSE *3
20H PROCESS WATER STORAGE TANK
20J LIME SLURRY PITS *
22A GAS METER BLDG.
22B STORM SEWER LIFT STATION
22C TRUCK SCALE
22D SCALE HOUSE & WEIGH SCALE
22E UTILITY TRENCH TO PIT AREA
23 METEOROLOGICAL TOWER
24A RAILROAD SCALE HOUSE
24B RAILROAD ENGINE HOUSE
25A CHLORINATION BLDG.
25B M.W. *ITS/EFS LINE/SAMPLING BLDG.
25C SEWAGE LIFT STATION BLDG.
25D U.V. DISINFECTION BLDG.
25E DIGESTER & CONTROL BLDG.
25F SLUDGE DRYING BEDS
25G PRIMARY SETTLING BASINS
25H TRICKLING FILTERS
25J IQ PLEX3 SEWAGE LIFT STATION
26A PUMP HOUSE-HP FIRE PROTECTION
26B ELEVATED WATER STORAGE TANK
26C MAIN ELECTRICAL STRAINER HOUSE
28A SECURITY BLDG.
28B HUMAN RESOURCES BLDG.
28D GUARD POST ON WEST END OF "2ND" STR.
28E GUARD POST AT T8I
28F TRAP HOUSE (FORMERLY SKEET RANGE BLDG. *90)
28G GUARD POST SOUTH OF BLDG. 51
28H GUARD POST SOUTH OF K-65 AREA
30A CHEMICAL WAREHOUSE
30B DRUM STORAGE WAREHOUSE
30C OLD TEN TON SCALE (REMOVED)
31A ENGINE HOUSE/GARAGE
31B OLD TRUCK SCALE
32A MAGNESIUM STORAGE BLDG.
32B BLDG. 32 COVERED LOADING DOCK
34A K-65 STORAGE TANK (NORTH) *
34B K-65 STORAGE TANK (SOUTH) *
34C RTS BLDG. *
35A METAL OXIDE STORAGE TANK (NORTH) *
35B METAL OXIDE STORAGE TANK (SOUTH) *
37 PILOT PLANT ANNEX
38A PROPANE STORAGE
38B CYLINDER FILLING STATION
39A INCINERATOR BLDG.
39B WASTE OIL DECANT SHELTER
39C INCINERATOR SPRINKLER RISER HOUSE
39D SEWAGE TREATMENT PLANT INCINERATOR
44A TRAILER COMPLEX (6-PLEX)
44C TRAILER COMPLEX (7-PLEX SJ)
44D TRAILER COMPLEX (7-PLEX NJ)
44E TRAILER COMPLEX (10 PLEX)
45A CONSTRUCTION DIVISION BLDG.
45B UTILITY SHED EAST OF RUST TRAILERS
46 HEAVY EQUIPMENT BLDG.
51 ADVANCED WASTEWATER TREATMENT FACILITY (AWWTF)
53A HEALTH & SAFETY BLDG.
53B IN-VIVO BLDG.
54A SIX TO FOUR REDUCTION FACILITY *1
54B PILOT PLANT WAREHOUSE
54C PILOT PLANT DISSOCIATOR SHELTER
55A SLAG RECYCLING BLDG.
55B SLAG RECYCLING PIT/ELEVATOR
56A CP STORAGE WAREHOUSE
56B STORAGE SHED (WEST)
56C STORAGE SHED (EAST)
60 QUONSET HUT *1
61 QUONSET HUT *2
62 QUONSET HUT *3
63 KC-2 WAREHOUSE
64 THORIUM WAREHOUSE
65 (OLD) PLANT 5 WAREHOUSE
66 DRUM RECONDITIONING BLDG.
67 PLANT 1 THORIUM WAREHOUSE
68 PILOT PLANT WAREHOUSE
69 DECONTAMINATION BLDG.
71 GENERAL IN-PROCESS WAREHOUSE
72 DRUM STORAGE BUILDING
73A FIRE BRIGADE TRAINING CENTER BLDG. (REMOVED)
73B FIRE TRAINING POND (REMOVED)
73C FIRE TRAINING TANK (REMOVED)
73D FIRE TRAINING BURN TROUGH (REMOVED)
73E CONFINED SPACE BURN TANK (REMOVED)
74A PLANT 2 EAST PAD
74B PLANT 2 WEST PAD
74C PLANT 8 EAST PAD
74D PLANT 8 WEST PAD
74E PLANT 4 PAD
74F PLANT 7 PAD
74G PLANT 5 EAST PAD
74H PLANT 5 SOUTH PAD
74J PLANT 6 PADS
74K PLANT 9 PAD
74L BUILDING 65 WEST PAD
74M BUILDING 64 EAST PAD & R.R. DOCK
74N BUILDING 12 NORTH PAD
74P DECONTAMINATION PAD
74Q PLANT 8 OLD METAL DISSOLVER PAD
74R PLANT 8 NORTH PAD
74S BUILDING 63 WEST PAD
74T PLANT 1 STORAGE PAD
74U PLANT PAD
74V LABORATORY PAD
74W INCINERATOR BLDG. PAD
77 FINISHED PRODUCTS WAREHOUSE (4A)
78 D & D BUILDING
79 PLANT 6 WAREHOUSE
80 PLANT 8 WAREHOUSE
81 PLANT 9 WAREHOUSE
82 RECEIVING/INCOMING MAT'LS. INSP.
88 CLEARWELL LINE
89 PARKING LOTS
94 CRU 4 VITRIFICATION PILOT PLANT (UNDER CONSTR.)
T76 INTERIM OFFICE SPACE
T77 INTERIM OFFICE SPACE
T80 INTERIM OFFICE SPACE
T81 INTERIM OFFICE SPACE

NOTE:
NUMBERING SCHEME DOES NOT REFLECT ACTUAL M.M.I.C. SYSTEM SCHEME. CONTACT SITE SERVICES/MAINTENANCE INFORMATION SYSTEM FOR FURTHER ASSISTANCE.

* - COMPONENT NOT OWNED BY OU3.

JAN 5 '95

NO.	REVISIONS	DATE	DWN. BY	APPD.	NO.	REVISIONS	DATE	DWN. BY	APPD.	REF. DWG. NO.

NOTE:
FERMCO C.A.D.
DRAWING NOT
TO BE REVISED
MANUALLY

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE
FRACTIONS ± 1/16
ANGLES ± 0° - 30'
DECIMALS
.X ± .02
.XX ± 0.03
.XXX ± 0.005
.XXXX ± 0.0050
ORIG. RELEASE DATE

APPROVALS

CIVIL & STR.		SAFETY ENG.	
ELECTRICAL		MAINTENANCE	
ENGINEER		Q.A.	
INSTRUMENT		FIRE PROTECT.	
MECHANICAL		WASTE MANAGE	
CHECKED		D.O.E.	
APPROVED		SECURITY	

FERNALD ENVIRONMENTAL
RESTORATION MANAGEMENT
CORPORATION
FERMCO
Fernald
Environmental Management Project
U.S. DEPARTMENT OF ENERGY

FEMP OPERABLE UNIT 3
SITE MAP
PLATE #1 000238

DATE 12/20/94
DRAWN S.J.SMOCK

FILE NAME: /STEVE/IGOR.DGN