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IMPROVED STORAGE OF SOIL AND DEBRIS REMOVAL ACTION 17 2 WORK PLAN FEBRUARY 1993 REVISION NO. 2

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WORK PLAN

Improved Storage of Soil and Debris Removal Action 17 Work Plan

Fernald Environmental Management Project
February 1993
Revision No. 2

Submitted by:
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Improved Storage of Soils and Debris
Removal Action 17
Removal Action Work Plan

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LIST OF ACRONYMS

AEA	Atomic Energy Act
ALARA	As Low As Reasonable Achievable
AM	*Action Memorandum*
AOC	Area of Contamination
ARAR	Applicable or Relevant and Appropriate Requirement
ASI/IT	Advanced Sciences Inc./International Technology
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CLP	Contract Laboratories Program
CRU	*CERCLA/RCRA Unit*
CSF	Central Storage Facility
D&D	Decontamination and Decommissioning
DFP	Decontamination Facility Pad
DOE	United States Department of Energy
DOE/CH	United States Department of Energy - Chicago
DOE-EML	United States Department of Energy - Environmental Measurements Laboratory
DOE-FN	United States Department of Energy - Fernald
DOT	United States Department of Transportation
DSR	Dose-to-Source Ratios
EML	Environmental Measurements Laboratory
F&ME	Facilities and Materials Evaluation
F&W	Facilities and Warehousing
FEMP	Fernald Environmental Management Project (formerly FMPC)
FERMCO	*Fernald Environmental Restoration Management Corporation*
FR	Federal Register
FMPC	Feed Materials Production Center (currently FEMP)
HDPE	High-Density Polyethylene
HSL	Hazardous Substance List
HWFAB	Hazardous Waste Facility Approval Board
HVAC	Heating, Ventilation and Air Conditioning
ICRP	International Commission on Radiation Protection
IRS&T	Industrial, Radiological Safety and Training
ISF	Improved Storage Facility
LDR	Land Disposal Restrictions
LLW	Low-Level Waste
MC&A	Material Control and Accountability
MEF	Material Evaluation Form
NCP	National (Oil and Hazardous Substances Pollution) Contingency Plan

LIST OF ACRONYMS (Continued)

NESHAP	National Emission Standards for Hazardous Air Pollutants
NPDES	National Pollution Discharge Elimination System
NRC	Nuclear Regulatory Commission
NTS	Nevada Test Site
OAC	Ohio Administrative Code
OBBC	Ohio Basic Building Code
ORC	Ohio Revised Code
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
PCB	Polychlorinated Biphenyl
pCi/g	pico-curie per gram
PTI	*Permit to Install*
PTO	*Permit to Operate*
QAPD	Quality Assurance Program Description
RAWP	Removal Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RSE	Removal Site Evaluation
SMP	Scrap Metal Pad
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SRPC	Soil and Rubble Pile Cover
SSOP	Site Standard Operating Procedure
TBC	To-Be-Considered
TCLP	Toxicity Characteristic Leaching Procedure
TSS	Tension Support Structure
TSWP	Toxic and Solid Waste Programs
USC	United States Code
US EPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WEMCO	Westinghouse Environmental Management Company of Ohio

EXECUTIVE SUMMARY

This Removal Action Work Plan provides a response to a Removal Site Evaluation (RSE) and Section IX of the Amended Consent Agreement (Removal Action 17) between the United States Environmental Protection Agency (US EPA) and the United States Department of Energy (DOE) for the improved storage of soil and debris generated at the Fernald Environmental Management Project (FEMP). The plan provides a sitewide management concept and implementation strategy for improved storage and management of excess soil and debris over the period that is required to design and construct the improved storage facilities, referred to as Phase I. Phase II addresses the management of excess soil and debris from the time the improved storage facilities are constructed until the final remedial alternatives are selected and implemented in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Records of Decision (RODs). The initiating activity for delineating the appropriate soil and debris controls will be a contaminant assessment. The assessment of contaminants in the affected soil and debris will include a review of existing characterization data, historical records, and process knowledge. If the existing data is insufficient, the material will be sampled and analyzed for specific constituents. The assessment results will be used to determine the management options for the soil and debris in accordance with this plan. These options include decontamination, disposal off site, or storage in either a controlled stockpile or an improved storage facility. *Soil and debris that is known to contain hazardous waste will either be containerized or stored in a containment building.*

In the event that significant contamination is identified for large areas of soil during construction projects, removal actions, as well as routine maintenance activities, the DOE may elect to establish an Area of Contamination (for hazardous waste). This will be done to allow for redeposition of hazardous waste contaminated soils in the excavations from which they were removed. Soils which contain hazardous waste that cannot be redeposited within its own area of contamination will be stored in a containment building, or containerized and stored in a FEMP hazardous waste storage area. The DOE may also conduct a Removal Site Evaluation to determine if a new Removal Action is warranted.

This work plan introduces *two* primary components for soil and debris management at the FEMP:

1) Establishment of a 100 pico-curie per gram (pCi/g) activity concentration for total uranium, a 5 pCi/g activity concentration for total radium, and a 50 pCi/g activity concentration for total thorium in soil to determine storage requirements

2) Construction of Improved Storage Facilities

The activity concentrations noted above are not final clean-up standards, but are levels that will be used for storage determination. The *soil* clean-up standards will be determined at the completion of the feasibility studies *for Operable Unit 5* and will be specified in the Record of Decision (ROD). *The debris clean-up standards will be specified in the ROD for Operable Unit 3.*

SECTION 1

INTRODUCTION

Production activities at the Fernald Environmental Management Project (FEMP) near Fernald, Ohio (formerly the Feed Materials Production Center) ceased in 1989 and the mission is now site clean-up and remediation. In 1986, the DOE and US EPA entered into a Federal Facility Compliance Agreement (FFCA), which included provisions to remediate the FEMP pursuant to the Comprehensive Environmental Response, Compensation, and Liabilities Act (CERCLA). The provisions of the 1986 FFCA relating to the Remedial Investigation/Feasibility Study (RI/FS) and remedial action were amended in 1990 with the signing of the Consent Agreement under CERCLA Section 120 and 106(a). The amended Consent Agreement established the five Operable Units *(OUs)*. In 1991, the DOE and US EPA amended the Consent Agreement to revise the remediation schedules and to add additional removal actions.

This Removal Action Work Plan (RAWP) establishes a sitewide soil and debris concept and proposes the construction of four improved storage facilities and *five* controlled stockpiles at the Fernald Environmental Management Project (FEMP).

The need for this removal action was documented in a Removal Site Evaluation (RSE) (enclosed in Attachment A). As a result of site activities, various types of contaminated soil and debris have been and will be generated and managed. Excavated soil will be returned to the excavation when the capacity exists for backfill *provided the excess soil contains neither PCB or petroleum contaminants*. Excess soil will be defined as soil that can not be returned to the excavation. Excess contaminated soil and debris will be generated at the site during removal and remedial actions, construction projects, and maintenance activities. Soil and debris are currently being accumulated on site, in piles, since disposal capacity is limited. The final disposition of these waste materials is unknown. These piles are located in areas which are as unobtrusive and controllable as possible. However, if open piles are exposed to the weather, this could result in the release of contaminants to the environment. The exposure pathways expected to be most significant are inhalation of suspended particles and direct external radiation. The primary potential receptors of the contaminants are site workers. However, wind dispersed materials could be carried off site and result in exposure to members of the general public. This removal action addresses the improved storage of these open piles and provides a procedure for the management and storage of future generated excess soil and debris.

The removal action is identified in Section IX of the Amended Consent Agreement (US EPA 1991) as Removal Action Number 17 - Improved Storage of Soil and Debris. This RAWP is being submitted in accordance with the provisions of the Amended Consent Agreement and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The plan provides a sitewide management concept and implementation strategy for improved storage and management of soil and debris over the period that is

required to design and construct the improved storage facilities, referred to as Phase I. Phase II addresses the management of soil and debris from the time the improved storage facilities are constructed until the final remedial alternatives are selected and implemented in accordance with Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Records of Decision (RODs). The selection of the remedial alternatives are not included within this document. This management plan will be applicable to Removal Actions, Construction Projects, Maintenance Projects, and other environmental response actions.

1.1 Goals and Objectives

The goal of this RAWP is to establish a sitewide management concept for soil and debris and propose to construct four improved storage facilities and *five* controlled stockpiles at the FEMP. The plan introduces a total uranium activity concentration of 100 pCi/g that will be used to determine soil storage disposition. The plan also establishes an activity concentration of 5 pCi/g for total radium and 50 pCi/g for total thorium that will be used to determine soil disposition in areas where these contaminants are identified. These activity concentrations are not final clean-up standards, but are field action levels that will be used for storage determination. The plan provides the overall programmatic direction for managing excess contaminated soil and debris during Phase I and Phase II. Specific objectives of this removal action are to:

1) Minimize the potential for contaminant release from soil and debris to the environment

2) Contribute to efficient performance of interim response actions and other FEMP activities

3) Support the future implementation of the final remediation activities

4) Minimize soil and debris waste volumes requiring storage

5) Comply with federal and state Applicable or Relevant and Appropriate Requirements (ARARs) to the maximum extent practicable (Attachment B identifies the ARARs for the removal action)

1.2 Contents of the Removal Action Work Plan

This RAWP provides a description of the activities that will be implemented. Section 2 provides background information on soil and debris at the FEMP and justifies the need for improved storage. Section 3 describes FEMP policies and the management plan for addressing soil and debris prior to construction of improved storage facilities (Phase I). The section also outlines a sitewide management concept and implementation strategy for future soil and debris until the remedial alternatives are selected

and implemented (Phase II). Section 4 provides conceptual design information and functional requirements for the improved storage structures.

Section 5 discusses the management support activities for the overall FEMP soil and debris management strategy. Section 6 provides a sampling and analysis plan that will be used to guide analysis that is required to supplement the contaminant determination. Section 7 provides a list of references that were used during the preparation of the soil and debris work plan.

1.3 Definitions

The following subsections provide the regulatory definitions for soil and debris and identify the specific contamination types that may be present within soil and debris.

Soil

The United States Environmental Protection Agency (US EPA) proposed to redefine soil (in revised 40 CFR Part 268 [55 FR 55172]) as unconsolidated earth material composing the surficial geologic strata, consisting of clay, silt, sand, or gravel size particles (sizes as classified by the US Soil Conservation Service). Soil will also include a mixture of the above-mentioned materials with other liquids, sludges, or solids that are inseparable by simple mechanical removal processes. At the FEMP, soil is defined in the FEMP Site Standard Operating Procedure (SSOP-0044), "Management of Soil, Debris, and Waste from a Project". This procedure is included for information as Attachment C. In general, soil is defined as dirt or gravel particles with maximum dimensions of 2 inches *(5 cm)*. Soil requiring management at the FEMP will result from excavation activities.

Debris

The US EPA redefined debris (i.e., revised 40 CFR 268.2 [57 FR 37270]) as solid material exceeding a 60 mm particle size that is intended for disposal and that is: a manufactured object; or plant or animal matter; or natural geologic material. However, the following materials are not debris: any material for which a specific treatment standard is provided in Subpart D, Part 268; process residuals such as smelter slag and residues from the treatment of waste, wastewater, sludges, or air emission residues; and intact containers of hazardous waste that are not ruptured and that retain at least 75 percent of their original volume. A mixture of debris that has not been treated to the standards provided by 40 CFR 268.45 and other material is subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection.

At the FEMP, debris is defined by SSOP-0044 as materials such as concrete block, stone, asphalt paving, and similar material that cannot be reused and varies in size from broken fragments of masonry or stone to large structures like tank pads or walls that are scheduled for demolition. Debris at the FEMP will

primarily consist of process equipment and scrap building materials that will be generated during decontamination and decommissioning (D&D) activities.

The determination of matrix types is based on the factors of physical characteristics, treatability, recyclability, as well as regulatory requirements. With respect to these factors, debris materials are further categorized into:

1) Concrete and construction rubble
2) Structural steel
3) Non-ferrous metals
4) Process equipment
5) Glass
6) Wood
7) Paper and cloth
8) Rubber and plastic
9) Ferrous metal that is not recoverable

Structural steel, nonferrous metals (i.e., scrap copper), and process equipment are identified as specific categories of debris that may be decontaminated and recycled (recoverable). Glass, wood, paper and cloth, rubber and plastic, and ferrous metals that are not recoverable will be managed similarly to concrete and construction rubble which are not easily decontaminated (non-recoverable). *Non-recoverable* materials will be sent off site for disposal or stored in an improved storage facility.

CERCLA hazardous substances are any substances designated pursuant to Section 311 (b)(2)(A) of the Federal Water Pollution Control Act; any substances having characteristics identified in Section 3001 of the Solid Waste Disposal Act; any toxic pollutants listed under Section 307(a) of the Federal Water Pollution Control Act; any hazardous air pollutants listed under Section 112 of the Clean Air Act; any imminently hazardous chemical substances or mixtures with respect to which the Administrator has taken action pursuant to Section 7 of the Toxic Substances Control Act; and any element, compound, mixture, solution or substance designated pursuant to Section 102 of CERCLA.

Hazardous wastes are those wastes that are designated hazardous by the Resource Conservation and Recovery Act. Hazardous waste is defined by 40 CFR 261 as substances that are specifically listed by the US EPA (40 CFR 261, Subpart D) in addition to wastes and/or waste mixtures that exhibit the characteristics of ignitability, corrosivity, reactivity, or toxicity, as specified in 40 CFR 261, Subpart C. Soil and debris contaminated with hazardous waste are not expected to be a major material stream.

Radioactive waste, as defined by DOE Order 5820.2A, is a solid, liquid, or gaseous material that contains radionuclides regulated under the Atomic Energy Act (AEA) and is of negligible economic value considering recovery costs. Low-level radioactive waste contains radioactivity but is not classified as

high-level waste, transuranic waste, spent nuclear fuel, or a byproduct material. Radioactively contaminated soil and debris are expected to be the largest streams of material.

Materials at the FEMP have the potential to contain both hazardous and radioactive contamination, a combination termed mixed waste. **Mixed waste** is defined by DOE Order 5820.2A as waste containing both radioactive and hazardous components as defined by the AEA and RCRA, respectively. Mixed waste is regulated pursuant to RCRA and is anticipated to be a very small component of the material stream. It is likely that most hazardous waste at the FEMP will also be mixed waste.

Solid Waste is defined in OAC 3734.01 (the Ohio Solid and Hazardous Waste Disposal Law) as unwanted residual solid or semisolid material resulting from industrial, commercial, agricultural, and community operations, excluding earth or material from construction, mining, or demolition operations, or other waste materials of the type that would normally be included in demolition debris. Ohio EPA policy states that petroleum-contaminated soil may be considered a solid waste.

Underground Storage Tank (UST) waste is petroleum-contaminated soil and debris that are generated as a result of the closure and remediation of underground petroleum storage tanks in accordance with Ohio Administrative Code (OAC), Chapter 1301:7, as promulgated by the Ohio State Fire Marshall. The closure of underground storage tanks has been managed in accordance with this regulation since the closure of underground petroleum storage tanks is exempt from CERCLA regulation. Petroleum-contaminated soils from UST removals may be considered a solid waste under Ohio Law. This determination will be made on a case-by-case basis.

Asbestos-contaminated debris contains friable asbestos that is regulated by the Ohio EPA pursuant to OAC, Chapter 3745-20. Construction (decommissioning) and maintenance activities will generate asbestos-contaminated debris. Debris is considered to be contaminated if the asbestos concentration is greater than 1 percent (by volume). This material may also be contaminated with radiological or hazardous constituents. Asbestos-contaminated debris will be managed in accordance with the OAC requirements. The materials may be stored in improved storage facilities until they can be disposed. Asbestos-contaminated debris are expected to comprise a small portion of the material stream.

Polychlorinated-biphenyl (PCB)-contaminated soil and debris are materials that contain PCB contaminants at concentrations that exceed material specific concentrations. The FEMP established a PCB contaminant concentration action level of 2 parts per million in the Sitewide CERCLA Quality Assurance Project Plan (SCQ). The SCQ also identifies three classifications of PCB-contaminated material: solid non-radiological, solid radiological, and liquid radiological. PCB-contaminated materials are currently segregated with respect to the three classifications and are stored in RCRA warehouses until a disposal option is identified. It is possible that soil and debris will be contaminated with PCBs. The primary sources of PCBs are electrical transformers and hydraulic fluids. PCBs are regulated by 40 CFR 761.60. The cleanup of PCB-contaminated soils at the FEMP is regulated by 40 CFR 761.125(c)(3)(v). PCB-

contaminated soil and debris will be managed according to FEMP procedures that comply with this regulation. The materials will be stored in improved storage facilities until they can be disposed or treated/remediated. Very small quantities of PCB-contaminated material are expected.

SECTION 2

BACKGROUND AND JUSTIFICATION

2.1 Summary of Potential Threat and Project Justification

Contaminated soil and debris are generated at the site during removal actions, environmental response actions, construction projects, and maintenance activities. Soil and debris *piles* are currently accumulated on site. The final disposition of these waste materials will be determined through the CERCLA process. These piles, if exposed to the weather, could potentially result in the release of contaminants to the environment via airborne and surface water/groundwater pathways. An RSE (Attachment A) indicated that contaminant migration from the soil and debris piles could have an adverse impact on human health and the environment. The improved storage of soil and debris was incorporated into Section IX of the 1991 Amended Consent Agreement as Removal Action Number 17 *to address this potential threat.*

2.2 Removal Action Scope

The scope of this removal action is divided into two phases. Phase I addresses the segregation and management of soil and debris during the time period when the improved storage facilities are being designed and constructed. Phase II extends from the construction of the improved storage facilities until the final remedial alternatives are selected and implemented. This work plan addresses the segregation and management of both existing and future soil and debris during Phase I and Phase II.

Phase I

During Phase I, controlled stockpiles will be created for soil that has a field correlated total uranium activity concentration of less than or equal to 100 pCi/g, 5 pCi/g total radium, 50 pCi/g total thorium, and is not contaminated with nonradiological regulated waste materials. Section 3.1.2 provides a rationale for the selection of activity concentrations for storage determination. Soil that has a total uranium activity concentration that exceeds 100 pCi/g uranium, 5 pCi/g radium, 50 pCi/g thorium, and is not contaminated with other nonradiological regulated waste substances will be stored temporarily under tarpaulins until the improved storage facilities are constructed. Soil that contains hazardous waste or PCBs at concentrations that exceed the regulatory standards will be containerized and stored in designated storage facilities on site. Any material that contains PCBs at concentrations that exceed 2 parts per million will be containerized and stored *(per the FEMP Sitewide CERCLA Quality Assurance Project Plan [SCQ]).* Any soil that contains hazardous waste at concentrations that exceed regulatory standards will be containerized regardless of the uranium, radium, and thorium activity concentrations. Soil piles currently existing on site will be managed according to current site policy during this time period.

The Soil and Rubble Pile on North Third Street will be managed similarly to the other existing piles until the in-place containment structure for it is completed.

Debris will be decontaminated and recycled/re-used if possible. Recoverable contaminated debris will be stored under tarpaulins prior to being decontaminated. Non-recoverable radiologically contaminated debris will be containerized and shipped for off-site disposal if possible. Non-recoverable debris that can not be shipped off-site (hazardous) will be containerized until the improved storage facilities are constructed. Uncontaminated debris that can not be shipped off-site to an industrial solid waste landfill will be stored in appropriate containers (i.e., Sea-Land containers) until a disposal facility is identified.

Phase II

This phase is similar to Phase I, with the exception that existing soil piles containing a total uranium activity concentration greater than 100 pCi/g, a total radium concentration exceeding 5 pCi/g, a total thorium concentration exceeding 50 pCi/g, or nonradiological regulated waste materials will be consolidated and placed into the Central Storage Facility. It should be noted that uranium will be the primary contaminant in soil and debris at the FEMP. Materials that exceed 100 pCi/g total uranium, 5 pCi/g total radium, or 50 pCi/g total thorium activity concentrations will be stored in an improved storage facility. Subsection 3.1.2 describes the selection and utilization of these storage determination activity concentrations. The Soil and Rubble Pile on North Third Street, which has been determined to remain in place, will have an in-place containment structure built over it. Contaminated debris will be placed in the Scrap Metal Pad structure, the Decontamination Facility Pad structure, as well as the Central Storage Facility.

2.3 Sources and Quantification of Soil and Debris

This section identifies the soil and debris materials that will be temporarily stored in an improved storage facility or sent to a controlled stockpile area. In addition, future sources and estimated quantities of soil and debris are identified to the extent possible. The FEMP will identify future removal actions through the Removal Site Evaluation (RSE) documentation and the associated Action Memorandum in accordance with the NCP and the Amended Consent Agreement.

Existing Sources of Soil and Debris

There are and will be many removal actions and other activities on site that will generate soil and debris requiring storage in containment structures or in-place containment structures. Current activities have produced approximately 20 on-site soil piles that will require additional handling and storage. The existing piles are listed in Attachment D. The existing piles may be contaminated with petroleum products, PCBs, hazardous waste, radioactive waste, or mixed wastes.

Identifying Future Sources of Soil and Debris

Attachment D lists the anticipated future sources of soil and debris that are expected to require placement into improved storage. A contaminant assessment will determine whether the material requires storage in a containment or an in-place containment structure as opposed to storage in a controlled stockpile or off-site disposal. Although is it difficult to identify all the future soil and debris sources, the information presented is an estimate of the volume of storage that may be needed for planning purposes. The generation schedule for these activities will also be important because additional containment structures or in-place containment structures may be needed. It should be noted that future-generated materials not identified in Attachment D will be managed according to this plan.

SECTION 3

SOIL AND DEBRIS MANAGEMENT PLAN

Soil and debris have been generated at the FEMP as a result of construction projects and removal actions, as well as routine maintenance activities. Additional soil and debris will be generated during the future, as a result of these same activities. Excess soil and debris are currently stored in piles or containers; the primary method is outdoor piles. This section presents a soil and debris management plan that has been developed to ensure that excess accumulated soil and debris are properly managed to protect the public, employees, and the environment. The plan provides a sitewide management concept and implementation strategy for improved storage and management of soil and debris during the previously defined Phase I and Phase II periods.

The basic strategy of this management plan is to provide covered storage facilities for excess soil and debris which requires on-site storage. This plan will identify and segregate soil and debris into categories which are based upon regulatory considerations, in addition to segregation of contaminants that are likely to require different methods of treatment/disposal. Soil and debris will also be segregated to ensure that incompatible materials are not mixed together.

The temporary storage capacity for each specific type of soil and debris is dependent upon the contaminants encountered and the required storage duration. Since these factors are subject to change, this plan and the storage facility design will provide operational flexibility. The flexibility of the storage structures is described in Section 4. It should be noted that the FEMP is currently shipping radiological contaminated soil and debris off site for storage/disposal in approved facilities. This Removal Action Work Plan will not preclude the off-site shipment of these materials. However, the FEMP places a high priority on the shipment of non-recoverable contaminated debris and residues. Soil shipment is a lower priority because soils may be treated at a later date.

Elements which are common to both the soil and debris management plans include waste minimization policies and waste classification procedures. Some of the global FEMP policies and components related to waste generation, minimization, and management are summarized in Subsection 3.1. Subsection 3.2 identifies and discusses the function of the four proposed improved storage facilities. *The new buildover policy for the FEMP is discussed in Subsection 3.3.* The procedures for assessing soil and debris to determine the classification of the material and associated management/storage requirements are described in Subsection 3.4. Subsections 3.5 and 3.6 address the management of soils. Subsections 3.7 and 3.8 address debris management. Subsection 3.9 describes post-storage activities. This management plan will form the basis for developing detailed new FEMP soil and debris management procedures.

3.1 Waste Minimization and Management Strategies

The following subsections describe the strategies developed for the minimization and management of waste. Subsection 3.1.1 *describes the waste minimization* concept for the FEMP. Analysis of the total uranium, radium, and thorium activity concentrations to determine whether soil and debris requires improved storage is discussed in Subsection 3.1.2.

3.1.1 *Waste Minimization*

The FEMP will minimize the generation of waste by returning excavated soil to its source (where applicable). This Removal Action Work Plan addresses excess soil that cannot be returned to the excavation. In addition, soil that meets the contamination criteria established in Subsection 3.1.2 will be stored in a controlled stockpile. Each OU will establish a controlled stockpile. Soil from a controlled stockpile will be used as backfill (as required) within the specific OU of its origin. When backfill material is used in an area within the OU other than its original excavation source, the FEMP will track the contaminants within this backfill with a database (see Subsection 5.3.3). The combination of returning soil to the excavation and using soil from a controlled stockpile as backfill will reduce the amount of clean backfill that is brought on site and mixed with contaminated soils that will require treatment/disposal during the remedial action period. Soils that are used as backfill will be treated/disposed when soils on site are remediated in accordance with the OU-5 ROD. Figure 3-1 provides a FEMP map that designates the OU boundaries.

This plan does not address contaminated soil and debris which is located outside of the FEMP property. This contaminated material will be handled on a case by case basis. *This will be necessary due to the complex political and legal issues surrounding off-site contamination (such as property acquisition). The management of off-site contaminated soil and debris will be documented via Removal Site Evaluations, Best Management Practice documentation, or Removal/Remedial Action Work Plans.* Any material brought onto the FEMP will be handled in accordance with the provisions of this work plan.

3.1.2 Activity Concentrations for Storage Determination

The plan proposes a sitewide activity concentration for total uranium in soils (at the natural isotopic distribution) that can be easily detected in the field. A 100 pCi/g field-correlated activity concentration above the background activity concentration for total uranium will be used to determine the storage disposition requirements for soil throughout most of the FEMP unless thorium and radium are present. The correlation can be adjusted for the natural or depleted isotopic distribution of uranium. This guideline is not intended to be used as a final clean-up standard; instead, it is intended to provide a guideline for determining the level of management and the type of storage facility required. This activity concentration is based on the Nuclear Regulatory Commission Branch Technical Position entitled,

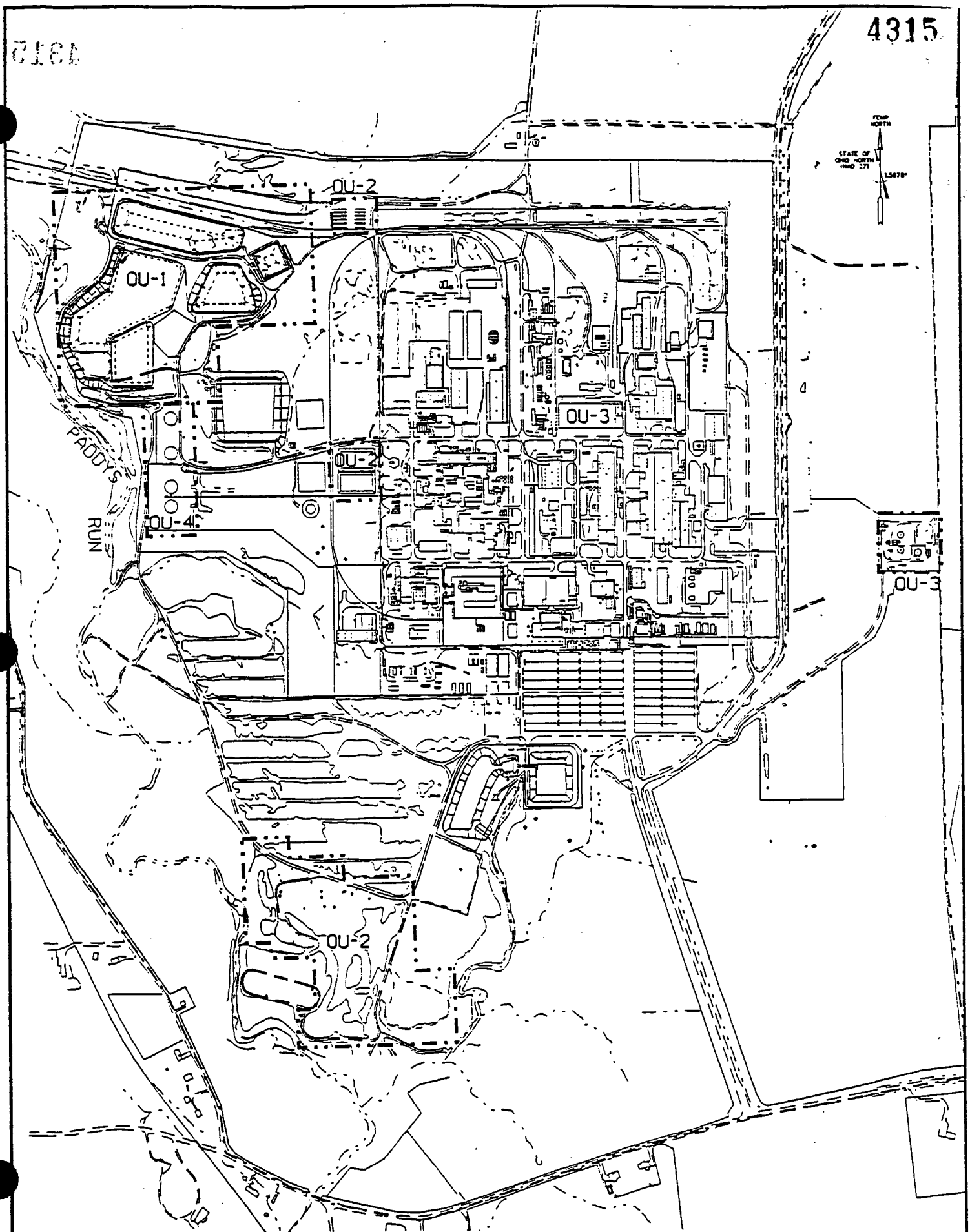


Figure 3-1 - FEMP *Operable Units*

"Disposal or On-Site Storage of Thorium or Uranium Wastes from Past Operations" (46 FR 52061). The FEMP will change its previous three-level total uranium policy (U<35 pCi/g, 35 pCi/g < U < 100 pCi/g, and U > 100 pCi/g) for soil management because it cannot be implemented in the field. The hand-held field monitoring instrumentation cannot accurately determine activity concentrations less than 100 pCi/g. The 100 pCi/g activity concentration will be used to separate soil into two major categories: (1) contaminated materials for placement into improved storage facilities or (2) material for placement in a controlled stockpile. Soil that is less than 100 pCi/g (total uranium) and does not contain concentrations of hazardous constituents (that exceed regulatory standards) will be placed on controlled stockpiles. The storage disposition determination will be based on the contaminant assessment and the associated Material Evaluation Form (MEF). RI/FS data, process knowledge, and other analytical data will be the primary sources of information when completing the MEF. Sampling/analysis will be conducted as required when adequate information does not exist to complete the MEF.

Soil from specific areas of the FEMP (i.e., *OU-1 and OU-4*) may contain thorium and radium contaminants. The contaminant assessment that is conducted to complete the MEF will identify whether radium and thorium are present in the soil. The activity concentration for the storage determination of soils that contain radium (total) is 5 pCi/g above the background activity concentration. This activity concentration is based 40 CFR 192. The activity concentration for the storage determination of soils that contain thorium (total) is 50 pCi/g above the background activity concentration. This activity concentration is based on the Nuclear Regulatory Commission Branch Technical Position entitled, "Disposal or On-site Storage of Thorium or Uranium Wastes from Past Operations (46 FR 52061)". These radium and thorium activity concentrations are <u>not</u> final clean-up standards but are levels designated for storage disposition requirements. Soil that has an activity concentration of radium and thorium that is less than or equal to 5 pCi/g and 50 pCi/g respectively, and an activity concentration of total uranium that is less than or equal to 100 pCi/g will be placed on the *OU* specific controlled stockpiles.

Past construction projects and RI/FS field experience have demonstrated that hand-held radiological detection instrumentation can be correlated to the 100 pCi/g activity concentration for total uranium. The correlation is approximate due primarily to the mix of radionuclides, detector efficiencies, and detection geometries. Excavation surveys will be conducted with real-time radiological measurements. Hand-held radiological instrumentation will be employed to direct the excavation process and to determine when soils exceed the 100 pCi/g activity concentration threshold. A radiological survey will be performed on a study area employing a NaI detector and the protocols defined in the SCQ (DOE 1992). When radium and thorium are expected to be present, samples may be sent to a laboratory because the field instruments may not detect total radium at 5 pCi/g and total thorium at 50 pCi/g with a high level of confidence.

Debris will be decontaminated for free-release in accordance with *40 CFR 268.45,* 40 CFR 192, NRC Regulatory Guide 1.86, and DOE Order 5400.5 whenever possible. The FEMP will establish stockpiles for clean debris that may be shipped off site for disposal in an industrial solid waste landfill. Recoverable

debris will be stored in improved storage facilities prior to being decontaminated. Nonrecoverable debris that cannot be decontaminated may be stored in improved storage facilities prior to being packaged and shipped to a DOE-approved disposal facility.

3.2 Improved Storage Facilities for Soil and Debris Management

This subsection describes the four improved storage facilities that will be constructed for Phase II. Currently, the structures are all located in *the former production area (OU-3)*. This *area* has the highest potential for generating soil and debris during removal actions. The FEMP proposes to relocate contaminated soil and debris from other *OUs* to the improved storage facilities in *OU-3* as required for protection of human health and the environment. A single centralized storage facility was chosen over multiple storage facilities for the following reasons: (1) The available property for storage structures is limited in *OUs 1, 2, and 4*; (2) It will be easier to control the disposition and management of materials if they are located in a central facility; and (3) since the amount of PCB, asbestos, and hazardous wastes is expected to be limited, central storage of these materials will be most effective. Soil and debris that will be moved to the Central Storage Facility (CSF) structure *in OU-3* will be radioactively contaminated (as presented in Subsection 3.1.2) and/or contaminated with other nonradiological regulated waste materials. *Soil and debris from the other OUs will be stored within the improved storage facilities located in OU-3.* Once soil and debris are moved into the CSF, they will remain in storage until the final remediation options are implemented. It should be noted that additional improved storage facilities may be added as required in the future to support removal actions and other FEMP activities. The following paragraphs introduce and describe the proposed improved storage facilities. Table 3-1 summarizes the disposition alternatives for soil and debris at the FEMP. Section 4 includes a detailed description of the improved storage facilities.

Central Storage Facility (CSF)

The CSF will be a containment structure that will store contaminated soil and non-recoverable debris generated from various areas throughout the FEMP. Materials will be segregated in the containment structure based on the type of contamination (i.e., asbestos, petroleum, PCB, hazardous, and radioactive). Material will remain in the CSF until it can be decontaminated, treated, or packaged for final disposal. Material from the CSF will not be used as backfill.

Decontamination Facility Pad (DFP)

This containment structure will be located near the new decontamination facility. The DFP will provide short-term storage for contaminated recoverable metal and equipment until they can be decontaminated. Radioactive constituents will be the primary contaminants. However, there may be small quantities of other hazardous contaminants.

Scrap Metal Pad (SMP) Cover

This containment structure will be built over the location of the existing Scrap Metal Pile. The current pile will be removed under another removal action prior to construction of this facility. Contaminated metal debris will be stored here until it can be sent for decontamination or shipped off site for disposal. Radioactive constituents will be the primary contaminants. However, there may be small quantities of other hazardous contaminants.

Soil and Rubble Pile Cover (SRPC)

This in-place containment structure will be built over the existing radioactively contaminated soil and rubble pile that is located in the northwest corner of the production area on North Third Street. The contaminated material will remain in this in-place containment structure until it can be treated or packaged for final disposal.

3.2.1 Material Segregation Justification

Soil and debris will be segregated based on the contaminant assessment. For example, the radioactive non-hazardous soil and debris will be segregated from the hazardous or mixed materials. Therefore, the hazardous materials will not be diluted by radioactive non-hazardous materials. In addition, segregation is a sound technical strategy because the final remedial alternative for treatment/disposal may be different for radioactive and hazardous wastes. It may prove to be technically or economically feasible to treat/dispose of these soil and debris categories separately. For example, shipment of low-level radioactive debris to an off-site disposal facility may be a feasible alternative. However, these facilities generally do not accept hazardous materials. Figure 4-3 provides a conceptual layout for the CSF which shows how soil and debris will be segregated.

Soils and debris that have similar hazardous constituents will be stored together. Combining these wastes is technically justifiable because the selected treatment/disposal alternative is likely to be the same for these waste streams. This practice will not violate the dilution prohibition because the combination of these materials is not a substitute for adequate treatment. Storage will be an interim measure until the final remedial treatment/disposal alternative is selected and implemented. It should be noted that organic hazardous material may be segregated from inorganic hazardous material because these materials may use different treatment technologies for remediation. In addition, listed hazardous soil and debris will be segregated from soil and debris that is classified as containing characteristic hazardous waste.

Mixed waste soil and debris will be segregated from other materials within improved storage facilities. Soil that contains mixed waste will be segregated from debris that contains mixed waste.

Asbestos-contaminated debris will be managed according to the FEMP asbestos management procedures and may be stored and segregated from the other materials because asbestos materials will have specific treatment and disposal requirements.

Petroleum-contaminated materials will be segregated from the hazardous soil and debris so that it will not have to be treated/disposed as hazardous material during remediation. The UST material may have different treatment/disposal requirements than the radioactively contaminated soil and debris.

PCB-contaminated soil and debris will be managed in accordance with 40 CFR 761.125 and will be segregated from the other categories because they have specific containerization, treatment, and disposal requirements from any of the other materials.

It is likely that additional segregation will occur based on the anticipated method of treatment/disposal/recycling. Soil and debris that have more than one type of contaminant will be handled according to the most restrictive regulation. For example, asbestos and PCB materials that are also hazardous will be containerized and segregated rather than put into the hazardous pile. Soil will be segregated from debris for a specific contaminant category because the materials are likely to be handled differently. Debris material will be segregated based on whether they can be decontaminated and recycled.

3.3 Build-Over Policy

The FEMP has established a build-over policy to minimize the amount of soil excavated during a construction project, to minimize the need to bring in soils from off-site locations, and to identify criteria for the construction of new facilities. The build-over policy depends on whether a facility is temporary or permanent. *It should be noted that this build-over policy replaces the current policy at the FEMP.*

Temporary facilities are defined as those that will be removed during or following site remediation activities. Temporary facilities may be constructed without prior detailed characterization if the site is not expected to pose a significant risk to human health or the environment. During construction, soil will be returned to the excavation pit or the surrounding area when possible. If it is not possible to reuse the soil at the point of excavation, the excess soil will be managed in accordance with the Phase I or Phase II plans. Should soil be required as fill for construction of a temporary facility, the feasibility of using soil from a controlled stockpile will be evaluated. This evaluation will be based on the amount of soil required and the project location.

Table 3-1 - Detailed Summary of Disposition Alternatives

Alternative	Description
Free-Release	Allows for the uncontrolled release of debris which have been determined to be nonhazardous and nonradioactive contaminated (i.e., do not originate from a hazardous waste management unit, and are below the radiological limits specified in DOE Order 5400.5). This material may be disposed of in a permitted sanitary landfill if recycling is not feasible.
Controlled Stockpile	Provides for the bulk storage of the *soil* determined to be nonhazardous and below the field-correlated 100 pCi/g activity concentration for total uranium, the 5 pCi/g activity concentration for *total* radium, and *an activity concentration of 50 pCi/g for total* thorium. This bulk storage area is the designated controlled stockpile. Seeding and runoff controls will be provided for this area.
Central Storage Facility or Future Facilities (as required)	Provides for the bulk storage of the material in accordance with the standards of a permitted facility (and all other ARARs as discussed herein). The material will be stored pending final treatment/disposal pursuant to the selected CERCLA remedial alternative.
Improved Storage Facilities (Scrap Metal Pad, Soil and Rubble Pile Cover, and Decontamination Facility Pad)	Provides for the bulk storage of the material in accordance with the standards of a permitted facility (and all other ARARs as discussed herein) prior to being decontaminated. If the material is successfully decontaminated, the material may be free-released for recycling or reuse. If the material cannot be decontaminated, the material will be packaged and shipped to an off-site LLW disposal facility in accordance with the receiving facility acceptance criteria and all required regulations. This action is intended to accommodate existing recycling and excess programs and to allow for the reuse or recycling of materials to the greatest extent possible. This approach is consistent with the idea of waste minimization.
Off-Site Disposal	Material that meets the waste acceptance criteria for off-site treatment/disposal facilities will be packaged and transported in accordance with FEMP Procedures, DOT requirements, and the acceptance criteria of the receiving facility.

Permanent structures (i.e., structures that will remain after the completion of the final remedial action) will require that any contaminated soil under the proposed building location be excavated. The excavation will remove contaminated soil until radioactivity levels and contaminant concentrations are less than or equal to established background concentrations. If soil is required for the construction of a permanent building, clean fill materials may be brought in from a noncontaminated borrow area (potentially off-site). However, the quantity of clean soil brought onto the site from off-site sources will be minimized. Hydraulic barriers may be considered to prevent contamination of clean soils. Few permanent buildings are expected to be constructed at the FEMP during remediation activities.

If uncontaminated soils (as described in Subsection 3.1.2) are excavated, then the spoil material may be used as backfill or for fill material elsewhere on site. For example, uncontaminated soils may be present in remote areas of the facility for projects where fences or monitoring wells may be installed.

3.4 Contaminant Determination

The management and segregation of soil and debris is dependent upon the proper assessment of the waste materials and contaminants contained within the materials. An assessment of contamination will be *begin* prior to initiating work activities. *The contaminant assessment will provide the information that is required for completing the FEMP Material Evaluation Form (MEF) (SSOP-0002).* This subsection addresses the approach which will be utilized to determine the appropriate management and segregation requirements. Whenever possible, existing analytical information (Remedial Investigation characterization results, RCRA waste determinations, and environmental monitoring results), historical facility information, and/or process knowledge will be utilized to complete the assessment. *During construction/excavation, soil will be temporarily staged near the excavation so that it can be returned to the point of excavation (if backfill is required). During staging, the pile will be tarped and fenced/roped off in a manner similar to the Phase I activities. Excess soil that cannot be returned to the point of excavation will remain in the tarped staging pile until disposition to a controlled stockpile or an improved storage facility. If excess soil requires sampling and analysis to complete the MEF, then the soil will remain in the temporary staging pile until the analysis and MEF are completed.* Physical sampling and analysis will be performed, as necessary, to obtain the information needed to complete the contamination assessment. *The MEF will be required to be completed before the disposition of soil and debris.* Attachment E provides an informational copy of the SSOP-0002 procedure. The MEF will be used to determine the disposition of soil and debris. It should be noted that the current Construction Waste Identification and Disposition Policy (included in SSOP-0044) will be updated with the modifications to the MEF (SSOP-0002). The MEF procedure will, therefore, address contaminant determination of all soil and debris streams.

The RI/FS characterization and RCRA waste determination programs have established a characterization database for some soil and debris. This analytical data will be used to the extent practicable to determine

the contaminants and to assess if the concentrations exceed specific regulatory limits. This information will be particularly useful for soil.

Facility historical data (including photographs) and process knowledge will also be used to determine the contaminants. Historical data includes documented spills and releases, and past sample results (including discharge effluent and environmental monitoring samples). Process knowledge includes the types of raw materials utilized, operation and waste management procedures, and construction materials. This information will be particularly useful for debris.

Physical samples and/or field measurements will be used to characterize materials when sufficient information is not available from the other data sources to complete the MEF (Attachment E included for information). Chapter 6 provides a sampling and analysis plan that will be used as the guide for obtaining additional characterization information. However, specific sampling and analysis plans will be developed for specific projects that require analytical activities. The project-specific sampling and analysis plan will be prepared on a case-by-case basis to obtain the specific data required to complete the MEF.

In addition, hand-held field instruments will be used to perform radiological surveys and chemical vapor screening prior to and during soil and debris removal operations. For example, a radiation detector will be used to assess radiological contamination, and a photoionization detector (i.e., an HNu) or a flame ionization detector (i.e., organic vapor analyzer) will be used to detect the presence of organic constituents. The analytical results from the field instruments will also be used to confirm historical and process information. The information gained through the contaminant assessment will be incorporated into the sitewide database (see Subsection *5.3.3*).

Process knowledge and additional analysis (if required) will be utilized to determine if a material is hazardous. Samples that are required to complete the MEF evaluation will be collected and analyzed using the Toxicity Characteristic Leaching Procedure (TCLP) to facilitate a hazardous waste determination according to the FEMP Material Evaluation Form (SSOP-0002 that is included as Attachment E). The procedure will be followed for specifying the proper management requirements. This hazardous waste determination procedure could be significantly revised in the near future. The nature of these revisions depend upon the outcome of several key *proposed* regulatory changes by the US EPA. These changes include potential revisions to the "derived from rule" (40 CFR 261.3(c)(2)), the "mixture rule" (40 CFR 261[a][2]) (57 FR 7638), and the advanced proposed new LDR rule for contaminated soil (56 FR 55160). The proposed mixture and derived from rule changes could *establish* de minimis (below regulatory concern) levels of RCRA waste. The FEMP may revise the procedure for the hazardous waste determination process *as* proposed regulatory changes *warrant. Soil and debris that is known to contain hazardous waste will either be containerized or stored in a containment building.*

3.4.1 Establishment of an Area of Contamination Based on the Contaminant Determination

The FEMP may establish an Area of Contamination (AOC) in the event that a large quantity of soil containing hazardous waste is excavated. The AOC concept is presented in the US EPA Superfund Land Disposal Restriction (LDR) guides and the National Contingency Plan preamble (55 FR 8758, 8760). The AOC would be delineated by contiguous contamination with respect to contaminants and concentrations. The establishment of an AOC would enable the FEMP to return soil from that AOC back into an excavation within that AOC without constituting placement which would invoke the RCRA LDR regulations.

Characterization data from the delineation of the AOC will be entered into the FEMP database for soil and debris tracking as well as the RI/FS database. Section 5.3.3 provides details concerning the database tracking system.

The FEMP will notify the US EPA and the Ohio EPA Division of Hazardous Waste Management if an AOC is delineated for the control and management of soil that is contaminated with hazardous waste. The notification will include a map of the delineated AOC and the characterization data that was used to determine the areal extent of the AOC.

3.4.2 Establishment of a New Removal Action Based on the Contaminant Determination

The FEMP may establish a new Removal Action through a Removal Site Evaluation and an Action Memorandum when the soil contaminants and concentrations justify the removal of additional soils surrounding a specific maintenance, construction, or environmental response project excavation. The location of the contamination will also be an important factor for deciding the appropriateness of a new Removal Action. An example when a new Removal Action could be established is if new contamination at concentrations that could have an adverse impact to human health or the environment were discovered during a maintenance activity in a heavily utilized area.

The FEMP will notify the US EPA if it is determined that a new Removal Action is required. The notification will be followed by a subsequent Removal Action Work Plan and other appropriate Removal Action Documentation.

3.5 Soil Management Plan

This subsection provides the management plan and identifies specific management procedures to allow proper segregation of each type of soil expected to be encountered at the FEMP. *The soil management strategy has three components. The Phase I plan addresses the storage of soil prior to the construction of improved storage facilities. The Phase II plan addresses the disposition and storage of soil in the improved storage facilities. A plan is also developed to handle soil generated during emergency maintenance activities.*

3.5.1 Soil Management Plan Overview

The basic approach for the management of soil at the FEMP is to provide controlled bulk storage of contaminated soils that remain as surplus at the completion of various site activities. Phase I of this management plan requires placement on and covering of contaminated soils with a heavy, nonpermeable tarpaulin. It is intended to improve this current management practice by constructing a containment structure, known as the CSF, for soils which contain a waste material in addition to or other than radioactive constituents (i.e., hazardous waste, mixed waste, petroleum contaminants, or PCBs). In addition to the CSF, controlled stockpile areas will be provided for the storage of soils which have a field-correlated total uranium activity that is less than or equal to 100 pCi/g, a total radium activity concentration less than or equal to 5 pCi/g, a total thorium activity concentration less than or equal to 50 pCi/g, and does not contain concentrations of other nonradiological regulated waste materials that exceed regulatory limits. Soil may be taken from a controlled stockpile and used as backfill in the *OU* of its origin where the radioactive contaminants are similar. This will reduce the amount of clean fill that will be brought on site and then require treatment during final remediation.

The CSF will improve the management of soil by centralizing the storage operations and maintenance activities. Normal practice will be to store the soil within the CSF in bulk to minimize the material handling required to support the final remediation efforts. However, some of this waste may be containerized to isolate or segregate a specific quantity of soil. The soil that is stored in the improved storage structures (CSF, SRPC) will not be used as backfill. These soils will remain in storage until they can be treated/disposed.

Phases I and II include the establishment of controlled stockpiles. Controlled stockpiles will be outdoor piles for the bulk storage of excess soils resulting from various removal actions, construction projects, and maintenance, closure and environmental response activities. Controlled stockpiles will be limited to soils that contain less than or equal to 100 pCi/g total uranium, 5 pCi/g total radium, 50 pCi/g total thorium, and no other nonradiological regulated waste materials at concentrations that exceed regulatory limits. Each stockpile area will have runon and runoff controls; runoff will be retained and managed in

accordance with established FEMP stormwater controls. The exposed pile will also be provided with erosion control such as seeding, silt fencing, hay bales, or polymeric binding agents.

During Phase I, existing soil piles may be consolidated, moved to a controlled stockpile area or containerized to reduce the number of piles which exist. Radiologically contaminated soils that contain activity concentrations that exceed 100 pCi/g total uranium; contain total thorium at activity concentrations that exceed 50 pCi/g; or contain total radium at activity concentrations that exceed 5 pCi/g will be consolidated in temporary covered piles (see Section 4.2.4) until the CSF is constructed. Excess soil that has a total uranium activity-concentration that is less than 100 pCi/g and does not contain thorium, radium, or other nonradiological regulated waste materials at concentrations that exceed regulatory limits will be placed on the controlled stockpiles. Hazardous soils and soils that contain PCB-concentrations above 2 ppm will be containerized during Phase I and stored in designated areas. After construction of the CSF is completed, it is intended to relocate the smaller contaminated soil piles to the CSF (Phase II). However, it is not practical to relocate the larger consolidated soil piles, such as the North Third Street Soil and Rubble Pile. To improve the storage of this pile, an in-place containment structure will be erected over the pile. Additional in-place containment structures may be erected over other existing soil piles based on a comparison of the cost of relocation versus the cost of erecting the in-place containment structure. The tarpaulin covers over the consolidated soil piles will be maintained prior to completion of the in-place containment structures. Tarpaulin covers or other controls (e.g., polymeric spray coatings, seeding) will only be allowed for the temporary staging of material *(prior to disposition)* in the future.

In summary, the soil management plan consists of a set of phased management procedures. To facilitate the management of the soil, a centralized storage containment structure, in-place containment structures, and controlled stockpiles will be provided. The disposition of the soil will be dependent upon the type of contaminants contained within the soil. The specific requirements for the various soil types expected to be encountered at the FEMP are presented in Subsections 3.4.2 to 3.4.8. The existing and future soil management requirements are summarized in Table 3-2. Figures 3-2 presents the Soil Management Plan Flow Diagram *for* Phase I *and Phase II.*

Figure 3-2 also specifies a strategy for handling soil during "Emergency Maintenance Actions." Emergency Maintenance Actions are defined as unplanned events that require immediate action, (ruptured stream/water lines, and problems with underground electrical lines, etc.). The strategy for emergency maintenance actions consists of returning soil back in the excavation immediately after repairs are performed. During the emergency maintenance activities, the excavated soil will be stockpiled adjacent to the excavation according to the Phase I strategy. The soil will be returned to the excavation upon completion of the emergency maintenance action. These actions will not require an MEF unless excess soil is generated. The exception to this strategy is that soil that is known to contain PCB or petroleum contaminants will <u>not</u> be returned to the excavation, in the unlikely event that these contaminants are encountered.

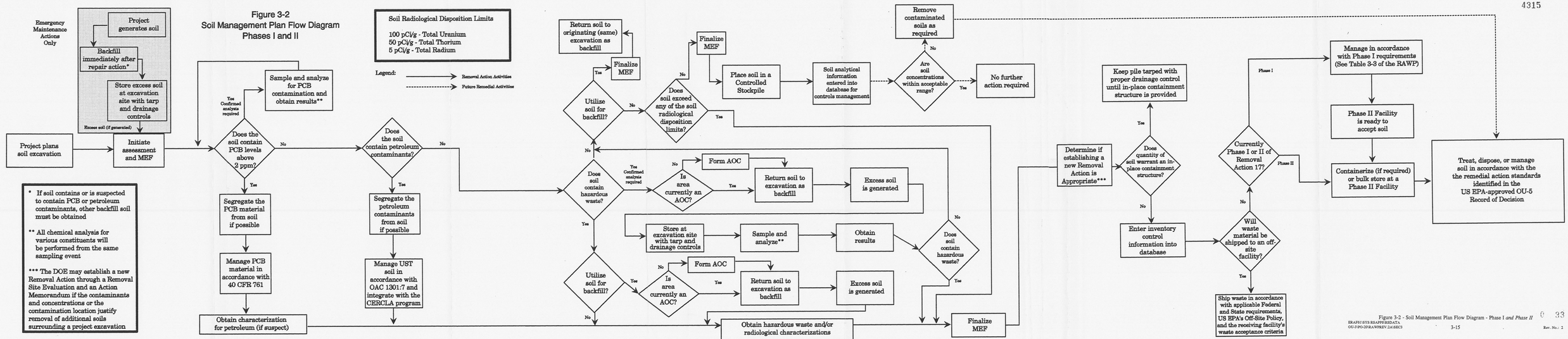
3.5.2 Non-Hazardous, Radiological *Concentrations Less than the Disposition Limits*

The field-correlated activity concentration (based on total uranium) that is established for soil management at the FEMP is 100 pCi/g. The 100 pCi/g total uranium activity concentration has been proposed for similar projects at the FEMP. Also, activity concentrations of 5 pCi/g for total radium and 50 pCi/g for total thorium will be utilized when these radionuclides are present in excess soil. The FEMP will impose institutional controls on soil at these activity concentrations. These activity concentrations do not represent free release levels. In addition, there is a relatively short duration of these management requirements. The time frame for the controlled stockpiles is 10 years which is based on the assumption that the Record of Decision for *OU-5* will be issued during that time.

As discussed in Subsection 3.1.2, an activity concentration of 100 pCi/g that has been field-correlated for total uranium represents a level of surface radioactivity in soil that can be used to determine the storage disposition. Excess soil which is statistically less than or equal to this concentration over an area of 100 square meters, and does not contain hazardous wastes, PCBs, or petroleum products, at concentrations that exceed regulatory limits, will either be used as backfill within the *OU* of origin, placed in a controlled stockpile *(within the OU)* area with drainage controls, or left in place with the installation of improved drainage controls. It should be noted that excess soil will be used as backfill in its *OU* of origin if the soil has radioactive constituents that are similar to the soils where it will be used as backfill. Field monitoring (Section 3.1.2) using hand-held instruments will be used to determine if the soil can be placed in a controlled stockpile. The field survey and determination of whether the soil exceeds the 100 pCi/g activity concentration will be conducted in accordance with existing FEMP procedure SP-P-35-023 (WEMCO 1992a) entitled "Radiological Contamination Surveys." Laboratory radiological analysis may also be performed (as required) in conjunction with the field surveys. A Student's "t" test (or equivalent statistical procedure) will be used for statistical analysis (if necessary) to determine whether soil activity concentrations are significantly higher than *the activity concentrations designated for soil disposition.* Large quantities of material are expected to be utilized as backfill or stored in the controlled stockpiles.

The disposition of soil from controlled stockpiles will be tracked by the use of a database. This database will ensure that, when the remediation of soil begins, information will be available as to where soil from the controlled stockpile has been dispositioned.

Figure 3-2
Soil Management Plan Flow Diagram
Phases I and II



* If soil contains or is suspected to contain PCB or petroleum contaminants, other backfill soil must be obtained

** All chemical analysis for various constituents will be performed from the same sampling event

*** The DOE may establish a new Removal Action through a Removal Site Evaluation and an Action Memorandum if the contaminants and concentrations or the contamination location justify removal of additional soils surrounding a project excavation

Figure 3-2 - Soil Management Plan Flow Diagram - Phase I *and Phase II*

Table 3-2 - Soil Management Summary

1)	If surplus the soils contain radiological contaminants in concentrations that are less than or equal to 100 pCi/g total uranium, 5 pCi/g total radium, and 50 pCi/g total thorium they will be stored in a controlled stockpile area. Drainage improvements will be required for these stockpiles.
2)	If radiological contaminant concentrations in surplus soil exceed 100 pCi/g total uranium, 5 pCi/g total radium, 50 pCi/g total thorium, or the soil contains hazardous waste, PCB, or petroleum constituents above regulatory levels, then either (1) place it into a containment structure; (2) erect an in-place containment structure over the soil; or (3) during Phase I, these soils will be stored under tarpaulins or containerized.
3)	If adequate information is not available to make the management determination, then collect and analyze representative samples (as required), and manage the soils based on he analytical results.

Utilization of the controlled stockpile methodology has commenced. Soil from the controlled stockpile will be utilized as backfill for temporary structures or other projects that will be addressed during the final remedial action within the *OU* from which it was generated. The FEMP does not intend to cross *OU* boundaries when using soil from a controlled stockpile for backfill. Each *OU* will have a controlled stockpile, and material from a controlled stockpile will remain within the *OU* of origin. The FEMP will revise the existing procedure (SSOP-0044) that specifies the requirements associated with utilizing soil from the controlled stockpile as backfill in site excavations.

3.5.3 Non-Hazardous, Radiological *Concentrations Greater than the Disposition Limits*

Radioactively contaminated soil at a concentration that exceeds 100 pCi/g for total uranium, 5 pCi/g for total radium, or 50 pCi/g for total thorium will be placed under tarpaulins during Phase I, stored in a segregated pile in the Central Storage Facility during Phase II, or containerized during either of the two phases. Large quantities of material that exceed the uranium disposition activity concentration are expected.

3.5.4 Hazardous and Mixed Waste

During Phase I, soil that is determined to contain hazardous waste or mixed waste generated will be containerized and stored for an interim basis within an existing, approved hazardous and/or mixed waste storage area. Existing soil piles that contain hazardous or mixed waste will also be containerized during Phase I.

During Phase II, soil in this category will be stored in a segregated pile within the Central Storage Facility (or a containment structure within the *OU*) in accordance with RCRA regulations. The Phase II improved storage facilities will not accept materials that *contain free liquids or that* are determined to be ignitable, reactive, or incompatible. The FEMP does not expect to generate significant amounts of ignitable, reactive, or incompatible materials. The FEMP will have to designate special storage areas if these materials are generated.

3.5.5 Petroleum-Contaminated Soil

Petroleum-contaminated soil generated prior to the construction of the improved storage facilities will be managed in accordance with current site policy (SSOP-0044). When the improved storage facilities are operational, petroleum-contaminated soil and soil from a UST project that is radioactively contaminated will be sent to a segregated pile in the Central Storage Facility (or a containment structure within the *OU*). These soils were placed in piles pursuant to OAC Chapter 1301:7. The FEMP is investigating sending UST material to an off-site treatment facility.

3.5.6 PCB-Contaminated Soil

During Phase I, PCB-contaminated soil will be containerized and stored for an interim basis within an existing FEMP area that is approved for storage of PCB contaminated material. During Phase II, soil in this category will be containerized in accordance with 40 CFR 761 requirements and stored in the Central Storage Facility (or a containment structure within the *OU*). PCB-contaminated soil may also be shipped off site for management during either of the two phases. In addition, PCB-contaminated soil that also contains hazardous waste will be drummed and stored in a segregated area for PCBs. The current FEMP strategy for PCB-contaminated material management is to containerize and store the material containing concentrations greater than 2 ppm.

3.5.7 Existing Soil and Rubble Pile *North of Third Street*

The Soil and Rubble Pile *north of Third Street* is the only pile identified at this time that *may* require an in-place structure for soils. This structure will be known as the Soil and Rubble Pile Cover (SRPC). The pile consists of approximately *13,500* cubic yards of radiologically contaminated soil and debris.

This pile *has been* taken out of service*; thus,* and additional soil and debris placement *is* prohibited. The pile will be graded and seeded during Phase I to prevent runon from coming in contact with the pile and to prevent the migration of contaminants due to runoff and wind erosion. Runoff will also be managed pursuant to the existing FEMP Production Area stormwater management strategy.

Regrading of the pile may be required to facilitate erection of the SRPC. The SRPC will be erected over the existing regraded pile. The soil and debris contained within the SRPC will remain in place until it is addressed during the final remedial action.

3.6 Specific Soil Management Procedures

This subsection describes the specific Phase I and Phase II management procedures for the types of soil expected to be encountered at the FEMP. The Phase I and Phase II soil management procedures are summarized in Table 3-3. In addition to the summary table, Figure 3-2 provides the flow diagrams for the Phase I, Phase II, *and emergency maintenance activity* soil management plans. It should be noted that Figure 3-2 includes activities that are not specifically addressed by this RAWP (i.e., selection and implementation of the final CERCLA remedial measures). These future activities are included in the figure to indicate how the interim and future soil management plans are integrated into the overall CERCLA remediation effort.

3.7 Debris Management Plan

This subsection describes the management plan for recoverable and non-recoverable debris at the FEMP and identifies specific management procedures for the decontamination, off-site shipping, or storage of debris.

3.7.1 Debris Management Plan Overview

The basic approach for the management of debris at the FEMP during both Phase I and Phase II is to decontaminate recoverable material for recycle or reuse, ship material off site for disposal, or provide controlled bulk storage for materials that are non-recoverable and can not be shipped off site for disposal. This strategy for debris is consistent with the FEMP policies of shipping materials off site for disposal (when possible) and decontaminating and recycling as much material as practicable (waste minimization). Gross surface contamination will be removed in the field during decontamination activities prior to being removed from the site. The existing FEMP procedures for containerizing and shipping non-recoverable debris off site will not be modified by this management plan.

Table 3-3 - Soil Management Plan

CATEGORY (Waste Type or Form)	SOIL MANAGEMENT PROCEDURES	
	Phase I	**Phase II**
Existing Soil and Rubble Pile *North of Third Street*	Regrade the pile. Improve the drainage controls around the pile to minimize runon and to retain runoff for management in accordance with established FEMP Production Area stormwater controls. Install a security fence.	Regrade the pile (if required) and erect an in-place containment structure (designated as the Soil and Rubble Pile *Cover*) over the existing pile. Maintain storage structure until the soils are treated/managed in accordance with the selected CERCLA remedial alternative (OU-5).
Non-hazardous, >100 pCi/g total U and/or >5 pCi/g total Ra, >50 pCi/g total Th	Cover with tarp. Extend security fence around the pile. Establish drainage controls around the pile to minimize runon and provide runoff controls.	Bulk placement into the CSF, segregate from other waste forms. Maintain storage structure until the soils are treated/managed in accordance with the selected CERCLA remedial alternative. Ship contaminated soil for off-site disposal as required (OU-5).
Non-hazardous, ≤100 pCi/g total U and/or ≤5 pCi/g total Ra, ≤50 pCi/g total Th	Establish locations for the new controlled stockpiles (proposed to locate one controlled stockpile in each of the *OUs*) and provide runoff controls (may include seeding).	Continue to utilize the controlled stockpiles established as part of the interim procedures. Maintain the controlled stockpile until the soils are treated/managed in accordance with the selected CERCLA remedial alternative (OU-5).

Table 3-3 - Soil Management Plan (continued)

CATEGORY (Waste Type or Form)	SOIL MANAGEMENT PROCEDURES	
	Phase I	**Phase II**
Hazardous and Mixed Waste	Containerize and store containers in designated hazardous waste storage areas.	Bulk placement into the CSF and segregate from other waste forms. [Note: Depending upon the quantity encountered, restricted hazardous waste soils may be containerized and stored within the CSF.] Maintain storage structure until the soils are treated/managed in accordance with the selected CERCLA remedial alternative (OU-5).
Petroleum Contaminated Soils (includes radiological contaminated soils)	Establish a new soil pile specifically for UST soils or combine any new UST soils with the existing soil piles established for UST soils. *Cover pile with a tarp.* Install a security fence around the pile.	Bulk placement into the CSF and segregate from other waste forms. Maintain storage structure until the soils are treated/managed in accordance with the selected CERCLA remedial alternative (OU-5).
PCB-contaminated Soil (>2 ppm) [includes radiological contaminated soils]	Containerize and store in designated areas in accordance with 40 CFR 761. PCB contaminated soil will be shipped off-site if adequate treatment/disposal capacity is available.	Same as Phase I soil management procedure. The CSF will be a designated area for containerized PCB contaminated soils. PCB contaminated soil will be shipped off-site if adequate treatment/disposal capacity is available, otherwise the PCB contaminated soils will be stored until a final remedy is selected.

When debris is generated, FEMP waste management personnel will perform the contaminant assessment (Section 3.4) to determine whether the materials can be decontaminated, require storage in an improved storage facility, or can be sent directly off site for disposal. A procedure will be prepared to provide guidance in determining whether debris requires storage in an improved storage facility. Results from the contaminant assessment will be reviewed to determine the characteristics of the materials. It is likely that process and past construction practice knowledge will be used to determine if debris are contaminated. Samples will be taken, if necessary, to determine the appropriate management of debris. Debris may be decontaminated during dismantling. General surveying with hand-held radiation monitors is likely to provide sufficient radiological information. Process knowledge will likely provide sufficient data as to whether hazardous waste, petroleum, asbestos, or PCB contaminants could exist.

Recoverable debris include structural steel, scrap copper, and other materials which can be successfully decontaminated for recycle, reused, or free-released. A new decontamination facility is currently under construction to provide additional capacity to decontaminate recoverable materials and other debris which may be free-released. The construction of this new decontamination facility is outside the scope of this removal action. It is intended that this facility will be operational during Phase I of this management plan. During Phase I, recoverable debris and other debris that will be free-released will be covered with tarpaulins or containerized for staging prior to decontamination. During Phase II, this debris will be staged within the Decontamination Facility Pad.

Non-recoverable debris include items such as concrete, asbestos, hazardous mixed waste, regulated PCB materials, and other construction wastes that cannot be decontaminated. During Phase I and II, it is intended that non-recoverable debris be containerized and shipped, to the extent possible, at the time of generation. The containerized contaminated non-recoverable debris will be managed in accordance with Removal Action 9 and may be temporarily staged at the FEMP until shipping arrangements can be made. During Phase I and Phase II, non-recoverable uncontaminated debris will be placed in an appropriate container for off-site disposal. In addition, contaminated non-recoverable debris may be stored in bulk in the CSF during Phase II.

In summary, the debris management plan consists of Phase I and Phase II management procedures. The management plan will depend on whether the material is recoverable or non-recoverable. Table 3-4 provides a management summary plan for recoverable debris, and Table 3-5 provides a summary plan for non-recoverable debris. Figure 3-3 provides a debris management diagram for Phase I of this removal action. Figure 3-4 provides a management diagram for debris generated during Phase II.

Table 3-4 Recoverable Debris Management Summary

1)	Recoverable debris (typically metals thicker than 1/4 inch) will be staged prior to being sent to a decontamination facility. During Phase I, staged materials will be covered with tarpaulins or containerized. During Phase II, the Decontamination Facility Pad will be used to stage these materials.
2)	Decontaminated debris will be recycled, reused, or free-released (as determined by *40 CFR 268.45,* 40 CFR 192, NRC Regulatory Guide 1.86, and DOE Order 5400.5).
3)	If decontamination is unsuccessful, the debris will be managed as a non-recoverable debris.

Table 3-5 - Non-Recoverable Debris Management Summary

1)	During Phase I, non-recoverable contaminated (radiological hazardous, etc.) debris will be containerized for off-site disposal. During Phase II, the material may be stored in bulk in an appropriate storage facility.
2)	Non-recoverable uncontaminated (radiological hazardous, etc.) debris will be placed in appropriate containers during Phases I and II for off-site disposal.

Figure 3-3
Debris Management Plan Flow Diagram - Phase I

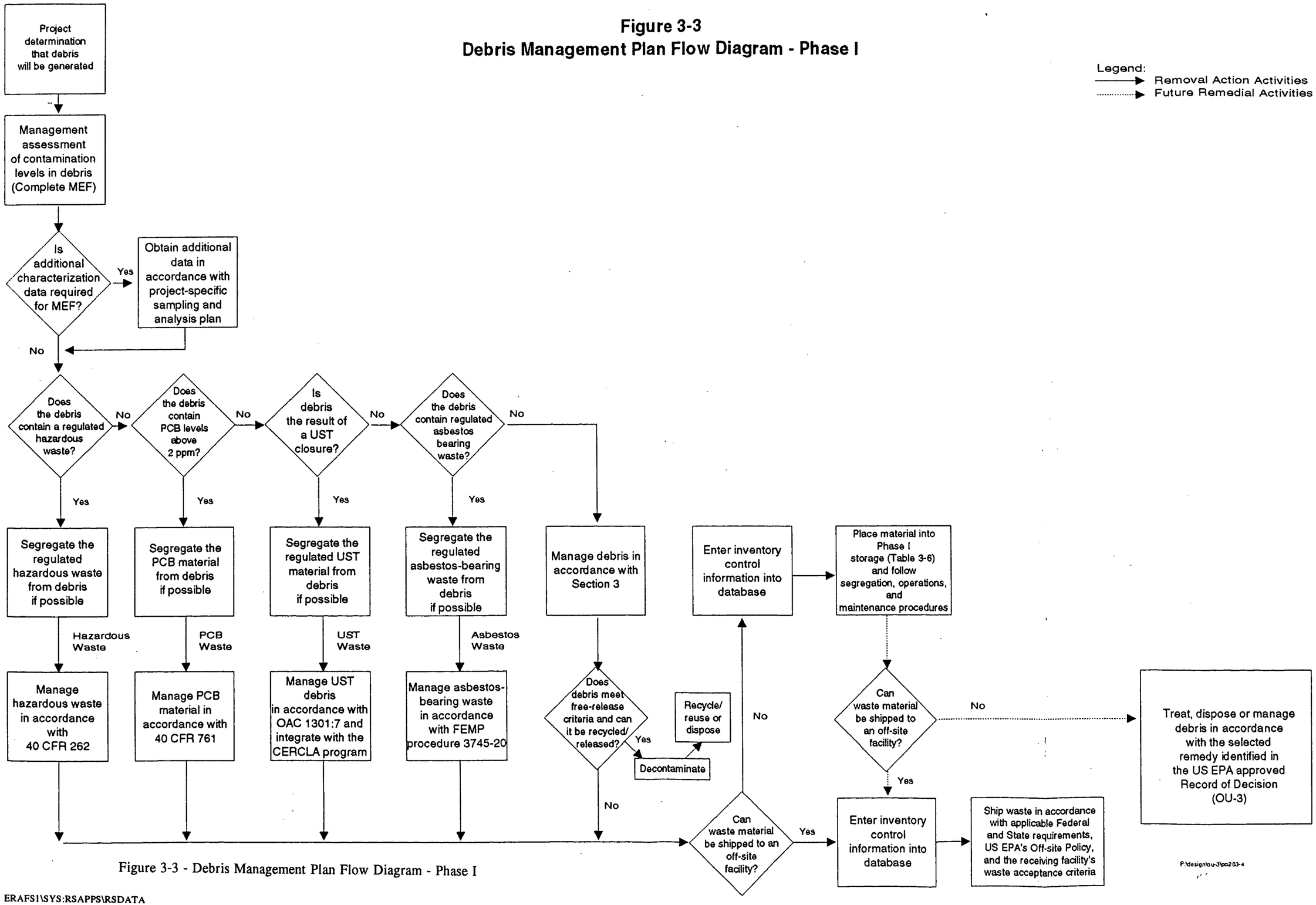


Figure 3-3 - Debris Management Plan Flow Diagram - Phase I

Figure 3-4
Debris Management Plan Flow Diagram - Phase II

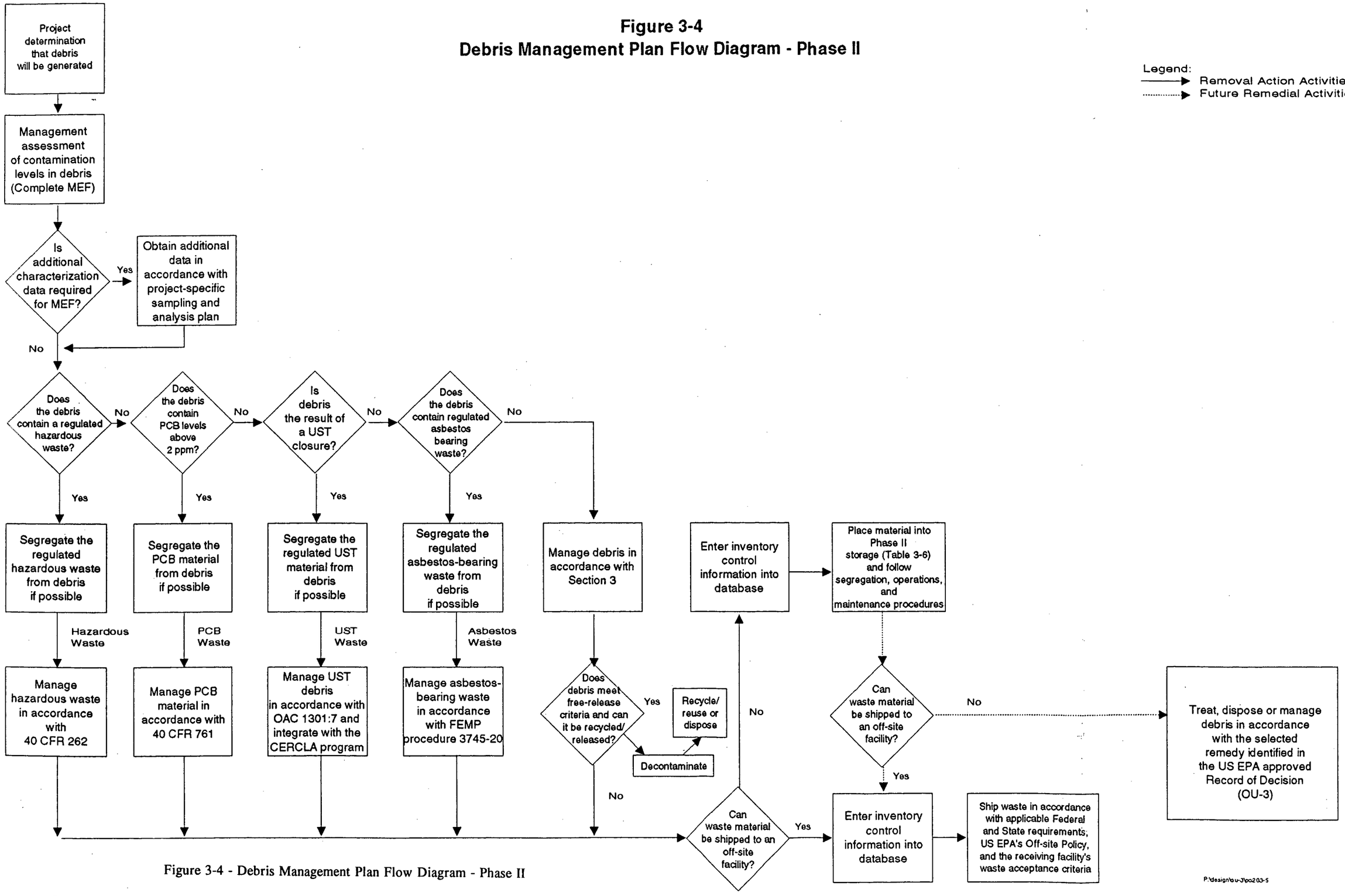


Figure 3-4 - Debris Management Plan Flow Diagram - Phase II

3.7.2 Recoverable Debris Management

Debris which can be decontaminated will be segregated in temporary storage facilities primarily by its recycle/reuse potential to facilitate decontamination during Phase I and Phase II. Recoverable contaminated debris will be stored under tarpaulins during Phase I. Covered storage areas will be provided by Phase II for the segregation and storage of recoverable contaminated debris prior to decontamination, and for the staging of clean materials prior to disposal or off-site shipment for recycle/reuse. These materials will include structural steel, scrap copper, and process equipment. Materials that are successfully decontaminated and determined to be clean, with respect to criteria established by *40 CFR 268.45,* 40 CFR 192, NRC Regulatory Guide 1.86, and DOE Order 5400.5 for radioactivity, and do not contain hazardous wastes, petroleum products, PCBs, or asbestos, will be free-released from the FEMP for recycle/reuse to the extent possible. This is consistent with the FEMP Waste Minimization Policy. Consideration will be given to the economic value of the material with respect to its processing cost. Clean materials that have a low economic value may be free-released from the FEMP and disposed in accordance with Federal, state, and local requirements. Materials which cannot be decontaminated and are specifically regulated waste types will be managed in accordance with this management plan and the ARARs identified in Attachment B.

Radioactive, hazardous, and petroleum-contaminated recoverable materials will be decontaminated and free-released, if possible. If decontamination is not successful, the materials will be managed according to the specific requirements for non-recoverable debris. Large quantities of recoverable materials are expected to be sent through the decontamination process.

3.7.2.1 Recoverable Radioactively Contaminated Debris

Recoverable materials will be stored under tarpaulins during Phase I. This material will be stored in the decontamination facility pad during Phase II. This material will be decontaminated to facilitate recycling or reuse. The determination of activities and procedures for the decontamination facility are beyond the scope of this work plan.

3.7.2.2 Process Equipment

In general, equipment that is uncontaminated will be free-released for reuse or recycling. Small volumes of these equipment are expected. The free-release criteria for the radiologically contaminated process equipment are defined in 40 CFR 192, NRC Regulatory Guide 1.86, and DOE Order 5400.5. Contaminated process equipment requiring storage during Phase I will be stored under tarpaulins. The materials will be stored during Phase II in a containment structure (Decontamination Facility Pad).

3.7.2.3 Existing Copper Scrap Pile

The existing Copper Scrap Pile is currently being addressed by Removal Action 15. All existing copper scrap that is recoverable will be removed from the pad and decontaminated during Phase I. Non-recoverable material may be disposed off-site in a low-level waste repository without decontamination during Phase I and Phase II. Scrap copper generated during Phase II will be stored in improved storage facilities as required.

3.7.3 Non-Recoverable Debris Management

This discussion specifies the disposition for non-recoverable debris which will primarily consist of concrete/rubble construction debris. Non-recoverable debris also includes glass, wood, paper and cloth, rubber and plastic, and ferrous metal that is not recoverable. Materials that are determined to be uncontaminated with respect to the established criteria specified by *40 CFR 268.45,* 40 CFR 192, NRC Regulatory Guide 1.86, and DOE Order 5400.5 will be free-released for disposal or reuse (if possible). Non-recoverable debris that has been free-released but is not accepted for off-site disposal will be containerized in both Phase I and Phase II. Small quantities of these materials may be generated outside of the process areas.

Off-site disposal will be the primary disposition for non-recoverable radiologically contaminated debris during Phase I and Phase II. These materials will be packaged and shipped according to the existing FEMP procedures established by Removal Action 9. Non-recoverable debris which cannot be shipped off site will be containerized during Phase I. During Phase II, this material may also be stored in bulk at the CSF.

During Phase II, debris that is contaminated with hazardous wastes, petroleum products, asbestos-bearing material, and PCB-contamination that cannot be decontaminated or shipped off site will require storage in segregated areas of the CSF to comply with the regulatory mandates and to facilitate the anticipated final treatment and/or disposal of these materials. In general, these materials will be segregated and stored in bulk. Small quantities of specific types of materials and potentially incompatible materials, such as asbestos and PCB-contaminated materials, will be containerized in accordance with the specific regulation for these contaminants (OAC Chapter 3745-20 and 40 CFR 761.25, respectively) to facilitate segregation and management.

3.7.3.1 Existing North Third Street Soil and Rubble Pile

Subsection 3.5.7 describes the management of this pile.

3.7.3.2 Existing Scrap Metal Pile

The existing Scrap Metal Pile is currently being addressed by Removal Actions 9 and 15. All existing scrap metal that is recoverable will be removed from the pad and decontaminated to free release levels so the material may be recycled or reused. If this material can be decontaminated, it may be sent to the decontamination facility. If decontamination to free-release levels is achieved, then the material may be disposed as industrial solid waste. Non-recoverable material will be disposed off site in a low-level waste repository without decontamination. A tension-support structure will be erected over the existing location when all the current scrap metal is removed. This facility, known as the Scrap Metal Pad (SMP), will be utilized for the storage of contaminated recoverable scrap metal during Phase II until such a time it can be decontaminated and released for disposal. Disposal of this material as industrial waste is more cost effective than shipping the material to a low-level waste repository.

3.7.3.3 Asbestos Bearing Waste

Asbestos-contaminated, non-recoverable debris, asbestos-contaminated debris that is also hazardous, petroleum, or radiologically contaminated will be containerized and stored in accordance with OAC 3745-20 within a designated on-site storage facility (Phase I). Under Phase II, material in this category will be containerized separately and stored together in an area of the CSF (or a containment structure within the *OU*). Otherwise uncontaminated asbestos materials may be shipped to a licensed landfill for asbestos disposal. Small volumes of these materials are anticipated.

3.7.3.4 Regulated PCB Debris

PCB-contaminated debris (concentrations greater than 2 parts per million) will be decontaminated and the resulting decontamination process wastes will be managed in accordance with 40 CFR 761. The resulting decontaminated debris will be managed as recoverable or non-recoverable debris (as required). If PCBs cannot be removed through decontamination, then the material will be containerized and stored in designated areas (Phase I). During Phase II, the *PCB*-contaminated debris will be containerized and stored in the CSF (or a containment structure within the *OU*).

3.7.3.5 Hazardous and Mixed Waste Debris

Non-recoverable debris that contains hazardous waste or mixed waste will be containerized and stored temporarily in a designated area during Phase I. During Phase II, the material will be *containerized and* stored in a segregated area in the CSF (or an improved storage facility within the *OU*) *for management* according to the RCRA regulations *and the relevant and appropriate NRC regulations and DOE Orders*. Organic-contaminated debris may also be segregated from inorganically contaminated materials. Based on process knowledge, small quantities of these materials are anticipated.

3.7.3.6 Petroleum-Contaminated Debris

Petroleum-contaminated non-recoverable debris and radioactive contaminated UST debris will be stored in a designated storage area during Phase I. Material will be containerized if off-site disposal is possible. This material will be *containerized and* stored in a segregated area in the CSF (or an improved storage facility within the *OU*) pursuant to OAC 1301:7 during Phase II. Small amounts of these materials are expected. The FEMP is investigating the potential for shipping these materials off site for treatment.

3.8 Specific Debris Management Procedures

This subsection describes the specific Phase I and Phase II management procedures for the types of debris that will be encountered at the FEMP. The Phase I and Phase II debris disposition requirements are summarized in the Debris Management Plan (Table 3-6). Figures 3-3 and 3-4 provide the flow diagrams for the Phase I and Phase II debris management plans, respectively. It should be noted that the Figures include activities that are not specifically addressed in this RAWP (i.e., selection and implementation of the final CERCLA remedial measures, and the sitewide post-remediation risk assessment activities). These future activities are included in the figures to indicate how the Phase I and Phase II soil management plans are integrated into the overall CERCLA remediation effort.

3.9 Post-Storage Activities

Storage Documentation - A yearly update report will be submitted by January 15 for all soil and debris dispositioned in the previous fiscal year. The report will document the activity concentrations, chemical concentrations, quantities, and the disposition of soil and debris. The report will be submitted to the regulatory agencies and placed in the FEMP CERCLA Administrative Record. *Future Removal Actions expected to generate excess soil and/or debris will be documented with the Phase III Removal Actions submitted from DOE to the US EPA annually on January 15.*

Improved Storage - Soil and debris placed in an improved storage facility will remain there until treatment/disposal becomes available or until the selected remedial alternative is available. Once treated, the soil and debris will be disposed in compliance with the *clean-up levels specified in the* RODs *for OU-5 and OU-3 respectively.*

Materials in Controlled Stockpiles - Soil and debris placed in a controlled stockpile may be used for backfill during construction and closure projects. Material from the controlled stockpile will be used as backfill within the *OU* of origin if the radiological constituents of the backfill are similar to the surrounding soils. The activity concentrations will be monitored by FEMP personnel and recorded within a computerized data base. This monitoring will allow material tracking so that the origin, quantity, and

Table 3-6 - Debris Management Plan

CATEGORY (Waste Type or Form)	Debris Management Procedures	
	Phase I	**Phase II**
Existing Soil and Rubble Pile *North of Third Street*	Regrade the pile, if required, to facilitate seeding. Improve the drainage controls around the pile to control runon and runoff. Install a security fence. Some non-recoverable rubble may be segregated from the pile during regrading operation, and containerized for off-site disposal.	Regrade the pile (if required) and erect an in-place containment structure (designated as the Soil and Rubble Pile *Cover*) over the existing pile. Maintain storage structure until the debris are treated/managed in accordance with the selected CERCLA remedial alternative (OU-5).
Recoverable Materials (All Forms)	Segregate based upon type of material (i.e., copper, steel, usable equipment) and need for decontamination (i.e., hazardous, radiological, PCB, etc.). If debris is non-contaminated (e.g., below free-release levels), the material will be shipped off-site when a suitable buyer or reclaimer of the material is located. If the material is contaminated, the material will be temporarily stored in containers or under tarpaulins until it can be decontaminated. If decontamination is not successful, manage as a non-recoverable debris. [Note: Radiologically contaminated materials and equipment may be shipped to another DOE facility without meeting the free-release requirements.]	Same as the Phase I debris management procedure.
Existing Copper Scrap Pile	To be managed in accordance with Removal Action 15.	None.

Table 3-6 - Debris Management Plan (continued)

CATEGORY (Waste Type or Form)	Debris Management Procedures	
	Phase I	**Phase II**
Existing Scrap Metal Pile	To be shipped off-site in accordance with Removal Actions 9 and 15.	None.
Non-recoverable (includes building materials such as concrete, structural steel, and walls/siding) [This category is for non-hazardous debris, including radiological contaminated debris]	Decontaminate the surface of the material to remove any gross loose radiological or chemical (includes asbestos removal) contaminants prior to demolition or dismantling efforts. For non-recoverable debris to be shipped off site, follow Removal Action 9 for containerization, interim storage, and off-site disposal shipping requirements. Decontaminated material may be disposed in a landfill that accepts construction debris. Place uncontaminated material into appropriate containers for storage and shipment to an off-site disposal facility. Contaminated non-recoverable debris will be containerized and shipped off site (if possible) during Phase I. This debris may be stored in the CSF during Phase II.	Same as the Phase I debris management procedure. These procedures may also be revised if an on-site disposal facility is utilized.
Hazardous Waste (includes mixed waste)	Remove hazardous components if possible. Containerize hazardous waste and store containers in designated hazardous waste storage areas. Manage remaining non-hazardous debris as recoverable or non-recoverable scrap as required.	Same as the Phase I debris management procedure. The CSF will be a designated storage area for containerized hazardous waste. Containers will be segregate from other waste forms as required. If the debris is a restricted hazardous waste, the container will be stored in the CSF.

Table 3-6 - Debris Management Plan (continued)

CATEGORY (Waste Type or Form)	Debris Management Procedures	
	Phase I	**Phase II**
Petroleum Contaminated Debris (includes radiological contaminated debris)	Remove petroleum contaminants if possible. Manage remaining debris as recoverable or non-recoverable scrap as required.	Same as the Phase I debris management procedure. *Containerized UST contaminated debris may be stored in the CSF.*
Asbestos Bearing Waste (includes radiological contaminated debris)	Remove all asbestos bearing waste prior to dismantling efforts, containerize asbestos in accordance with existing FEMP procedures for asbestos removal operations to meet the requirements of OAC 3745-20. Store containers in designated areas, prior to shipment for off-site disposal.	Same as the Phase I debris management procedure. The CSF will be a designated area for containerized asbestos bearing waste.
Regulated PCB Debris (includes radiological contaminated debris)	Remove PCBs and decontaminate the debris for PCBs. Manage PCBs in accordance with 40 CFR 761. Store containerized PCBs in designated areas and manage remaining debris as recoverable or non-recoverable scrap as required. If PCBs cannot be removed or debris cannot be PCB decontaminated, containerize and store PCB debris. Regulated PCB debris or PCBs will be shipped off-site if adequate treatment and/or disposal capacity is available.	Same as the Phase I debris management procedure. The CSF will be a designated area for the storage of containerized PCBs and regulated PCB debris. The regulated PCB debris will be stored until a final remedy is selected.

concentration will be traceable to locations where the soil and debris is utilized. All available characterization data will be entered into the database. *Soil will be removed from the controlled stockpiles and treated/disposed in accordance with the clean-up levels established by OU-5 ROD. Soil from a controlled stockpile that has been used as backfill will be treated/disposed along with the soils adjacent to the area of backfill (in accordance with the clean-up levels established by the OU-5 ROD).*

SECTION 4

IMPROVED STORAGE FACILITY DESIGN CONSIDERATIONS

As required by 40 CFR 300.415, an objective of this removal action is to attain compliance with ARARs to the maximum extent practicable considering the exigencies of the situation. In determining whether compliance with an ARAR is practicable, the urgency of the situation and the scope of the removal action were considered. Attachment B contains the list of ARARs identified for this removal action. The identified ARARs address the management aspects and establish the design criteria for this removal action. Section 3 addresses the management aspects, and this section addresses the design requirements for the improved storage facilities.

In addition to the ARARs, other Federal and State advisories, criteria, or guidance (termed "To-Be-Considered" [TBC]) may be considered in formulating the removal action. The incorporation of any TBC requirement into the design of the improved storage facilities is discretionary to an extent. The TBCs which the DOE has identified are also presented in Attachment B.

The design concept presented in this section was developed to achieve compliance with the ARARs and TBCs identified in Attachment B. For each identified ARAR and TBC, the strategy for compliance is provided in Attachment B. The following subsections provide a more detailed description for the design concept and criteria for the improved storage facilities.

4.1 Identification and Description of Alternatives for Phase II

The following section identifies the potential alternatives for improved storage and provides a brief description of each alternative. It should be noted that a "no-action" alternative is not a potential alternative, because the Amended Consent Agreement between the DOE and the US EPA specifies that the storage of soil and debris must be improved.

The three general alternatives for handling soil and debris at the FEMP include:

1) Shipping the materials for off-site disposal
2) Containerizing the materials and storage on site
3) Construct improved storage facilities for bulk storage

The FEMP currently ships some soil and debris off site for disposal (particularly non-recoverable contaminated debris and residues). However, not all of the soil and debris can be shipped. *The FEMP does not currently have access to a disposal facility* for soil or debris *containing low-level mixed waste.* In addition, the FEMP does not wish to send all soil and debris for off-site disposal. It is economically

advantageous to decontaminate and reuse recoverable debris. Decontamination would save the direct cost of shipping and disposal in addition to the indirect cost savings from material reuse; *also*, decontamination would conserve space at the disposal facilities.

The FEMP is currently performing soil treatability studies in accordance with the approved RI/FS Soil Treatability Work Plan. Treating soil on site and then using it for backfill during remediation would also be economically advantageous. The direct shipping and disposal costs would be saved in addition to the cost incurred by buying and transporting clean fill for on-site backfill. The indirect cost savings from saving disposal facility space would also be realized. Improved storage facilities would be required to store soil and debris prior to decontamination or treatment.

The FEMP currently containerizes some materials (i.e., mixed and hazardous wastes) for on-site storage. This option will become impractical as the FEMP continues with removal actions and remediation. The anticipated volume of soil and debris would require a large expenditure for storage containers and would quickly utilize all available storage space. Additional storage facilities would be required.

The FEMP will initiate the design and construction of improved storage facilities for the temporary bulk storage of soil and debris until decontamination or treatment/disposal in accordance with the RODs. It should be noted that all three of these alternatives will be used on an as-required basis for specific soil and debris materials.

Temporary storage facilities will be built to store the contaminated soil and debris that will be generated from various site removal actions, construction, maintenance, and environmental response projects in accordance with the Amended Consent Agreement (Removal Action 17). The potential alternatives that were evaluated to improve storage of existing materials and to provide additional capacity for future materials are discussed in the following subsections. They are as follows:

1) Tarpaulins
2) Tarpaulins with a Liner System
3) Pre-Engineered Buildings
4) Tension-Support Structures

4.1.1 Alternative Number 1 - Tarpaulins

A tarpaulin is a waterproof fabric or material which is laid upon the surface of a pile to contain the material and to control erosion and fugitive dust emissions. Tarpaulins are supplied on rolls and are resistant to sunlight, oxidation, and reaction with the waste before degrading. The functional life of a tarpaulin is about 5 years.

The tarpaulin would be unrolled to cover the inactive surface and slopes of the piles. The active surface of the piles would be uncovered when new material is deposited on the surface. The tarpaulin would then be unrolled to completely cover the pile after accumulation. Concrete blocks or stakes driven through grommets would be used to anchor the cover system in case of high winds.

The contaminated material piles would be regraded and compacted periodically to reduce the peak elevation and the side slope. In addition, the edges of the tarpaulin would be overlapped and joined each time the tarpaulin is placed over the pile. This type of improved storage would allow flexibility with respect to the size and shape of the piles. The potential for the expansion of storage capacity is limited only by property availability. Earthen berms and drainage ditches will be used to control runon and runoff.

4.1.2 Alternative Number 2 - Tarpaulins with a Liner System

The alternative would utilize the same tarpaulin discussed in Subsection 4.1.1. However, a subsurface liner system that meets the requirements of 40 CFR 264.250 for waste piles would also be provided. The liner system would likely be 12 mil, High-Density Polyethylene Elastomer (HDPE). The liner would need to be chemically resistant to the contaminated materials present in the pile and would require sufficient strength and thickness to prevent failure of the system.

The liner system would consist of a primary and secondary leachate collection/removal system that would collect and remove leachate from the pile. The primary liner would drain leachate that percolated through the pile. The secondary leachate collection system would contain leachate that leaked through the primary liner. This system must be designed and operated to function without clogging. A runoff management system would be required to control at least the volume from a 24-hour, 25-year storm event. Runon from the same storm event must also be prevented. The liner system would make it difficult to expand the size of the facility for additional storage capacity. The liner system would be constructed on the site, where the pile would be deposited and covered with a thin layer of soil to prevent damage during operations. The soil and debris would be dumped upon the liner system to create the pile. Tarpaulins would be used to cover the soil and debris pile.

4.1.3 Alternative Number 3 - Pre-Engineered Buildings

Pre-engineered buildings are erected with a steel beam and column system covered with a metal roof and siding. These permanent buildings would provide a storage facility for waste piles that would completely control runoff and fugitive dust emissions. Because the building is considered to be permanent, it can be expected to last more than 30 years. As the shape of the existing waste piles is irregular, a certain amount of soil and debris would need to be regraded to form rectangular piles with a moderate peak elevation for structures that would be built around in-place piles. New materials would be moved into a pre-engineered building through a large door. A method of segregating and containing specific types

of materials would be required with sufficient aisle space for loading/unloading. Adding extra storage capacity to a pre-engineered building would likely require the construction of another building.

4.1.4 Alternative Number 4 - Tension-Support Structures

Tension-support structures are built with metallic arch frames covered by PVC-coated polyester fabric. A large tension-support structure will require a strip foundation in order to resist wind or tornado loads. These structures can shelter the waste piles and control the runoff erosion and the migration of dust particles. A structure's normal life expectancy is more than 10 years.

The durable fabric is fire retardant and translucent which would maximize the entry of sunlight. The structure can be erected relatively quickly for both existing or future waste piles. The existing waste piles would be reshaped before the rectangular structure could be built to cover them. Large doors would be located at both ends of the structure to facilitate the movement of waste material. A method of segregating and containing specific types of materials would be required with sufficient aisle space for loading/unloading. Tension-support structures could easily be expanded for enhanced storage capacity by erecting an additional length to an end of an existing structure.

There are two types of tension-support structures which are currently in use at the FEMP site. The two types of structures differ with respect to their arches which are typically 10 feet apart. The differences are:

1) Arch trusses wrapped by fabric - The arch trusses are made of galvanized steel tubes. The FEMP has a RUBB® building system of this type.

2) Arch frames tied with fabric - The arch frames are constructed from aluminum I-beams. The FEMP has a SPRUNG® structure of this type.

Both structures would serve the purpose of improved storage.

4.1.5 Selected Alternative

These above mentioned alternatives were evaluated with respect to protection from the elements, runoff control, long-term remediation considerations, operation considerations, ease of decontamination and decommissioning, and cost. The tension-support alternative was selected because it was determined to be the superior alternative with respect to ease of operation and effectiveness at isolating soil and debris from the environment in a cost-effective manner. Tension-support structures are currently used for similar applications at the FEMP and are commonly used in the environmental remediation industry. The tension-support structure concept is consistent with the long-term remedial action plan of the FEMP. The alternatives evaluation report is included as Attachment F.

4.2 Improved Storage Facility Description

As discussed in Section 3, the FEMP anticipates that four improved storage facilities will be constructed to accommodate the storage of soil and debris. The facilities are proposed pending confirmation of the anticipated waste quantities and the development of design criteria. Preliminary design information for each structure is presented in Table 4-1. The proposed locations of the proposed facilities are shown on Figure 4-1. *Each OU will have a designated controlled stockpile (if necessary). The locations for these piles are currently being considered. The overall property utilization within the OUs is being planned. The US and Ohio EPAs will be notified as to the locations of the controlled stockpiles when they are determined.*

The DFP, CSF, and the SMP will be designed as containment structures with a slab floor. Soil and debris will be transported to the containment structures for storage. The SRPC will be designed as an in-place containment structure that will be erected over an existing pile of soil/debris and will not have a slab floor.

The following design considerations will be applied to the structures:

1) Radiological and security access controls will be consistent with DOE Orders, ALARA goals, NCP, 29 CFR 1910.120, and ARARs. The six proposed facilities will be located within fenced areas of the FEMP.

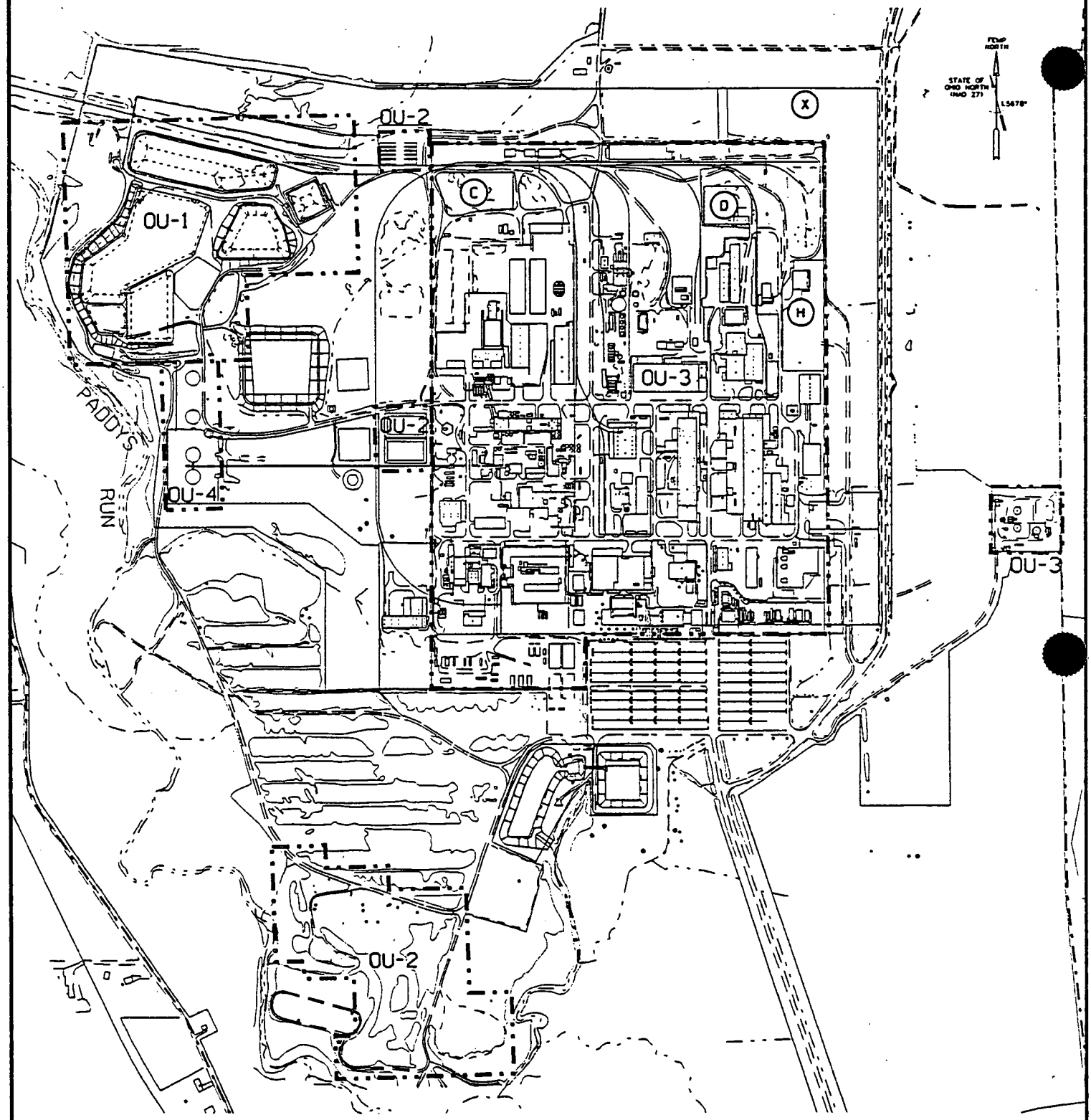
2) Provisions shall be made for appropriate environmental monitoring of the air, soil, water runoff, and groundwater. During construction, stormwater will be appropriately managed to abate discharges of potential contaminants to the environment.

3) All facilities and structures will be designed for easy decontamination, removal, and disposition upon project completion.

4) Location of the structures will consider the needs of other projects at the FEMP.

5) Jurisdictional wetlands and areas within 100-year floodplains have been and will continue to be avoided when siting improved storage facilities (siting criteria are addressed in the ARARs table).

6) Structures within the former production area will be tied into the existing stormwater control system.



(C) SOIL AND RUBBLE PILE COVER

(D) SCRAP METAL PAD

(H) DECONTAMINATION FACILITY PAD

(X) CENTRAL STORAGE FACILITY

NOTE:
OU5 CONSISTS OF ALL SOIL NOT INCLUDED IN THE DEFINITIONS OF OUS #1-4. THE CONTROLLED STOCKPILE FOR OU5 WILL BE SITED AT A LATER DATE PENDING FUTURE CONSTUCTION ACTIVITY IN THE OU.

OU3/PO20
01-01-01104

Figure 4-1 - Location of Improved Storage Facilities

Table 4-1 - Listing of Proposed Improved Storage Facilities

Proposed Name and Acronym	Approximate Size	Proposed Use	Approximate Location
Soil and Rubble Pile Cover (SRPC Structure)*	200 feet wide 340 feet long	Cover existing north third street soil and rubble pile	North of Plant 1 Pad
Scrap Metal Pad (SMP Structure)	100 feet wide 160 feet long	Storage of metal debris	Northeast corner of process area
Decontamination Facility Pad (DFP Structure)	100 feet wide 100 feet long	Staging of contaminated metal scrap/debris prior to decontamination	Near new decontamination facility
Central Storage Facility (CSF Structure)	100 feet wide 400 feet long	Storage of soil and debris generated from various Removal Action and site construction projects	North of existing scrap metal pile

Note: * In-place containment structure

The CSF, DFP, and SMP Structures will have the following internal services:

a) Forced ventilation equipment mounted on the floor (unless detailed design indicates static ventilation is sufficient).

b) Electrical lighting to Illuminating Engineering Society of North America warehouse illumination levels.

c) A small *modular* office will be provided at the CSF for facility supervisory/security and health physics uses. This office will be equipped with a telephone, and will also have an HVAC system to maintain worker comfort levels throughout the year.

d) Portable-type eyewash/hand-held drench stations will be provided at appropriate locations. These will be heat traced/freeze protected.

e) A warehouse-type sweeper/vacuum will be used periodically to clean the floors of the storage structures. In addition, process water connections for periodic "wash down" of the facility floor may be provided. In addition, water will be needed to clean equipment before it is transferred for use on another pile. This will prevent cross-contamination between segregated piles. A vehicle and equipment *washing area* will be constructed *within* the CSF. Water used for *washing* purposes will be collected in a sump and pumped to a portable tank for subsequent treatment at Plant 8.

f) Provisions for portable ambient air radionuclide monitoring.

The SRPC will be an in-place containment structure. Since this structure is intended *only* to cover the existing soil and debris pile, it will not be routinely occupied. Lighting, fire water, office structures, or process water will not be provided for this structure. Essentially, installation of this structure will only require a foundation that is adequate for the structure and any grading necessary to manage stormwater properly. However, the design of the facility will not prevent the upgrade of lighting necessary for future remediation. Should ventilation be required, portable fans will be used at the SRPC. The SRPC will be designed with a passive ventilation system (gravity type).

The following permanent facility services will not be required for in-place containment structures:

1) Restrooms, showers, lunch or breakrooms
2) Parking lot (beyond a laydown/parking area during construction)
3) Potable water
4) Steam or air
5) Heating and air conditioning
6) Fire water sprinklers

The following subsections describe the features of the improved storage facilities that will be provided.

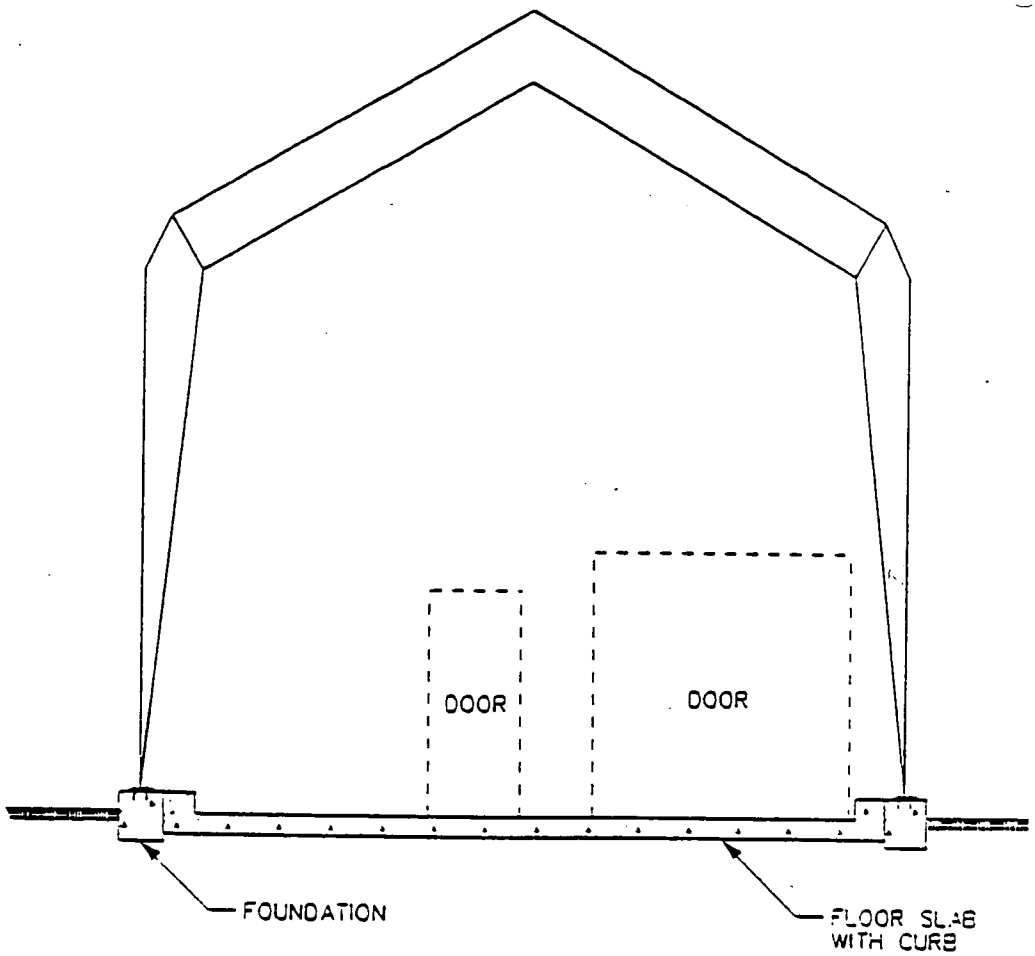
4.2.1 Design Concepts for the Containment Structures

The containment structure will consist of a tension-support structure that is constructed over a floor slab. The following subsections describe the design features for each engineering discipline.

4.2.1.1 Civil/Structure/Architectural

Containment structures will be built with connected long-span arches and fabric siding. A typical section of the tension-support structure is shown in Figure 4-2. Structural design criteria will be established for this removal action that are based on the requirements of DOE Order 6430.1A. State and local building codes are reviewed for possible conflicts with the criteria of DOE Order 6430.1A. The Ohio Basic Building Code (OBBC 1989) governs issues not covered in the DOE Order 6430.1A.

The containment structure will require a strip foundation in order to resist wind loads. The strip foundation will prevent overturning and sliding due to lateral forces. The top of the concrete will be higher than the subgrade surface to prevent runon from entering the structure. It is envisioned that interlocking modular concrete block walls will be used to form storage compartments for specific types of contaminants (as required). These blocks may be *double* stacked as high as *10* feet. The interlocking concrete blocks may also be used to line the structure so soil and debris are not forced against the structure walls.



TYPICAL SECTION OF - TENSION SUPPORT STRUCTURE

Figure 4-2 - Typical Section of Tension-Support Structure

Dry methods of decontamination will be favored in comparison to wet methods. However, periodic washing of contaminated equipment may be required. Therefore, a sump drain system will be required. This system will also collect liquids that might leach from the contaminated soil and debris piles. Portable sump pumps will be provided to remove collected liquids.

The CSF will be designed so that water collected in sumps can be sampled and analyzed before it is removed from the collection sump by a portable pump. The water will be pumped into a portable tank and transported to the Plant 8 sump for treatment.

Ditches and drains for surface water removal will be provided to connect to the existing drains and ditches. The new drainage systems will be designed in accordance with the requirements of DOE Order 6430.1A, Section 0270-2, and will be designed to accommodate a minimum of a 25-year, 24-hour, storm event per RM-FMPC-0001. The drainage ditch gradients will be limited to prevent erosive velocities. The existing drainage system will be upgraded as required.

Liquid collected in drainage ditches and gutters from stormwater runoff will be discharged into storm sewers, drainage ditches, and may be controlled by splash blocks or paving, as required by DOE Order 6430.1A, Section 0760-2.3.2.

4.2.1.2 Material Handling

It is anticipated that material handling equipment (forklifts, loaders, backhoe, etc.) will be used to handle materials within the structures. Soil and debris will be segregated inside each facility depending upon their physical/chemical characteristics. Soil and debris will be further segregated into:

1) Hazardous/Radioactive (Mixed) Materials
2) Asbestos-Contaminated Materials
3) Radioactive Non-Hazardous Materials
4) UST Materials
5) PCB-Contaminated Materials

Segregation barriers will be installed to define storage areas for each type of waste. Soils will be segregated from debris because it is anticipated that final treatment/processing/disposal will be different for each material. Most of these barriers will be portable so that the area storage capacity can be adjusted as needed. This option will maximize the operating flexibility for the facilities. One of the barriers will be fixed to allow the waste to be pushed against it during operations and retrieval. The barriers will be designed to withstand forces exerted by the material handling equipment. Fixed barriers will be made of concrete or other suitable construction material. The height of the segregation barriers will depend on the required storage capacity as well as the angle of repose of the waste. It is predicted that the

barriers will not exceed *12* feet in height. *The stored soil will not exceed a height of 11 feet.* Figure 4-3 provides a conceptual floorplan for the CSF that shows how soil and debris will be segregated.

Waste piles will be reclaimed from one end only to allow the material handling equipment to back into the aisleway provided for its operation. Various types of attachments such as a backhoe, grapple, or loader may be required. All attachments will be of the small connector type so that minimal time is lost during changeover.

Each facility will have equipment doors at each end for facility operations, removal of equipment, and maintenance. Access will also be provided for operating personnel to enter the facility. Normally, all equipment will be stored inside the facility.

Dump trucks (or containers on flat-bed trucks) will be used to transport soil and debris to the storage facilities. Soil and debris will be directly transferred from the containers or dump truck to the storage facility (this will be the preferred method.) Materials may also be unloaded outside and later transferred into the facility by commercially available material handling equipment (if necessary). Equipment will not require special modifications since soil and debris are expected to be low-level radioactively contaminated. Personnel working inside the facility will be required to wear personal protective equipment and follow guidelines as stipulated in the Health and Safety Plan.

4.2.1.3 Electrical

All of the containment structures will require electrical power for mechanical ventilation and safety shower heat tracing. The fabric material will be translucent; *however, lighting will be provided to a level of 100 foot candles*. The addition of lights will be reviewed during the design phase. The buildings' metal framework will be grounded. Electrical power will be provided to the Central Storage Facility's *modular* office which will be pre-wired.

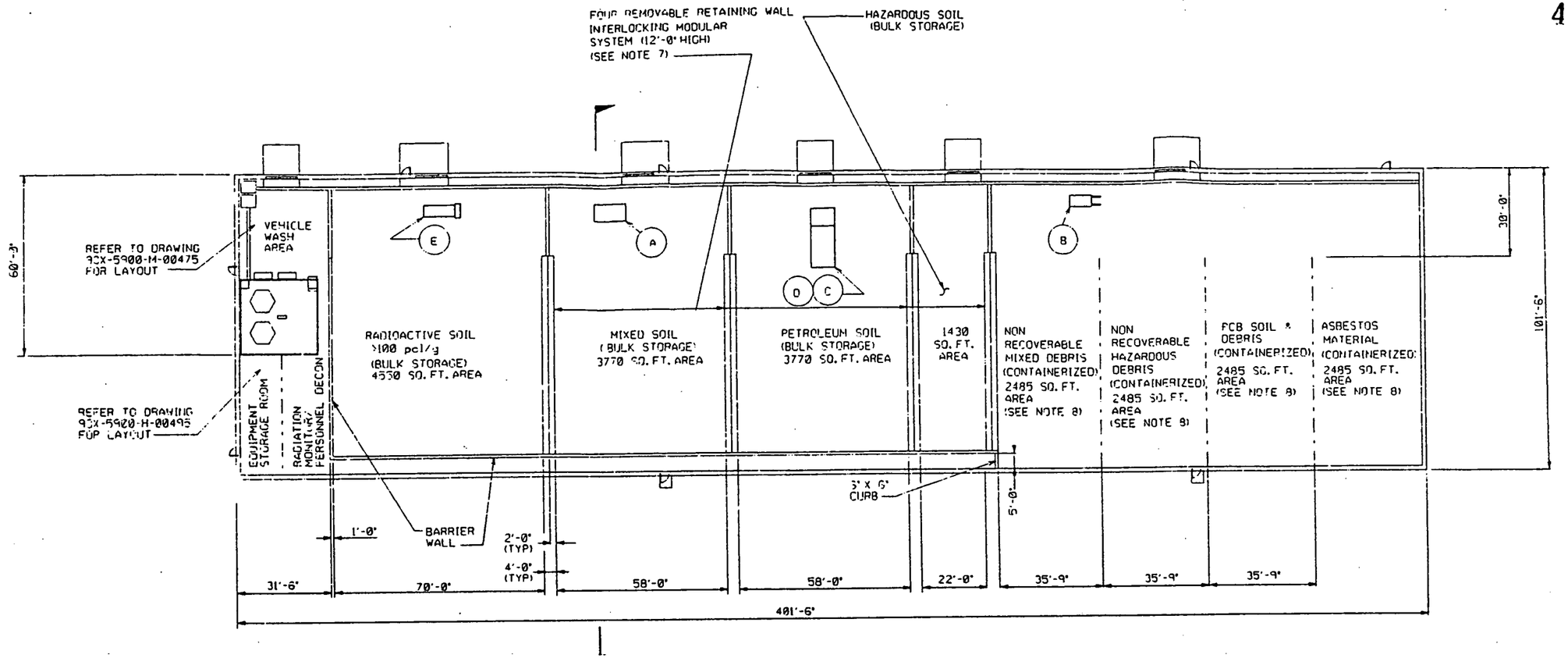
4.2.1.4 Heating, Ventilating, and Air Conditioning

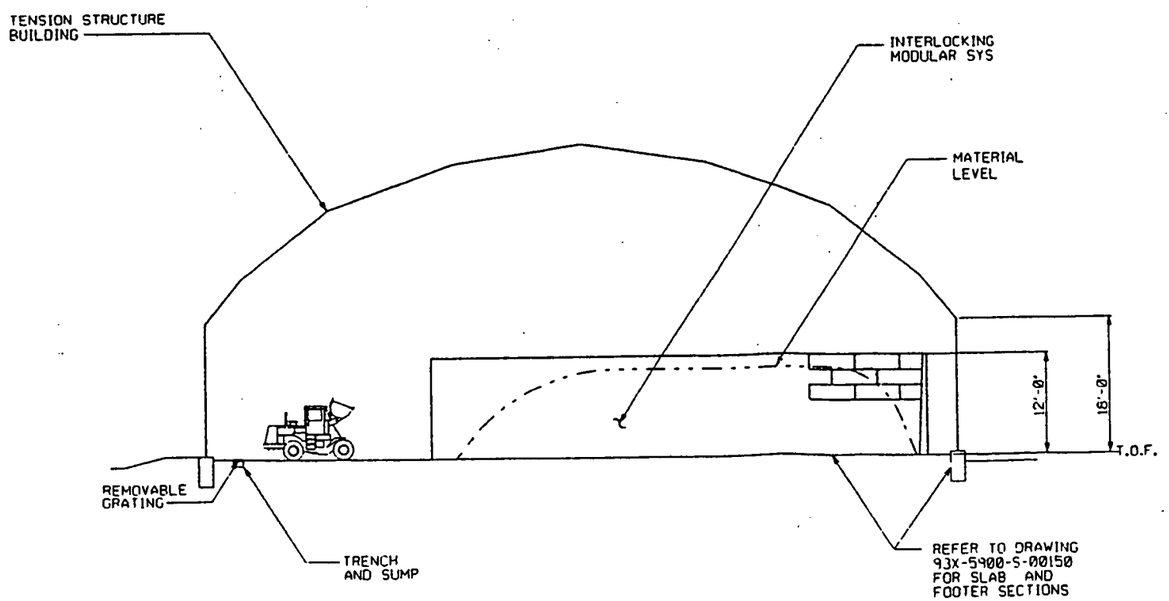
The CSF, SMP, and the DFP structures will be designed within the following parameters:

1) Mechanical ventilation will be provided to remove fumes from machinery used inside the structures.

2) Heating and air conditioning will not be provided. However, the *vehicle washing* area in the CSF will be heated.

3) The office provided at the CSF will have a HVAC system to maintain worker comfort levels.





MAJOR EQUIPMENT LIST		
MARK	QTY	EQUIPMENT NAME
A	1	VACUUM SWEEPER
B	1	FORK TRUCK
C	1	DUMP TRUCK
D	1	FLAT BED TRUCK
E	1	FRONT END LOADER

Figure 4-3 - Conceptual Layout of the Central Storage Facility

4) Portable-type eyewash/hand-held drench stations will be provided at appropriate locations. These will be heat traced/freeze protected.

Periodic industrial hygiene surveys will be conducted. During operation of these facilities, if required, additional control measures (i.e., dust suppressants, personal protective equipment, and increased ventilation) will be used to correct any problems identified during the surveys.

4.2.1.5 Facility Siting

A site contaminant assessment will be performed for the CSF and any other future containment structure that will not be constructed over an existing pad. This assessment will be conducted during the siting of containment structures, but will not be conducted for construction of in-place containment structures over existing piles. The contaminant assessment specified in Section 3.4 will be utilized for the determination of potential contaminants. A containment structure will not be constructed at a site that contains hazardous, PCB, or petroleum product contaminants. In addition, the siting requirements presented as ARARs for this Removal Action (Attachment B) will be complied with during site selection.

4.2.2 Design Concepts for the In-Place Containment Structures

The in-place containment structure will consist of a tension-support structure that is anchored to a strip foundation. In-place containment structures do not have a floor slab. The following subsections describe the design features for each discipline.

4.2.2.1 Civil/Structural/Architectural

An in-place containment structure will be designed similarly to the containment structure except that there will not be a floor slab. The foundation of the in-place containment structure will require a strip foundation in order to resist wind and tornado loads. The strip foundation will prevent overturning and sliding due to lateral forces. The top of the concrete will be higher than the subgrade surface to prevent runon from entering the structure.

Ditches and drains for surface water removal will be connected to the existing drains and ditches. These drainage systems shall be designed in accordance with the requirements of DOE Order 6430.1A, Section 0270-2. The drainage control systems will be designed to accommodate a minimum of a 25-year, 24-hour storm event per RM-FMPC-0001. The drainage ditch gradients will be limited to prevent erosive velocities. The existing drainage system will be upgraded as required.

Liquid collected in drainage ditches and gutters from stormwater runoff will be discharged into storm sewers and drainage ditches and may be managed by splash blocks or paving, as required by DOE Order 6430.1A, Section 0760-2.3.2.

4.2.2.2 Material Handling

The piles will be regraded prior to construction of the in-place containment structure. There will be very little movement of materials once the structure is erected. When material handling is necessary, the same procedures specified for the containment structures will be utilized.

4.2.2.3 Electrical

The in-place containment structures will not require electric power.

4.2.2.4 Heating, Ventilating, and Air Conditioning

The in-place containment structures will not require an HVAC system.

4.2.2.5 Facility Siting

Contaminant assessments for siting (as described in subsection 4.2.1.5) do not apply to in-place contaminant structures. However, compliance with ARARs for siting (i.e., avoidance of wetlands) is required.

4.2.3 Design Concept for Controlled Stockpile

The controlled stockpiles will not require isolation from wind and precipitation because the radioactive concentrations will be below 100 pCi/g for total uranium, 5 pCi/g for total radium, 50 pCi/g for total thorium, *and does not contain concentrations of other contaminants that exceed regulatory standards*. However, runon and runoff controls will be implemented to prevent water from running onto the piles and to ensure that precipitation runoff flows away from the controlled stockpile areas. Ditches and drains for surface water removal will be connected to the existing drains and ditches. These drainage systems shall be designed in accordance with the requirements of DOE Order 6430.1A, Section 0270-2. The drainage control systems will be designed to accommodate a minimum of a 25-year, 24-hour storm event per RM-FMPC-0001. The drainage ditch gradients will be limited to prevent erosive velocities. The existing drainage system will be upgraded as required.

Seeding the piles will be the likely erosion control method. Polymeric barriers may also be used to prevent erosion. Each *OU* will have a controlled stockpile to minimize movement of material and to

provide a source of fill material for other projects within the *OU* which may require fill material. It should be noted that soil from a controlled stockpile will be used as backfill within that specific *OU* if it has radiological constituents that are similar to the surrounding soils. Soil used as backfill will be logged into the computer database for future tracking.

The siting ARARs concerning wetlands and floodplains (Attachment B) will be complied with during the selection of a location for a controlled stockpile.

4.2.4 Phase I Period Design

Phase I soil piles will be managed by placing a heavy tarpaulin on the ground in the area where soil is to be stored. To drain runoff away from the stockpile area, the site of the stockpile will be an area slightly higher in elevation than the surrounding areas. The perimeter of the tarpaulin will be securely fastened to the ground by stakes or other appropriate means. Soil will be piled starting at the center of the tarpaulin and proceeding outward. Soil will not be placed within 3 feet of the edge of the tarpaulin. Each day, at the completion of that day's stockpiling activities and all excavating activity, a second tarpaulin will be placed over the stockpiled soil. The stockpiled soil will be completely covered by the tarpaulin, and the tarpaulin will be well secured at its perimeter and intermittently over its surface area to avoid wind disturbance. Covering the stockpile with the tarpaulin will prevent precipitation from coming in contact with the stockpiled soil. Precipitation will fall onto the tarpaulin cover and run by gravity to the ground.

Track-mounted construction vehicles shall not be driven onto the tarpaulins. Tarpaulins shall be provided with temporary wooden access ways for wheeled vehicles to drive onto the tarpaulin without causing tears or punctures.

After final disposition of the stockpiled soils, tarpaulins will be dispositioned in an appropriate manner considering the types of contaminants identified within the soils stored on or under the tarpaulin in question. Soil stockpile areas will be seeded after removal of stockpiles and tarpaulins.

4.3 Permitting Requirements

Pursuant to CERCLA Section 121(e), 40 CFR 300.400(e), and Section XIII.A of the Amended Consent Agreement, on-site removal actions are exempt from the procedural requirements to obtain Federal, State, or local permits. However, the removal action must satisfy all Federal and State standards, requirements, criteria or limitations that would have been included in any such permit to the extent required by CERCLA and the NCP.

For any proposed on-site response action which, in the absence of CERCLA Section 121(e) and the NCP, would require a Federal or State permit, Section XIII.B of the Amended Consent Agreement requires DOE to include in its submittal to the US EPA:

1) Identification of each permit that would otherwise be required,
2) Identification of the standards, requirements, criteria, or limitations that would have been necessary to obtain each such permit, and
3) Explanation of how the response action will meet the standards, requirements, criteria, or limitations identified in Item 2.

The purpose of this subsection is to fulfill the submittal requirements set forth in Section XIII.B of the Amended Consent Agreement. Each permit that would otherwise be required is identified in the subsections that follow.

4.3.1 Hazardous Waste Facility Installation and Operating Permit

For any new hazardous waste storage facility within the State of Ohio, the Hazardous Waste Facility Approval Board (HWFAB) issues the installation and operating permit. Since it is proposed to store a limited quantity of hazardous waste in the Improved Storage Facilities, a permit from the HWFAB would be required in the absence of CERCLA Section 121(e). The permitting requirements are identified in OAC Title 3745 Chapter 50 and address siting constraints, design standards for storage facilities, and operating requirements.

The pertinent standards, requirements, criteria, or limitations for the construction and operation of a hazardous waste storage facility are identified as ARARs in Attachment B. The proposed approach to satisfy each of these ARARs is documented in Attachment B and addressed within this RAWP. In general, the siting constraints are fully satisfied. Compliance with the hazardous waste storage facility design standards is addressed in Section 4.2. Procedures were established to comply with the hazardous waste operational requirements (e.g., emergency planning, monitoring, records, and training) for the existing hazardous waste facilities. These current FEMP procedures and subsequent revisions will be followed for the Improved Storage Facilities.

4.3.2 NPDES Stormwater Discharge Permit

An NPDES Stormwater Discharge Permit is required under 40 CFR 122.26 for specifically identified industrial facilities. These regulations require the owner/operator to establish sample collection locations and analytical parameters to monitor stormwater discharges. A sitewide monitoring program is being established for the FEMP and will be identified in the sitewide NPDES Stormwater Discharge Permit Application. Since the stormwater resulting from the Improved Storage Facilities and Controlled Stockpile Area will be handled by the existing sitewide drainage system, these stormwater discharges will

be monitored in accordance with the sitewide stormwater monitoring program. As such, a separate NPDES Stormwater Discharge Permit Application would not be required for this removal action. The improved storage of soil and debris is anticipated to reduce the amount of contaminants in stormwater runoff.

4.3.3 NESHAP Permit

A permit is required under 40 CFR 61.07 for the construction of a new source or the modification of any existing source which emits a regulated hazardous air pollutant. The Improved Storage Facilities could be designated as a new source of radionuclide emissions under 40 CFR 61, Subpart H. Since the radionuclide emissions from the Improved Storage Facilities are expected to be below the specified limitation, no *NESHAP* permit would be required for this removal action. *However, the CSF has been identified as a new source under the OAC 3745-31-01(K) requirements and must, therefore, meet the requirements of a Permit to Install (PTI) and a Permit to Operate (PTO). Under the Amended Consent Agreement with respect to CERCLA, the facility is exempt from actually obtaining the permits.*

4.4 Implementation

The generator of soil and debris material will conduct a contaminant assessment. Additional sampling and analysis may be required as a result of the initial data review. The Sampling and Analysis Plan (Section 6) provides guidance for characterizing soil and debris if necessary. Characterization information and the Material Evaluation Form (Attachment E) will be provided to the storage facility operator. The soil and debris material generator (responsible project) will be responsible for the completion of the material identification/classification (Material Evaluation Form) shipping papers and transportation to the improved storage facilities.

The operator in charge of the improved storage facilities will review the documentation, inspect the incoming materials (if necessary), and designate the specific storage location. The operator will have the authority to reject soil and debris materials that do not meet the acceptance criteria (i.e., free liquids; combined materials that require segregation; PCB or asbestos materials that are not properly containerized; and materials that are ignitable, reactive, and incompatible).

During the storage period, the storage facility operator will be responsible for facility maintenance and day-to-day material placement/movement operations. These activities will be minimized.

It is likely that the existing pile of soil and debris will be regraded prior to the construction of the SRPC. It is *necessary* that the scrap metal will be removed prior to the construction of the SMP (due to Removal Action Number 15). However, sampling and analysis of the scrap metal pile and the existing soil pile located on Third Street will not be required. New materials will not be stored in existing in-place containment structures.

During the storage period, the storage facility operator of the in-place containment structure will be responsible for facility maintenance. There will be very little movement of materials or day-to-day operations for the in-place containment structures.

4.5 Integration with the Remedial Action

This removal action will be managed by the DOE and *FERMCO CRU-3* coordinators to ensure compatibility with the final remedial action(s) selected. Data and results from this removal action will be provided to the RI/FS contractor to be used in the evaluation of final remedial options for both OU-3 and OU-5.

The Uranium Removal from Soil Technology Demonstration Program will initiate construction of a prototype soil remediation system at the FEMP. The objective of this program is to demonstrate and select an efficient, cost-effective soil remediation system that can be used on site. Contaminated soils from the improved storage facilities, as well as those generated during the implementation of the remedial actions, could be treated by the selected soil remediation system that may be established at the FEMP.

In addition, a decontamination facility is being constructed at the FEMP. The Decontamination Facility Pad will be constructed to support the decontamination facility. Some debris materials (i.e., recoverable scrap metal, structural steel, and scrap copper) stored in the various improved storage facilities may be sent to the decontamination facility. Following decontamination, these materials could be sold as scrap and/or recycled.

Removal Action 15 is currently underway to remove the scrap metal pile that exists on the scrap metal pad. The tension-support structure is scheduled to be constructed over the existing location prior to the receipt of additional debris materials.

The soil in the stockpiles, as well as all soil at the FEMP, will be remediated to meet the clean-up levels determined by the OU-5 ROD. OU-5 is responsible for the design and construction of a treatment facility for soils throughout the FEMP if treatment is chosen as the remediation alternative. The work plan addresses the management of soil and debris until the implementation of the OU-5 ROD. At that point, soil and debris will be managed in accordance with the Remedial Action Work Plan of the respective OU. During the remedial action period, soil will be removed from the storage structures and the controlled stockpiles for treatment/disposal in accordance with the clean-up standards specified by the OU-5 ROD. Soil from the controlled stockpiles will not be used as backfill during either the remedial action period (unless the specified clean-up standards are less than the pile concentrations) or for the construction of permanent facilities (any remaining after remediation). Soil from controlled stockpiles will be used as backfill (where applicable) prior to the remedial action period (with the exception of permanent facilities).

The remediation of debris at the site will be conducted under OU-3 since this OU contains almost all the debris requiring remediation. Treatment/decontamination and disposal of debris will be conducted with respect to the OU-3 ROD.

SECTION 5

MANAGEMENT SUPPORT

Activities that will be undertaken prior to the actual site work are planning, training, designing, and management of the removal action preparatory efforts. These activities are required to render the work areas reasonably free of hazards to personnel and/or the environment.

5.1 Roles of Participants

The following organizations will be involved with various activities associated with the RAWP.

The United States Department of Energy is the owner of the FEMP, and is responsible for the oversight of all site activities.

Fernald Environmental Restoration Management Corporation (FERMCO) is the site integrator contracted to the DOE. FERMCO is tasked with managing the site during its restoration. *FERMCO* will be responsible for the implementation of this soil and debris management plan *and will supervise the construction of the improved storage facilities.*

PARSONS is the architectural/engineering firm contracted to *FERMCO* to provide the remedial design to support the overall FEMP remediation. **PARSONS** will provide the engineering design for this removal action. This effort includes the evaluation of alternatives for improved storage and preparation of the RAWP.

The Construction Contractor is the organization that will construct the improved storage structures. This contractor will be selected through the standard DOE bid and award process.

The United States Environmental Protection Agency (US EPA) has approval authority for this work plan.

The Ohio EPA may provide guidance and participate in the development and review of this work plan.

5.2 Project Planning Activities

The following project planning activities will be performed prior to the implementation of this removal action.

Project Planning

Included in this activity will be the preparation of detailed task listings and delineation of responsibilities. These project planning documents will be established as the internal DOE control mechanism to ensure that the removal action is implemented to meet the schedule milestones identified in Section 5.4.

Design of Removal Action

Definitive design documents will be prepared for the removal action construction work.

Training of Personnel

Section 5.5 presents the training requirements.

Bid and Award/Construction Management

All bid and award documents will be prepared for the removal action construction work along with the procurement of all equipment, materials, and subcontractors necessary to complete the removal action construction work.

Revision and Preparation of Operating Procedures

The FEMP will revise existing operating procedures and prepare new procedures to implement the soil and debris management plan. Table 5-1 lists the operating procedures that will be revised, and Table 5-2 identifies new operating procedures that will be prepared. The Material Evaluation Form Procedure (SSOP-0002) will be revised to address the contaminant assessment. The procedure will outline the steps that will be taken to determine whether a specific project will generate soil and debris and how to obtain the data necessary to complete the Material Evaluation Form. This procedure will also specify contaminant concentrations that, if exceeded, will require improved storage. The specific concentrations will likely be based on limits such as:

1) 100 pCi/g for total uranium in natural isotopic distribution
2) 50 pCi/g for total thorium
3) 5 pCi/g for total radium
4) TCLP limits for hazardous constituents
5) 2 parts per million for PCB contaminated soils and debris
6) 1 percent (by volume) for friable asbestos

Table 5-1 - Existing Procedures Requiring Revision

Procedure	Title
SSOP-0002	Material Evaluation Form
RM-0005	Lot Marking and Color Coding System
SSOP-0044	Controlling the Generation of Construction/Maintenance Waste

Table 5-2 - New Procedures Requiring Preparation

Procedure	Title
To Be Determined	Contaminant Assessment Waste Acceptance Criteria
To Be Determined	CSF Operation Procedure/Waste Acceptance Criteria
To Be Determined	DFP Operation Procedure/Waste Acceptance Criteria
To Be Determined	Improved Storage Facility Inspection
To Be Determined	Correlation of Radiation Field Instruments for Storage Disposition Levels

Operational procedures will be prepared for the containment structures (CSF, SMP, and DFP) to specify the facility waste acceptance criteria and to specify the storage disposition requirements. The procedures will also address how segregated piles will be managed and how equipment will be used and decontaminated. An inspection procedure will also be developed to guide the inspection of all the various types of improved storage facilities. It should be noted that specific projects will produce individual work plans that follow the guidance of this sitewide soil and debris management plan. The individual plans will use the specific procedures listed in Table 5-1 and 5-2. Procedures will be prepared in the future to guide the operators during the removal of soil and debris for treatment or disposal.

5.3 Operations and Data Management

5.3.1 Phase I Operations

Soil and debris generated during Phase I will be managed according to the provisions of Section 3. Soil piles will require maintenance (i.e., tarp placement, seeding) until Phase II of this removal action is implemented. Weekly visual inspections will be performed during this time period.

The controlled stockpiles will be easy to maintain because the pile will only be seeded, and equipment will dump or load soil on an as-needed basis. Grading may be required to rework the pile after *unloading* or loading activities. Active portions of a controlled stockpile may be covered with tarpaulins or polymeric spray coatings.

5.3.2 Phase II Operations

Soil and debris that will be generated in Phase II (and require improved storage), or existing materials that require relocation will be contained within partitions/walled areas of the containment structures. The partitions will segregate the petroleum, radioactive, hazardous, mixed, and PCB materials within the facility. The facility may also store, prior to disposal, segregated asbestos material that has been containerized in accordance with FEMP asbestos management procedures prior to disposal. Soil will also be segregated from debris.

A clear aisle space of sufficient width for the material handling equipment will be maintained. A warehouse sweeper/vacuum will be used to clean up soil and debris that spill from their respective piles. Front-end loaders will also be available as required to load, unload, and manipulate piles. Collected materials will be returned to their respective piles or the pile which is stored pursuant to the most restrictive regulation. Equipment will be washed or decontaminated before being used on another pile to prevent cross-contamination between segregated piles.

The existing piles that will be stored in place may be regraded during construction of the improved storage facility. Once the structure is built, there will be very little movement or maintenance of the soil and debris. Newly generated materials will not be stored in in-place containment structures. Sufficient space will be provided for construction equipment that will be required to remove the materials for treatment/disposal.

The controlled stockpiles will be easy to maintain because the pile will only be seeded, and equipment will *unload* or load soil on an as-needed basis. Grading may be required to rework the pile after *unloading* or loading activities. Active portions of a controlled stockpile may be covered with tarpaulins or polymeric spray coatings.

All of the improved storage facilities will be visually inspected weekly to make sure that leaks have not developed within the roof, that the soil and debris piles have not spilled over their area, and that liquids have not accumulated in the sumps. Controlled stockpiles will also be inspected on a weekly basis. Inspections will also be required after major storm events that exceed a 25-year storm intensity. An inspection procedure with an inspection form will be developed during the implementation of the soil and debris management plan. The weekly inspection form will be signed by the inspector and the facility operation supervisor and placed in the file. If a problem is identified during an inspection, then the form will be given to the maintenance department with detailed repair instructions prepared by the facilities design group. Once the repairs are completed, the maintenance supervisor will sign the form and return it to the inspector. The inspector will inspect the repair work and sign the form signifying completion of the repairs.

Liquids that may accumulate in sumps within the improved storage facilities are likely to result from drainage of liquids from waste piles, leaks in the roof, potential equipment decontamination, and safety shower/eyewash waste. It is anticipated that the volume of liquid waste will be small and irregular in frequency of generation. Portable pumps will be provided to remove liquid wastes as required. The collected liquid will be transferred to the Plant 8 sump. This wastewater will be combined with other plant wastewaters for treatment prior to discharge to the Great Miami River via the existing National Pollution Discharge Elimination System (NPDES) permitted outfall. As such, the treatment and discharge of this decontamination wastewater and the monitoring of the effluent discharge will be in accordance with the existing Permit to Install/Permit to Operate and NPDES permits issued to the FEMP by the Ohio EPA. In consideration of the anticipated contaminants and the expected volume of wastewater to be generated, the existing wastewater treatment facilities are deemed to be adequate.

5.3.3 Phase I and II Database/Planning

The development and upkeep of a computerized database for material tracking will be an important component to the successful implementation of the remediation effort at the FEMP. Analytical results from soil and debris sampling will be entered into the computerized database. In general, data containing the origin, quantity, and contaminant concentrations of soil and debris will be entered into the database so that the materials can be accounted for while in storage. This information will be used when the materials are utilized or treated/disposed. Material from the controlled stockpile may be used to fill excavations and for other engineering applications. However, the use of this soil will be logged into the database with respect to contaminant concentration, soil quantity, and origin. Wastes that are treated/disposed from the improved storage facilities will also be entered into the database with respect to concentration, quantity, and origin. This procedure will allow the tracking of soil and debris from their point of origin to their final point of use/disposal. This information will ultimately be used as characterization input into the sitewide risk assessment.

The FEMP uses a coding system to identify waste materials with respect to waste type and origin. FEMP document RM-0005, Lot Marking and Color Coding System (issued August 23, 1991), describes the identification system. The soil and debris management plan will use this system for the computerized database tracking system. The coding system currently identifies materials by a number that consists of the following five elements:

1) Production Order Number
2) Origin or Source Code
3) Class or Enrichment Code
4) Material Description Code
5) Lot or Sequence Number

The Production Order Number identifies key production activities. It usually consists of a letter designation followed by three numerical digits. A special designation code will be established for CERCLA removal actions, construction projects, and maintenance activities. Waste packaged specifically for shipment to the NTS has been designated as N003.

The Origin or Source Code is a three-digit code with a block of 100 numbers that have been assigned to each plant. The plants are divided into subareas with subordinate blocks of numbers (1-99) assigned to each. Additional numbers may be used to identify specific areas where soil may be generated on site because the 1-99 codes are geared toward plant production areas. This code will be modified to identify the *OU* where the soil and debris was generated.

The Class or Enrichment Code will consist of one digit or letter that identifies the general class or enrichment of the soil and debris. The use of this code in combination with the material description code will make it possible to assign the same material description code to similar materials regardless of their class, enrichment, or special nature. This code will be modified to identify the contaminants that are contained.

The Material Description Code will be a three-digit code which is subdivided into residue and product categories. Soil and debris will typically have a material description code that is within the general low-grade residues (000-099). For example, contaminated soil, rocks, sand, bricks, and ceramics have been assigned the code 011; and contaminated steel, after washing/cleaning, is categorized as 004 under the existing systems. New codes may be assigned to soil and debris so that a specific code represents a specific type of material.

The Lot or Sequence Number will be a four-digit number which will be used to identify consecutive lots of specific material. Each month will be assigned a specific three-digit identifier with the fourth digit representing the specific removal date in cases where multiple lots (batches) are produced in a single month.

The FEMP Lot Marking and Color Coding System document RM-0005 contains tables that identify specific codes for each of these five elements of the identification system. Soil and debris materials will receive an 11- to 15-digit identification number, depending upon its origin, material, class/enrichment, and date of classification/sequence. A new classification will be added for soil and debris to identify the material disposition. The database will include a site coordinant for the disposition of material used as backfill or sent to a controlled stockpile to signify/track the final destination of the material. This code will identify the location of the shipped, utilized, or treated/disposed materials so that the materials and their chemical characteristics can be used *during the remedial action period and perhaps in the sitewide post-remediation risk assessment. When soil from a controlled stockpile is used as backfill, the concentrations of contaminants in both the backfill and the adjacent soils will be logged into the database.* It should be noted that RM-0005 will be revised to incorporate the requirements of this Soil and Debris Management Plan. Table 5-3 provides a summary of the FEMP Lot Marking and Color Coding System, and specifies the items that will be incorporated into the system for soil and debris management. The table also specifies additional information that will be logged into the database for use in disposition and future activities.

5.3.4 Phase I and II Monitoring

RI/FS monitoring data will be an important component of the RAWP during the initial contamination assessment to determine where the soil and debris will be stored. The soil and debris will be sampled and analyzed prior to future treatment/disposal if it is required to ensure that the material can be effectively treated or to ensure that the material can be disposed in compliance with the regulatory requirements. This information may also be used within the sitewide post-remediation risk assessment. The analytical results obtained from each monitoring event will be entered into the computerized database. Section 6 provides a sampling and analysis plan that will be used for guidance during characterization and monitoring activities.

Environmental monitoring will be performed using existing sitewide monitoring stations and programs. The specific environmental media that are monitored include air, groundwater, and stormwater.

5.3.5 Phase I and II Program Modifications

The soil and debris management program will be modified, as necessary, to remain in compliance with regulatory changes and DOE Orders. The plan may be modified in response to new technological developments, including any modifications that are required as a result of the selection of a final remediation alternative. It should be noted that each construction site or removal action may have a unique set of requirements. If necessary, a sampling and analysis plan and a health and safety plan will be developed to address these unique conditions.

Table 5-3 - FEMP Database System Summary

FEMP Lot Marking and Color Coding System Identifier	Soil and Debris Items that will be Specifically Coded	Additional Information Logged into Database
Product Order Number	1) Removal Action 2) Construction Project 3) Maintenance Activity	RA Number Responsible Party Responsible Party
Source Code	1) Each *OU*	None
Class Enrichment Code	1) Uranium $\leq$100 pCi/g 2) Uranium >100 pCi/g 3) Radium $\leq$5 pCi/g 4) Radium >5 pCi/g 5) Thorium $\leq$50 pCi/g 6) Thorium >50 pCi/g 7) PCBs 8) Asbestos 9) Petroleum Products 10) Hazardous 11) Mixed Waste	Identify contaminants/ concentrations
Material Description Code	1) Soil 2) Recoverable Debris 3) Non-Recoverable Debris	None
Lot or Sequence Number	1) Removal Date	Quantity Involved
Destination	1) NTS 2) Controlled Stockpile* 3) Central Storage Facility 4) Scrap Metal Pad 5) Decontamination Facility 6) Soil and Rubble Pile Cover 7) Backfill*	*Log coordinants of the location *and log contaminants/ concentrations for area adjacent to backfilled soils.*

5.4 Schedule

A proposed milestone schedule for the removal action is presented in Tables 5-4 and 5-5. Actual dates are *based on* US EPA approval of the RAWP *comment responses and revised strategy which was received on December 31, 1992.*

Table 5-4 - Phase I Milestones for the Removal Action Schedule

Milestone	*Completion Dates*
Work Plan Approval *(Final Approval of Comment Responses and Strategy)*	*12/31/92*
Provide Phase I Storage Upgrades for Existing Piles	*04/30/93*
Revise Existing Procedures	*04/30/93*

Table 5-5 - Phase II Milestones for the Removal Action Schedule

Milestone	*Completion Dates*
Design Completion (4 Storage Facilities)	*12/31/93*
Prepare New Procedures	*5/31/95*
Procurement/Mobilization of Construction	*5/31/94*
Construction Completion (4 Storage Facilities)	*5/31/95*

Notes: The design and construction of these facilities will be staggered.

The major milestone activities identified in Tables 5-3 and 5-4 are discussed in the following subsections.

5.4.1 Work Plan Approval

The US EPA acceptance date will initiate the establishment of all subsequent milestones.

5.4.2 Provide Interim Storage for Existing Piles

The FEMP will begin to implement the interim improvements to the existing soil and debris piles concurrently with the agency review.

5.4.3 Revise Existing Procedures

The FEMP will revise the existing procedures (Table 5-1) upon approval of the RAWP.

5.4.4 Design Completion

The FEMP will begin to design the improved storage facilities when the RAWP is approved. The design activities will include preparing design drawings for site work and utilities, and performance-type specifications for the tension-support structures.

5.4.5 Prepare New Procedures

The FEMP will prepare new procedures to implement the RAWP (Table 5-2). Preparation will commence upon approval of the RAWP. The FEMP will complete the new procedures *concurrently with* design details of the improved storage facilities. *Some procedures, which* will be required *for* operation, *will be finalized by construction completion.*

5.4.6 Procurement/Mobilization of Construction

This activity includes the selection of a vendor to supply the tension-support structures (including procurement) and a construction contractor to install the facilities.

5.4.7 Construction Completion of Four Storage Facilities

Improved storage facili*ties will require varying durations* to construct. However, by staggering the construction start dates, the FEMP anticipates that all four improved storage facilities can be designed and constructed in 24 months.

5.5 Training of Personnel

Employees who will operate and inspect the improved storage facility will receive training in accordance with the applicable *FERMCO* policies and the requirements specified by 29 CFR 1910.120, 29 CFR 1926.21, and OAC 3745-54-16(A). Employees will receive the required training prior to starting work

at any of the facilities for improved storage. The training will include radiation worker training with respirator training and quantitative fit testing.

SECTION 6

SAMPLING AND ANALYSIS PLAN

The FEMP will conduct an assessment of the contaminants that are contained within the soil and debris (Subsection 3.3) to complete the MEF. The assessment will include a review of existing analytical data (primarily the RI/FS data) and a review of historical and process operation knowledge to identify potential constituents of concern. *Historical records review, pre-activity field surveys, sampling and analysis (if required), and construction radiation surveys will be performed prior to and during activities to prepare and implement project specific Health and Safety plans. Industrial Hygiene and Radiation Safety specialists are involved during excavation activities to ensure worker protection. This information will be available to assess contamination and prepare the MEF. If additional sampling and analysis is required, then the pile will be tarped and fenced in a manner similar to the Phase I activities.* Sampling and analysis will be performed for identified potential constituents that are not included in an existing analytical database and are required to complete the MEF. This section outlines a program to guide the sampling and analysis of soil and debris for the purpose of determining the materials' storage requirements. However, a specific sampling and analysis plan will be developed on a case-by-case basis for specific projects that require analytical activities. It should be noted that the contaminant assessment and MEF completion will occur prior to *dispositioning soil and debris into storage.*

6.1 Objective

The primary objective of this sampling and analysis plan is to collect representative samples that will allow both accurate and precise measurements of the chemical and radiological contaminants in the soil and debris. If the chemical measurements are sufficiently accurate and precise, then they will be considered reliable estimates of the chemical properties of the soil and debris.

This sampling and analysis plan provides a general framework for sampling soil and debris, and describes the procedures that will be undertaken to obtain analytical data of sufficient quality and quantity to characterize the soil and debris generated at the FEMP. The FEMP will review existing RI/FS data, previous sampling results, and process knowledge to complete an MEF and determine disposition requirements. Sampling and analysis will be performed when sufficient data is not available to complete the MEF and determine the storage disposition. It should be noted that when sampling and analysis are required to complete the MEF, a project-specific sampling and analysis plan will be prepared to obtain the specific data required to complete the MEF. The project-specific plan will be developed in accordance with the Amended Consent Agreement, applicable environmental regulations, and DOE Orders to ensure that the results are applicable for selecting storage requirements for the materials. Project specific sampling and analysis plans will be submitted to the regulatory agencies within removal action work plans.

6.2 Parameters for Analysis

The FEMP will utilize historical information and process knowledge concerning chemicals and wastes that were stored, processed, or generated, in addition to results of the RI/FS as a guide for identifying potential analytical parameters. This section discusses the potential constituents that are likely to be contaminants within soil and debris.

6.2.1 Hazardous Constituents

Hazardous constituents have been used/generated in the facility processes and have been detected in soil and debris samples. It is a FEMP standard operating procedure that characterization of soil and debris materials from construction projects include TCLP analysis to determine presence and mobility capabilities of/for inorganic and organic constituents.

Selection of the specific constituents for analysis will be based on process/facility knowledge, results of the RI/FS program, including but not limited to the applicable constituents listed in Appendix VIII of 40 CFR 261 and 40 CFR 302.4. Field screening may also be used to identify potential contaminants. An X-ray fluorescence spectrometer may be used as a general field screen for the presence of metals. A flame ionization detector or photoionization detector will be used to detect the presence of organic chemicals. Hazardous constituents that were used or produced on site and have been detected in the RI/FS program include arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, PCBs, 1,1,1-trichloroethane, tetrachloroethylene, and trichloroethylene.

6.2.2 Radionuclide Constituents

The FEMP was involved in the manufacturing of a variety of uranium and thorium products between 1951 and 1989. As a result, uranium (and other radionuclide) contamination has been detected in soil and debris. Analysis will be conducted for the uranium isotopes U-234, U-235, U-238, and thorium isotope Th-232 in addition to their specific daughter products that have long half-lives. Initial screening for alpha, beta, and gamma contamination will be performed with hand-held monitoring devices. If the initial screening indicates that the soil and debris contains radioactive constituents, then additional analysis will be performed based on process knowledge, the results of the RI/FS work, or a general list of radionuclides that could be present. Table 6-1 identifies the major radionuclides that may be present and their daughter products that result from natural radioactive decay.

Table 6-1 - Major Radionuclides and Their Daughter Products

Radionuclide	Daughter Products
U-238	Th-234, Pa-234, U-234, Th-230, Ra-226, Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210, Pb-206
U-235	Th-231, Pa-231, Ac-227, Th-227, Ra-223, Rn-219, Po-215, Pb-211, Bi-211, Tl-207, Pb-207
Th-232	Ra-228, Ac-228, Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Po-212, Tl-208, Pb-208

The following radionuclides may be included on the analytical list based on a review of their half-lives: Th-230, Ra-226, Pb-210, U-235, Pa-231, Ac-227. These are the uranium and thorium daughter products that have a long enough half-life that they could be expected to exist in significant concentrations within Th-228, Ra-228, and uranium contaminated soil and debris. In addition, Sr-90, Tc-99, Cs-137, Ru-106, and Np-237 may be analyzed for based on process knowledge and the results from the RI/FS program. It should be noted that the analytical list may be modified for each project-specific soil and debris pile or removal action project.

The field instruments utilized for total uranium determination will be correlated to the field action level of 100 pCi/g in soil by comparing radiation instrument readings to a range of soil concentrations. This will be achieved by performing a radiological survey of the area requiring excavation. Low, medium, and high instrument readings should be collected for a greater distribution of correlation data. At areas where soil samples are to be taken, three 2-minute readings will be recorded, averaged, and recorded as the gross reading. Then, using a shielded instrument, three 2-minute readings will be taken to determine the radiation from other sources other than the soil. These three readings will be averaged, and the result subtracted from the gross readings to calculate the net reading of radiation detected from the soil. *It should be noted that this procedure was originally specified in the Removal Action Work Plan for the Sewage Treatment Plant Incinerator contaminated soils.*

One liter soil samples (approximately 14 inches in depth and 14 inches in diameter) will be collected and sent to a laboratory for the analysis of the soil concentrations. The results of the sampling will be plotted versus radiation survey information on a semi-log graph. From this graph, the field instrument reading correlating to the field action level of 100 pCi/g (total uranium) can be determined.

Activity concentrations for radium and thorium are likely to be determined in the laboratory because field instruments may not detect the disposition activity concentrations with a high level of confidence.

This methodology will be incorporated into a site procedure that will be developed in support of this removal action.

6.2.3 Additional Analysis

As necessary for specific applications, soils may be tested for geotechnical parameters such as moisture content, density, compressive strength, grain size, and will be classified with respect to type. This information, as well as the chemical characteristic data, will be entered into the computerized database for future waste tracking and risk assessment activities.

6.3 Sampling Procedures

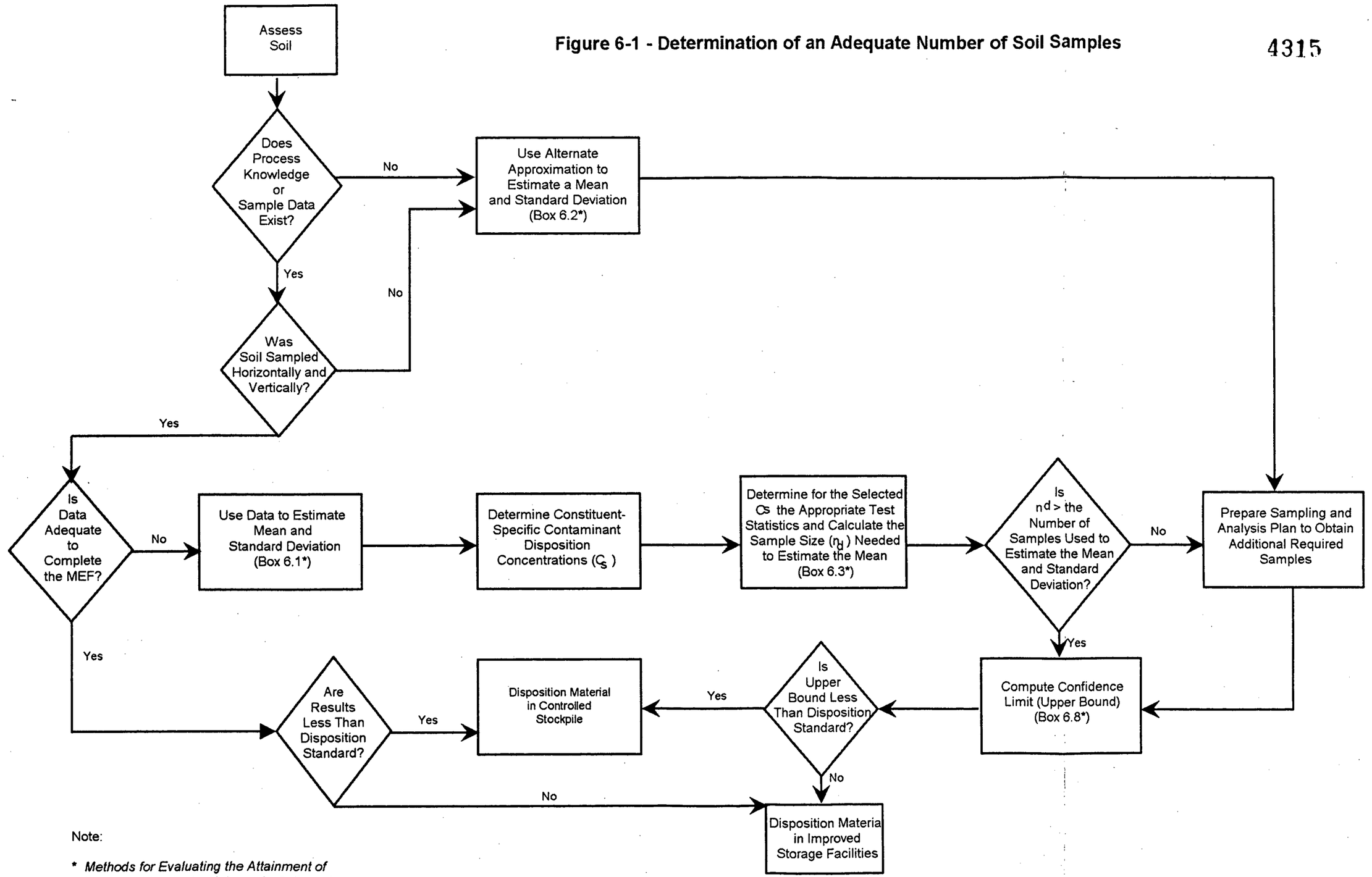
As discussed in Subsection 3.4, soil and debris will be subjected to a contaminant determination with respect to the Material Evaluation Form (MEF; SSOP-0002). The determination will utilize existing characterization data, historical knowledge, or process information to identify the contaminants. Field screening may be performed during initial project strategizing and development. This screening data will also be considered during the MEF process.

6.3.1 Soil Sampling

The FEMP will assess soil contamination prior to developing a strategy for sampling and analysis. Figure 6-1 presents a flow chart that will be followed to estimate the number of samples that should be collected from a pile and to determine if soil requires further characterization. The first step in the assessment will involve a historical records search to identify from what facility or area the soil originated and what contaminants are likely to be encountered during analysis. If the origin is determined, the process knowledge is likely to identify the anticipated contaminants. The second step in the assessment will determine if previous analytical data exist for the soil. These first two steps should determine if the soil is anticipated to be homogeneous or heterogeneous and identify the anticipated contaminants. The next two subsections will discuss the approach for determining the level of sampling and analysis for a situation where previous sampling results exist, and for a situation where analytical results do not exist.

If sampling data exist for specific soil, then the data will be used to determine if additional sampling and analysis are required. The data will be inspected to identify the primary contaminants and to determine if samples were taken from different locations (with respect to both vertical profile and lateral coverage). If it is determined by inspection that the soil was not adequately sampled, then it will be considered to be an unsampled area (if the historical data cannot verify homogeneity). If inspection determines that the soil is adequately sampled, then the data will be statistically examined to determine if the results indicate that enough samples were taken.

Figure 6-1 - Determination of an Adequate Number of Soil Samples



Note:

* *Methods for Evaluating the Attainment of Clean-up Standards, Volume 1: Soils and Solid Media* (US EPA 1989a)

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Figure 6-1 - Determination of an Adequate Number of Soil Samples

The statistical procedure described in Chapter 6 of the "Methods for Evaluating the Attainment of Clean-Up Standards, Volume 1: Soils and Solid Media (US EPA 1989a) will be used to determine whether additional samples are required. When analytical results exist, the data will be used to estimate a mean, variance, and standard deviation (Box 6.1; US EPA 1989a). If adequate samples do not exist, then the standard deviation will be estimated by dividing the difference of the estimated range of concentration values by 6 (Box 6.2; US EPA 1989a). The primary contaminant disposition concentration (C_s) will be utilized (i.e., uranium at 100 pCi/g) in an equation (Box 6.3; US EPA 1989a) to estimate the sample size needed to estimate the mean.

If the calculated sample size (n_d) is greater than the number of samples used to determine the mean and standard deviation, then additional sampling will be required. If the calculated sample size is less than or equal to the number of samples used to estimate the mean and standard deviation, then no additional samples will be required. When sampling data does not exist, the calculated sample size dictates the number of samples to collect.

The mean of the sample results can be used to determine the disposition requirement by calculating the upper bound confidence interval (95 percent) and comparing the sum of the mean and the upper bound confidence interval to the contaminant disposition concentration. If the sum of the mean and the upper bound confidence interval are less than the contaminant disposition concentration, the soil could be dispositioned on a controlled stockpile (with respect to the specific contaminant). Otherwise, the soil would require disposition in an improved storage facility.

Pile size or project area are a key factors in the design of a sampling strategy for a soil. Ideally, soil should be sampled using a three-dimensional simple random sampling strategy. This strategy can be employed only if all points within the pile can be accessed. In such cases, the area should be divided into a three-dimensional grid system, the grid sections assigned numbers, and the sampling points then chosen using random-number tables or random-number generators. If sampling is limited to certain portions of the area, then the collected samples will be representative only of those portions, unless the soil is known to be homogeneous. Radionuclide disposition will be determined by averaging the values from a 100 square meter area *(1,076 square feet). It should be noted that if an area is less than 100 square meters, then the actual area of excavation will be surveyed.*

Soil samples will be collected with trowels, shovels, thief samplers, sampling triers, or other coring devices. Shovels may be appropriate for homogeneous waste piles, whereas thief samplers and sampling triers will be better suited for heterogeneous soil sampling (or sampling over a depth profile). Any equipment used for sampling will be decontaminated prior to taking any sample. Equipment will be cleaned as specified in Appendix J of the Fernald Environmental SCQ. The soil sampling techniques specified in the SCQ, Section 6 (and Appendix K), will be followed to ensure consistency among data sets.

For the TCLP, the number of samples collected will be based on the volume of the material. Some of the samples will be used for the preliminary TCLP evaluations and radionuclide analysis. The remaining samples will be used to analyze the volatile organics and metals.

Hand-held alpha, beta, and gamma radiation detection devices will be used to survey soil samples in the field for radionuclide contamination. Subsection *3.1.2* presents the methodology for correlating the instruments to the storage disposition concentrations. This information may be used to determine material disposition in conjunction with the MEF. For example, if the MEF process indicates that hazardous, petroleum, or PCB contaminants do not exist, then soil may be dispositioned as field work progresses by the results of the field radiation surveys. This information will be required for packaging and transportation requirements, and may determine which laboratory will perform the analysis. The radiological screening information will also be used to determine if detailed radionuclide analysis is required.

Trip and rinseate blanks will be collected during sampling for Quality Assurance/Quality Control. These samples will be analyzed with the TCLP procedure and radionuclide analysis as required for the specific project.

6.3.2 Debris Sampling

Debris will be determined to contain hazardous waste based on process knowledge, TCLP analysis with any applicable SW-846 procedures, and if it is determined necessary, analysis for HSL constituents. It is very important first to identify what plant operations occurred within the immediate area of the debris. This information will provide guidance in determining analytical needs.

Debris with potential surface contamination will be measured with direct reading instruments and swipe tests in accordance with DOE Order 5400.5. The first method consists of scanning the debris with alpha, beta, and gamma detection devices. In swipe testing, the amount of removable contamination per 100 cm^2 of debris surface area will be collected by wiping the debris with a dry filter or soft absorbent paper. The amount of radioactivity will be measured from the swipe by appropriate radionuclide counting instruments. The maximum contamination level applies to an area of not more than 100 cm^2. When removable contamination on objects with a surface area less than 100 cm^2 is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped for analysis. For materials that exceed 100 cm^2, a representative number of 100 cm^2 samples will be wiped. The results will be averaged to determine the expected concentration of radioactivity. The maximum result may also be used as an indicator of whether the material exceeds a free-release level.

It should be noted that radiation scanning (continuously while excavating) will be the preferred method of choice for debris piles with various materials of different shapes and sizes. The swipe test will be

important for specific items that have been decontaminated and need to be tested to determine if they can be released.

6.4 Chain-of-Custody

An essential component of the soil and debris sampling and analysis plan is ensuring the integrity of the sample from collection to analysis and, finally to data reporting. A chain-of-custody procedure will be utilized so that the samples are traceable from the time of collection through analysis to the final result reporting. The chain-of-custody procedures that were developed and applied to the RI/FS program will be followed during the sampling and analysis of soil and debris. This chain-of-custody program is presented in the SCQ, Section 7.

6.5 Analytical Procedures

The following subsections provide the analytical methodologies that will be used to determine the specific constituent concentrations for both soil and debris materials. Hazardous waste constituents will be analyzed according to the US EPA Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846) procedures. Radionuclide activities will be counted based on procedures specified in the FEMP SCQ. However, the data will also be used to support the RI/FS activities. In addition, hand-held field instruments will be used to perform radiological surveys and chemical vapor screening prior to and during soil and debris removal operations. For example, a radiation detector will be used to assess radiological contamination, and a photoionization detector (i.e., an HNu) or a flame ionization detector (i.e., organic vapor analyzer) will be used to detect the presence of organic constituents. The analytical results from the field instruments will also be used to confirm historical and process information.

6.5.1 Soil Analysis

Appendix K of the SCQ specifies sample container and preservation requirements. Soil samples for hazardous waste constituents can be stored in pre-washed plastic or glass containers. The samples should be stored at 4 degrees C. The sample will be prepared for analysis by the TCLP as specified in 40 CFR 261 Appendix II. Preservatives must not be added to samples before extraction. TCLP extracts should be prepared for analysis (and be analyzed) as soon as possible following extraction. Extracts for metallic analysis should be acidified with nitric acid to a pH that is less than 2.0. Extracts for other analytes should be preserved in accordance with the guidance from the specific analytical methodology. This procedure will result in the preparation of the sample for chemical analysis by techniques specified in SW-846. Table 6-2 provides US EPA-approved methods that can be used to determine concentrations of hazardous constituents. Table 6-3 provides methodologies that may be utilized to analyze the concentrations of radioactivity. A sufficient volume of soil should be collected for the required analytical procedures. At least a 250 ml sample should be collected for metal analysis. An additional 250 ml

sample should be collected for hydrocarbon analysis. Two 40 ml samples will be collected for volatile organic analysis. (Additional analyses described in Section 3.4, if specified, will require approximately 2,000 grams.)

6.5.2 Debris Analysis

The same analytical procedures that are used for soils may also be used for debris. However, as discussed in Section 6.3.2, the sampling procedures differ. Sample preparation prior to analysis may differ in that some debris materials may require pulverizing or crushing prior to the TCLP procedure.

6.6 Quality Assurance

Laboratories in the US EPA Contract Laboratories Program (CLP) must follow specific analytical methods and QA/QC standards. These standards specified in the CLP Statement of Work for Organic and Inorganic Analyses and are audited by the US EPA. CLP protocols do not include radioanalytical procedures, which are necessary due to the radioactive components in FEMP wastes. To address this problem, WEMCO has developed CLP equivalent sampling protocols which are included in the SCQ.

DOE Order 5400.1 requires all DOE and contract laboratories that conduct radiological analyses for environmental monitoring programs participate in the DOE Interlaboratory Quality Assurance Program. This program is coordinated by the DOE Environmental Measurements Laboratory (EML). Under this program, the DOE-EML submits (semi-annually) samples of various environmental matrices to participating laboratories for analyses of a variety of radionuclides. A report listing the performance of each participating laboratory is distributed semi-annually by the DOE-EML. The FEMP Analytical Laboratories are participating in the DOE-EML Interlaboratory QA Program on a continuing basis. The off-site contract laboratory that conducts radiological analyses for the FEMP also participates in the DOE-EML program. The quality assurance procedures that have been applied to the RI/FS program will be utilized during the sampling and analysis of soil and debris. This QA program is specified in the SCQ.

6.7 Data Validation, Manipulation, and Management

Section 11 of the SCQ will dictate how the analytical results are validated and reported.

The results that are provided by the laboratory will be statistically analyzed to determine if the soil and debris contain hazardous waste or are contaminated with CERCLA hazardous substances with respect to regulatory limits. Soil and debris will be assessed for radioactive contamination. A mean will be calculated for each contaminant and will be compared to the regulatory limit or 100 pCi/g concentration. Statistical analysis between the calculated mean value and the limit may be required to determine whether

there is a significant difference at a 95 percent confidence level. A Students "t" test will be used to perform the statistical analysis. The analytical results will also be entered into the computerized database for record keeping and future risk analysis work.

Table 6-2 - Methods for Determining Concentrations of Hazardous Constituents for Parameters Commonly Detected in the RI/FS Analysis

Constituent	SW-846 Method of Analysis	Procedure
Arsenic	7060 7061	AA Furnace AA Gaseous Hydride
Barium	7080 6010	AA Direct Aspiration ICPAES
Cadmium	7130 7131 6010	AA Direct Aspiration AA Furnace ICPAES
Chromium	7190 7191 6010	AA Direct Aspiration AA Furnace ICPAES
Chromium (hexavalent)	7195 7196 7197 7198	Coprecipitation Colorometric Chelation/Extraction Differential Pulse Polargraphy
Lead	7420 7421	AA Direct Aspiration AA Furnace
Mercury	7471 6010	Manual Cold Vapor ICPAES
Selenium	7740 7741	AA Furnace AA Gaseous Hydride
Silver	7760 6010	AA Direct Aspiration ICPAES
1,1,1 - trichloroethane	8010 8240	Gas Chromatograph GC/MS
Tetrachloroethylene	8101 8270	Gas Chromatograph GC/MS
Trichloroethylene	8010 8270	Gas Chromatograph GC/MS
Polychlorinated Biphenyl	Site Method FM-ORG-0030 or 8080	Gas Chromatograph

Notes: AA = Atomic Adsorption
ICPAES = Inductively Coupled Plasma Atomic Emission Spectroscopy
GC/MS = Gas Chromatography/Mass Spectrometry
This represents the most common contaminants detected in RI/FS analysis at the FEMP. A complete list of RCRA hazardous constituents and CERCLA hazardous substances is given in Appendix IX of 40 CFR 264 and the HSL.

Table 6-3 - Methods for Determining Radionuclide Concentrations

Radionuclide	Method
U-238	RSL-304
U-234	RSL-304 & RAD-0110
U-235	RSL-304 & RAD-0110
Th-230	RSL-304
Ra-226	RSL 309 & RAD-0065
Pb-210	RSL-315
Pa-231*	RSL-112 or calculate*
Ac-227	RSL-304
Sr-90	RSL-305
Tc-99	RSL-310
Cs-137	RSL-112
Ru-106	RSL-112
Np-237	RSL-7103
Gross Alpha	RSL-308
Gross Beta	RSL-308
Th-232	RSL-304
Th-228	RSL-304
Ra-228	RSL-309
Th-234	RSL-304 or calculate*

Notes: Method RSL-201 is a technique that is typically used to prepare radioactive samples for analysis.

RSL Procedures will be conducted in accordance with IT/RSL Radioanalytical Methodology and Procedures Manual.

RAD treatment methods can be referenced from the Fernald Laboratory Analytical Method.

*The FEMP laboratory prefers that concentrations of Pa-231 be calculated from U-235 activities, and that concentrations of Th-234 be calculated from U-238 activities.

SECTION 7

REFERENCES

The following references were reviewed while preparing the Removal Action Work Plan. Some of the references are cited for use in accordance with the work plan. These references are available from the FEMP upon request.

(DOE 1992) US DOE, July 15, 1992. *Sitewide CERCLA Quality Assurance Plan, Final Draft, Fernald: US DOE, FEMP(FD-100).*

(PARSONS 1992) PARSONS, March 1992. Engineering Evaluation for Improved Storage of Soil and Debris, Removal Action 17.

(US EPA 1989a) *United States Environmental Protection Agency, February 1989. Methods for Evaluating the Attainment of Clean-Up Standards, Volume 1: Soils and Solid Media. EPA 230/02-89-042.*

(US EPA 1989b) -----, 1989. *RSIC Computer Code Collection.* AIRDOS-PC, Oak Ridge National Laboratory.

(US EPA 1990) -----, September 1990. *Superfund LDR Guide #6A (2nd Edition) Obtaining a Soil and Debris Treatability Variance for Remedial Actions.* OWSER 9347.3-06FS.

(US EPA 1991) ----- - Region V, 1991. *U.S. Department of Energy, Feed Materials Production Center, Fernald, Ohio (OHG 890 008 976), Consent Agreement as Amended Under CERCLA Sections 120 and 106(a).* Administrative Docket Number: V-W-90-C-057.

(WEMCO 1991a) Westinghouse Environmental Management Company of Ohio, October 22, 1991. *Completing the Material Evaluation Form.* SSOP-0002.

(WEMCO 1991b) -----, August 23, 1991. *FEMP Lot Marking and Color Coding System.*

(WEMCO 1991c) -----, December 6, 1991. *Removal Site Evaluation - Improved Storage of Soil and Debris.*

(WEMCO 1991d) ----, November 27, 1991. *Controlling the Generation of Construction/ Maintenance Waste*. SSOP-0044.

(WEMCO 1992e) ----, November 27, 1991. *Quality Assurance Project Program Description, Fernald: WEMCO(RM-0012)*.

(WEMCO 1992a) ----, January 22, 1992. *Radiological Contamination Surveys*. SP-P-35-023.

ATTACHMENT A

REMOVAL SITE EVALUATION

REMOVAL SITE EVALUATION

for the

IMPROVED STORAGE OF SOIL AND DEBRIS

Fernald Environmental Management Project

Fernald, Ohio

Introduction

This Removal Site Evaluation is presented to assist the lead agency in determining the necessity for a removal action to address the potential threat of a release affected by the storage of soil and debris at the Fernald Environmental Management Project (FEMP).

Source Term

Storage of contaminated soil and debris presents a potential threat of a release. The soils and debris generated at the FEMP are typically contaminated with CERCLA regulated hazardous substances. The potential exists for the migration of airborne or waterborne contaminants from soil and debris stockpiles to the surrounding environment. Weather conditions and or physical movement of the soils and groundwater on or by personnel and equipment are the potential causes of this migration.

Evaluation of the Magnitude of the Potential Threat

The magnitude of the potential threat of migration of contamination from the soil and debris is significant. Surface runoff could potentially carry significant amounts of contaminants from soil and debris stockpiles into surface runoff structures or into the area groundwater. Wind conditions could create airborne particulates which have a widespread potential for migration. In an attempt to significantly reduce this potential threat, a course of action is being undertaken which will significantly improve the soil and debris handling and storage methods at the FEMP.

Assessment of the Need for a Removal Action

Consistent with Section 40 CFR 300.65 of the National Contingency Plan, the Department of Energy (DOE) shall determine the appropriateness of a removal action. Eight factors to be considered in this determination are listed in 40 CFR 300.65 (b) (2). The following apply specifically to improvement of soil and debris storage methods:

<u>40 CFR 300.65 (b) (2) (i)</u>

Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations, animals, or food chain.

<u>40 CFR 300.65 (b) (2) (ii)</u>

Actual or potential contamination of drinking water supplies or sensitive ecosystems.

<u>40 CFR 300.65 (b) (2) (v)</u>

Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.

Appropriateness of a Response

If it is determined that a response is appropriate due to the potential for contaminant migration, a removal action may be required to address the situation. If a planning period of less than six months exists prior to initiation of a response action, COE will issue an Action Memorandum. This Action Memorandum will describe the selected response and provide supporting documentation for the decision.

If it is determined that there is a planning period greater than six months before a response is initiated, COE will issue an Engineering Evaluation/Cost Analysis (EE/CA) Approval Memorandum. This memorandum is to be used to document the threat to public health and the environment. It will also serve as a decision document to be included in the Administrative Record.

ATTACHMENT B

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ATTACHMENT B
APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

CATEGORY	REGULATORY REQUIREMENTS	IMPLEMENTATION STRATEGY
Improved Storage Structures - Aisle Space	All personnel must have immediate access to emergency communication or alarm systems whenever hazardous waste is being handled at the facility. Aisle space must be sufficient to allow unobstructed movement of personnel, fire and spill control, and decontamination equipment. 40 CFR 264.34 and 264.35 {OAC 3745-34 and 35} [Applicable]	Alarm systems will be present at the administrative trailer for the Central Storage Facility. The floor plan of the improved storage facilities (containment structures) will allow for sufficient aisle space. In-place structures will be provided with access roadways around the perimeters of the structures
Improved Storage Structures - Containment	The storage area must have a containment system that is designed and operated to drain and remove accumulated liquids (i.e., slope containment area, elevate or protect containers from contact with accumulated liquids). If the storage area is used to store containers holding free liquids <u>or</u> F020, FO21, F022, F023, F026, or F027 (liquid or solid), the containment system must also: (1) be free of cracks and gaps and be sufficiently impervious to contain accumulated liquids until they are removed, (2) have a capacity to contain the larger of either 10% of the volume of the containers which hold free liquids or the volume of the largest container which holds free liquids, (3) prevent runon from entering the containment system unless it has sufficient capacity to accommodate any runon which may enter the containment area, and (4) be operated to remove accumulated liquids in a timely manner to prevent overflow of the collection system. 40 CFR 264.175 {OAC 3745-55-75} [Applicable]	Containers holding F020, F021, F023, F026, or F027 listed hazardous waste will not be stored in the improved storage facilities. However, the improved storage facilities will be designed to comply with these containment provisions. The containment structures will have an impervious diked foundation which slopes to a sump. A portable pump will be provided to remove any collected liquid. Both the containment and in-place structures will have berms or site grading to prevent runon from entering the facilities.
Improved Storage Structures - Final Closure	At closure, all hazardous waste and residues must be removed from the containment system. Contaminated structures, liners, bases, waste containers, and soils must be removed or decontaminated. 40 CFR 264.178 and 264.258 {OAC 3745-55-78 and 3745-56-58} [Applicable]	Provisions for waste removal, decontamination, and facility closure will be identified as part of the final remediation program for OU-3.

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CATEGORY	REGULATORY REQUIREMENTS	IMPLEMENTATION STRATEGY
Improved Storage Structures - Security Fencing	A physical barrier (e.g., fence) or 24-hour surveillance system must be provided to control the unknowing or unauthorized entry of persons or livestock onto the active portion of the storage facilities. Signs (legible from a distance of 25 feet) must be posted at each entrance to the active portion and at other locations as required by 40 CFR 264.14(c). 40 CFR 264.14 {OAC 3745-54-14} [Applicable]	The fence surrounding the FEMP is adequate to restrict access to the improved storage facilities. Warning signs (indicating the potential presence of hazardous waste) will be posted at each entrance in the improved storage facility.
Improved Storage Structures- Siting (Endangered Species)	The removal action shall mitigate any adverse impact which may affect the continued existence of any endangered species or threatened species. The removal action shall also not result in the destruction or adverse modification of a critical habitat. Endangered Species Act 16 USC 1531 [Applicable]	There are no federally listed threatened or endangered species at the FEMP or its immediate vicinity. Therefore, neither notification nor mitigative measures are required for this removal action (Initial Screening of Alternatives for OU-5, December 1991).
Improved Storage Structures - Siting (Historic Sites)	The Secretary of the Interior must be notified in writing whenever DOE finds or is notified in writing by an appropriate historical or archaeological authority that the activities in connection with a project may cause irreparable loss or destruction of significant scientific, prehistorical, historical, or archaeological data. National Historic Preservation Act, 16 USC 470 [Applicable]	There are no known sites of historical or archaeological significance at the FEMP. Therefore, neither notification nor mitigative measures are required for this removal action (Initial Screening of Alternative for OU-5, December 1991).

ATTACHMENT B APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS		
CATEGORY	**REGULATORY REQUIREMENTS**	**IMPLEMENTATION STRATEGY**
Improved Storage Structures - Siting (Floodplains and Wetlands)	Storage facilities are not to be located in a 100-year floodplain unless the storage facilities are designed, constructed, operated, and maintained to prevent wash-out of any hazardous waste. 40 CFR 264.18(b) {OAC 3745-54-18(b)} [Applicable] Adverse impacts to floodplains and wetlands are to be avoided. If it is necessary to locate an improved storage facility within a floodplain or wetland, the impacts must be minimized. A floodplain or wetland assessment must be published in the Federal Register prior to taking any action within the floodplain/wetland to allow time for public review and comment. 10 CFR 1022 [Applicable] Federal agencies are to avoid construction within a floodplain or wetland unless there are no practicable alternatives and all practicable measures are included in the construction project to minimize any impacts to the floodplain or wetland. A public notice (with prescribed contents) and opportunity for public comment provided. Executive Orders 11988 and 11990 [To Be Considered]	Jurisdictional wetlands occupy areas along the railroad on the north side of the FEMP, along Paddy's Run, and in several drainage ways. These areas, as well as those within a 100-year floodplain, will be avoided in siting any storage facilities.
Improved Storage Structures - Siting (Seismic)	Storage facilities for hazardous waste shall not be located within 200 feet of a fault which has had displacement in the Holocene time. 40 CFR 264.18(a) {OAC 3745-54-18(a)} [Applicable]	The FEMP is not located in political jurisdictions identified in 40 CFR 264, Appendix VI. As allowed by 40 CFR 264.18(a), facilities not listed in Appendix VI are assumed to be in compliance with this seismic requirement.

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CATEGORY	REGULATORY REQUIREMENTS	IMPLEMENTATION STRATEGY
Improved Storage Structures - Waste Piles (In Place)	Any hazardous waste pile that is inside or under a structure that provides protection from precipitation, is not subject to the waste pile design requirements (40 CFR 264.251) or groundwater monitoring requirements (40 CFR 264, Subpart F), provided that: 1) Liquids or materials containing free liquids are not placed in the pile, 2) The pile is protected from surface water runon 3) Wind dispersal is controlled by means other than wetting, and 4) Leachate will not be generated through decomposition or other means. 40 CFR 264.250 {OAC 3745-56-50} [Applicable]	All hazardous waste will be placed inside an improved storage structure. Bulk liquids and bulk materials containing free liquids will not be placed within in-place containment structures. The improved storage facility will have a curb/barrier around the entire base of the facility to prevent runon. Wind dispersal will be controlled by the enclosed building and closing of access doors when required. The soil and debris will not contain any material which will generate leachate through decomposition.
Improved Storage Structures - Asbestos Handling	Asbestos waste generated must be disposed in accordance with OAC 3745-20-06. No visible emissions during the collection, processing, packaging, transporting, or disposition of any asbestos-containing waste material. Waste material shall be sealed into durable leak-tight disposal containers or an approved alternative disposal system. Containers must be labeled in accordance with this section OAC 3745-20-06 [Applicable]	The Central Storage Facility will accept friable and nonfriable asbestos. One of the methods below will be used if the material contains friable asbestos. 1) Adequately wet asbestos-containing waste material and seal the material into durable lead-tight disposal containers or enclosure system in accordance with Paragraph (C) 3745-20-04. 2) For facilities demolished in accordance with Paragraph (A)(1)(a) of Rule 3745-20-04 or Paragraph (C) of Rule 3745-20-04 of the Ohio Administrative Code, where asbestos was not removed prior to dismantling, keep asbestos-containing dismantling debris adequately wet or encapsulated until collected for disposal. 3) Process friable asbestos-containing waste material into nonfriable forms, such a nonfriable pellets or other shapes.

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CATEGORY	REGULATORY REQUIREMENTS	IMPLEMENTATION STRATEGY
Management Plan-General	Management of contaminated debris shall be in accordance with the provisions of the final rule for Land Disposal Restrictions for Newly Listed Wastes and Contaminated Debris. 40 CFR 260.10 and 264, Subpart DD [Applicable] Hazardous and mixed waste management activities shall be implemented according to the DOE hazardous waste management procedures for facilities operated under the authority of the Atomic Energy Act of 1954, as amended. DOE Order 5480.2 [To Be Considered]	All design activities shall be implemented according to the DOE hazardous waste management procedures. Work Plan will incorporate the proposed management requirements for contaminated debris. Also, the use of "containment buildings" *for the storage of material containing hazardous waste*, as specified by this rule, have been incorporated. *The containment buildings are not considered to be land disposal units and are exempt from waste pile requirements as well as the RCRA Land Disposal Prohibition.*
Management Plan-PCB-contaminated Material	PCB-contaminated material will be managed in accordance with 40 CFR 761 40 CFR 761 [Applicable]	Procedures to manage PCB-contaminated material are located in Section 3.
Management Plan-Petroleum-Contaminated Material	Petroleum-contaminated material will be managed in accordance with OAC 1301:7. OAC 1301:7 [Applicable]	Procedures to manage petroleum-contaminated material are located in Section 3.

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CATEGORY	REGULATORY REQUIREMENTS	IMPLEMENTATION STRATEGY
Management Plan - Ignitable, Reactive, and Incompatible Waste	Ignitable and reactive waste must be separated and isolated from sources of ignition or reaction according to 40 CFR 264.17(a). Containers with ignitable or reactive waste must be located at least 50 feet from the FEMP property boundary. Ignitable waste cannot be placed on the waste pile unless: 1) 40 CFR 268 is complied with, and 2) The ignitable and reactive characteristics are eliminated and the provisions of 40 CFR 264.17(b) are met, or the waste is managed to prevent ignition or reaction. Precautions shall be taken to ensure that incompatible wastes are not mixed together which could cause any of the conditions identified in 40 CFR 264.17(b). Incompatible materials must be separated from each other by distance, or a dike, berm, wall, or other device. 40 CFR 264.17, 264.176, 264.177, 264.256, and 264.257 {OAC 3745-54-17, 3745-55-76 and 77, and 3745-56-56 and 57} [Applicable]	Waste segregation will be based upon process knowledge and/or characterization information. It is expected that all of the soil and debris wastes will neither be ignitable, reactive, or incompatible. Any waste which is suspected of being ignitable or reactive will not be placed into an improved storage structure. The guidelines identified in 40 CFR 264 Appendix I will be followed to ensure that incompatible wastes are not mixed together.
Management Plan - Land Disposal Restrictions (Storage)	Except as provided in Section 40 CFR 268.50, the storage of a restricted hazardous waste beyond one year is prohibited. 40 CFR 268.50 {OAC 3745-59-50} [Applicable]	*This removal action requires that contaminated soil and debris be stored until they are addressed in the remediation effort. This storage exceeds the one-year limit specified under this regulation.*
Management Plan - Land Disposal Restrictions (Dilution)	A restricted waste or the residue from the treatment of a restricted waste shall not be diluted in any way to achieve compliance with the required LDR treatment standards. 40 CFR 268.3 {OAC 3745-59-03} [Applicable]	Soil and debris stored in improved storage facilities will be remediated in accordance with the method specified in the Record of Decision.

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CATEGORY	**REGULATORY REQUIREMENTS**	**IMPLEMENTATION STRATEGY**
Management Plan - Off-site Transport	Any generator who transports hazardous waste for off-site treatment, storage, or disposal must use a manifest to track and record each waste shipment. 40 CFR 262, Subpart B {OAC 3745-52-20 to 23} [Applicable] Before transporting, a hazardous waste must be packaged, labelled, marked, and placarded in accordance with 40 CFR 262.30 to 33 and applicable Department of Transportation regulations (49 CFR Parts 172, 173, 178, and 179) 40 CFR 262.30 to 262.33 {OAC 345-52-30 to 33} [Applicable]	As required by Section IX.E of the Consent Agreement, all materials removed from the FEMP will be managed in compliance with applicable provisions of RCRA and other Federal and State requirements, including the US EPA's Off-Site Policy (Revised Procedures for Planning and Implementing Off-Site Response Action - Interim Policy, from J. Winston Porter, dated November 13, 1987). For any hazardous waste shipped off site, the applicable RCRA and DOT transportation regulations will be met.

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CATEGORY	REGULATORY REQUIREMENTS	IMPLEMENTATION STRATEGY
Management Plan - Residual Contamination	The management and free release of wastes, residues, structures, equipment, and other property shall adhere to the radiological protection requirements and guidelines described in DOE Order 5400.5. DOE Order 5400.5, Chapter IV [To Be Considered] Remedial actions shall be conducted so as to provide reasonable assurance that the residual radioactivity in any occupied or habitable building, the annual average (or equivalent) radon decay product concentration (including background) shall not exceed 0.02 WL. In any case, the average shall not exceed 0.03 WL. The level of gamma radiation shall not exceed the background level by more the 20 microroentgens per hour. Guidance for implementation of this standard and criteria for establishing alternative limits are described in 40 CFR 192, Subpart C. 40 CFR 192, Subparts B and C [Relevant and Appropriate] Remedial actions shall be conducted so as to provide reasonable assurance that the residual radioactivity of the soil shall have a concentration of Ra-226, in land greater than 100 m^2, less than 5 pCi/g above background averaged over the first 15 cm of soil and 15 pCi/g above background averaged over each 15 cm-thick soil layer which is more than 15 cm below the surface. Guidance for implementation of this standard and criteria for establishing alternative limits are described in 40 CFR 192, Subpart C. 40 CFR 192, Subparts B and C [Relevant and Appropriate] A reasonable effort shall be made to eliminate residual contamination and to achieve the acceptable surface contamination levels as stated in the US NRC Regulatory Guide 1.86. US NRC Regulatory Guide 1.86 [To Be Considered]	Radiation surveys will be performed prior to releasing any potentially contaminated materials off site to demonstrate compliance with the specified standards. These surveys should show compliance averaged over limited areas rather than point-by-point compliance. Procedures for the measurement of gamma radiation exposure rates above and below the surface shall be based on realistic radium distributions near the surface.

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CATEGORY	REGULATORY REQUIREMENTS	IMPLEMENTATION STRATEGY
Management Plan - Waste Analysis	Detailed chemical and physical analysis of a representative sample must be obtained prior to storage of any waste. A Waste Analysis Plan (WAP), specifying the sampling and analytical procedures, and rationale and frequency for analysis, must be prepared in accordance with 40 CFR 264.13. 40 CFR 264.12 {OAC 3745-54-13} [Applicable]	The FEMP will assess the contaminants within soil and debris by examining both the RI/FS database and process/historical records. If this information is not sufficient for waste characterization, then sampling and analysis will be performed to supplement the characterization effort. Attachment 2 provides guidance for sampling and analysis procedures.
Management Plan - Waste Determination	A person who generates a solid waste must determine if that waste is a hazardous waste using the procedures identified in 40 CFR 262.11 40 CFR 262.11 {OAC 3745-52-11} [Applicable]	Soil and debris will be assessed by the specific project for hazardous wastes by review of the RI/FS database, review of process/historical records, and sampling and analysis (as required). Attachment 2 provides a sampling and analysis plan to guide required characterization studies.

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CATEGORY	REGULATORY REQUIREMENTS	IMPLEMENTATION STRATEGY
Operational - Air Discharges (Fugitive Dust)	The emission or escape into open air from any source whatsoever in such a manner or in such amounts as to endanger the health, safety, or welfare of the public or to cause unreasonable injury or damage to property shall be declared a public nuisance and is prohibited. OAC 3745-15-07 and ORC 3704.03(E) [Applicable] The significant and avoidable deterioration of air quality shall be prohibited. OAC 3745-17-05 [Applicable] For those communities and areas identified in OAC 3745-17-08, Appendix A, the visible emissions of fugitive dust generated during grading, loading, or construction operations and other practices which emit fugitive dust are to be minimized or eliminated. The FEMP is not within a community of area identified in Appendix A; however, the remedial construction activities may generate fugitive dust. As such, this requirement is deemed to be relevant and appropriate due to potential fugitive dust generation during construction activities. OAC 3745-17-08 [Relevant and Appropriate]	Visible emissions will be mitigated during construction using standard construction practices such as water sprays. Wind dispersal of the soil and debris piles will be controlled by the enclosed building and the closing of access doors when required. There will not be wind dispersal control mechanisms for the controlled stockpile because the dose-based risk assessment establishes a limit that is protective of human health and the environment.

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CATEGORY	**REGULATORY REQUIREMENTS**	**IMPLEMENTATION STRATEGY**
Operational - Air Discharge (Radionuclides)	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, in any year, an effective dose equivalent of 10 mrem per year above background. This limit is based on an effective dose equivalent as calculated per the International Commission on Radiological Protection's Publication, No. 26. Modeling and sampling procedures are specified in 40 CFR 61.93. An annual report must be submitted to EPA headquarters and regional offices by June 30. This report includes the monitoring results, as recorded in DOE's Effluent Information System, and the effective dose equivalent calculation, as required by 40 CFR 61.93, for the previous year. Records, as specified under 40 CFR 61.95, must be maintained for at least 5 years. 40 CFR 61, Subpart H [Relevant and Appropriate] DOE Order 5820.2A, Chapter III.3.a.2 [To Be Considered]	Ambient air monitoring will be conducted at the FEMP using the existing sitewide monitoring stations and programs. The results of this monitoring program are provided to the US EPA on an annual basis. [Note: WEMCO-Environmental Compliance will propose this compliance strategy to the US EPA during FY92.]
Operational - Container Management	Containers of RCRA hazardous waste must be: 1) Maintained in good condition 2) Compatible with hazardous waste to be stored 3) Closed during storage (except to remove old waste) 4) Managed to prevent rupture 40 CFR 264.171 to 264.173 {OAC 3745-55-73} [Applicable]	Containers will be periodically inspected and records of these inspections will be kept.

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CATEGORY	REGULATORY REQUIREMENTS	IMPLEMENTATION STRATEGY
Operational - Emergency Planning	The improved storage facilities must be designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release. Unless demonstrated otherwise, the following equipment must be provided: (1) an internal communications or alarm system, (2) telephone or two-way radio to summon emergency assistance, (3) portable fire extinguishers, spill control equipment, and decontamination equipment, and (4) water at adequate volume and pressure. Arrangements must be made with the local authorities to ensure proper emergency planning procedures. Procedures need to be consistent with existing arrangements. 40 CFR 264, Subpart C {OAC 3745-54-30 to 37} [Applicable]	The existing sitewide internal communication/alarm system will be extended to the improved storage facility office trailer. The small office trailer will be provided to house administrative functions, which will be equipped with telephone service. Portable fire extinguishers will be provided on the material handling equipment to extinguish equipment fires. The existing sitewide spill control and decontamination equipment will be available to respond to any incidents. A fire sprinkler system will not be provided since uncontainerized ignitable and reactive waste will be prohibited; the soil and debris are expected to be nonflammable.
Operational - Emergency Planning	A Contingency Plan and Emergency Procedures are to be developed for the storage facilities in accordance with 40 CFR 264, Subpart D. The emergency procedures will include procedures for notifying off-site officials in the event of a situation which could threaten human health or the environment, as required by 40 CFR 264.56(d). 40 CFR 264, Subpart D, {OAC 3745-54-50 to 56} [Applicable]	The existing RCRA Part B Contingency Plan and Emergency Procedures will be followed for any hazardous waste release associated with the improved storage facilities.
Operational - Groundwater Monitoring	A detection groundwater monitoring program must be developed to ensure that the specified groundwater protection standard is not exceeded. The monitoring program is to consist of a list of monitoring parameters and associated limits, monitoring frequency, sampling and analytical procedures, and statistical evaluation procedures. Groundwater monitoring wells are to be provided at the point of compliance in sufficient numbers and locations to allow detection of contaminant migration from the facility into the uppermost aquifer. 40 CFR 264, Subpart F {OAC 3745-54-90 to 99} [Applicable]	The existing sitewide groundwater monitoring program will be used to ensure that the groundwater protection standard is not exceeded.

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ATTACHMENT B APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS		
CATEGORY	**REGULATORY REQUIREMENTS**	**IMPLEMENTATION STRATEGY**
Operational - Inspections	The improved storage facility must be inspected to prevent an event which may cause the release of hazardous waste constituents to the environment or pose a threat to human health. The inspection items and frequencies are to be specified in an Inspection Plan. All inspections are to be recorded and maintained in an inspection log. Inspection items are to include: (1) testing and maintenance of emergency equipment (including facility communications, alarms, and decontamination equipment), (2) weekly inspections of the containers and containment system for leaks and deterioration and (3) proper functioning of runon controls. 40 CFR 264.15, 264.33, 264.174, and 264.254 {OAC 3745-54-15, 3745-54-33, 3745-55-74, and 3745-56-54} [Applicable]	The Inspection Plan for the Improved Storage Structures is presented in Section 3. All requirements on these provisions have been included in this plan.
Operational - Public Health and Environment	The total effective dose equivalent to members of the public is limited to 100 mrem in a year, exclusive of the disposal for radioactive material into sanitary sewage in accordance with 10 CFR 20.2003. The dose in unrestricted areas in limited to 2 mrem in 1 hour. 10 CFR 20 Subpart D [Relevant and Appropriate] Operations must be in accordance with the requirements of DOE Order 5400.5, Chapter II involving DOE public dose limit for all exposure modes and DOE sources of radiation. DOE Order 5400.5, Chapter II.1.a [To Be Considered]	The improved storage facilities will be designed and operated to minimize the release of radionuclides. The radiological discharges will be estimated in order to qualitatively determine the impact of the facility upon the off-site residents. Compliance will be demonstrated by sitewide environmental monitoring (including air, soil, and groundwater). Reports summarizing the sitewide monitoring results will be submitted annually to the EPA.

ATTACHMENT B
APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

CATEGORY	REGULATORY REQUIREMENTS	IMPLEMENTATION STRATEGY
Operational - Records	An operating record must be written and maintained until closure of a hazardous waste storage facility. The operating record is to include the following reports: (1) storage records (type, quantity, location, manifest number, dates, and storage method) for each waste shipment, (2) waste analysis, (3) contingency plan incidents, (4) inspection reports, (5) groundwater monitoring results, (6) annual waste minimization certificate, (7) LDR waste analysis certification, and (8) training records. The operating record is to be available for on-site inspection by US EPA/Ohio EPA. A biennial report is to be submitted to US EPA/Ohio EPA in accordance with 40 CFR 264.75. 40 CFR 264, Subpart E {OAC 3745-54-73 to 77} [Applicable] Record keeping must be performed according to DOE Order 5820.2A which specifies that records must be maintained from generation through final disposal. The specific data requirements are physical/chemical characteristics, quantity of radionuclides, waste volume, and other data necessary to demonstrate compliance with waste acceptance criteria. DOE Order 5820.2A Chapter III.9m [To Be Considered]	Current FEMP procedures for preparing and maintaining these operating records will be followed.
Operational - Records	Generators must keep copies of the following documents for 3 years: 1) Manifests 2) Biennial and exception reports 3) Test results, waste analyses, or other determination made in accordance with 40 CFR 262.11 Generators must submit biennial reports by March 1 of each even numbered year. Generators must submit exception reports within 35 days of shipment. 40 CFR 262, Subpart D {OAC 3745-52-40-42} [Applicable]	Current FEMP procedures for preparing and maintaining these operating records will be followed.

ATTACHMENT B
APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

CATEGORY	REGULATORY REQUIREMENTS	IMPLEMENTATION STRATEGY
Operational - Stormwater Monitoring	Industrial facilities (as defined in 40 CFR 122.26) are required to submit a NPDES Stormwater Discharge Permit Application to the US EPA by October 2, 1992. This permit application is to identify the sitewide monitoring program (including monitoring parameters and locations) for all stormwater discharges. 40 CFR 122.26 [Applicable]	The stormwater resulting from the improved storage facilities will be monitored in accordance with the monitoring program being established pursuant to the sitewide NPDES Stormwater Discharge Permit Application.
Operational - Worker Training	All storage facility personnel must be trained within 6 months from their date of hire or reassignment, and participate in annual reviews. The training requirements are to be specified in a Training Plan. Employees hired after April 15, 1981, are not to work unsupervised unless the requirements of OAC 3745-54-16(A) are fulfilled. 40 CFR 264.16 {OAC 3745-54-16} [Applicable]	Employees who will operate the improved storage facilities will receive the required training.
Operational - Worker Protection (Hazardous Substances)	Employers shall develop and implement a written safety and health program for their employees involved in hazardous waste operation. All occupational safety and health requirements of 29 CFR Parts 1910 and 1926 are to be followed. If there is a conflict or overlap, the most protective provision shall apply. 29 CFR 1910.120 [Relevant and Appropriate]	This removal action will be conducted in accordance with the provisions of the FMPC site Health and Safety Plan (WEMCO, June 1990). As required to 29 CFR 1910.120(b)(4), a task-specific health and safety plan will be developed for this removal action.

ATTACHMENT B APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS		
CATEGORY	**REGULATORY REQUIREMENTS**	**IMPLEMENTATION STRATEGY**
Operational - Worker Protection (Radiation)	The occupational radiation doses specified in 10 CFR 20, Subpart C, shall be followed. Although the radiation protection standards promulgated under 10 CFR 20, Subpart C, are only applicable to NRC licensed facilities, these protection standards are deemed to be relevant and appropriate for individuals entering a radiologically controlled area at the FEMP. Radiation surveys and monitoring will be provided, with the appropriate records kept. Also, control of access to areas of radiation will be implemented. Persons in controlled areas will be provided respiratory protection, if necessary. Reports of exposures, radiation levels, and concentrations of radioactive material exceeding the limits will be kept. These standards are mandatory after January 1, 1993, with early compliance encouraged. 10 CFR 20, Subparts C, F, G, H, L, and M [Relevant and Appropriate] At DOE facilities, the radiation protection standards contained in DOE Order 5480.11 for occupational workers, unborn children, minors, and on-site members of the public shall not be exceeded. DOE Order 5480.11 [To Be Considered]	The existing FEMP radiation protection program is being implemented under DOE Order 5480.11. This program is consistent with the requirements of 10 CFR 20. Occupational workers and on-site members of the public shall be required to wear dosimeters and personal protection equipment when entering a radiologically controlled area. Radiation monitoring shall also be required for all individuals exiting a radiologically controlled area. Details regarding the personal protection and radiation monitoring requirements will be identified in the task-specific health and safety plan developed for this removal action.

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ATTACHMENT C

MANAGEMENT OF SOIL, DEBRIS, AND WASTE FROM A PROJECT (SSOP-0044)

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 1 of 32
Title: MANAGEMENT OF SOIL, DEBRIS, AND WASTE FROM A PROJECT		DOCUMENT NO: SSOP-0044 REVISION NO. 0
Authorization: H. F. Daugherty, President	Supersedes: SSOP-0044I, Dated 02-19-92	Effective Date: 06-19-92

1.0 PURPOSE

NON-CONTROLLED COPY

This procedure provides instructions for controlling and handling soil, debris, and waste from projects at the Fernald Environmental Management Project (FEMP), while maintaining standards for worker safety and environmental protection.

2.0 SCOPE

This procedure describes the requirements and responsibilities for controlling and handling the soil, debris, and waste from removal actions, construction projects, and planned maintenance activities at the Westinghouse Environmental Management Company of Ohio (WEMCO). This procedure provides a management method which minimizes the release of hazardous substances to the environment during construction maintenance, or removal action-excavation, and demolition activities.

3.0 DEFINITIONS

Administrative Record - An organized collection of records open to public review, that documents FEMP compliance with the requirements set forth by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) - The law that mandates the development of organizational structure and procedures to respond to releases, or threats of releases of hazardous substances or pollutants/contaminants.

Construction Excavation/Penetration Permit - A permit that lists known hidden hazards or obstructions in an area where excavation or penetration activities will take place.

Debris - Solid materials that have been manufactured or processed (excluding treatment residuals). Natural geological material that exceeds a 9.5 mm sieve size such as gravel, cobbles, and boulders, or an inseparable mixture of such material with soil, liquid, sludge, or other solid waste materials.

Disposition Location - A location designated on the Construction Waste Identification and Disposition (CWID) form for the storage or disposal of waste.

Fixed Contamination - Radioactive contamination that is not readily removable.

Future Use Material - Reusable material held for anticipated use in the plant and/or in projects.

3.0 DEFINITIONS (cont.)

Hazardous Substance - A substance designated for special consideration under the Clean Air Act, Clean Water Act, or Toxic Substance Control Act (TSCA), any waste that Resource Conservation and Recovery Act (RCRA) designates as hazardous, and any material that the Environmental Protection Agency (EPA) lists as presenting a substantial danger to health and the environment and a material, including its mixtures and solutions as listed in 49 CFR.

Hazardous Waste - Discardable material containing or exhibiting hazardous or toxic waste characteristics or listed as defined in Title 40 of the Code of Federal Regulations, Part 261 Resource Conservation Recovery Act (RCRA).

Metal Refuse - Metal not suitable for reclamation due to a hard-to-remove non-metallic wrapping, mixed metal composition, heavily rusted, less than 1/4-inch thick, or internal non-decontaminatable surfaces.

Mixed Waste - Contains RCRA constituents and radiological contamination.

Pollutant/Contaminant - A substance, not listed as hazardous, that may cause an adverse affect in organisms and/or the offspring of organisms if inhaled, absorbed, or ingested.

Project - For purposes of this procedure, project is defined as any (1) CERCLA Removal Actions, (2) Construction projects, or (3) maintenance activities.

Project Sampling Plan - A plan developed by Environmental Monitoring that specifies the sampling to be conducted for a specific operation.

Radioactive Contaminated Waste - Material such as concrete, liquid, or soil, that contain concentrations of radionuclides exceeding those specified in DOE Order 5400.5, "Radiation Protection of the Public and the Environment". Also non-bulk materials such as metal, which exhibit surface contamination in excess of unrestricted release criteria specified in Industrial Radiological Safety and Training (IRS&T) departmental procedures.

Recoverable Metals - Metals that are suitable for free release, reuse, or recycling.

RCRA Project File - A file that consists of a scope of work, "Construction Waste Identification/Disposition (CWID)" form, National Environmental Protection Agency (NEPA) documents, activity drawings, process knowledge, sampling plan, and analytical results.

3.0 DEFINITIONS (cont.)

Removable Contamination - Surface contamination that is readily removed using the filter paper smear technique.

Removal Site Evaluation (RSE) - The documented results of an inspection (if necessary) and assessment of a release or threat of release of a hazardous substance, pollutant, or contaminant to determine if a CERCLA response is required. The RSE is submitted to the Department of Energy (DOE) for review and is also maintained as a part of the Administrative Record File.

Resource Conservation and Recovery Act (RCRA) - The regulatory statute that mandates "cradle-to-grave" control of specified hazardous waste by imposing management requirements on generators, transporters, and owners/operators of treatment, storage, and disposal (TSD) facilities.

Rubble - Non-metallic and non-reusable material (such as tiles, gravel, concrete, asphalt, masonry) greater than 2 inches in thickness.

Soil - Unconsolidated earth material composing the surficial geologic strata, consisting of clay, silt, or gravel size particles (sizes as classified by the U.S. Soil Conservation Service). Soil may also include roots, grasses, weeds or leaves, a mixture of the above-mentioned materials with other liquids, sludges, or solids that are inseparable by simple mechanical removal process.

Toxic Substance Control Act (TSCA) - The law that enables the Environmental Protection Agency to control chemicals and substances, such as PCBs, dioxins, and asbestos, by requiring that all old and new materials entering the environment be tested. Also regulating the release of chemicals and substances when necessary.

Waste - Refuse or discarded materials that are abandoned, inherently waste-like, or recycled. Waste can be comprised of solids, liquids, or gases.

Waste Packaging Area - An area adjacent to the construction site where empty waste containers are filled with construction waste.

NOTE: The packaging area background radiation level shall not exceed limits established by IRS&T if waste will be transferred to a dedicated clean storage area or transported from the site.

Waste Sampling Request - Requirements provided by Environmental Engineering to Environmental Monitoring for number of samples, type, location, and lab analysis necessary to characterize project waste.

4.0 RESPONSIBILITIES

4.1 Project Management (PM) shall be responsible for the following:

4.1.1 Coordinating with representatives of other departments to plan construction waste handling, determine if material is reusable or waste, and discuss waste minimization options.

4.1.2 Initiating a request for RCRA Determination/Radiological Characterization (RD/RC) for a project.

4.1.3 Coordinating delivery of empty waste containers to the project site.

4.1.4 Monitoring subcontractor and FEMP employee compliance with the "Construction Environmental Safety and Health Work Survey" (CESHWS) (see Figure 1) and Construction Waste Identification/Disposition (CWID) (see Figure 2) to ensure contaminated construction waste is handled and packaged in accordance with Standard Operating Procedures.

4.1.5 Maintaining the "Property Disposal Log" and coordinating the sale or disposal of surplus material.

4.1.6 Ensure free liquids are removed from process equipment prior to project start. Provide signed documentation to Environmental Engineering and/or Facilities and Materials Evaluation for RCRA project file.

4.1.7 Ensuring that waste minimization is accomplished.

4.1.8 Obtaining approved on-site disposition locations from Environmental Engineering and Waste Management for waste generated from the project.

4.1.9 Notifying Materials Control and Accountability of the container serial number and getting the inventory number.

4.1.10 Preparing a "Property Disposal Request", Form FMPC-CONT-563 (see Figure 3) per applicable department procedures before equipment (tagged or untagged) is removed.

4.1.11 Instructing subcontractors to segregate clean packing and shipping materials to prevent contact with contaminated waste. Packing materials shall be removed, whenever possible, before entering a radiologically contaminated area.

4.0 RESPONSIBILITIES (cont.)

4.2 Environmental Engineering (EE) shall be responsible for the following:

4.2.1 Developing a RCRA project file for each project.

4.2.2 Ensuring that an adequate waste sampling request is developed.

4.2.3 Coordinating with the Project Management/Project Engineering to review the CWID form.

4.2.4 Responding to waste handling problems on a case-by-case basis.

4.3 Industrial, Radiological Safety and Training (IRS&T) shall be responsible for the following:

4.3.1 Performing preliminary surveys to assist in identifying contaminated locations and the quantity of contaminated construction waste that will be generated. This survey will also be used by Environmental Engineering to determine any sampling locations for waste characterization.

4.3.2 Surveying waste and debris generated during a project for surface contamination prior to releasing it as waste, and monitoring the site for radiological safety purposes.

4.3.3 Sampling asbestos material or material that may contain asbestos.

4.3.4 Arranging for laboratory analysis to determine the presence of asbestos in samples.

4.3.5 Notifying the Project Engineer or Planner/Estimator of asbestos sample analysis results.

4.3.6 Specifying protective equipment required for personnel handling asbestos, RCRA, mixed waste material, and/or radioactive material.

4.4 Environmental Monitoring (EM) shall be responsible for the following:

4.4.1 Developing the Project Sampling Plan as requested by Environmental Engineering, in accordance with departmental procedures.

4.4.2 Taking field samples in accordance with applicable department procedures and the Project Sampling Plan.

4.5 Environmental Restoration shall be responsible for the following:

4.5.1 Providing CERCLA integration guidance.

4.0 RESPONSIBILITIES (cont.)

4.5.2 Maintaining the Administrative Record.

4.5.3 Providing information pertaining to radiological or other hazardous substances contamination from CERCLA activities at the construction area.

4.5.4 Reviewing RSE documents prior to submitting to DOE.

4.6 **Sitewide Quality Assurance (SQA)** shall be responsible for the following:

4.6.1 Inspecting waste containers to verify container integrity.

4.6.2 Verifying preparation of containers before they are filled.

4.6.3 Observing containers being filled with waste and debris to verify adherence to applicable departmental procedures and the CWID.

4.6.4 Completing material identification documentation, obtaining the supervisors signature on the documents, and delivering the documentation to Materials Control and Accountability (MC&A).

4.6.5 Issuing Deviation Reports (DR) and Corrective Action Reports (CR) when waste is not handled in accordance with departmental procedures, the CWID, or CESHWS.

4.6.6 Preparing and issuing a "Sitewide Quality Surveillance Checklist".

4.7 **Materials Control and Accountability (MC&A)** shall be responsible for the following:

4.7.1 Maintaining an inventory of filled containers.

4.7.2 Producing documentation to move filled containers to storage.

4.8 **Maintenance** shall be responsible for the following:

4.8.1 The Site Services Department Maintenance Planner/Estimator shall perform the PM/PE responsibilities as follows:

4.8.1.1 Consulting with representatives of other involved departments to plan waste handling methods, determine material disposition (reusable or waste), and discuss waste minimization options.

4.8.1.2 Initiating RD/RC requests for maintenance projects.

4.0 RESPONSIBILITIES (cont.)

4.8.1.3 Monitoring FEMP and subcontractor personnel to ensure that contaminated waste is handled in accordance with applicable departmental SSOPs.

4.8.2 Obtaining approved on-site disposition locations from Environmental Engineering and Waste Management for waste generated from the project.

4.8.3 Ensuring that free liquids are removed from process equipment prior to project start. Provide the signed documentation to Environmental Engineering and/or F&ME for RCRA Project file.

4.8.4 Providing MC&A with the container's serial number, and getting an inventory number from MC&A.

4.9 **Site Services** shall be responsible for the following:

4.9.1 Coordinating delivery of empty containers to the packaging site.

4.9.2 Preparing a designated location for receiving contaminated materials to be stored prior to shipment.

4.9.3 Making the required preparation for International Shipping Order (ISO) (sea/land) container loading.

4.9.4 Providing final closure for ISO containers.

4.9.5 Providing material movement services (including weighing filled containers and delivering containers to and from the site) and providing proper shipping documentation.

4.10 **Waste Management** shall be responsible for the following:

4.10.1 Participating in the development of the Waste Sampling Request and providing concurrence on the final request.

4.10.2 Issuing a RCRA Determination/Radiological Characterization (RD/RC) Letter based on process knowledge and/or sample results.

4.10.3 Identifying disposition locations for all streams.

4.10.4 Shipping materials designated for shipment.

4.10.5 Management of soil and debris which is to be stored at the FEMP.

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5.0 GENERAL

5.1 The "Contaminated Waste Packaging Requirements" (see Table 1 for requirements) shall be followed for each type of contaminated waste to be shipped to a DOE burial site.

5.2 Containers that exceed the specified capacity shall be returned to the job site to bring the container within limits.

5.3 The following materials shall not be packaged in box type containers for shipment to a designated DOE burial site.

(A) Resource Conservation and Recovery Act (RCRA) hazardous wastes.
(B) Pressurized vessels
(C) Explosives
(D) Radioactive gases
(E) Pyrophoric materials
(F) Toxic or poisonous substances (except asbestos containing materials)
(G) Reactive material
(H) Liquid metals
(I) Flammable substances
(J) Alkaline metals
(K) Liquid organic waste
(L) Waste containing free liquid, dry powder, or respirable fines that have not been immobilized per NVO-325.
(M) PCBs
(N) Etiologic agents
(O) Chelating agents

NOTE: Packaging of materials listed in 5.3 shall be handled on a case-by-case basis by Environmental Engineering.

5.4 Asbestos shall be packaged in accordance with applicable IRS&T departmental procedures.

5.5 The appropriate CERCLA Programs Operable Unit Manger shall review completed RSE documents to ensure that all CERCLA requirements have been met and then forward the RSE to DOE for review and approval.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

None

7.0 PROCEDURE

7.1 Pre-project Planning/Estimating

NOTE: A pre-project meeting attended by departmental representatives involved in the Project shall be held. Project interface requirements shall be addressed and agreed to by all. The meeting may incorporate the project site walkdown to review the project scope for sampling and waste characterization. No excavation, demolition, or penetration activities will be allowed to begin until a RCRA Determination/Radiological Characterization has been completed for the associated project. This includes projects not generating soil, debris, or waste. When an emergency situation occurs and work must begin before the RD/RC is completed, authorization to generate the waste must be obtained from Waste Management.

PROJECT MANAGEMENT & MAINTENANCE (PM&M)

7.1.1 Prepare form FMPC-CONT-563, "Property Disposal Request" (see Figure 3) per applicable department procedures before equipment (tagged or untagged) is removed.

7.1.2 Instruct subcontractors to segregate clean packing and shipping materials to prevent contact with contaminated waste. Packing materials shall be removed, whenever possible, before entering a radiologically contaminated area.

7.1.3 Prepare a draft form FMPC-CONST-2716, "Construction Waste Identification/Disposition" (CWID) sheet (see Figure 2).

NOTE: Accuracy and detail are required in preparing the CWID since the CWID and supporting documentation may be used by the planner/estimator or the subcontractor to estimate the costs associated with handling construction wastes and by F&ME for completion of RD/RC. The CWID is also used to report and quantify the estimated waste versus the actual waste generated at the completion of the project and to quantify the amounts and waste types for use on the CESHWS form (see Table 2 and Figure 1, for requirements).

7.1.3.1 Complete Part II of the CWID using the waste requirements provided.

7.0 PROCEDURE (cont.)

PROJECT MANAGEMENT & MAINTENANCE (PM&M)

7.1.4 Forward preliminary project information to Environmental Engineering.

NOTE: Environmental Engineering will expedite RCRA Determination/ Radiological Characterization (RD/RC).

ENVIRONMENTAL ENGINEERING

7.1.5 Initiate a RCRA Project File for each project.

7.1.6 Issue priorities list for RD/RC and update status information.

7.1.7 Consult with the applicable departments and conduct a project site walkdown.

NOTE: The following groups should be represented: Facility Owner, PM/PE, Radiological Safety, Waste Management, Environmental Monitoring, and CERCLA Program Group (depending on the nature of the project, other groups may also be required).

7.1.8 Document the walkdown using process and historical knowledge.

7.1.9 Submit a request for Radiological Safety to survey the project site.

NOTE: The result of this survey, along with historical and process knowledge, shall be used in the preparation of a Waste Sampling Request.

7.1.10 Complete an "Environmental Media Sampling Request", Form FMPC-EM-3307 (see Figure 4).

7.1.11 Obtain F&ME concurrence with the Waste Sampling Request.

7.1.12 Submit the Waste Sampling Request to Environmental Monitoring.

ENVIRONMENTAL MONITORING

7.1.13 Prepare and obtain approval of a "Construction Excavation/ Penetration Permit", Form FMPC-T-2711 (see Figure 5) for field sampling.

7.1.14 Using the Waste Sampling Request provided by Environmental Engineering, develop the Project Sampling Plan.

7.0 PROCEDURE (cont.)

ENVIRONMENTAL MONITORING

7.1.15 Take samples in accordance with the sampling plan.

7.1.16 Submit samples to the analytical lab for analysis.

7.1.17 Notify Environmental Engineering that sampling is complete and that samples have been sent to the lab.

ENVIRONMENTAL ENGINEERING

7.1.18 Track and expedite lab analysis.

7.1.19 Update information for projects on the RCRA priority list.

ENVIRONMENTAL MANAGEMENT

7.1.20 Perform analysis of samples per the applicable department procedures.

NOTE: Samples may be submitted to an off-site laboratory.

7.1.21 Forward analysis results to Environmental Engineering and Environmental Monitoring.

ENVIRONMENTAL ENGINEERING

7.1.22 Review the analysis results from the lab and complete the RCRA Project File.

7.1.23 Transmit the RCRA Project File to F&ME and the completed analytical data package to Environmental Monitoring.

7.1.24 Using analysis results, update the FEMP Site Sampling Data Base.

WASTE MANAGEMENT

7.1.25 Using the information provided by the RCRA Project File prepare and issue RCRA Determination/Radiological Characterization (RD/RC) letter (see Table 2 and Figure 7 for requirements).

7.1.26 Provide disposition location for all waste streams.

7.0 PROCEDURE (cont.)

PROJECT MANAGEMENT & MAINTENANCE

7.1.27 Revise the CWID based on the RD/RC letter.

7.1.28 Consult with Environmental Engineering and review the CWID form to identify and document the disposition location for each waste.

NOTE: A consideration of waste minimization possibilities shall be included.

7.1.29 Obtain required approvals for the completed CWID.

NOTE: The waste planning phase of a construction project is complete when the CWID is approved and issued.

7.1.30 Contact Environmental Engineering to determine the type of waste containers necessary for packaging contaminated and hazardous waste.

PROJECT MANAGEMENT

7.1.31 Develop a set of excavation and demolition drawings specifying contamination levels for soil and equipment and listing construction wastes, weights, and volumes.

7.1.32 If excavation involves potentially hazardous substances or if more than 1 cubic yard of soil is to be removed, draft an RSE.

7.1.33 Transmit the RSE to the appropriate CERCLA Program Operable Unit (OU) Manager for review.

ENVIRONMENTAL RESTORATION

7.1.34 Review the draft RSE to determine the need for CERCLA removal action.

7.1.35 Submit the RSE to DOE for approval.

NOTE: DOE will determine if a specific CERCLA removal action is required.

7.0 PROCEDURE (cont.)

PROJECT MANAGEMENT

7.1.36 Complete form FMPC-Q-2717, "Construction Environmental Safety and Health Work Survey" (CESHWS) per Project Management department procedure.

7.1.37 Post the CESHWS and supporting documentation in the work area.

7.1.38 Post a "Prohibited Materials List" on the waste containers.

7.2 Controlling and Disposing of Uncontaminated Waste

PROJECT MANAGEMENT

7.2.1 After the project starts, waste and debris shall be handled in accordance with the CESHWS posted in the work area. The CESHWS shall have the completed CWID and all supporting documentation required for waste identification and compliance attached.

7.2.1.1 If changes are required, except for minor modifications in quantities, revise and reissue the CWID and CESHWS with all approvals.

7.2.1.2 In order for bulk material (i.e. soil, concrete, and liquid) from a radioactive material management area to be free-released, analytical data and appropriate process knowledge shall be required in order to obtain approval from Radiation Safety.

7.2.2 Uncontaminated Soil

PROJECT MANAGEMENT

7.2.2.1 Contact Radiological Safety and request that a radiation survey be conducted.

RADIATION SAFETY

7.2.2.2 Survey the truck that is to be loaded to ensure that applicable transportation limits are not exceeded as specified by departmental procedures.

NOTE: If transportation limits are exceeded do not use the truck.

7.0 PROCEDURE (cont.)

RADIATION SAFETY

7.2.2.3 Complete a Radiological Survey Report.

7.2.2.4 Release loaded truck to the designated and marked location as specified by Waste Management for unloading.

NOTE: Soil shall be unloaded in the designated controlled area within one hour. No loads, full or partial, shall sit overnight.

7.2.2.5 Deliver a copy of the Radiological Survey Report(s) to PM.

NOTE: A survey report is required for each load.

7.2.3 Uncontaminated Debris and Waste

PROJECT MANAGEMENT

7.2.3.1 Request that Radiological Safety conduct a survey for unrestricted release.

RADIATION SAFETY

7.2.3.2 Survey the debris and waste to identify contaminated spots.

7.2.3.3 Notify the PM/PE of survey results.

PROJECT MANAGEMENT

7.2.3.4 Consult with the subcontractor to remove and package contaminated waste and debris that may be present in accordance with the CWID or CESHWS.

RADIATION SAFETY

7.2.3.5 Survey the construction site and establish a staging area that will prevent radiological contamination of materials.

PROJECT MANAGEMENT & MAINTENANCE (PM&M)

7.2.3.6 Contact Site Services and arrange for delivery of a lockable dumpster.

7.0 PROCEDURE (cont.)

PROJECT MANAGEMENT & MAINTENANCE (PM&M)

7.2.3.7 Locate the lockable dumpster in the staging area specified by Radiological Safety.

7.2.3.8 As waste and debris is generated, ensure that material is moved to the staging area and placed outside the dumpster until the waste is monitored by Radiological Safety.

NOTE: Waste shall not remain outside the dumpster overnight.

IRS&T

7.2.3.9 Survey collected waste to ensure that no contaminated waste enters the dumpster.

PROJECT MANAGEMENT

7.2.3.10 Have the subcontractor place the verified clean waste into the dumpster.

NOTE: The dumpster shall be picked up after project completion or when the dumpster is full.

7.3 Controlling and Disposing of Contaminated Waste

NOTE: Loose or removable contamination shall be removed (as practicable) prior to demolition or removal of contaminated or hazardous construction waste. Contaminated waste removal shall be coordinated with waste operations high level cleaners and Site Maintenance.

NOTE: Excavation/demolition activities involving contaminated materials shall be accomplished in accordance with the Site Specific Safety and Health Plan (SSHP). The SSHP addresses abatement processes required to protect human health and the environment.

PROJECT MANAGEMENT & MAINTENANCE

7.3.1 Contact Inventory Control and Warehousing and obtain containers required for project.

7.0 PROCEDURE (cont.)

PROJECT MANAGEMENT & MAINTENANCE

7.3.2 Contact Sitewide Quality Assurance and request that waste containers be inspected during preparation and loading.

NOTE: Sitewide Quality Assurance shall be notified at least one hour in advance.

SITEWIDE QUALITY ASSURANCE

7.3.3 Ensure that the container is loaded and secured in accordance with applicable SSOPs (SSOP-0024).

7.3.4 Coordinate with the subcontractor to segregate and package construction waste (Refer to CWID OR CESHWS).

NOTE: Packaging shall be in accordance with the SSHP.

NOTE: Material too large for the designated container shall be reduced in size by the subcontractor.

NOTE: Material designated for future use shall be handled as specified on the CWID.

7.3.5 Install a status indicator on the container.

7.3.6 Complete Form FMPC-CONT-1945-XX, Item Production/Certification/ Identification (W-65 card). (See Figure 6)

PROJECT MANAGEMENT & MAINTENANCE

7.3.7 When the container is secure, sign the Item Production/ Certification/Identification (W-65 card), most recent update, as "generator".

7.3.8 Coordinate with MC&A to transport waste to the disposition location.

SITE SERVICES

7.3.9 Transport containers from the job site to the scale to be used for weighing.

7.0 PROCEDURE (cont.)

SITE SERVICES

7.3.10 Weigh the material in accordance with SSOP-0024.

NOTE: Waste containers shall be prepared in accordance with SSOP-0024, "Packaging Low Level Radioactive Waste (LLRW) for Offsite Disposal"

7.3.11 Record the weight on the Item Production/Certification/Identification (W-65 card).

7.3.12 Coordinate with MC&A to transport the containers to designated storage location.

7.3.13 Contact MC&A when a box must be emptied for any reason.

PROJECT MANAGEMENT

7.3.14 Prepare a final CWID when the project is complete and submit a copy to F&ME for the RCRA Project file.

8.0 APPLICABLE DOCUMENTS

8.1 Drivers

8.1.1 DOE Order 5480.5, "Radiation Protection of the Public and the Environment"

8.1.2 Title 40 CFR, Parts 260, 261 "Resource Conservation and Recovery Act", and 300, "Comprehensive Environmental Response Compensation Liability Act"

8.2 References

8.2.1 PO-D-035, "Shipment of Low Level Radioactive Waste Requirements"

8.2.2 PP-0314, "Packaging, On-site Movement and Offsite Shipment of Material"

8.2.3 SSOP-0024, "Packaging Low Level Radioactive Waste for Off-Site Disposal"

8.2.4 SSOP-0027, "Control of Box-Type Containers"

9.0 APPLICABLE FORMS

9.1 FMPC-CONST-563, "Property Disposal Request"

9.2 FMPC-PM&A-2716, "Construction Waste Identification and Disposition"

9.3 FMPC-EM-3307, "Environmental Media Sampling Request"

9.4 FMPC-T-2711, "Construction Excavation/Penetration Permit"

9.5 FMPC-Q-2717, "Construction Environmental Safety and Health Work Survey"

9.6 FMPC-CONT-1945-XX, "Item Production/Certification/Identification"

10.0 FIGURES

10.1 Figure 1, "Construction Environmental Safety and Health Work Survey"

10.2 Figure 2, "Construction Waste Identification/Disposition"

10.3 Figure 3, "Property Disposal Request"

10.4 Figure 4, "Environmental Media Sampling Request"

10.5 Figure 5, "Construction Excavation/Penetration Permit"

10.6 Figure 6, "Item Production/Certification/Identification"

10.7 Figure 7, "Construction Waste Requirements"

TABLE 1
CONTAMINATED WASTE PACKAGING REQUIREMENTS

MATERIALS[1]	METAL CONTAINERS	DRUMS	INTERNATIONAL SHIPPING ORGANIZATION (ISO)	CONTAMINATED DUMPSTERS
Metal refuse	Yes	N/A	Yes[2]	N/A
Scrap wood/pallets	Yes	N/A	Yes	Yes
Concrete	Yes	N/A	N/A	N/A
Soil	Yes	N/A	N/A	N/A
Asbestos	Yes	N/A	Yes	N/A
Misc. trash	N/A	N/A	N/A	Yes[2]
Floor sweepings/dust collector residues	N/A	Yes[2]	N/A	N/A

(1) RCRA material shall be handled on a case-by-case basis.

(2) Refer to SSOP-0024 for specific packaging guidelines.

TABLE 2
RADIOLOGICALLY CONTAMINATED AND UNCONTAMINATED CONSTRUCTION WASTE DEFINITIONS AND DISPOSITION REQUIREMENTS

MATERIAL	MAXIMUM CONCENTRATION[1]	
	Category 1	Category 2
Depleted uranium	≤ 100	> 100
Enriched uranium	≤ 100	> 100
Thorium	≤ 50	> 50

[1] In Picocuries per gram (pCi/gm).

Category 1
Less than or equal to 100 pCi/g, nonhazardous

Category 2
Greater than 100 pCi/g, nonhazardous

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 21 of 32
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FEMP

CONSTRUCTION ENVIRONMENTAL SAFETY AND HEALTH WORK SURVEY

This form has been completed for: ☐ Design Purposes ☐ Posting in the Work Area (The following precautions will be complied with in connection with the work.)

Emergency Telephone Nos.: _____ Plant Shift Superintendent: _____

ISSUED TO	WEMCO NO.
PROJECT TITLE	RUST WO NO.
PLANT / PROJECT BOUNDARIES	TIME DURATION (DATE & TIME) FROM: TO:

This project will be conducted in accordance with OSHA Dept. of Labor 29 CFR, Part 1926, "Safety and Health Regulations for Construction", and "Construction Safety, Health and Fire Protection" and the following specific construction safety requirements.

GENERAL	YES	NO
1. Service process lines, tanks and vessels drained, valved, purged and tagged		
2. Processes under pressure, tagged (describe on back sheet)		
* 3. Machinery and equipment safe for work to proceed		
4. Construction excavation/penetration permit required (hidden services - electrical, piping, etc.)		
5. Daily/Weekly renewal of Work Permit by WEMCO necessary		
6. All process equipment, parts and supplies will have been/have been removed or protected by operations		

FIRE PREVENTION	YES	NO
1. Flammable materials in area (describe on back sheet)		
2. Explosive atmosphere test required (to be performed by WEMCO)		
3. Non-sparking tools required		
4. Active and approximate fire fighting equipment available		
5. Welding and/or burning required? If welding and/or burning, following provisions required:		
a. Sprinkler system in service		
b. Existing combustible materials will be/have been removed to a safe location or provided with fireproof covers		
c. Welding blankets required		
d. Fire watch required		
* e. Fire Department standby required		

ELECTRICAL	YES	NO
1. Circuits deenergized and tagged per WEMCO Lock & Tag Procedure (if not described on back sheet)		
2. Permanent power sources and switch boxes checked and approved		

CRITICALITY SAFETY	YES	NO
1. Criticality, Nuclear Safety review made		
2. Safety Analysis Review		
3. Special instructions (see reverse side)		

HEALTH PHYSICS	YES	NO
1. Contamination and radiation hazards review made		
2. Special instructions (see reverse side)		

MINIMUM SPECIAL REQUIREMENTS
1. RESPIRATORS: ☐ Self Contained ☐ Half Mask ☐ Full Mask ☐ Fresh A
Type of Canister Cartridge: _____
2. SPECIAL VENTILATION REQUIREMENTS:
Describe: _____
3. CONFINED SPACE ENTRY PROCEDURE: ☐ YES ☐ NO
4. HEAT STRESS CONDITIONS INVOLVED: ☐ YES ☐ NO

MINIMUM PROTECTIVE EQUIPMENT REQUIRED	
☐ Complete dressout with showers	☐ Safety Shoes
☐ Complete dressout without showers	☐ Rubber Shoes
☐ No dressout or showers required	☐ Gloves
☐ Safety Glasses	☐ Acid Suits
☐ Hard Hats	☐ Paper Suits
☐ Face Shields	☐ Air Conditioned Suits
☐ Hearing Protection	☐ Safety Harness
☐ Monogoggles	☐ Corrosive Protection Gear
☐ Other (Describe): _____	

CONSTRUCTION RUBBLE DISPOSAL REQUIRED	YES	NO
1. Contamination and radiation review made of rubble		
2. Special instructions (see reverse side)		

INDUSTRIAL HYGIENE	YES	NO
1. Toxicity and health hazards review made		
2. Special instructions (see reverse side)		

ENVIRONMENTAL COMPLIANCE	YES	NO
1. Environmental contamination review required		
2. Special instructions (see reverse side)		

* No answer required if Survey is for "Design Purposes"

A. Per Design Purposes - The undersigned believe that the information provided in the survey is accurate for the conditions expected in the work area during construction. Should additional information which would have a significant impact upon the design become available this Survey shall be updated to reflect the changes.

B. Per Posting - The undersigned certify that the work area has been cleared for the work indicated. This Construction ES&H Work Survey is valid pursuant to the compliance of the recipients with the conditions stated herein. This Survey shall be voided and a new survey completed for posting should conditions in the work area change and force a modification on the information provided herein.

Industrial Hygiene ID: (Printed) DATE:	SAFETY & FIRE ID: (Printed) DATE:	RADIT TECHNICIAN ID: (Printed) DATE:	ENGLAN SITES SAFETY ID: (Printed) DATE:
Signature/Date	Signature/Date	Signature/Date	Signature/Date
WEMCO PROJECT ENGINEER: (Printed) DATE:	Construction Employee ID: (Printed) DATE:	SUPERVISOR SAFETY ID: (Printed) DATE:	(Printed) DATE:
Signature/Date	Signature/Date	Signature/Date	Signature/Date

FS-2717 (REV 4/20/90)

CONSTRUCTION ENVIRONMENTAL SAFETY AND HEALTH WORK SURVEY
FORM FMPC-Q-2717
Figure 1 (Sheet 1 of 2)

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CONSTRUCTION ENVIRONMENTAL SAFETY AND HEALTH WORK SURVEY
(CONTINUED)

1. Initial cuts on ductwork, equipment and piping shall be made by mechanical means only
☐ YES ☐ NO (If yes, describe special instructions)

2. Space restrictions
☐ YES ☐ NO (If yes, check appropriate restrictions and give details.) ☐ JOB ACCESS ☐ STORAGE AREA ☐ TOILET FACILITIES

3. Special instructions:
☐ YES ☐ NO (If yes, give details.)
OPERATIONAL REQUIREMENTS

ADDITIONAL JOB HAZARDS (Also attached on ESH work hazard form.)

GENERAL (TBD etc.):

FIRE PREVENTION (TBD etc.):

ELECTRICAL (TBD etc.):

NUCLEAR AND SYSTEM CRITICALITY SAFETY:

HEALTH PHYSICS:

INDUSTRIAL HYGIENE:

ENVIRONMENTAL COMPLIANCE:

Construction Rubble Disposal Required:

TYPE OF MATERIALS	APPROXIMATE QUANTITY	DISPOSAL AREA
1.		
2.		
3.		
4.		
5.		

FMPC-2717 Revision GREY 4/20/91

CONSTRUCTION ENVIRONMENTAL SAFETY AND HEALTH WORK SURVEY
FORM FMPC-Q-2717
Figure 1 (Sheet 2 of 2)

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FEED MATERIALS PRODUCTION CENTER
CONSTRUCTION WASTE IDENTIFICATION/DISPOSITION FORM

PART I - PROJECT DESCRIPTION

Date ___/___/___

Project Title _____ WBS Project No. _____

Project Description _____

Project Location (Include Location drawings, if possible) _____

Project Engineer/Phone No. _____/_____ Project Dates Start ___/___/___ End ___/___/___

PART II - CONSTRUCTION WASTE DETAILS

Date ___/___/___

	UNCONTAMINATED WASTE			CONTAMINATED WASTE		
WASTE TYPE	VOLUME Cu. Ft.	WEIGHT Pounds	DISPOSITION LOCATION*	VOLUME Cu. Ft.	WEIGHT Pounds	DISPOSITION LOCATION*
Soil						
Rubble (concrete, block, etc.)						
Metal						
Process Equipment						
Glass Containers						
Asbestos						
Liquid						
PCBs						
Hazardous/Radioactive Glass						
Tanks/Radioactive Glass						
Wood						
Other (Identify)						

*Also complete Part III - Future Use Material Ownership and Disposition.

PART III - FUTURE USE MATERIAL OWNERSHIP AND DISPOSITION

OWNER	MATERIAL DESCRIPTION	DISPOSITION LOCATION

c: Manager, Environmental Compliance
Manager, Fire & Safety
Manager, Industrial Hygiene & Safety
Manager, Waste Operations
Manager, RUST ESAH
Manager, Environmental and Radiological Monitoring
Manager, Health Physics
Manager, Quality Assurance
Manager, Waste Technology & Plant Projects
Manager, Maintenance

FMPC-ENGL-2716 (Rev. 1/4/91)

CONSTRUCTION WASTE IDENTIFICATION/DISPOSITION
FORM FMPC-CONST-2716
Figure 2

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Fernald Site
CONTROLLER - GENERAL ACCOUNTING
PROPERTY DISPOSAL REQUEST

Date:

ACCTNG. RECORD NO | CONTROL NO

FOR GENERAL ACCOUNTING USE ONLY

COST	
Basic	
Other	
Accumulated Depreciation	
Net Book Cost	

Acquisition Date | R U No
Estimated Cost

SECTION — A

DESCRIPTION | LOCATION
MAPICS NO | EQUIPMENT NO
ID NO | BAR CODE NUMBER | DOES UNIT CONTAIN PRECIOUS OR CRITICAL MATERIALS? ☐ YES ☐ NO IF YES TYPE
MANUFACTURER
MODEL NO | SERIAL NO
MSDS NO. MATERIAL EVALUATION FORM
SIZE OR CAPACITY

	CHECK ONE YES	NO	N A
Are spare parts available?			
Are manuals available?			
Are spare parts to be excessed?			
Material Evaluation Form			
Material Safety Data Sheet			

SECTION — B

☐ SURPLUS ☐ NON-SURPLUS

PHYSICAL CLASSIFICATION	DISPOSAL CONDITION CODE									1 = Unused — good 2 = Unused — fair 3 = Unused — poor	4 = Used — good 5 = Used — fair 6 = Used — poor	7 = Repairs Required — good 8 = Repairs Required — fair 9 = Repairs Required — poor
Excess	1	2	3	4	5	6	7	8	9			

Salvage | REASON FOR CLASSIFICATION AS SALVAGE | REASON TO RECLASSIFY AS SCRAP BY SALVAGE & DISPOSAL SECT
Scrap | REASON FOR CLASSIFICATION AS SCRAP | CLASSIFIED BY | EXCESS DISPOSAL COORDINATOR & DATE
DOE Scrap Approval | SIGNATURE & DATE | APPROVED BY | PROCUREMENT DIRECTOR & DATE
ADP EQUIPMENT ☐ Information Erased from Hard Disk ☐ Information Not Erased from Hard Disk

SECTION — C

MONITOR DATA Type of contamination — ☐ Normal; ☐ Enriched; ☐ Depleted ☐ Other
See attached Radiological Monitoring Data Sheet

INITIATOR	STAFF MANAGER
PRINT OR TYPE	PRINT OR TYPE
SIGNATURE	SIGNATURE

SECTION — D

RECEIVED RECLAMATION AND DISPOSAL AREA | EXCESS DISPOSAL COORDINATOR & DATE | REVIEWED BY STOREKEEPER | STOREKEEPER & DATE

SECTION — E

PREPARATION AND ROUTING:

1. Initiator prepares original and five (5) copies and completes Section A.
2. Initiator contacts the EDC and completes Section B.
3. Initiator has material monitored by ERMT and completes Section C.
4. Initiator has form approved by Staff Manager.
5. Initiator forwards all copies to EDC via Stores Warehouse Supervisor
6. EDC and Storekeeper complete Section D
7. All Copies are then sent to Property Accounting who numbers forms and retains original and one copy, sends one copy to originator, one copy to ADP Department Head, and two copies to EDC
8. Initiator upon receipt of two controlled numbered forms affixes one to excessed items and retains one for record purposes
9. Initiator calls EDC to coordinate removal of items

PLEASE PRINT FORM

PROPERTY DISPOSAL REQUEST
FORM FMPC-CONST-563
Figure 3

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ENVIRONMENTAL MEDIA SAMPLING REQUEST # _____

(To be completed by requester)

Project Name: _____ Project/WO #: _____

Requester: _____ Phone #: _____

Field Contact: _____ Phone #: _____

Charge #: _____

PROJECT INFORMATION

Regulatory Driver (e.g. RCRA, RI/FS, CERCLA, DOE Order, ARAR's) _____

Objective: _____

Scope of Work: _____

Requested completion date: _____

Location of samples (attach maps, blueprints and/or surveys): _____

Special instructions: _____

* SOLID	** LIQUID	MULTIPHASE/ SLUDGE	ANALYSIS TABLE (see reverse for listing) 1	2	3	4	5	6	7	Archive
Concrete/Asphalt	Drum	Drum								
Soil	Tank	Tank								
Surface	Sump	Sump								
1 ft 6 ft	Pit	Pit								
2 ft 7 ft	Basin	Basin								
3 ft 8 ft	Other	Other								
4 ft 9 ft										
5 ft 10 ft										
Paint										
Residue										
Other										

* Soil depths greater than 10 ft attach additional instructions.

** Liquids with greater than 5 % solid per volume are considered multiphase.

Analysis Support Level	A	B	C	D	E

CONCURRENCE

Environmental Engineering: _____ Date: _____

Facility Material Evaluation: _____ Date: _____

Requester Signature: _____ Date: _____

Date Recieved: _____ Sceduled Start Date: _____ Sceduled Completeion Date: _____

ENVIRONMENTAL MEDIA SAMPLING REQUEST
FORM FMPC-EM-3307
Figure 4 (Sheet 1 of 2)

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TABLE 1 TCLP (Full Spectrum)

METALS
- Arsenic
- Barium
- Cadmium
- Chromium
- Lead
- Mercury
- Selenium
- Silver

PESTICIDE/HERBICIDE
- Chlordane
- 2,4 - D
- Endrin
- Lindane
- Methoxychlor
- Toxaphene
- 2,4,5 - TP Acid (Silvex)

VOLATILES
- Benzene
- Carbon Tetrachloride
- Chlorobenzene
- Chloroform
- 2 - Butanone
- 1,1 - Dichloroethane
- 1,2 - Dichloroethane
- Tetrachloroethylene
- Trichloroethylene
- Vinyl Chloride

SEMI VOLATILES
- 1,4 - Dichlorobenzene
- 2,4 - Dinitrotoluene
- Hexachlorobenzene
- Hexachloroethane
- Hexachloro - 1,3 - Butadiene
- Nitrobenzene
- Pentachlorophenol
- 2,4,5 - Trichlorophenol
- 2,4,6 - Trichlorophenol
- o - Cresol
- m - Cresol
- p - Cresol
- Pyridine

TABLE 2 METALS
_ TCLP _ TOTALS

METALS
- Arsenic
- Barium
- Cadmium
- Chromium
- Lead
- Mercury
- Selenium
- Silver

TABLE 3 PEST/HERB
_ TCLP _ TOTALS

PESTICIDE/HERBICIDE
- Chlordane
- Methoxychlor
- Toxaphene
- 2,4,5 - TP Acid (Silvex)
- 2,4 - D
- Endrin
- Lindane

TABLE 4 VOA/SEMI VOA
_ TCLP _ TOTALS

VOLATILES
- Benzene
- Carbon Tetrachloride
- Chlorobenzene
- Chloroform
- 2 - Butanone
- 1,1 - Dichloroethane
- 1,2 - Dichloroethane
- Tetrachloroethylene
- Trichloroethylene
- Vinyl Chloride

SEMI VOLATILES
- 1,4 - Dichlorobenzene
- 2,4 - Dinitrotoluene
- Hexachlorobenzene
- Hexachloroethane
- Hexachloro - 1,3 - Butadiene
- Nitrobenzene
- Pentachlorophenol
- 2,4,5 - Trichlorophenol
- 2,4,6 - Trichlorophenol
- o - Cresol
- m - Cresol
- p - Cresol
- Pyridine

TABLE 5 RAD
- _ Cs 137
- _ Np 237
- _ Pu 238
- _ Pu 239/240
- Ra 226
- Ra 228
- Ru 106
- Tc 99
- _ Th Total
- _ Th 228
- _ Th 230
- _ Th 232
- _ U Total
- _ U 234
- _ U 235/236
- _ U 238
- Gross Alpha/Beta

TABLE 7
- _ Paint Filter Liquid Test (PFLT)
- _ pH (If PFLT fails)
- _ Flash Point (If PFLT fails)
- _ HSL
  - _ Full
  - _ Extended
  - _ Abbreviated

TABLE 6 TOTAL VOA
- Acetone
- Benzene
- Carbon Disulfide
- Carbon Tetrachloride
- Chlorinated Hydrocarbon
- Chlorobenzene
- Chloroform
- Chloromethane
- 1,1 - Dichloroethane
- 1,2 - Dichloroethane
- Trans - 1,2 - Dichloroethene
- o - Dichlorobenzene
- 2 - Butanone
- Ethyl Acetate
- Ethyl Benzene
- Ethyl Ether
- Isobutanol
- Methanol
- Methyl Isobutyl Ketone
- Methyl Ethyl Ketone
- Methylene Chloride
- Nitrobenzene
- 2 - Nitropropane
- Pyridine
- Tetrachloroethylene
- Toluene
- 1,1,1 - Trichloroethane
- 1,1,2 - Trichloro - 1,2,2 - Trifluoroethane
- Trichlorofluoromethane
- Vinyl Chloride
- Xylenes

ENVIRONMENTAL MEDIA SAMPLING REQUEST
FORM FMPC-EM-3307
Figure 4 (Sheet 2 of 2)

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FEED MATERIALS PRODUCTION CENTER

CONSTRUCTION EXCAVATION/PENETRATION PERMIT

Issued to: _____ Date Issued: _____

WMCO Permit No.: _____ Subcontractor W.O. No.: _____

WMCO Project/Title No.: _____/_____

Plant: _____ Location: _____

Scope of Work: _____

_____

This permit is issued on the basis of available information, and may not be a complete description of all obstructions. Stop work immediately, and contact the WMCO Project Engineer if obstructions, other than those defined, are encountered.

The following utilities are known to exist in the EXCAVATION/PENETRATION area, and a sketch or drawing defining the same utilities is attached for verification to this permit.

_____

_____

Drawings: _____

_____

Special Hazards and/or Precautions: _____

_____

Disposal of Excavated Material: Yes ____ No ____

If NO is checked, excavated dirt may be used for backfill provided it meets engineering specifications for backfill. Construction Rubble from the EXCAVATION/PENETRATION must be disposed of as described below.

Material Type	Disposal Area	Material Type	Disposal Area
_____	_____	_____	_____
_____	_____	_____	_____

Note: Contractors shall notify appropriate utilities for work outside the plant boundaries in accordance with Ohio Underground Utility Damage Act. All drilling and cutting tools shall be grounded in accordance with OSHA regulations.

The following approvals are required as determined, and checked by the WMCO Project Engineer.

____ Civil Engineer _____ ____ Electrical Engineer _____

____ Utilities Engineer _____ ____ Others _____

The following approvals are required on all CONSTRUCTION EXCAVATION/PENETRATION PERMITS:

WMCO Project Engineer/Phone No.: _____/_____
Operational Supervisor/Phone No.: _____/_____
Waste Mgmt. Operations/Phone No.: _____/_____
Industrial Safety/Phone No.: _____/_____
Health Physics/Phone No.: _____/_____
Env. Compliance/Phone No.: _____/_____

CONSTRUCTION EXCAVATION/PENETRATION PERMIT
FORM FMPC-T-2711
Figure 5

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CARD XX **ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION** 159791

P O NO	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE MO	DAY	YEAR	SHIFT	BADGE NO	PACKAGE NO.

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR

WASTE DESCRIPTION AND COMMENTS

PACKAGE TYPE

PACKAGE SIZE

PACKAGE PHYSICAL CERTIFICATION	YES	NO
EMPTY CONTAINER AT START		
RUST HOLES OR DENTS		
MATERIAL IS AS CODED		
PROHIBITED MATERIALS		
LIQUIDS IN CONTAINER		
MINIMUM OF VOID SPACE		
PACKAGE SECURED		
DRAIN PLUG SECURED		

PLANT	PROD MBA

PLANT TO MBA TO

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE

SUPERVISOR SIGNATURE DATE

FMPC-CONT-1945-XX (REV 12-15-88)

ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION
FORM FMPC-CONT-1945-XX
Figure 6

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SOIL, DEBRIS AND WASTE REQUIREMENTS

I SOIL

1. Soils within the Category 1 limits (see Table 2) may be used as backfill on the project or stockpiled in designated Category I soil areas.

2. Soils within Category 2 may be used as backfill or stockpiled in designated Category II soil areas.

3. All soil temporarily stockpiled at the project site during the project will be placed on plywood, tarps, or plastic and covered with plastic sheeting or tarps to prevent wind or rain erosion. Chain link fencing is required around soil piles which are stored for extended periods. Waste Management will determine when fencing is required.

4. When an emergency situation occurs and excavation must be done before characterization can be completed, the soil can be temporarily stockpiled at the project site. The soil will be placed on plastic, tarps or plywood and covered with plastic sheeting or tarps to prevent wind or rain erosion. Soil can be used as backfill, however the excess soil must be characterized. Characterization must be completed immediately after the job has been finished. A project is not considered complete until the excess soil is adequately characterized and removed from the job site. Chain link fencing is required around soil piles which are stored for extended periods. Waste Management will determine when fencing is required.

II DEBRIS

A. RUBBLE

1. All rubble that can not be free released in accordance with IRS&T departmental procedures shall be packaged for shipment to a designated DOE burial site.

B. METAL

1. Metal waste is categorized as recoverable or nonrecoverable. Recoverable metal consists of ferrous (carbon steel material such as structural shapes and piping) and non-ferrous (stainless steel, copper, aluminum, lead, brass, monel inconel, or nickel) material. Nonrecoverable consists of oxidized sheet metal and mixed metals, and metal that cannot be decontaminated to meet free-release limits as specified in IRS&T departmental procedures.

CONSTRUCTION WASTE REQUIREMENTS
Figure 7 (Sheet 1 of 3)

SOIL, DEBRIS AND WASTE REQUIREMENTS

B. METAL

2. Metal can be released for unrestricted use provided that it meets the requirements specified in applicable IRS&T departmental procedures.

3. Contaminated metal that is decontaminated to meet free-release limits specified in IRS&T department procedures shall be released for burial at a sanitary landfill or sold as scrap.

4. Nonrecoverable metal shall be packaged for shipment to a designated DOE burial site.

5. Recoverable metals shall be stored on-site to support the excess metal sales program.

C. PROCESS EQUIPMENT

1. Reusable equipment, such as machine tools, valves, and instruments, shall be classified as future-use material.

2. Equipment that is not re-usable shall be classified by waste type and disposed of in the same manner as other waste.

D. WOOD

NOTE: Pressure-treated wood shall be segregated pending RCRA determination.

1. Wood scrap (such as pallets, crates, form lumber, sheeting, and similar material) generated by construction activities shall be surveyed by Radiological Safety to determine if it meets the requirements specified in department procedures.

   Wood removed during the demolition phase of construction shall be reviewed by the Radiological Safety Lead Technician, on a case by case basis.

2. The Radiological Safety Technician (RST) shall determine if the wood has been exposed to radioactive materials and if the material is surveyable.

   NOTE: Based on RST findings, the wood shall be processed as Low-Level Waste (LLW) or certified clean and free released.

CONSTRUCTION WASTE REQUIREMENTS
Figure 7 (Sheet 2 of 3)

SOIL, DEBRIS AND WASTE REQUIREMENTS

E. ASBESTOS

1. Materials that contain asbestos or that are suspected to be asbestos, shall be handled as asbestos.

2. All asbestos material shall be handled according to applicable IRS&T department procedures.

F. POLYCHLORINATED BIPHENOLS (PCBs)

1. PCB material consists of transformers, capacitors, and similar electrical equipment containing PCBs and material (gloves, rags, spill absorbents) that has been used in removing PCB-containing equipment from service or for clean-up of spills of PCB-containing materials.

2. PCBs shall be packaged and stored at a location specified by Environmental Compliance.

G. OTHER

1. Construction waste (liquid or solid) not specifically categorized on the Construction Waste Identification and Disposition (CWID) form posted in the area shall be handled on a case-by-case basis by Environmental Engineering and Radiological Safety.

2. When hazardous or mixed waste is to be generated on a project, a Material Evaluation Form (MEF) must be completed for that waste stream prior to the generation of the waste.

3. All hazardous and mixed wastes must be containerized and packaged in accordance with applicable site procedures.

CONSTRUCTION WASTE REQUIREMENTS
Figure 7 (Sheet 3 of 3)

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 32 of 32
Title: MANAGEMENT OF SOIL, DEBRIS, AND WASTE FROM A PROJECT		DOCUMENT NO: SSOP-0044 REVISION NO. 0
Authorization: H. F. Daugherty, President	Supersedes: SSOP-0044I, Dated 02-19-92	Effective Date: 06-19-92

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
06-19-92	0	Procedure for controlling and minimizing waste produced by construction and/or maintenance projects, required per Request No. P91-028, initiated by S. Lund.

ATTACHMENT D

IDENTIFICATION OF SOIL AND DEBRIS SOURCE QUANTITIES

The following tables identify the soil and debris that had accumulated at the time that the Removal Action Work Plan was prepared, and estimates future sources and quantities of additional soil and debris. This information was used for planning purposes with respect to identifying the number of improved storage facilities and estimating their required size. Additional improved storage facilities will be constructed in the future as required to store additional soil and debris.

ATTACHMENT D

CHARACTERIZATION TABLE FOR FUTURE SOURCES OF SOIL AND DEBRIS

GENERATOR (OU, FEMP Area, Project, etc.)	LOCATION (By OU)	MATERIAL (Soil, Concrete, etc.)	CLASSIFICATION (Haz, LLRW, Mixed)	START-END DATE	VOLUME (cu. yd.)	DESTINATION (ASSUMED)	NOTES
Utilities Life Extentsion/Tank Farm	3	Soil	Category I	(3/92-9/93)	250	CSF	
		Piping	Clean		1	SMP	Assume 1 ft depth
		4 Motors for cooling water pump	LLRW		n/a	DFP	
		Wood shoring	Clean			CSF	
		Boiler	Asbestos		n/a	DFP	
Maintanence	3	Soil	Category II	(10/91-9/92)	350	CSF	
Process Water Break Tank	3	Soil		(7/91-12/91)	89	CSF	
		Rubble(concrete, block, etc.)			7	CSF	
Storm Sump for Decon Pad	3	Soil	Category I	(3/92-5/92)	1,131	CSF	
		Soil	Mixed(Catagory III)		59	CSF	
Sidewalk Replacement	3	Soil	Mixed(Catagory III)	(3/92-4/92)	7	CSF	
Clean Scrap Metal Storage Pad	3	Soil	Category II	(8/91-8/92)	20	CSF	
		Concrete/Asphalt/Masonry	Clean		5	CSF	
RCRA Closure Bulk Storage Tanks	3	Soil	Category II	(10/91-8/92)	2	CSF	
		Concrete/Asphalt/Masonry	Mixed		1	CSF	
		Miscellaneous Metals/Equipment	Mixed		3	SMP	
Fuel Storage Tank Facility	3	Soil	Clean	(1/92-4/92)	297	CSF	
		Rubble(concrete, block, etc.)	Clean		4	CSF	
Dock Leveler at the New Receiving Facility (RIMIA)	3	Soil	Clean	(1/92-3/92)	19	CSF	
		Concrete	Clean		8	CSF	
Guard Posts for Sampling Well	3	Concrete	Contaminated	(9/90-11/90)	1	CSF	
Plant 8 Sump	3	Soil	Category II	(8/92-12/94)	131	CSF	
		Concrete/Asphalt/Masonry	LLRW		249	CSF	
		Structural Steel	LLRW		3	SMP	Assume steel=490 pcf
		Gypsum, Plastic, Glass	Clean		2	CSF	
		Asbestos	LLRW(Asbestos)		58	CSF	Assume 1 ft depth
		Process Piping and Grates	LLRW		1	SMP	Assume steel=490 pcf
		Wiring, Conduit	LLRW		60	CSF	
Duplex Office Trailers	3	Soil	Category II, III	(10/91-1/92)	415	CSF	
		Concrete/Asphalt/Masonry	LLRW		5	CSF	
EPA/Parsons Office Trailers	3	Soil	Category I, II	(9/91-4/92)	17	CSF	
		Concrete/Asphalt/Masonry	Clean		2	CSF	
FEMP Firing Range	2	Lead	Clean		9	CSF	Assume Pb=710 pcf
Plant 8 Storage Pad (West)	3	Soil	Category I, II	(3/93-1/94)	208	CSF	
		Soil	Category III		86	CSF	
		Concrete/Asphalt/Masonry	LLRW		9	CSF	
		Structural Steel	LLRW		4	SMP	1712 lbs.
		Asbestos	LLRW(Asbestos)			CSF	250 lf

ATTACHMENT D (continued)

CHARACTERIZATION TABLE FOR FUTURE SOURCES OF SOIL AND DEBRIS

GENERATOR (OU, FEMP Area, Project, etc.)	LOCATION (By OU)	MATERIAL (Soil, Concrete, etc.)	CLASSIFICATION (Haz, LLRW, Mixed)	START-END DATE	VOLUME (cu. yd.)	DESTINATION (ASSUMED)	NOTES
Plant 8 Storage Pad (East)	3	Soil	Category I	(3/93-1/94)	160	CSF	
		Soil	Category III		57	CSF	
		Concrete/Asphalt/Masonry	LLRW		8	CSF	
		Structural Steel	LLRW		7	SMP	2990 lbs.
		Asbestos	LLRW(Asbestos)			CSF	600 lf
Plant 1 Pad TSS	3	Wood Products	Hazardous			CSF	6 light and 1 FSO Box
Truck Loading Dock	3	Concrete/Asphalt/Masonry	Mixed		36	CSF	
		Fencing	Mixed			SMP	20 lf
Water Treatment Replacement	3	Piping	Clean	(10/91-10/92)		SMP	120 lbs.
		Soil	Clean		1	CSF	
Manhole #34 Spill Control	3	Soil	Clean	(5/91-9/91)	1	CSF	
		Soil	Contaminated		1	CSF	
Building #30 Ladies Restroom	3	Electrical Conduit and Wire	Contaminated			CSF	26 lf
		Asbestos	Contaminated		4	CSF	
Plant 7 D & D	3	Transite Siding				CSF	
UNH Tank Removal	3					CSF	
Sewage Treatment Plant	3					CSF	
Plant 1 Pad Closure	3					CSF	
Waste Pit 5 ETF Removal Action	1					CSF	
UST Removal	3	Soil	Petroleum contaminated		4,000	CSF	
Waste Pit Runoff Control	1					CSF	
			TOTAL:		7,788		

NOTES: OU4 soils (6000 cy) are from remedial activities, not removal actions which may or may not require storage in an improved storage structure.
Classification of LLRW is based on FMPC-720 (now SSOP-0044).
Total columns do not include estimate for unknowns (blank spaces).
If classified as LLRW, the following categories apply:
Category I = < 35 pCi/g
Category II = 35-100 pCi/g
Category III = > 100 pCi/g
These categories will be replaced by the activity concentrations specified in Section 3.1.2.

DESTINATION CODES

IN-PLACE STRUCTURES
SRPC = Soil and Rubble Pile
SMP = Scrap Metal Pad
CONTAINMENT STRUCTURES
DFP = Decontamination Facility Pad
CSF = Central Storage Facility
(This option also includes the controlled stockpile for soils)

ATTACHMENT D (continued)

CHARACTERIZATION TABLE FOR CURRENT SOIL AND DEBRIS SOURCES

GENERATOR (OU, FEMP Area, Project, etc.)	LOCATION (By OU)	MATERIAL (Soil, Concrete, etc.)	CLASSIFICATION (Haz, LLRW, Mixed)	VOLUME (cu. yd.)	DIMENSIONS (LxWxH, ft)	DESTINATION (ASSUMED)	NOTES
Plants 2/3 (East)	3	Soil		4	5 x 5 x 4	CSF	Not coverd
Bldg. 71 (South)	3	Soil		408	51 x 36 x 6	CSF	Tarp covered
Truck Dock (S.W.)	3	Soil		10	8 x 8 x 4	CSF	Not covered,back fill spread, Water line leak
Pilot Plant (S.W.)	3	Soil	Category I	719	154 x 18 x 7	CSF	Tarp coverd, to be boxed
Lab near Bldg. 80 (N.W.)	3	Soil		234	84 x 15 x 5	CSF	Tarp covered
Plant 8 Center (South)	3	Soil		11	12 x 6 x 4	CSF	Not covered
Plant 8 Center (South)	3	Soil		9	10 x 8 x 3	CSF	Not covered
Plant 8 (S.E.)	3	Soil		327	84 x 15 x 7	CSF	Tarp covered
Plant 5 (N.W.)	3	Soil	Mixed (Category III)	550		CSF	Some grass/weeds, uncovered, to be boxed
Plant 9 (N.E.)	3	Soil		103	22 x 21 x 6	CSF	Not covered
Boiler Plant (West)	3	Soil		907	204 x 30 x 4	CSF	Tarp covered
Butler Bldg. (NE)	3	Soil		4,000		CSF	UST, Tarp covered
North Third St. Soil & Rubble Pile	3	Soil and Debris	Category II	23,300		SRPC	Grass, weeds; covered. This is the only pile to remain in place.
Butler Bldg. on 3rd St. (NW)	3	Soil		540	90 x 54 x 3	CSF	Straw and grass; uncovered
Soil Pile (W of RR tracks)	1	Soil	Category I	4,400	300 x 132 x 3	CSF	Clean dirt–weeds; uncovered
Soil Pile (E of RR tracks)	3	Soil and Debris		20,097	609 x 297 x 3	--	Seeded; currently being dispositioned
Lab near Bldg. 65 (W)	3	Soil		2,800	63 x 60 x 20	CSF	Covered w/ sod; to stay until Thorium is removed
Lab Bldg. (SW)	3	Soil	Category I	142	51 x 15 x 5	CSF	Uncovered
Plant 6 (NE)	3	Soil		26	21 x 11 x 3	CSF	Covered with plastic
Plant 6 (E)	3	Soil		14	19 x 10 x 2	CSF	Covered with plastic
Bldg. 46 (N)	3	Soil		23	22 x 14 x 2	CSF	HWMU–UST; covered with plastic
			TOTAL:	58,624			

NOTES: Classification of LLRW is based on FMPC–720 (now SSOP–0044).
Total columns do not include estimate for unknowns (blank spaces).
If classified as LLRW, the following categories apply:
Category I = < 35 pCi/g
Category II = 35–100 pCi/g
Category III = > 100 pCi/g
These categories will be replaced by the activity concentrations specified in Section 3.1.2.

DESTINATION CODES

IN–PLACE STRUCTURES
SRPC = Soil and Rubble Pile
SMP = Scrap Metal Pad
CONTAINMENT STRUCTURES
DFP = Decontamination Facility Pad
CSF = Central Storage Facility
(This option also includes the controlled stockpile for soils)

ATTACHMENT E

COMPLETING THE MATERIAL EVALUATION FORM

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 1 of 18
Title: COMPLETING THE MATERIAL EVALUATION FORM		DOCUMENT NO: SSOP-0002 REVISION NO. 3
Authorization: W. H. Britton, President	Supersedes: None	Issue Date: 10-22-91

NON-CONTROLLED COPY

1.0 PURPOSE

The purpose of this document is to provide the procedure for completing the Material Evaluation Form (MEF) to classify material as RCRA or NON-RCRA.

2.0 APPLICABILITY

This procedure shall apply to the classification of raw, process, excess, and waste material.

3.0 RESPONSIBILITIES

3.1 The Material Generator shall be responsible for the following:

3.1.1 Completing Section I, with input from IRS&T, of the Material Evaluation Form.

3.1.2 Maintaining a copy of the completed MEF for each generated stream.

3.1.3 Determining if a prior MEF has been submitted.

3.1.4 Completing a new MEF if changes occur to a previously evaluated material stream.

3.2 Facilities and Materials Evaluation (F&ME) shall be responsible for the following:

3.2.1 Completing Section II of the MEF per this procedure.

3.2.2 Determining that sufficient information exists to classify material as RCRA or NON-RCRA.

3.2.3 Recommending to Environmental Monitoring additional information that is required to complete a RCRA determination.

3.2.4 Maintaining the original of the completed form on file.

3.2.5 Establishing a primary and alternate contact within F&ME responsible for replying to inquiries on the completing and utilization of the Material Evaluation Form.

3.3 Environmental Engineering shall be responsible for the following:

3.3.1 Completing Section III of the MEF per this procedure.

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3.0 RESPONSIBILITIES (cont.)

3.3.2 Maintaining a record of the completed form.

3.4 Material Control and Accountability (MC&A) shall be responsible for the following:

3.4.1 Retaining a record copy of Section IV for each Material Evaluation Number.

3.4.2 Maintaining a listing that relates inventory numbers to the Material Evaluation Number.

3.4.3 Assisting Material Generator in maintenance of Material Evaluation files and tracking the Material Evaluation form.

3.5 Facilities & Warehousing (F&W) shall be responsible for the following:

3.5.1 Providing a Material Evaluation Number to generator upon request.

3.5.2 Maintaining a log of Material Evaluation Numbers.

3.5.3 Retaining a record copy of Section IV for each Material Evaluation Number.

3.6 Industrial, Radiological Safety, and Training (IRS&T) shall be responsible for the following:

3.6.1 Reviewing data provided by the Material Generator to establish the Health & Safety requirements applicable to the sampling, handling, packaging processing or transportation of material.

3.6.2 Reviewing, after completion of Section I and II of the MEF, the additional information and identifying additional personnel safety requirements.

3.7 Toxic and Solid Waste Programs (TSWP) shall be responsible for the following:

3.7.1 Providing the Department of Transportation (DOT) shipping name.

3.7.2 Providing the DOT hazard class.

3.7.3 Specifying required labels.

3.7.4 Providing DOT identification No.

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3.0 RESPONSIBILITIES (cont.)

3.7.5 Providing EPA waste No.

3.7.6 Providing applicable reactivity group codes.

3.7.7 Filling out Section IV of the MEF.

4.0 DEFINITIONS

4.1 Material Generator - a person at the originating facility who is authorized to prepare raw material, process material, and waste material for transfer.

4.2 Resource Conservation and Recovery Act (RCRA) - The congressional act which established safe and environmentally acceptable management practices for specific wastes. RCRA requires strict "cradle to grave" control and proper management of hazardous waste.

4.3 Hazardous Waste - A discarded material which is listed in the Environmental Protection Agency Hazardous Waste List which exhibits characteristics of ignitability, corrosivity, or reactivity. Both "listed" and "characteristic" wastes are regulated under RCRA.

4.4 Ignitable - Liquid waste with closed-cup flash points < 60°C (140°F), or non-liquid waste capable of causing fire through friction, absorption of moisture, or spontaneous chemical changes.

4.5 Corrosive - Aqueous (water based) wastes with a pH $\leq$ 2 or $\geq$ 12.5.

4.6 Reactive - Waste that exhibits properties such as reacting violently, forming potentially explosive mixtures or generating toxic gases when mixed with water, generating toxic gases (cyanide or sulfied) at pH between 2 and 12.5, or detonating or exploding at standard temperature and pressure or when heated under confinement.

4.7 Authorized Personnel - Personnel who have successfully completed all training requirements to perform work related to this procedure and have been authorized by the Facility Owner to perform the work.

4.8 Controlled Holding Area - The area designated for holding uncharacterized material and staging characterized material (excluding backlog material and material generated from a soil boring activity) for a maximum period of 90 calendar days.

4.0 DEFINITIONS (cont.)

4.9 Fingerprint Analysis - An analytical process providing a brief description of material parameters as listed in Table 5.

4.10 Raw Material - A non-manufactured substance at the FEMP.

4.11 Process Material - A substance which has gone through a physical state of change.

4.12 Excess Material - A substance which has exceeded its recommended shelf life or intended use.

4.13 Waste Material - A substance which has expended its usefulness, non-recyclable and non-recoverable.

5.0 GENERAL

5.1 General Instructions for Completing the Material Evaluation

5.1.1 Fill in all items of each section. If an item cannot be answered, enter "NOT KNOWN".

5.1.1.1 If an item is not applicable to the material stream being evaluated, indicate as "N/A".

5.1.2 If there is not enough space on the form to record the required data, proceed as follows:

5.1.2.1 Prepare an attachment sheet with the MEF number (and Revision Number, if applicable) and date.

5.1.2.2 Enter the Item Number that corresponds to the Item Number on the MEF.

5.1.2.3 Enter the required data on the attachment sheet.

5.1.2.4 Sign the attachment sheet.

5.1.2.5 In the item block on the MEF, enter "See attachment".

5.1.2.6 Fasten the attachment sheet to the MEF.

5.1.3 Refer questions regarding the form to F&ME.

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Authorization: W. H. Britton, President	Supersedes: None	Issue Date: 10-22-91

6.0 PROCEDURE

6.1 Identification of Material

MATERIAL GENERATOR

6.1.1 If no information is known on the material and the container has no identification, contact F&ME and IRS&T for direction.

6.1.2 Obtain a Material Evaluation Number from F&W.

6.1.3 Record the Material Evaluation Number at the top of each sheet of the Material Evaluation, Form FMPC-OPR-3252 (See Figure 1).

6.1.4 Complete Section I, Items 1 thru 16b, of the Material Evaluation Form per Table 1.

6.1.5 When Section I (Items 1 thru 16b) is completed, forward the form to IRS&T.

NOTE: The material being evaluated shall remain in the generator area until direction is received from F&ME for disposition.

6.2 Establish Safety Requirements

IRS&T

6.2.1 Review the data provided in Section I of the MEF.

6.2.2 Determine potential health or safety concerns that may be encountered while sampling, handling, or processing the material.

6.2.3 In Item 16c specify protective gear that must be used while sampling, handling, or processing material (such as protective clothing, respirator, gloves).

6.2.4 Sign Item 16d and return the MEF to the Material Generator.

6.3 Identification of Material

MATERIAL GENERATOR

6.3.1 Complete Section I of the MEF and forward the form to F&ME.

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Authorization: W. H. Britton, President	Supersedes: None	Issue Date: 10-22-91

6.0 PROCEDURE (cont.)

6.4 Evaluation of Material

F&ME

6.4.1 Ensure an evaluation has not been previously completed for this material type per the source and material type code (Item 1 of Section I). F&ME may use entire lot codes to designate a waste stream.

6.4.2 Complete Section II of the Material Evaluation form per Table 2.

6.4.3 When Section II is complete, proceed as follows:

6.4.3.1 If the material is classified RCRA or additional information is required for the classification (refer to Item 7 of Section IV), forward the form to Environmental Engineering and Material Generator.

6.4.3.2 If the material is classified as NON-RCRA or exempt (refer to Item 7 of Section II), retain the original form on file and transmit copies to distribution.

NOTE: The Material Generator shall respond by moving the drum to the designated storage area.

6.5 Material Analysis/Disposition Determination

F&ME

6.5.1 Refer to Section II and complete the following applicable substep.

6.5.1.1 If the material had been classified, proceed to Item 6.8.

6.5.1.2 If additional information is required to classify the material, complete items 13 and 14 of Section II.

6.5.1.3 Forward MEF to IRS&T to determine any additional safety requirements.

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6.0 PROCEDURE (cont.)

6.6 Establish Safety Requirements

IRS&T

6.6.1 Review additional information for safety concerns and identify any additional safety requirements.

6.6.2 Sign and forward the MEF to F&ME.

6.7 Additional Requirements

F&ME

6.7.1 Forward a copy of Section II to the Material Generator as authorization to prepare uncharacterized material for transfer to the Controlled Holding Area and a copy to Environmental Monitoring to identify and authorize sampling requirements.

NOTE: The original form shall be retained until the required information is received.

6.7.2 When additional information is received, proceed as follows:

6.7.2.1 Fill in the completion date (Item 15 of Section II).

6.7.2.2 Ensure that Section II is complete.

6.7.2.3 Initial and date each revision of Section II.

6.7.2.4 Briefly explain any corrections made (Item 2 of Section II) to the information contained in Section II.

6.7.2.5 Forward the Material Evaluation and analysis results to Environmental Engineering.

6.8 Classified Material

ENVIRONMENTAL ENGINEERING

NOTE: Refer to Item 7 of Section II for material classification.

6.8.1 If the material is classified as NON-RCRA, proceed as follows:

6.0 PROCEDURE (cont.)

6.8.1.1 For material in storage, transmit the original Material Evaluation form to F&ME, a copy to the Facility Owner of the Controlled Holding Area, and a copy to the material generator.

6.8.1.2 For material being held at the generator area, forward the original Material Evaluation form to F&ME and a copy to the material generator.

6.8.2 If the material is classified as RCRA, proceed as follows:

6.8.2.1 Complete Section III per Table 3.

6.8.2.2 Forward the Material Evaluation Form to Toxic & Solid Waste Programs.

6.9 Material Identification

TSWP

NOTE: DELETED

6.9.1 Complete Section IV per Table 4.

6.9.2 Review section IV and confirm container information is correct.

6.9.3 Forward the MEF to FM&E.

6.10 Revising the Material Evaluation

MATERIAL GENERATOR, F&ME, OR ENVIRONMENTAL ENGINEERING

6.10.1 Determine a revision to the MEF is required.

6.10.2 Notify the appropriate departments of the numbered MEF requiring change and the revision required.

MATERIAL GENERATOR

6.10.3 Obtain file copy of the specified MEF and a new MEF.

6.10.4 Obtain a revision number from Waste Management.

R - MATERIAL REVISED, ADDED, OR DELETED.

6.0 PROCEDURE (cont.)

6.10.5 Record the original MEF number and the revision number on the new MEF.

6.10.6 Complete Section I of the new MEF incorporating the necessary revisions and submit to F&ME.

6.10.6.1 If the revision requested is not applicable to Section I, complete Section I per the original MEF and forward to F&ME.

F&ME/ENV. ENG./TSWP/IRS&T

6.10.7 If the revision is applicable to Section II, III, or IV, complete the new MEF incorporating the revision.

7.0 APPLICABLE DOCUMENTS

7.1 Drivers

None

7.2 Reference Documents

None

8.0 APPLICABLE FORMS

8.1 FS-F-3252, "Material Evaluation Form"

TABLE 1
INSTRUCTIONS FOR COMPLETING MATERIAL EVALUATION FORM - (SECTION I)

ITEM NO	DESCRIPTION
1	Record the FEMP Source Code (SRC), Material Type Code (MTC), and the 15 digit Lot Code.
2	Designate the Plant/Building/Site location where material was generated.
3	Specify the process/building area which generates the material.
4	Provide the name of equipment generating the material.
5	Record the approximate date of generation (year, month, day) as specifically as possible.
6	Indicate the physical state of the material.
7	Estimate net weight of the material.
8	Indicate whether the material contains more than one substance (such as contaminated gloves, coveralls, booties, or other contaminated items).
9	Indicate whether the material is a waste.
10	Provide common names of the material.
11	Provide chemical names associated with the material.
12	Indicate sources of the common and chemical names.
13	Specify alternate material name (For example, identical material generated by different equipment).
14	Record alternate codes (source or material codes) used for material which is chemically identical to this material.
15	Indicate any substance, such as pesticides, solvents, or heavy metals, which is contained or suspected to be contained in the material.
16	a) Specify the reason for suspecting the substance indicated and quantity of suspect material[1]. b) List sources of information utilized for identifying the suspect substances indicated.

[2] Attach a copy of the MSDS as applicable.

R - MATERIAL REVISED, ADDED, OR DELETED.

TABLE 1 (cont.)
INSTRUCTIONS FOR COMPLETING MATERIAL EVALUATION FORM - (SECTION I)

ITEM NO	DESCRIPTION
16 (cont.)	c) Identify safety concerns & special safety requirements. d) Sign and date the form
17	If a fingerprint visual inspection (Table 5) of the material was completed, attach to the Material Evaluation Form.
18	Record and describe the number of solid/liquid/gas layers within the material.
19	Record the pH of liquid material or liquid phase of material[2].
20	Record the flashpoint of liquid material or liquid phase[2].
21	If the material is a wet solid (sludge) and a paint filter test has been completed, specify test results (solid or liquid)[2].
22	Indicate if material is considered reactive. Include an explanation.
23	If the material is not a liquid, indicate if material is ignitable. Include an explanation.[2]
	DELETED
24	Provide additional information that may be used to evaluate the material.
25	List additional sources (such as phone call, specification, procedures, or other input) of information used to complete this form.
26	a) Provide the name and extension number of the individual responsible for responding to questions regarding Section I. b) Record the date Section I is completed.

[2] Attach results if available. Identify source, such as a sample plan.

R - MATERIAL REVISED, ADDED, OR DELETED.

TABLE 2
INSTRUCTIONS FOR COMPLETING MATERIAL EVALUATION FORM - (SECTION II)

ITEM NO	DESCRIPTION
1	Indicate if material is waste (discarded, used, by- product).
2	Indicate if waste is excluded under 261.4(a) (CWA pointsource discharge, irrigation return flow, AEC source, special nuclear or by-product material, insitu mining waste).
3	Indicate if waste excluded from regulation under 264.1(b).
4	If the waste is listed in 261 Subpart D, or material contains a waste listed in subpart D, indicate the list and the waste number.
5	Indicate if waste exhibits characteristics specified in 261 Subpart C. List the characteristic exhibited.
6	Indicate if the material is a possible RQ hazardous substance. If yes, list the RQ amount in Lbs.
7	Indicate material classification. If material can not be classified indicate that the material needs further action and provide recommendations regarding information required.
8	Indicate if classification was based on data from Section I or an evaluation of an identical waste stream. If based on previous evaluation, list the Material Evaluation # and lot code of stream.
9	Indicate whether or not the material is subject to land ban restrictions and the effective date if applicable.
10	Distribute to the Departments listed in Section IV (Item 9).
11	List additional sources of information (phone calls, manufacturing specification, reference) used in this evaluation.
12	Provide the name and phone extension of the individual responsible for responding to questions regarding Section II and the date that Section II was completed.books).
13	Indicate if sampling is required (Refer to Section II Item 7).
14	Indicate if amount of time necessary for sampling and analysis require transfer of material to a controlled holding area. If yes, record date that the material was authorized for transfer.
15	Indicate date that additional information was included.
16.a	Identify any additional safety concerns and requirements.
16.b	Sign and date the form.

R - MATERIAL REVISED, ADDED, OR DELETED.

TABLE 3
INSTRUCTIONS FOR COMPLETING MATERIAL EVALUATION FORM - (SECTION III)

ITEM NO	DESCRIPTION
	DELETED
	DELETED
	DELETED
1	Based on Section I and II (or recent information) indicate container recommended (such as carbon steel, stainless steel, polyethylene).
2	Based on Section I and II (or recent information) indicate the reactivity group codes associated with the material.
3	List additional sources of information used to complete the form (phone calls, material specifications, reference material).
4	Provide the name and extension of the individual responsible for responding to questions regarding Section III and the date that Section III was completed.

R - MATERIAL REVISED, ADDED, OR DELETED.

TABLE 4
INSTRUCTIONS FOR COMPLETING MATERIAL EVALUATION FORM - (SECTION IV)

ITEM NO	DESCRIPTION
1	Provide the D.O.T. Shipping Name for material.
2	Provide the D.O.T. Hazard Class for material.
3	List required D.O.T. drum labels.
4	Provide the D.O.T. Identification No. (UN or NA) and prefix.
5	Provide the EPA Waste No. noted for material.
6	List applicable reactivity group codes (Refer to Section III, Item 2).
7	Record the FEMP lot code (Refer to Section I, Item 1).
8	Indicate whether a revision is required to the MEF.
9	Distribution.
10	Provide the name and extension of the individual responsible for responding to questions regarding Section IV and the date that Section IV was completed.

R - MATERIAL REVISED, ADDED, OR DELETED.

TABLE 5
FINGERPRINT ANALYSIS PARAMETERS

PARAMETER	APPLICABILITY	TEST METHOD/REQUIREMENTS
Visual inspection	Required for all waste streams	To include, at a minimum, a discussion of the following: general description material color(s) particle size apparent stains multiple phases probe drum with pipe to ensure consistency
Liquid content	Required for waste suspected of containing free liquids	SW-846-9095: Paint Filter Liquids Test (PFLT)
pH	Required for waste streams with a free liquid phase (as determined by the PFLT)	SW-846-9040: pH Electrometric Method FMPC Method No. 3033[1]
Flash point	Required for waste with a free liquid phase (as determined by the PFLT)	Flash point meter
Density/specific gravity	Required for homogeneous wastes only; density for solid wastes, specific gravity for liquid wastes	Gravimetric for Density/ASTM D 1217 for Specific Gravity FMPC Method Nos. 1004 and 1005[1]

[1] These references are included for information, not for operational use.

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Authorization: W. H. Britton, President	Supersedes: None	Issue Date: 10-22-91

Fernald Site
MATERIAL EVALUATION FORM

MEF NO.: _____
MEF REV. NO.: _____

SECTION I - MATERIAL GENERATOR

1. FEMP SRC. | MTC
2. PLANT AND/OR BULDING NO.
3. PROCESS AREA
4. EQUIPMENT NAME(S):
5. MEF NO DATE | MEF REV DATE
6. MATERIAL PHYSICAL STATE: ☐ Liquid ☐ Gas ☐ Wet Solid (Sludge) ☐ Dry Solid
7. APPROXIMATE NET WEIGHT OF FULL CONTAINER? ☐ <100 lbs. ☐ 100 to 1000 lbs. ☐ >1000 lbs.
8. DOES MATERIAL CONSIST OF MORE THAN ONE SUBSTANCE? ☐ YES ☐ NO
9. IS MATERIAL A WASTE? ☐ YES ☐ NO
10. COMMON NAMES:
11. CHEMICAL NAMES:
12. COMMON/CHEMICAL NAME SOURCE: ☐ Process Information ☐ MSDS ☐ Container Label ☐ FEMP Lot Code | OTHER
13. SIMILAR MATERIAL NAME
14. SIMILAR MATERIAL LOT CODE(S)
15. SUBSTANCES SUSPECTED:

		☐ Endrine	☐ Methylene Chloride	☐ TBP/Kerosene
☐ Aerosols	☐ Cresol	☐ Heptachlor	☐ Motor/Engine Oil	☐ Tetrachloroethylene
☐ Arsenic	☐ m-Cresol	☐ Hexachlorobenzene	☐ Nitrobenzene	☐ 1,1,1-Trichlorethane
☐ Barium	☐ o-Cresol	☐ Hexachloroethane	☐ Other Organics	☐ 2,4,5-TP (Silvex)
☐ Benzene	☐ p-Cresol	☐ Hexachloro-1,3-butadiene	☐ Paint Stripper	☐ 2,4,5-Trichlorophenol
☐ Cadmium	☐ 2,4-D	☐ Hydraulic Oil	☐ Paint Thinner/Mineral Spirits	☐ 2,4,6-Trichlorophenol
☐ Carbon Tetrachloride	☐ Degreaser	☐ Ink	☐ Pentachlorophenol	☐ Toxaphene
☐ Chlordane	☐ 1,4-Dichlorobenzene	☐ Lead	☐ Perchloroethylene	☐ Trichloroethylene
☐ Chlorobenzene	☐ 1,2-Dichloroethane	☐ Lindane	☐ Pyridine	☐ Unknown
☐ Chloroform	☐ 1,1-Dichloroethylene	☐ Mercury	☐ Selenium	☐ Vinyl Chloride
☐ Chromium	☐ 2,4-Dinitrotoluene	☐ Methoxychlor	☐ Silver	☐ Xylene
☐ Coolants	☐ Enamel	☐ Methyl ethyl ketone	☐ Synthetic oil	☐ Oil

16. a. REASON FOR SUSPECTING ALL SUBSTANCES AND QUANTITY
16. b. SOURCE FOR REASON AND QUANTITY (Attach MSDS if Available)

		☐ MSDS	☐ Prior Evaluation of Similar Material
☐ Personnel Interviews	☐ AEDO Log	☐ Container Label	What Material:
☐ Historical Records	☐ Physical Evidence	☐ Sump Report	
☐ FEMP Lot Code	☐ Process Information	☐ Soil Database	SRC: _____ MTC: _____

16. c. HEALTH AND SAFETY CONCERNS/REQUIREMENTS
16. d. SIGNATURE AND DATE
17. HAS THE "FINGERPRINT" VISUAL INSPECTION BEEN COMPLETED? ☐ YES ☐ NO
18. NUMBER OF PHASES
19. pH (IF KNOWN) (Attach Lab Results)
20. FLASH POINT (IF KNOWN) (Attach Lab Results)
21. HAS A PAINT FILTER TEST BEEN COMPLETED? ☐ YES ☐ NO
22. IS IT REACTIVE? ☐ YES ☐ NO | EXPLAIN
23. IS IT IGNITABLE? ☐ YES ☐ NO | EXPLAIN
24. OTHER INFORMATION: (Example: Is the Material a Product or Waste?)
25. ADDITIONAL SOURCES OF INFORMATION
26. PRIMARY CONTACT INDIVIDUAL | EXTENSION | DATE COMPLETED

NOTE: Form shall be completed using ink or a typewriter
NOTE: Only WEMCO employees shall sign this form

FS-F-3252 (REV. 10/10/91) Sheet 1

MATERIAL EVALUATION FORM
FORM NO. FS-F-3252
Figure 1 (Sheet 1 of 2)

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Fernald Site

MATERIAL EVALUATION FORM
(Continued)

MEF NO _____

MEF REV NO _____

SECTION II - FACILITY AND MATERIALS EVALUATION

1. IS MATERIAL A WASTE? ☐ YES ☐ NO
2. IS IT EXCLUDED UNDER 261.4(a)? ☐ YES ☐ NO
3. IS IT EXCLUDED UNDER 261.4(b)? ☐ YES ☐ NO
4. DOES IT CONTAIN A LISTED WASTE AS PER 261 SUBPART D? ☐ F ___ ☐ K ___ ☐ P ___ ☐ U ___ ☐ not listed
5. DOES IT EXHIBIT ANY CHARACTERISTICS AS PER 261 SUBPART C? ☐ YES ☐ NO EXPLAIN
6. IS IT A RQ HAZARDOUS SUBSTANCE? ☐ YES ☐ NO POUNDS
7. CLASSIFICATION AS A WASTE: ☐ RCRA Hazardous Waste ☐ Source Exempt ☐ Non-RCRA Waste ☐ Radioactive ☐ Needs Further Action (no sampling) EXPLAIN:
8. PRIMARY BASIS FOR CLASSIFICATION: ☐ Generator Information ☐ Prior material evaluation WHAT MATERIAL? _____ LOT NUMBER _____
9. IS IT SUBJECT TO LAND BAN RESTRICTIONS? ☐ NO ☐ YES Effective Date _____
10. DISTRIBUTE PER SECTION IV, ITEM 9
11. OTHER INFORMATION SOURCES USED
12. PRIMARY CONTACT INDIVIDUAL — EXTENSION — DATE COMPLETED
13. IS SAMPLING REQUIRED? ☐ YES ☐ NO
14. IS TRANSFER TO CONTROLLED HOLDING AREA REQUIRED? ☐ YES ☐ NO — DATE
15. INFORMATION ACTION COMPLETION DATE
16. HEALTH AND SAFETY CONCERNS REQUIREMENTS
18. S. SIGNATURE AND DATE

SECTION III - ENVIRONMENTAL ENGINEERING

1. RECOMMENDED STORAGE CONTAINER MATERIAL ☐ Carbon Steel ☐ Stainless Steel ☐ Polyethylene ☐ Other _____
2. APPLICABLE REACTIVITY GROUP CODES ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G ☐ -
3. OTHER INFORMATION SOURCES USED
4. PRIMARY CONTACT INDIVIDUAL — EXTENSION — DATE COMPLETED

SECTION IV - TOXIC AND SOLID WASTE PROGRAMS

1. PROPER D.O.T. SHIPPING NAME
2. D.O.T. HAZARD CLASS
3. REQUIRED LABELS
4. D.O.T. IDENTIFICATION NO ☐ UN ☐ NA — SUFFIX
5. EPA WASTE NO
6. APPLICABLE REACTIVITY GROUP CODES (COPY FROM SECTION III, ITEM 2)
7. FEMP SRC AND MTC (COPY FROM SECTION I, ITEM 7) — SRC — MTC
8. IS A REVISION TO MEF REQUIRED? ☐ YES ☐ NO
9. DISTRIBUTION

MATERIAL GENERATOR	DATE
ENVIRONMENTAL ENGINEERING	DATE
ENVIRONMENTAL MONITORING	DATE
MC&A	DATE
IPS&T	DATE
FACILITIES AND WAREHOUSING	DATE
F&ME	DATE
CONTROLLED HOLDING AREA	DATE

10. PRIMARY CONTACT INDIVIDUAL — EXTENSION — DATE COMPLETED

FS-F-3252 (REV 10/10/91) Sheet 2

MATERIAL EVALUATION FORM
FORM NO. FS-F-3252
Figure 1 (Sheet 2 of 2)

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Authorization: W. H. Britton, President	Supersedes: None	Issue Date: 10-22-91

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
01-11-91	0	Instructions for completing the Material Evaluation form required per Request No. P90-292, initiated by K. Nuhfer.
04-16-91	1	Revised to update form and include steps to allow for an MEF revision per Request No. P91-093, initiated by J. Ogg.
06-20-91	2	Revised to update technical content and form per Request No. P91-235, initiated by R. Henderson.
10-22-91	3	Revised to insert correct form per Request P91-390, initiated by L. Hamblin.

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ATTACHMENT F

ENGINEERING EVALUATION FOR IMPROVED STORAGE OF SOIL AND DEBRIS - REMOVAL ACTION 17

Engineering Evaluation for Improved Storage of Soil and Debris

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SECTION 1

INTRODUCTION

The following section provides summary background information that establishes the need for improved storage for soil and debris, and specifies the purpose of this alternative evaluation.

1.1 Background Information

Contaminated soil and debris associated with construction maintenance and environmental remediation projects have been generated at the Fernald Environmental Management Project (FEMP). Currently planned removal actions also predict further production of these types of materials. Problems which have inhibited the disposal of these materials involve a number of factors, including:

1) The presence of contaminated material whose movement has been restrained by regulatory considerations
2) The lack of adequate characterization data
3) A lack of available or approved storage/disposal space

Currently, these contaminated materials are being accumulated in piles at the site in areas which are as unobtrusive and controllable as possible. However, the maintenance provisions for the piles have been minimally applied. The potential for migration of contaminants from these piles is a source of concern. The associated potential for release to the surrounding environment is the basis for designating this activity as a Removal Action.

This project, entitled "Removal Action Number 17, Improved Storage of Soil and Debris," was recently required by the Consent Agreement between the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (US EPA). This Removal Action was determined to be on a time-critical schedule. The objective of the removal action is to provide facilities which will properly store soil and debris waste materials until the remedial alternative is selected and implemented. These materials may be classified as either hazardous waste, low-level radioactive waste, or mixed wastes. Some materials may also contain asbestos, polychlorinated-biphenyls, and petroleum products. The sources of soil and debris are current and planned removal actions, general site construction/maintenance projects, and existing soil and debris (rubble) piles.

1.2 Purpose

The purpose of this document is to identify potential alternatives that could be implemented to store soil and debris materials. The potential alternatives are evaluated against a set of selection criteria. This method ensures a rational comparison between the alternatives and leads to a justifiable alternative selection. It should be noted that a comprehensive engineering feasibility and alternative evaluation could not be conducted since this Removal Action is considered to be time critical. However, this document provides a general evaluation of commonly used methods for temporary storage.

1.3 Assumptions

The soil and debris materials are expected to include contaminated soil and concrete/rubble, asbestos-bearing materials, PCB-contaminated equipment, and other items which cannot be decontaminated. These materials will be segregated within the Improved Storage Facilities to comply with regulatory mandates and to facilitate the anticipated final remediation requirements. Therefore, there will be separate compartments/piles of similar materials within a storage area. The design life of the facilities must be at least 10 years. A storage area with dimensions of 100 feet by 400 feet is used within the evaluation.

Some Improved Storage Facilities will be constructed over existing soil and debris piles, and other Improved Storage Facilities will be constructed on vacant sites. Contaminated soil and debris will be brought to this second facility type for storage. This report focuses on the selection of an alternative that will receive materials for storage.

SECTION 2

IDENTIFICATION AND DESCRIPTION OF ALTERNATIVES

The following section identifies the potential alternatives for improved storage and provides a brief description of each alternative. These alternatives will be evaluated with respect to selection criteria that are identified in Section 3.

It should be noted that a no-action alternative is not a potential alternative, because the Consent Agreement between the DOE and the US EPA specifies that the storage of soil and debris must be improved.

Temporary storage facilities will be built to store the contaminated soil and debris that will be generated from various site construction, maintenance, and remediation projects. Temporary storage facilities are needed for a loading dock, an area for excess equipment, and decontaminated scrap metal. The potential alternatives to improve storage of existing materials and to provide additional capacity of future materials are discussed in the following sections. They are as follows:

1) Tarpaulins
2) Tarpaulins with a Liner System
3) Pre-Engineered Buildings
4) Tension-Support Structures

2.1 Alternative Number 1 - Tarpaulins

A tarpaulin is a waterproof fabric or material which is laid upon the surface of a pile to contain the material and to control erosion and fugitive dust emissions. Tarpaulins are supplied on rolls and are resistant to sunlight, oxidation, and reaction with the waste before degrading. The functional life of a tarpaulin is about 5 years.

The tarpaulin would be unrolled to cover the inactive surface and slopes of the piles. The active surface of the piles would be uncovered when new material is deposited on the surface. The tarpaulin would then be unrolled to completely cover the pile after accumulation. Concrete blocks will be placed upon the tarpaulins to anchor the cover system in case of high winds.

The contaminated material piles would be regraded and compacted periodically to reduce the peak elevation and the side slope. In addition, the edges of the tarpaulin would be overlapped and joined each time the tarpaulin is placed over the pile. This type of improved storage would allow flexibility with respect to the size and shape of the piles. The potential for the expansion of storage capacity is limited

only by property availability. Earthen berms and drainage ditches will be used to control runon and runoff.

2.2 Alternative Number 2 - Tarpaulins with a Liner System

The alternative would utilize the same tarpaulin discussed in Subsection 4.1.1. However, a subsurface liner system that meets the requirements of 40 CFR 264.250 for waste piles would also be provided. The liner system would likely be 12 mil, High-Density Polyethylene Elastomer (HDPE). The liner would need to be chemically resistant to the contaminated materials present in the pile and would require sufficient strength and thickness to prevent failure of the system.

The liner system would consist of a primary and secondary leachate collection/removal system that would collect and remove leachate from the pile. The primary liner would drain leachate that percolated through the pile. The secondary leachate collection system would contain leachate that leaked through the primary liner. This system must be designed and operated to function without clogging. A runoff management system would be required to control at least the volume from a 24-hour, 25-year storm event. Runon from the same storm event must also be prevented. The liner system would make it difficult to expand the size of the facility for additional storage capacity. The liner system would be constructed on the site, where the pile would be deposited and covered with a thin layer of soil to prevent damage during operations. The soil and debris would be dumped upon the liner system to create the pile. Tarpaulins would be used to cover the soil and debris pile.

2.3 Alternative Number 3 - Pre-Engineered Buildings

Pre-engineered buildings are erected with a steel beam and column system covered with a metal roof and siding. These permanent buildings would provide a storage facility for waste piles that would completely control runoff and fugitive dust emissions. Because the building is considered to be permanent, it can be expected to last more than 30 years. As the shape of the existing waste piles is irregular, a certain amount of soil and debris would need to be regraded to form rectangular piles with a moderate peak elevation for structures that would be built around in-place piles. New materials would be moved into a pre-engineered building through a large door. A method of segregating and containing specific types of materials would be required with sufficient aisle space for loading/unloading. Adding extra storage capacity to a pre-engineered building would likely require the construction of another building.

2.4 Alternative Number 4 - Tension-Support Structures

Tension-support structures are built with metallic arch frames covered by PVC-coated polyester fabric. A large tension-support structure will require a strip foundation in order to resist wind or tornado loads. These structures can shelter the waste piles and control the runoff erosion and the migration of dust

particles. A structure's normal life expectancy is more than 10 years.

The durable fabric is fire retardant and translucent which would maximize the entry of sunlight. The structure can be erected relatively quickly for both existing or future waste piles. The existing waste piles would be reshaped before the rectangular structure could be built to cover them. Large doors would be located at both ends of the structure to facilitate the movement of waste material. A method of segregating and containing specific types of materials would be required with sufficient aisle space for loading/unloading. Tension-support structures could easily be expanded for enhanced storage capacity by erecting an additional length to an end of an existing structure.

There are two types of tension-support structures which are currently in use at the FEMP site. The two types of structures differ with respect to their arches which are typically 10 feet apart. The differences are:

1) Arch trusses wrapped by fabric - The arch trusses are made of galvanized steel tubes. The FEMP has a RUBB® building system of this type.

2) Arch frames tied with fabric - The arch frames are constructed from aluminum I-beams. The FEMP has a SPRUNG® structure of this type.

Both structures would serve the purpose of improved storage.

SECTION 3

IDENTIFICATION AND DESCRIPTION OF SELECTION CRITERIA

In order to select the most effective improved storage method for soil and debris, selection criteria were established to evaluate the potential alternatives. The process of evaluating alternatives was performed in two stages. The first stage was the initial screening which evaluated and eliminated any alternative that did not meet the minimum regulatory requirements. Minimum regulatory requirements included the protection of stored waste from precipitation runoff and fugitive dust. The second stage of the evaluation process compared the alternatives against the engineering selection criteria. These selection criteria included the effect of long-term remediation action, the complexity of operation, ease of decontamination and decommissioning, and the relative cost. Selection criteria for the improved storage of soil and debris are identified and described in the following subsections.

3.1 Protection from the Elements

The selected alternative must possess a capability to protect the waste materials from the elements of precipitation, wind, and water infiltration. The storage of soil and debris must be improved to prevent the contaminated material from uncontrolled release to the environment. The preferred alternative will isolate the soil and debris from the environment.

3.2 Control of Runoff

The alternative must have the potential to be designed so that runoff is controlled and prevented from contacting the soil and debris. The ground surface surrounding the storage facilities must be graded and a storm drainage system must be provided to control the runoff from the facilities. During the construction period, stormwater and sediment must be appropriately managed to abate discharges of potential contaminants to the environment. The preferred alternative will prevent runon and runoff from contacting the soil and debris and from collecting within or adjacent to the storage facilities.

3.3 Long-Term Remediation Considerations

The contaminated soil and debris will be stored at the FEMP until the final disposition requirements for these materials are defined and selected with respect to the CERCLA remediation actions. At that time, the waste materials will be shipped, treated, and/or disposed in a properly licensed facility. The Improved Storage Facility should be designed to be functional until the waste material is removed for processing/disposal. The design life span of the Improved Storage Facility needs to be at least 10 years. The preferred alternative will provide a structure that will store the soil and debris materials for the required duration with little facility maintenance.

3.4 Operation Considerations

Requirements of manpower, utilities, and equipment to operate the storage facilities should be assessed. The complexity of design, construction, and procurement needs must be considered. The Improved Storage Facilities must be maintained to ensure the continuous effectiveness of storage. The preferred alternative will require few operating personnel and will require the least amount of utilities.

3.5 Ease of Decontamination and Decommissioning

The Improved Storage Facilities will be temporary structures. Therefore, the preferred alternative will be easy to dismantle and decontaminate. It may also be possible to use these structures for other purposes once the soil and debris are removed.

3.6 Cost

The relative cost of the capital investment, operation, and maintenance should be assessed. The cost of decontamination and disposal/reuse of the storage alternative should also be considered. The preferred alternative will have the lowest total cost with respect to capital and operating cost.

SECTION 4

ALTERNATIVE EVALUATION AGAINST SELECTION CRITERIA

All of the alternatives identified in Section 2 satisfy the minimum requirements in that they will protect the waste materials from precipitation, wind, and water infiltration. The alternatives can also control the runoff from the storage facilities.

In consideration of the long-term remediation criteria, the pre-engineered building has the longest functional life (greater than 20 years) followed by the tension-support structure where the normal life expectancy of fabric exceeds 10 years. The tarpaulin alternative with or without an underlain liner will last about 5 years. With respect to the decontamination and decommissioning (D&D) criteria, the quantity of material that would require D&D would be greater for the pre-engineered building than for the tension-support structure. The tarpaulin and liner system alternatives would have the least amount of material for D&D. It should be noted that the pre-engineered building and the tension-support structures may be able to be utilized for other activities after the temporary storage period is completed. It is unlikely that tarpaulins would be re-usable.

The operation of storage facilities for the pre-engineered building and the tension-support structures is relatively simple compared to the tarpaulin alternative. A front-end loader would be needed to cover and uncover the tarpaulined pile each time that soil and debris materials require operator attention. On the other hand, operators could easily manage the soil and debris piles from within the pre-engineered building or the tension-support structure.

Table 4-1 provides a summary cost comparison for the four alternatives. The comparison is based upon a storage area of 100 feet by 400 feet that will operate for 10 years. The table includes the Net Present Worth for each alternative broken down specifically by capital, D&D, operating and maintenance costs. The capital and D&D costs include a 30 percent contingency to account for uncertainty in the estimate. Table 4-2 provides a list of assumptions that were made for this magnitude of cost estimate.

The Net Present Worth of the tarpaulin alternative is the least ($1,835,000), whereas the pre-engineered building has the greatest Net Present Worth ($2,700,000). With respect to the Net Present Worth, the tarpaulin would be the preferred alternative.

Table 4-1 - Cost Summary Comparison
($ in thousands)

Cost	Pre-Engineered Building	Tension-Support Structure	Tarpaulin	Tarpaulin and Liner
Capital	$1,700	$1,600	$970	$1,240
D&D	200	200	65	130
Operating	560	560	670	1,000
Maintenance	240	100	130	200
Total	$2,700	$2,460	$1,835	$2,570

Table 4-2 - Assumptions Made within the Cost Estimates

Capital Cost Assumptions (Present Worth)

1) Construction costs include only direct costs.

2) No escalation applied.

3) Contingency is applied at 30 percent to capital and D&D costs.

4) D&D costs include dismantling, decontamination, and disposal.

5) Costs are based on square foot analysis and historical data. Units include material, labor, and construction equipment.

6) All scenarios include the procurement of capital equipment for operations.

Operations and Maintenance Assumptions

1) Operational costs include labor and costs to operate equipment for a 10-year period.

2) Labor costs for the pre-engineered building and tension-support structure are based on a schedule of 250 days/year at 4 hours/day. However, in the case of the two tarpaulin scenarios, an additional worker is added for 8 hours/week for repair activities.

3) Contingency is not applied to operation and maintenance costs.

Note: The estimate excludes all project management costs and miscellaneous supplemental expenditures (i.e., protective clothing, non-productive time, etc.).

Table 4-1 shows that the capital cost of the tarpaulin alternative is the lowest and the capital cost of the pre-engineered building is the highest. The D&D cost for the tarpaulin alternative is the lowest because only the tarpaulin would require disposal. On the other hand, the cost to decontaminate and decommission a building (pre-engineered building/tension-support structure) would be considerably higher.

The operating cost for the subsurface liner and tarpaulin alternative is the highest because the subsurface liner may require maintenance, and collected water would require disposal. In addition, the tarpaulins would require movement (cover/uncover) for operational procedures and maintenance/replacement due to a short material life span. The tarpaulin cover without a subsurface liner shares many of the costs that impact the previous alternative. However, the operating costs are predicted to be less due to the absence of operation and maintenance costs for the liner. The pre-engineered building and the tension-support structure alternatives are estimated to require less operating costs when compared to the tarpaulin alternatives.

A decision matrix is presented as Table 4-3 to help select the recommended alternative. The matrix scores each alternative with respect to each selection criteria. A ranking system from one to five is used to comparatively score each alternative against the selection criteria. The ranking system uses five points for the alternative that best satisfies the criterion and decreases for the alternative that least satisfies the criterion. This comparative analysis assumes that each selection criteria contributes equally to the selection process.

The scores are added across the selection criterion for each alternative to arrive at a total score. The total score for each alternative is compared against the scores for the other alternatives. The tension-support structure alternative received a score of 15 out of a maximum score of 20. This represents 75 percent of the maximum score. The tarpaulin received a score of 14, which represents 70 percent of the maximum score.

The tension-support structure alternative is superior to the tarpaulin alternative in a direct comparison. With respect to a magnitude of cost estimate, the price differential between the tarpaulin and the tension-support structure ($625,000) alternatives may not be significant. The tension-support structure will be more effective for keeping precipitation away from segregated piles within a storage facility. Tarpaulins over several segregated piles in a storage area will not provide overall drainage away from the storage area. All drainage from a tension-support structure will flow away from the storage site whereas some drainage off a series of tarpaulined piles will flow into central points between piles within the storage area. The tarpaulin system will therefore require an additional water collection system and may also require a water treatment system. A tension-support structure will be able to house segregated piles under one roof without the need for a water collection or treatment system.

A tarpaulin system will not be as durable and long lasting as the tension-support structure. The tension-

support structure fabric will not contact the soil and debris materials due to the lattice support framework. On the other hand, the tarpaulin material will be in direct contact with the soil and debris which could easily cause the fabric to rip or puncture. A damaged tarpaulin would greatly reduce the effectiveness of the system as a precipitation and wind barrier and could increase maintenance/replacement costs.

The tension-support structure is the selected alternative based on the results of the decision matrix, and the direct comparison. The tension-support structure is viewed to be the superior alternative with respect to ease of operation and effectiveness at isolating soil and debris from the environment. Tension-support structures are currently used for similar applications at the FEMP site and are commonly used in the environmental remediation industry. The tension-support structure is consistent with the long-term remedial action of the FEMP plan.

Table 4-3 - Evaluation of Alternatives

	D&D	Long-Term Remediation	Operation Consideration	Cost	Total
Tarpaulin	4	2	3	5	14
Tarpaulin & Liner	4	2	2	4	12
Pre-Engineered Building	2	5	4	2	13
Tension-Support Structure	3	4	5	3	15