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R-020-104 .5

**FEMP APPLICATION TO SHIP WASTE TO THE NEVADA TEST SITE  
REVISION 5, VOLUME 1 OF 2 - JUNE 1993 \*\*\*DRAFT\*\*\***

06/18/93

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**DOE-FN      DOE-NV**  
**317**  
**APPLICATION**

Control Number: \_\_\_\_\_

**DRAFT**

**6053**  
W01

**FEMP**  
**Application To Ship Waste**  
**To The**  
**Nevada Test Site**

Revision 5

Volume I

June 1993

**FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

**Fernald Environmental Restoration Management Corporation**

P. O. BOX 398704  
CINCINNATI, OH 45239-8704

PREPARED FOR THE

**U. S. Department of Energy**

FERNALD FIELD OFFICE  
UNDER CONTRACT DE-AC05-92OR21972

000001

Attachment to: G-43294 DOE-2250-93

# DRAFT

## FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

### APPLICATION TO SHIP WASTE TO THE NEVADA TEST SITE

MAY 1989

Revision 5.0

June 1993

Prepared by  
FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION  
P. O. BOX 398704  
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Prepared for  
U.S. DEPARTMENT OF ENERGY  
FERNALD FIELD OFFICE  
Contract DE-AC05-86OR21600

SIGNATURES BELOW ATTEST THAT THE INFORMATION CONTAINED IN THIS APPLICATION IS CORRECT AND THAT THE WASTE STREAMS TO BE SHIPPED WILL MEET THE NTS WASTE ACCEPTANCE CRITERIA:

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Site Operations

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Remediation Support Operation  
(Analytical Laboratory; Waste Operations: Traffic)

000002

## RECORD OF REVISIONS

<u>Revision No.</u>	<u>Date</u>
0	5/89
1	8/90
2	11/90
3	5/91
4	7/92
4.1	10/92
4.2	11/92
4.2	1/93
4.2	2/93
5	6/93

APPLICATION TO SHIP WASTE

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**NOTE:** Due to the transition from WEMCO to FERMCO, not all procedures controlling activities at the FEMP have been revised to reflect the new organizations at the time of this printing. For the purposes of this review, the old organization is listed [behind] the current organization. This information is provided to assist reviewers in understanding which organization is responsible for tasks listed in the SOPs and SSOPs that have not been revised.

**I. GENERATOR INFORMATION**

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**A. Signature Page**

See cover page.

**B. EPA Identification Number**

OH6890008976

**C. Facility Name and Location**

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## I. GENERATOR INFORMATION

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## E. Contractor Name and Contacts

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**F. Waste Certification Officials and Alternates**

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**Justification for additional alternate waste certification officials:**

- The FEMP is a large volume shipper of low level waste, over 744,000 cubic feet in FY-1992.
- Services of Waste Certification Officials are required each day of the work week, and occasionally on weekends and other shifts.
- The physical layout of operations, and inflexible work schedules, require the services of a Waste Certification Official in several places at the same time.
- Availability of certification personnel is limited by increased training

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requirements, vacations, and other assignments.

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### **G. Justification for Shipment to Nevada Test Site**

The FEMP proposes to ship waste streams consistent with those listed in Section III, Part A through Part I of this application in accordance with NVO-325 (Rev. 1) requirements. The waste streams will be processed (if necessary), packaged, transported, and disposed at the Nevada Test Site (NTS).

Since 1986, the FEMP has not been permitted to dispose of any Low Level Waste (LLW) on site. As a result, a backlog of low level waste, equal to approximately 9.5 million ft.<sup>3</sup> has accumulated at the FEMP.

In addition to the backlog waste, the FEMP continues to generate LLW from ongoing clean up activities required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), construction projects that are underway to refurbish the portions of the FEMP required to accomplish long term cleanup, and daily operational activities. The CERCLA cleanup activities and construction projects are expected to generate approximately 950,000 ft.<sup>3</sup> of LLW between 1991 and 1995. Daily operational activities currently generate approximately 740,000 ft.<sup>3</sup> of LLW per year.

Based upon the relatively small size of the Fernald Environmental Management Project (1,050 acres), its close proximity to densely populated areas, and its location over a major sole source aquifer, off-site disposal of this Low Level Waste is an essential part of the environmental remediation at the FEMP. The waste generated at the FEMP is defense waste and must be disposed of in accordance with DOE Order 5820.2A, III.2.c.

### **H. Waste Minimization Plan Statement**

The FEMP employs waste minimization techniques to reduce the quantity and toxicity of wastes generated at the facility. These efforts are outlined in the FEMP "Waste Minimization and Pollution Prevention Awareness Plan." This document educates personnel and establishes programmatic goals for waste minimization at the FEMP. This plan meets regulatory requirements of the Resource Conservation And Recovery Act as well as satisfying DOE Orders 5400.1 and 5820.2A.

### **I. Funding Method**

Funding shall be set up to prepay FEMP estimated waste volumes at least a fiscal quarter in advance. Purchase orders shall be prepared and addressed to Reynolds Electrical and Engineering Company (REECo), based upon the fiscal year estimated waste volume and consistent with the forecasts identified in this application and the current disposal charge per cubic foot. Upon receipt of an invoice from REECo, payment shall be expedited. FEMP shall adjust any quarterly forecast prior to the initiation of billing by REECo for that quarter.

## II. WASTE CHARACTERIZATION PROGRAM

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### Overview

The FEMP Waste Characterization Program Plan defines the goals and objectives of the program, describes the characterization process, summarizes the evaluation requirements, and identifies the documentation system for the program.

### Goals

The Waste Characterization Program at the FEMP has three primary goals: (1) support health and safety programs, (2) comply with the waste characterization requirements of regulatory programs and legal agreements, and (3) provide information required to ensure operational compliance for materials management (e.g., National Pollution Discharge Elimination System (NPDES) permit conditions, disposal facility Waste Acceptance Criteria (WAC), etc.).

### Objectives

There are several key objectives that assure the integrity of the program. These include the following:

- The scope of the program is identified.
- The waste characterization process, including roles and responsibilities, is well specified.
- The key questions to be answered are clearly stated. The evaluation criteria for answering each key question and the requirements for data quality and quantity are explicitly identified.
- There is a documentation system that supports all decision-making criteria and provides traceability to individual waste packages.

### Waste Streams

Waste characterization is required for all wastes generated or managed at the FEMP. Characterization is also required for environmental media (e.g., soils) that are managed as waste because they contain materials regulated under one or more of the material-specific regulatory authorities. In addition, under legal agreement with the state of Ohio, certain materials stored on site that may not be classified as waste must be characterized. Waste characterization is required for both currently generated wastes and for backlogged wastes that have not been appropriately characterized.

Waste characterization requirements apply to those wastes that are generated under continuing operation and maintenance programs as well as to those wastes generated or managed under the CERCLA Removal Action Programs at the FEMP.

## II. WASTE CHARACTERIZATION PROGRAM

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All LLW in the waste streams identified in this application fall within the scope of the Waste Characterization Program. However, it must be understood that for purposes of characterization, the FEMP definition of a Waste Stream is much more discrete than what is identified by the nine waste streams provided in Section III (Waste Stream Identification) of this application. At the FEMP a waste stream could comprise a single 55-gallon container, or several hundred box containers depending on the method of generation and the time period during which the waste is generated. For purposes of characterization at the FEMP, a waste stream is identified by the documentation contained in a discrete, uniquely identifiable characterization file. For purposes of disposal at the NTS, a waste stream is identified as one of the waste streams listed in Section III of this application. Therefore, there are multiple characterization files for each of the waste streams listed in this application.

### Waste Characterization Process

The FEMP's Waste Characterization Program has been developed and refined over several years as the facility has worked to characterize its inventory of backlogged (primarily process residues) and newly generated waste. The basic process is depicted in Figures 1 and 2 (reference pages 11 and 12) with responsible organizations identified for each stage of the process. The organization with primary responsibility for characterization and maintenance of the characterization files is Waste Characterization (WC) of Facilities and Materials Evaluation [FME] group under the Environmental Management Department. There are two basic processes for completing work characterization.

The first process for obtaining waste characterization at the FEMP has been developed into a site procedure (SSOP 0002 - Completing the Material Evaluation Form). This process is depicted in Figure 1 with the responsible organizations identified for each stage in the process. The responsibilities of each group involved in waste stream characterization is explained in detail in SSOP-0002. The primary vehicle for completing the characterization is the two page material evaluation form (MEF) which is part of the site procedure. Waste characterization for construction projects is currently documented with RCRA characterization / radiological determination letter or a MEF or checklist completed by the WC [FME] Group. The FEMP is in the process of converting the determination process to characterize all waste using the MEF process (target date,

The first page of the MEF is the Generator's Section which summarizes information provided by the FEMP (internal) waste generator. It is similar to the waste profile sheets used by commercial treatment, storage, and disposal facilities (TSDFs) allowing for documentation of information regarding generator and waste stream identification, generation information, gross material characteristics, material composition, and health and safety precautions.

The second page of the MEF is the Evaluation Section, which summarizes the results of the waste characterization with the evaluation criteria. It summarizes pertinent information from the evaluation process including material regulatory status, material management requirements, and health and safety precautions.

## II. WASTE CHARACTERIZATION PROGRAM

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Supplementing the MEF are a series of worksheets which are completed with each MEF to establish other relevant criteria for disposal of the waste. One of these worksheets is titled "NTS Waste Acceptance Criteria." This completed worksheet and completed MEF are the process by which waste is characterized and the characterization documented to ensure that NVO-325 (Rev.1) criteria are met.

A second process for completing characterization is used for project waste when the MEF process is not used. Site standard operating procedure, SSOP-0044 provides direction for completing this process. Under this process, all wastes from a given project (e.g., construction projects) identified by the project engineer are documented to the WC [FME] Group. Waste Characterization [FME] reviews the wastes, completes a project walkdown, documents process knowledge, and determines required sampling and analysis needs to support waste characterization. When all supporting information (including sampling and analysis) are complete, WC [FME] issues a RCRA determination/radiological characterization letter for the project. This letter serves as documentation of the regulatory status of the generated waste. The process for completing project waste characterization is documented in Figure 2.

### A. Process Knowledge

The FEMP relies on process knowledge to complete characterization at the FEMP for certain waste streams that have sufficient process knowledge documentation and material controls measures (these include a large number of process waste streams). In joint guidance issued by DOE and EPA, process knowledge was identified as being most appropriate when one or more of three conditions exist (employee exposure concerns (ALARA), the matrix is not amenable to sampling or highly heterogenous waste form). The NVO-325 (Rev. 1), WAC establish a higher standard for waste characterization stipulating that one or more of these conditions must be met in order for waste to be characterized by process knowledge alone.

Process knowledge includes the sum of all information that can be collected on a material, including information from operating procedures, manufacturing specifications, material safety data sheets (MSDS), spill reporting logs, visual inspections, and personnel affidavits. All process knowledge used for waste characterization is documented in the waste characterization file for each waste stream.

~~The RCRA regulations specifically provide that the waste generator may apply knowledge of the hazard characteristic of the waste in light of the material or processes used. The FEMP takes two basic approaches for evaluating waste using process knowledge. The first approach is to determine that the waste matrix (the material) can not exhibit a hazardous waste characteristic. For example a non-liquid waste, by definition, can not exhibit the characteristic of corrosivity. Likewise, bulk structural steel with virtually no absorptive capacity will never fail the Toxicity Characteristic (TC) provided any surface coatings have been appropriately addressed.~~

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The second approach is to demonstrate that the generating process was well documented, controlled, and did not involve the introduction or generation of any material that could cause the waste to be regulated. For example, materials generated from a high temperature furnace with sufficient residence (e.g., a metals reduction furnace) and which had known feed materials (e.g., UF<sub>6</sub>, Mg metal, and MgF<sub>2</sub>) may be determined by process knowledge not to fail the TC for organics.

Process knowledge is only used at the FEMP when there is sufficient objective information to support the determination. This information is captured in the individual waste characterization files that support each individual determination such that the logic for reaching a conclusion can be reconstructed by an independent reviewer if necessary. Additional information on the use of process knowledge is provided in the FEMP Waste Characterization Plan.

The FEMP recognizes that DOE/NVO has established a standard higher than either the federal/state regulatory requirements or the DOE/EPA guidance. The FEMP will comply with this higher standard in completing waste characterization to support shipment of waste to the NTS and will complete confirmatory characterization sampling and analysis (S&A) to supplement process knowledge determinations for materials that fail to meet one of the three criteria. When these waste streams do not meet one or more of the three conditions specified in NVO-325 (Rev. 1) for use of process knowledge (e.g., unsampleable, high heterogeneity, or ALARA concerns) the FEMP completes confirmatory sampling to satisfy the requirements of NVO-325 (Rev. 1). The basis for characterizing waste for shipment to the NTS is identified for each waste stream in the waste stream information Section (III). Protocol for confirmatory sampling is provided in Section II. 2.

### B. Sampling Plan

When process knowledge is not sufficient to characterize the waste, sampling and analysis is initiated. Sampling and analysis is conducted to support waste characterization in accordance with US EPA SW-846, "Test Methods for Evaluating Solid Waste," for RCRA waste characterization. Protocols required by other regulatory programs (e.g., polarized light microscopy (PLM) for identification of asbestos containing materials (ACM)) are used when applicable. All data required to support waste characterization by sampling and analysis are included in the waste characterization files. These files include the request for analysis, sampling plan, field sample log book, analytical data report, Quality Assurance/Quality Control (QA/QC) Report, chain-of-custody forms, and statistical treatment of analytical data. An individual sampling plan is written for each waste stream that must be sampled. The plans are written by personnel within FERMCO's Environmental Monitoring Section. Sampling plans are reviewed and signed by the author of the plan and the author's immediate supervisor. Sampling is then performed per the sampling plan.

For certain waste streams at the FEMP process knowledge alone is sufficient to meet all regulatory and waste management requirements at the FEMP. When these waste streams do not satisfy one or more of the conditions for use of process

**II. WASTE CHARACTERIZATION PROGRAM**

knowledge specified in NVO-325 (Rev. 1), (e.g., the waste form is amenable to sampling) confirmatory sampling and analysis is conducted to satisfy NVO-325 (Rev. 1) requirements. Confirmatory sampling and analysis is conducted in accordance with SW-846 (including all QA/QC requirements) but at a lower sampling rate than characterization sampling. Confirmatory sampling for containerized waste is completed in accordance with SMS-93-290 "Prototype Sampling and Analysis Plan for Containerized Waste at the FEMP."

Confirmatory sampling essentially serves as a quality assurance check on process knowledge to ensure that materials meet the NVO-325 (Rev. 1), WAC for shipment to the NTS. If confirmatory sampling and analysis fails to substantiate the process knowledge determination, then the waste is re-evaluated and further sampling and analysis completed, if necessary. Additional information on this protocol is provided in the FEMP Waste Characterization Plan (Section 13.1.2).

**C. Waste Analysis Requirements**

Materials characterized under the program fall into three general categories: (1) large volume scrap waste streams (Waste Stream ONL0000000001), (2) project waste (Waste Stream ONL0000000002), and (3) nonproject waste (Waste Streams ONL0000000006, ONL0000000007, ONL0000000008, ONL0000000009, ONL0000000010, ONL0000000011, and ONL0000000012).

Large volume scrap waste (Contaminated Process Area Scrap Wastes) are defined as a limited number of waste streams that are not difficult to characterize in terms of regulatory status and conformance to the NVO-325 (Rev. 1) WAC. Currently these waste streams include scrap metal, scrap wood, and scrap vehicles. These wastes are not amenable to sampling. These waste streams have been evaluated under the MEF process and determined to be acceptable for shipment to the NTS under the NVO-325 (Rev.1) WAC provided they meet certain specified criteria. Each container filled with large volume scrap waste is evaluated to ensure that all materials placed in the container meet the specified criteria. The criteria have been incorporated into a checklist that provides traceability from the waste container to the appropriate scrap waste MEF. Use of the checklists is controlled by a standard operating procedure (SOP 20-C-625, Evaluating Low Level Radioactive Waste Bulk Waste Streams for Shipment). Wastes that fail to meet the specified criteria for large volume scrap waste are generally characterized as nonproject waste.

Project generated wastes (Contaminated Construction/Removal Action Wastes) may be generated from construction projects, removal actions, or other large planned activities. Waste characterization is completed for project generated waste prior to actual waste generation whenever possible (e.g., to minimize the volume of waste generated for disposal at the NTS, soils from an excavation area are sampled prior to excavation). This proactive waste characterization supports waste management and compliance issues.

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Nonproject generated waste (Low/High Grade Residues, Contaminated Trash, Metal Melt Waste, Contaminated Regulated Asbestos Containing Material Waste, and Thorium Waste and Residue) are wastes from activities at the FEMP that are not large enough or planned with enough lead time to fall into the project generated waste category. The preference for these waste streams is still to characterize them prior to generation, but this is not generally as feasible as with the project generated waste.

### Documentation

All documentation to support the waste characterization is contained in WC [FME]'s Waste Characterization File System. The system is comprised of a physical file for each waste stream with its status summarized in the WC [FME] Waste Stream Database. Some elements of the waste stream file are mandatory (e.g., unique identification number), while others only contain information when applicable for the waste stream (e.g., sampling data). The WC [FME] Waste Stream Database provides a convenient way to track a material's status through waste characterization, to check the status of an evaluated waste stream, or to summarize information across broad categories of waste streams.

Access to the Waste Characterization File System is limited to WC [FME] personnel and persons assisted by WC [FME] personnel. Files removed from the trailer must be signed out. Duplicate copies of each element of the file are maintained at a separate location to provide backup documentation. The Waste Characterization System is maintained in a secured trailer with limited access.

### D. Standardized Data Reporting Forms

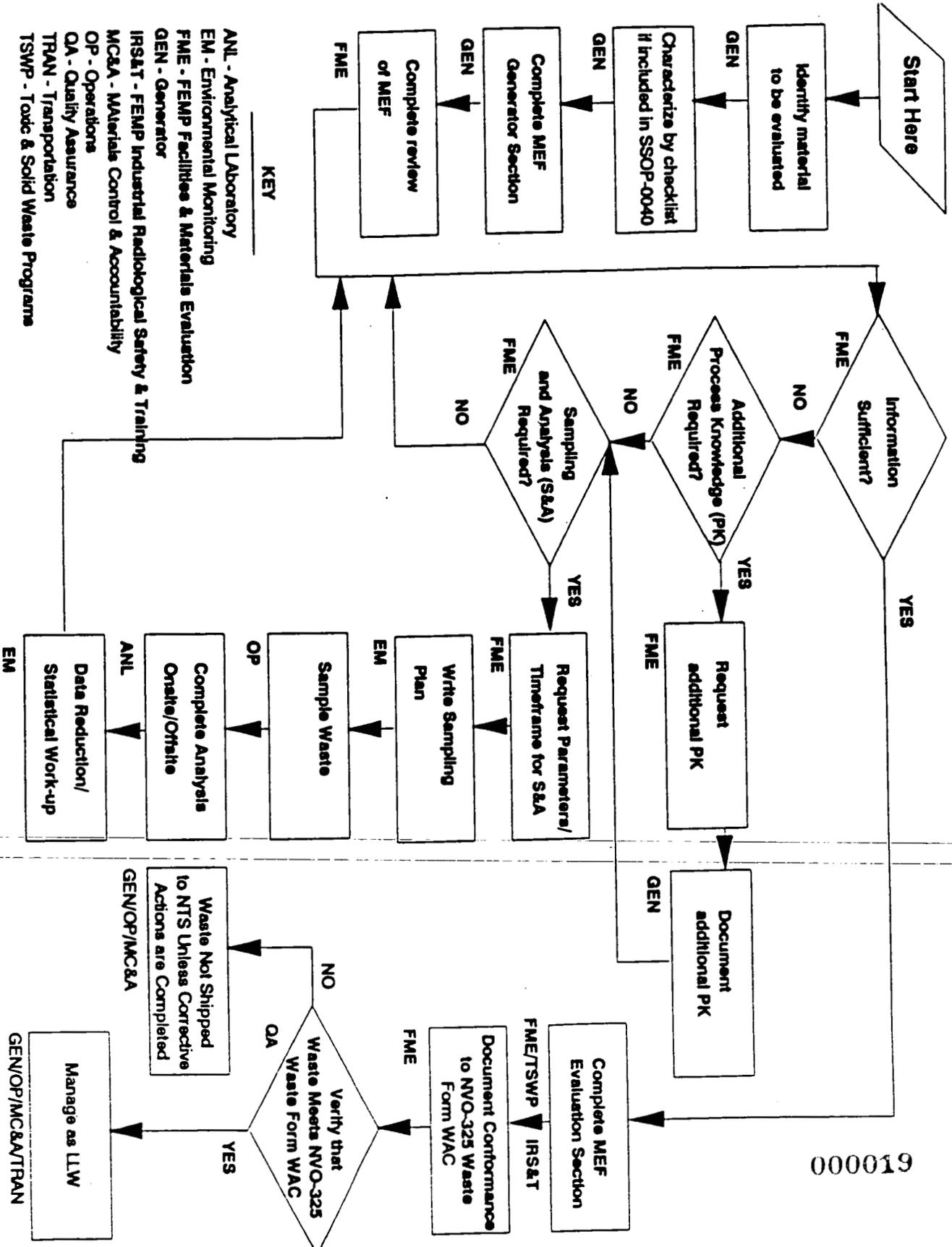
The FEMP has requested an exemption to this NVO-325 (Rev. 1) requirement. The exemption request is presented in Section V of this application.

II. WASTE CHARACTERIZATION PROGRAM

F. Waste Characterization Flow Diagram Figure 1

Simplified Block Flow Diagram for MEF Process

FIGURE 1



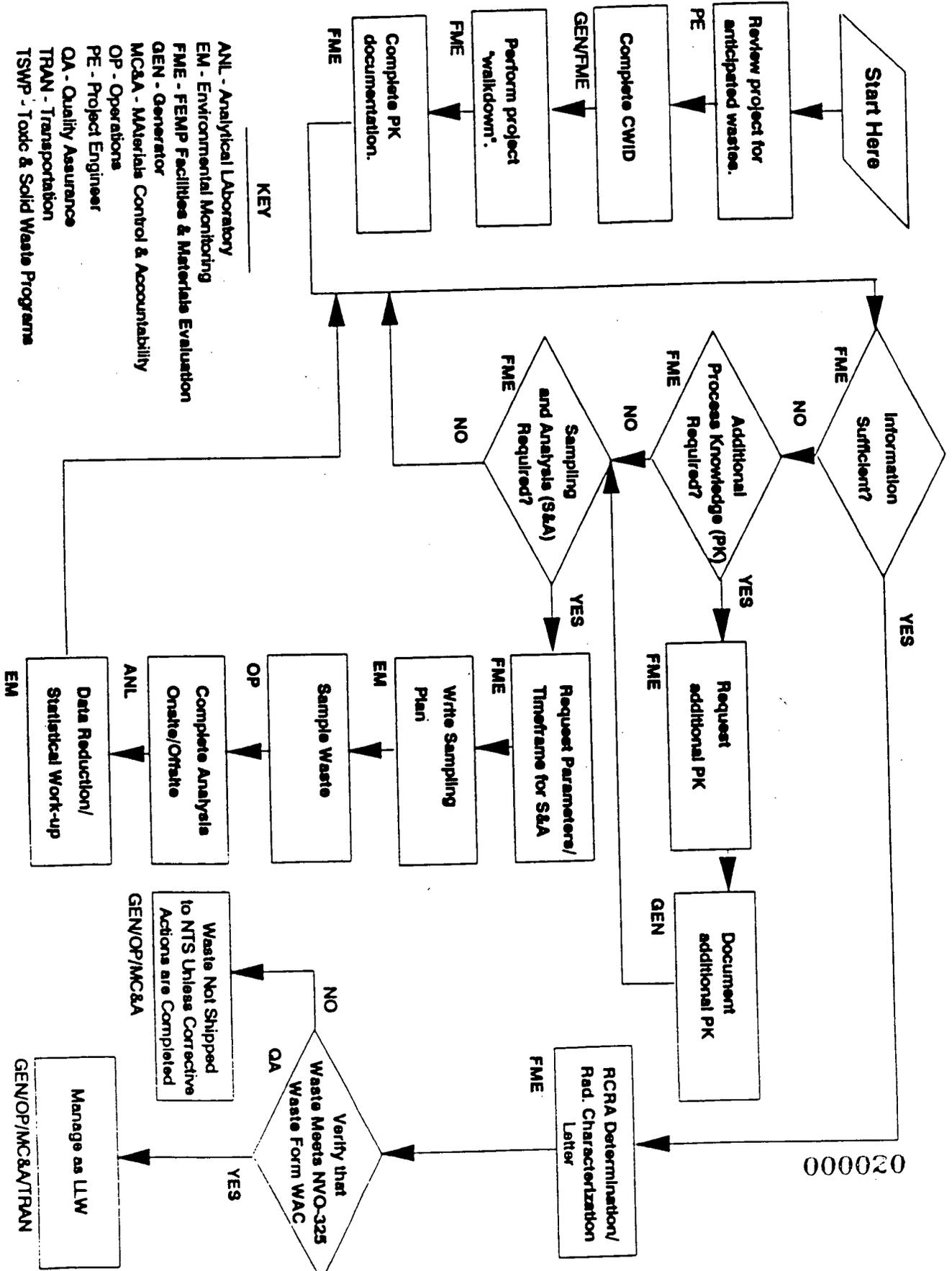
000019

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F. Waste Characterization Flow Diagram Figure 2

FIGURE 2  
Simplified Block Flow Diagram for Project Waste Characterization



020000

**III. WASTE STREAM INFORMATION**Revision 5.0  
June 1993**A. Waste Stream Identification Number**

ONL000000001 Contaminated Process Area Scrap Wastes

**1.0 Waste Type**

Low Level Waste

**2.0 Waste Description**

A waste stream is defined as a waste which is categorized by similar characterization process and/or point of generation. The criteria used for evaluating candidate LLW for shipment to the NTS, excerpted from the FEMP Waste Characterization Plan (Draft), are described on the following pages.

**2.1 Contaminated Process Area Scrap Wastes**

Contaminated process area wastes are generated at the FEMP. These wastes are currently being shipped to the NTS and may include the following:

- Scrap metal
- Scrap vehicles
- Scrap wood
- Personal protective equipment
- Maintenance debris (concrete, non-regulated asbestos, asphalt, plastic, paper, rope, etc.)

This waste is generated in remediation activities at the FEMP involving the dismantling of equipment and disposal of waste which has been stockpiled during FEMP operations. This remediation process generates scrap metal, scrap wood, and scrap vehicles which have become radioactively contaminated and must be disposed as low level waste.

This material is evaluated by operations personnel using SOP 20-C-625, "Evaluating Low Level Radioactive Waste Bulk Waste Streams for Shipment", which list specific criteria that must be met to ensure that NVO-325 (Rev. 1) criteria have been satisfied. No treatment of this waste is completed prior to packaging. If the waste does not meet disposal criteria as specified in the FEMP's Waste Characterization Program (SOP-20-C-625), the waste is not packaged for disposal. Scrap metal and scrap wood are the final forms of these wastes.

Scrap metal and scrap wood are packaged in their existing form. Scrap vehicles are drained of all liquids prior to packaging. SOP 20-C-625 permits a small percentage of equipment, rubber, plastic, etc. to be included with the scrap metal and scrap wood waste. No special handling or disposal requirements exist for this waste.

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2.1.1 Waste Stream Characterization Data Sheet

1. Waste Stream No.: 0 N L 0 0 0 0 0 0 0 0 0 1

2. Waste Description:

a. Physical Characteristics: Dry solid demolition materials from maintenance and remediation activities which generate scrap wood, scrap metal, and scrap vehicles. No treatment of this waste is performed prior to packaging.

b. Special Handling/Disposal Requirements: None  
The average radiation levels on contact is .50 mrem/hr. with a range of <.50 mrem/hr to .90 mrem/hr.

3. Basis for Characterization:

a. Process Knowledge:                       b. Analytical Knowledge:   
c. Both:

If B or C, provide Standard Data Reporting Forms as necessary.

4. Radioactive Characteristics:

a. Is Waste > NRC Class-C (see Title 10 CFR 61.55)?: No

b. WMIS Nuclide Category (circle): 1 (2) 3 4 5 NA 7 8

(Choose the highest predominate nuclide. The number 6 is not an option.)

c. Radioactive Constituents:

Specific Activity Range of Waste Stream

<u>Nuclide</u>	<u>Chemical Forms</u>	<u>Low</u>	<u>Mean</u>	<u>High</u>	<u>Units(Ci/kg)</u>
(1) U-238	*	3.36E-07	1.81E-06	3.29E-06	Ci/kg
(0.1% to 1.0% U)					
(2) U-235	*	4.76E-09	2.19E-07	4.34E-07	Ci/kg
(0.2% to 2.0% on a U basis)					
(3) U-234	*	1.38E-07	4.07E-06	8.01E-06	Ci/kg
(0.001% to 0.01% on a U basis)					

\* Uranium oxides and salts (typically UO<sub>2</sub>, U<sub>3</sub>O<sub>8</sub>, and UF<sub>6</sub>.)

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5. Hazardous Components (for MW): **NOT APPLICABLE**a. Basis for Identifying as MW (circle): (1) Ignitable  
(2) Reactive (3) Corrosive (4) TCLP (5) Listed Waste

b. List the applicable EPA waste code, the chemical name, the treatment performed (if applicable) and the Regulatory/Treatment Standard. Attach Standardized Data Forms.

<u>EPA Hazardous Waste No.</u>	<u>Chemical Name</u>	<u>Treatment Performed</u>	<u>Regulatory Threshold/Treatment Standard</u>
------------------------------------	--------------------------	--------------------------------	--

(1)

(2)

(3)

(4)

**NOTE:** Waste characterization of materials included in this waste stream is predominantly completed using process knowledge because the material meets all the criteria of NVO-325 (Rev. 1), Section 4.1.1.A, B, and C. Administrative controls are also employed to maintain waste stream integrity (SOP 20-C-625, Evaluating Low Level Radioactive Waste Bulk Waste Stream for Shipment).

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#### 2.2 Waste Stream Specific Criteria

- a. Low Level Waste: Only the contaminated process area scrap wastes defined as LLW per DOE Orders 5820.2A, 5400.1, and 5480.11 guidelines shall be shipped to the NTS. (NVO-325 (Rev. 1), 5.5.1).

Compliance Method: In general, wastes that originate from Controlled Areas at the FEMP are considered radioactive waste unless demonstrated otherwise through analysis or administrative controls. Further guidance on radioactive waste characterization is provided in the DOE Performance Objective (Draft). (In accordance with the "Waste Minimization and Pollution Prevention Awareness Plan," the FEMP attempts to minimize waste generation whenever possible.)

- b. Transuranics: The contaminated process area scrap wastes shall have a TRU concentration less than 100 nCi/g (e.g., shall not be regulated as TRU waste). (NVO-325 (Rev. 1), 5.5.1.1(A)).

Compliance Method: MC&A records indicate there are no materials at the FEMP with TRU concentrations above the 100 nCi/g level. The highest TRU concentration for any material at the FEMP as determined by analysis is 93,904 dpm/g (42 nCi/g). Because process area scrap wastes are bulk materials that have become radioactively contaminated they can not exceed these highest TRU concentrations recorded on site.

- c. Hazardous Waste: All contaminated process area scrap wastes shall be evaluated for any characteristics of, or listed, hazardous waste as identified in Title 40 CFR 261, "Identification and Listing of Hazardous Waste," or state of generation hazardous waste regulations. (NVO-325 (Rev. 1), 5.5.1.1(B)).

Compliance Method: Process area scrap wastes are evaluated in accordance with SOP 20-C-625 "Evaluating Low Level Radioactive Waste Bulk Waste Streams for Shipment". This procedure provides a checklist which identifies the criteria that must be met in order for the waste to be identified as non-hazardous and acceptable for shipment to the NTS. The checklist criteria were developed based on a detailed review of the waste stream versus the criteria for identifying hazardous waste codified in the federal and state hazardous waste regulations. This comprehensive review of regulatory criteria is documented on an MEF for the waste stream on file in the WC [FME] Waste Characterization Files.

All cases that could possibly cause a waste stream to be identified as a hazardous waste (or otherwise fail to meet NVO-325 (Rev. 1), WAC) are specifically excluded under the checklist. For example, because free liquids are specifically prohibited, scrap wastes that meet checklist criteria could not possibly exhibit the hazardous waste characteristic of corrosivity. Other such required exclusions are incorporated into the checklist criteria as well to ensure that no characteristic or listed hazardous waste are packaged for shipment to the NTS.

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- d. Free Liquids: The contaminated process area scrap wastes disposed at NTS waste management sites shall contain as little free liquids as is reasonably achievable, but in no case shall the liquid equal or exceed 0.5% by volume of the external waste container and shall meet the following criteria (NVO-325 (Rev. 1), 5.5.1.1(C)).

Compliance Method: Free liquids in process scrap wastes may be evaluated based on process knowledge or waste testing to determine whether the waste stream meets this criteria. Determinations based on process knowledge generally include a visual inspection of the waste (e.g., during a visual inspection or sampling episode) according to procedure SOP 1-C-604 "Inspection and Evaluation of Containerized LLRW". Working fluids from equipment will be determined to contain no free liquids when the chamber containing the liquid has been drained completely and no dripping is observed. Chambers will be plugged or sealed and the equipment tagged as being drained.

Free liquid determinations are generally completed as part of the RCRA waste characterization process. The PFLT test is performed to determine the presence of free liquids when process knowledge does not yield sufficient information to complete this determination. However, the PFLT is generally not required to make a determination because the waste matrix provides little effective absorptive capacity. Reference FEMP Waste Characterization Plan (Draft) - RCRA Section.

- e. Particulates: Wastes containing greater than 1 weight percent fine particulate materials less-than-ten-micrometer-diameter or 15 weight percent less-than-200 micrometer diameter particles shall be immobilized or packaged in accordance with NVO-325 (Rev. 1), 5.5.1.1(D).

Compliance Method: Based on the waste matrix and checklist requirements, process area scrap wastes will always meet this NVO-325 (Rev. 1), WAC requirement. In no case will the scrap waste streams (metal, wood, and vehicles) be comprised of or contain any particulate matter. The checklist provides additional assurance for this by requiring that all residues be removed from the scrap waste before the waste may be packaged for disposal at the NTS.

- f. Gases: Process area scrap waste streams shall not produce pressure in the package greater than 1.5 atmospheres at 20° celsius. (NVO-325 (Rev. 1), 5.5.1.1(E))

Compliance Method: Process area scrap waste are evaluated for their potential to produce pressure in excess of 1.5 atmospheres at 20° C during the hazardous waste determination (SSOP-0002). The primary source of gases in this waste stream, compressed gas cylinders, shall have their valves removed to demonstrate that they are at atmospheric pressure. Aerosol cans shall be punctured and void of all free liquids to demonstrate that they meet the WAC.

- g. Stabilization: Where practical, contaminated process area scrap waste shall be treated to reduce volume and provide a more structurally and chemically stable waste form. (NVO-325 (Rev. 1), 5.5.1.1(F))

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Compliance Method: Waste Storage and Disposition (WSD) will identify wastes that are candidates for treatment to reduce volume and provide a structurally stable waste form. No treatment of this waste will be required to stabilize harmful gases or vapors. Free liquids will be drained per SOP 20-C-625. WC [FME] will identify all LLW streams that have potential to generate harmful gases, vapors, or liquids. Waste that fail this WAC will not be shipped to the NTS.

- h. Etiologic Agents: Process area scrap wastes to be shipped to the NTS shall not contain pathogens, infectious wastes, or other etiologic agents as defined in Title 49 CFR 173.386. (NVO-325 (Rev. 1), 5.5.1.1(G))

Compliance Method: The only significant source of potential etiologic agents on site is from medical services. Such materials may include band aids, tongue blades, syringes, cotton balls or other materials stained with blood or other body fluids, and outdated pharmaceuticals. These materials are managed according to Ohio Infectious Waste Law/Regulation (ORC 3734 and OAC 3745-27-01 through 25) which includes segregated packaging at the point of generation. Materials are placed in a red bag in a box premarked with the international biohazard label. These boxes are then transported by a registered transporter to a licensed treatment facility. These administrative controls prevent etiologic agents from entering the process area scrap waste stream. Reference FEMP Waste Characterization Plan (Draft)- Infectious Waste Section for additional evaluation criteria.

- i. Chelating Agents: If a waste is determined to contain chelating agents above the one percent by weight limit, the waste shall not be approved for disposal at the NTS (NVO-325 (Rev. 1), 5.5.1.1(H)).

Compliance Method: Process area scrap waste will always meet this NVO-325 (Rev.1), WAC based on the waste matrix and compliance with the checklist requirements. None of materials which comprise the basic waste matrix (e.g., wood and metal) are considered chelating agents. In addition, the checklist requires that all residues be removed from the scrap waste before it may be packaged for disposal at the NTS.

- j. Polychlorinated Biphenyls: PCB contaminated waste shall not be shipped for disposal at the NTS in the contaminated process area scrap waste stream unless the PCB concentration meets the municipal solid waste disposal limits. See Title 40 CFR 761.60 for PCB disposal requirements. (NVO-325 (Rev. 1), 5.5.1.1(I))

Compliance Method: The FEMP samples wastes for PCB contamination when the waste matrix (e.g., oily material), review of previous operations, manufacturers manuals, and previous sampling and analyses provides a reason to suspect PCB contamination. This determination is performed during the hazardous waste determination (SSOP-0002). Reference FEMP Waste Characterization Plan (Draft) - TSCA PCB Section for evaluation criteria.

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- k. Explosives and Pyrophorics: Contaminated process area scrap waste shall not contain potentially explosive or pyrophoric material in a form that may spontaneously combust if the container is breached. (NVO-325 (Rev. 1), 5.5.1.1(J))

Compliance Method: This WAC is evaluated during the hazardous waste characterization. This evaluation is performed in accordance with SSOP-0002, "Completing the Material Evaluation Form and the FEMP Waste Characterization Plan" (Draft). Any waste that potentially fails this WAC will be identified by WC [FME] and the material will not be shipped to the NTS for disposal. None of the materials that comprise the basic waste matrix (e.g., wood and metal) of the process area scrap wastes are considered explosive or pyrophoric. The checklist requirements provide the additional controls necessary to ensure that in all cases this NVO-325 (Rev.1), WAC is met. For example, scrap vehicles must have their fuel tanks removed and rendered non-explosive (e.g., through steam rinsing) before being packaged for disposal at the NTS.

## 2.3 Waste Stream General Package Criteria

a. Design

Waste packaging criteria for contaminated process area scrap waste shipped to the NTS for disposal will meet DOT Regulations, 49 CFR 173, Subpart I. Standard operating procedures listed in Table I of the Waste Certification Plan, concerning storage and off-site shipments, will be used to assure that all shipments meet DOT requirements and NTS site-specific requirements.

b. Nuclear Safety

The quantity of radioactive materials in contaminated process area scrap waste shipped to the NTS will be limited so that an infinite array of packages will remain subcritical. This quantity will be determined on the basis of a specific nuclear safety analysis, considering credible accident situations, and taking into account the actual materials in the waste and will meet 49 CFR, Parts 173.453(c)(3) and 173.453(d). Process area scrap waste packages will not contain uranium enriched  $^{235}\text{U}$  greater than one percent by weight and with a mass of  $^{235}\text{U}$  greater than 800 grams per package. The total mass of plutonium and  $^{239}\text{Pu}$  will not exceed one percent of the mass of  $^{235}\text{U}$  in any package.

c. Nuclear Heating

In compliance with 49 CFR 173.442, Thermal Limitations, a Health Physics evaluation of waste packages of material to be shipped to the NTS from the FEMP will show no evidence of a heating effect above NVO-325 (Rev. 1), limits from radiological decay. Calculations from these waste streams at the FEMP show the power output from either  $^{233}\text{U}$  or  $^{235}\text{U}$  at maximum potential concentration in any waste package will not exceed 0.1 Watt. These calculations are based on the total alpha energy from each isotope in the waste and its associated daughters during normal radioactive decay.

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#### d. Radiation Levels

In compliance with 49 CFR 173.441, Radiation Levels, the radiation exposure rate at the surface and at 1 meter from each package of contaminated process area scrap waste will be measured and recorded in the data package. Packages that exceed 200 millirem/hr on contact shall not be shipped to NTS.

#### e. External Contamination

In compliance with 49 CFR 173.443, the surface contamination of each container of contaminated asbestos containing material will be measured using instruments calibrated by Environmental Health & Safety (EH&S), Dosimetry, Instrumentation Section and recorded in the data package. If these instruments indicate that the limits of 49 CFR 173.443 are exceeded, then the package will be cleaned until it is within the limits or the contents will be transferred to a clean container.

#### f. Activity Limits

The activity limits of Titles 49 CFR 173.421, "Limited Quantities of Radioactive Materials," and 49 CFR 173.425, "Transport Requirements for Low-Specific Activity Radioactive Materials" will be met.

In compliance with Title 49 CFR 173.421 and 173.425, strong, tight containers used for shipping Limited Quantities (LQ) and Low-Specific Activity (LSA) LLW will be constructed so they will not leak during normal transportation and handling conditions.

#### g. Multiple Hazards

Not applicable, the FEMP does not ship wastes with multiple hazards to the NTS.

### 2.4 Waste Stream Specific Package Criteria

#### a. Closure

All contaminated process area scrap waste package closures will be sturdy enough to assure the closures will not be breached under normal handling conditions and will not serve as weak points for package failure.

#### b. Strength

Contaminated process area scrap waste will be packaged in containers capable of supporting a uniformly distributed load of 4,000 lbs/ft<sup>2</sup>, except for waste packaged in DOE/NV approved containers (drums and ISO containers).

#### c. Handling

All contaminated process area scrap waste containers will have permanently attached skids, cleats, offsets, rings, handles, or other auxiliary lifting

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devices to allow handling by means of forklifts, cranes, or similar handling equipment. Lifting rings and other auxiliary lifting devices will be recessed, offset, or hinged in a manner that does not inhibit stacking the packages. The lifting devices will be designed to meet a 5:1 safety factor based upon the ultimate strength of the material. All rigging devices that are not permanently attached to the waste package will have a current load test based on 125 percent of the safe working load.

d. Size

The size of the containers used by the FEMP to package contaminated process area scrap wastes includes container codes: 109, 117, 119, 120 and 121 from Table I.

e. Weight

In addition to the weight limits set for specific packaging designs, a 9,000 lb. limit per box and a 1,200 lb. limit per 55-gallon drum will be maintained. Containers of contaminated process area scrap waste exceeding the 9,000 lb. limit will be shipped in removable-top trailers, or on flatbeds.

f. Loading

Contaminated process area scrap waste will be packaged to ensure that the interior volume is as efficiently and compactly loaded as practical.

g. Nonstandard Type A Packaging

The FEMP is currently using a Type 7A Container as a strong, tight container. Used for this purpose, the container does not require a DOE Type A Certification. If a Type A Container is required to ship process area scrap waste, only containers with a DOE Type A Certification will be used.

h. Package Protection

Every FEMP contaminated process area scrap waste package will be prepared for shipment so as to minimize damage during transit. The preshipment storage environment will be controlled to avoid adverse influence from weather or other factors on the containment capability of the waste packaging during handling, storage, and transport. FEMP will take all responsibility for preshipment storage and take all reasonable precautions to preclude the accumulation of moisture on or in packages prior to their arrival to the NTS. Tamper indicating devices are used to maintain control of the container contents once certification actions are completed.

The FEMP will package all contaminated process area scrap waste for shipment to NTS in containers meeting DOT requirements (e.g., DOT Type 17H 55-gallon drums or other NTS approved containers). All containers will be shipped to meet DOT requirements for interstate travel and will meet the requirements of 49 CFR 173.411, 173.421, and 173.425.

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#### i. Marking and Labeling

Contaminated process area scrap waste shipped to the NTS will be marked and labeled as required in Title 49 CFR 172, Subparts D and E [with exceptions noted in Title 173.425 (b) and (c)]. Also, each waste container will be marked with a unique six character container identification number and eight character shipment number per NVO-325 (Rev. 1), 5.5.1.3 (I,3) so that the container can be identified from another container within the shipment or from another set of containers. The approved 13 digit waste stream number (ONL0000000001) will also be placed onto the waste container. Marking and labeling of the contaminated process area scrap waste packages will be for radioactive material. The weight of the package will be marked in pounds and kilograms. Signed NV-211 labels will be attached to containers certified for shipment to the NTS.

#### j. Barcoding

Barcode labels will meet NVO-325 (Rev. 1), requirements and must be approved by DOE NV prior to use. Two barcode labels will be placed on each contaminated process area scrap waste package. The barcode labels will be placed near the top and on opposite sides of nonstandard containers. Barcode Labels on drums will be placed on the lid and one side near the top of the drum.

#### k. On-site Transfer

Only packaged contaminated process area scrap waste is shipped from the FEMP for disposal at the NTS. The FEMP will not provide any material which will require on-site transfer of unpackaged bulk materials by the NTS.

#### 2.5 Additional Criteria for Mixed Waste

None of the waste streams listed in this application are mixed waste. The FEMP will not be disposing of mixed waste at the NTS.

#### 2.6 Additional Criteria for Transuranic/Transuranic Mixed Waste

None of the waste streams listed in this application contain Transuranic or Transuranic Mixed waste. Therefore, the FEMP will not be disposing of Transuranic or Transuranic Mixed waste at the NTS.

#### 2.7 Additional Criteria for Bulk Waste

The FEMP is not currently and does not intend to ship mixed waste to the NTS for disposal. By default, the FEMP will not be shipping mixed waste as bulk waste or mixed waste for bulk disposal.

The FEMP will ship bulk waste to the NTS for disposal in the form of scrap material (e.g. metal, wood, equipment) that is radioactively contaminated. This material is well below the 49 CFR 173.425(c) requirement of 0.001 millicurie per square centimeter when averaged over one square meter of the material. The type

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of container in which the FEMP ships bulk waste is identified in the sections relating to the NTS specific packaging criteria.

**2.8 Additional Criteria for Case-by-Case Waste****2.8.1 Weight**

The FEMP is currently shipping and intends to continue to ship waste in ISO (International Shipping Organization) containers generally referred to as Sea/land containers. This is done following SSOP-0078, "Packaging LLRW into ISO Containers for offsite Shipment". These containers routinely weigh greater than 9,000 pounds and require either a large fork truck or crane for removal from the transport vehicle. The FEMP ships these containers on flat bed trailers which require no top or side wall removal.

**2.8.2 Activity Limits**

All containers shipped from the FEMP for disposal at the NTS are within the activity limits specified in NVO-325 (Rev. 1), Section 5.5.1.2.F.

**2.8.3 Radioactively Contaminated Asbestos**

Friable asbestos will not be shipped to the NTS before securing DOE/NV approval. All radioactively contaminated regulated asbestos will be in waste stream ONL000000010, "Radioactively Contaminated Regulated Asbestos Containing Material".

**2.8.4 DOE Comparable Greater-Than-Class-C As Defined in 10 CFR 61.55**

This requirement is not applicable to the FEMP waste streams since no greater-than-Class-C waste is shipped from the FEMP for disposal at NTS.

**2.8.5 Classified Waste Streams**

This requirement is not applicable, the FEMP will not ship classified waste for disposal at the NTS under this waste stream.

**~~2.8.6 Radioactive Animal Carcasses~~**

This requirement is not applicable to the FEMP since no radioactive animal carcasses are included in the process area scrap waste stream.

**2.8.7 Other Waste Forms**

The FEMP will secure DOE/NV approval for any waste forms that do not meet NTS requirements before shipping to the NTS.

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#### **2.9 Packaging and Shipping Information**

Radioactively contaminated Process Area Scrap Waste will be packaged and shipped according to the DOT requirements for Radioactive Material, Low Specific Activity materials, n.o.s. UN-2912 radionuclides.

#### **2.10 Waste Security Information**

This section is not applicable since no classified waste is shipped for disposal at the NTS in this waste stream.

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## B. Waste Stream Identification Number

ONL000000002 Contaminated Construction/Removal Action Wastes

## 1.0 Waste Type

Low Level Waste

## 2.0 Waste Description

A waste stream is defined as a waste which is categorized by similar characterization process and/or point of generation. The criteria used for evaluating candidate LLW for shipment to the NTS, excerpted from the FEMP Waste Characterization Plan (Draft), are described on the following pages.

## 2.1 Contaminated Construction/Removal Action Wastes

Radioactively contaminated construction wastes are generated at the FEMP. These wastes are currently being shipped to NTS and may include the following:

- Soil
- Rocks, gravel
- Concrete
- Metal
- Wood
- Trash (plastic, cardboard, paper, etc.)
- Asphalt
- Glass
- Floor tile, roofing material, and other non-regulated asbestos containing materials

This radioactively contaminated waste is generated during the demolition or excavation phase of construction, maintenance, and removal action projects. No treatment of this waste is completed prior to packaging. If the waste does not meet the disposal criteria in its existing form, the waste is not packaged for disposal. The final form of the waste is demolition waste typical of construction projects (e.g., crushed concrete, soil, broken pieces of wood). The waste is packaged directly into containers for disposal. No special handling or disposal requirements exist for this waste.



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## c. Radioactive Constituents:

Specific Activity Range of Waste Stream

<u>Nuclide</u>	<u>Chemical Forms</u>	<u>Low</u>	<u>Mean</u>	<u>High</u>	<u>Units(Ci/kg)</u>
(1) U-238 (0.1% to 1.0% U)	*	3.36E-07	1.68E-05	3.33E-05	Ci/kg
(2) U-235 (0.2% to 1.0% on a U basis)	*	4.76E-09	1.08E-06	2.16E-06	Ci/kg
(3) U-234 (0.001% to 0.01% on a U basis)	*	1.38E-07	2.15E-05	4.29E-05	Ci/kg

\* Uranium oxides and salts (typically UO<sub>2</sub>, U<sub>3</sub>O<sub>8</sub>, and UF<sub>6</sub>)

## 5. Hazardous Components (for MW): NOT APPLICABLE

- a. Basis for Identifying as MW (circle): (1) Ignitable  
(2) Reactive (3) Corrosive (4) TCLP (5) Listed Waste

b. List the applicable EPA waste code, the chemical name, the treatment performed (if applicable) and the Regulatory/Treatment Standard. Attach Standardized Data Forms.

<u>EPA Hazardous Waste No.</u>	<u>Chemical Name</u>	<u>Treatment Performed</u>	<u>Regulatory Threshold/Treatment Standard</u>
(1)			
(2)			
(3)			
(4)			

**NOTE:** Waste characterization of materials included in this waste stream is completed using a combination of sampling and analysis and process knowledge. Process knowledge is used when the material meets one or more of the criteria of NVO-325 (Rev. 1), Section 4.1.1.A, B, and C. (Examples of materials characterized by process knowledge includes metal, wood and other construction/demolition debris, equipment, etc.)

## 2.2 Waste Stream Specific Criteria

- a. Low Level Waste: Only contaminated construction/removal action wastes defined as LLW per DOE Orders 5820.2A, 5400.1, and 5480.11 guidelines shall be shipped to the NTS. (NVO-325 (Rev. 1), 5.5.1).

Compliance Method: The DOE Performance Objective (Draft) for radioactive waste characterization specifies the methodology to be used for identifying radioactive waste. In general, wastes that originate from Controlled Areas at the FEMP are considered radioactive waste unless demonstrated otherwise through analysis or administrative controls. Further guidance on radioactive waste characterization is provided in the DOE Performance Objective (Draft). In accordance with the "Waste Minimization and Pollution Prevention Awareness Plan," the FEMP attempts to minimize waste generation whenever possible.

- b. Transuranics: Contaminated construction/removal action wastes shall have a TRU concentration less than 100 nCi/g (e.g., shall not be regulated as TRU waste). (NVO-325 (Rev. 1), 5.5.1.1(A)).

Compliance Method: MC&A records indicate there are no materials at the FEMP with TRU concentrations above the 100 nCi/g level. The highest TRU concentrations determined through analysis was 93,904 dpm/g (42 nCi/g) on FEMP material.

- c. Hazardous Waste: All contaminated construction/removal action wastes shall be evaluated for any characteristics of, or listed, hazardous waste as identified in Title 40 CFR 261, "Identification and Listing of Hazardous Waste," or state of generation hazardous waste regulations. (NVO-325 (Rev. 1), 5.5.1.1(B)).

Compliance Method: All construction/removal action wastes are evaluated by the WC [FME] Group to determine if they are regulated as hazardous waste. During the planning phases of the project, the project engineer identifies to WC [FME] all wastes to be generated from the project for evaluation. A project walkdown is conducted to collect information on the wastes to be generated and the generation process (e.g., excavated or dismantled). During the project walkdown initial decisions for sampling and analysis plan for wastes and parameters of concern. Using a combination of process knowledge and sampling and analysis WC [FME] evaluations the waste with respect to each of the criteria by which a waste can be identified as either a characterization or listed hazardous waste. The characterization is documented using either the General MEF or by issuing a RCRA Determination/Radiological Characterization (RD/RC) letter.

- d. Free Liquids: Contaminated construction/removal action wastes disposed at NTS waste management sites shall contain as little free liquids as is reasonably achievable, but in no case shall the liquid equal or exceed 0.5% by volume of the external waste container and shall meet the following criteria (NVO-325 (Rev. 1), 5.5.1.1(C)).

Compliance Method: Free liquids in contaminated construction/removal action wastes may be evaluated based on process knowledge or waste testing to determine whether the waste stream meets this criteria. Determinations based on process knowledge generally include a visual inspection. Working fluids from equipment will be determined to contain no free liquids when the chamber containing the liquid has been drained completely and no dripping is observed. Chambers will

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be plugged or sealed and the equipment tagged as being drained. Free liquid determinations are generally completed as part of the RCRA waste characterization process. The PFLT test is performed to determine the presence of free liquids when process knowledge does not yield sufficient information to complete this determination. Reference FEMP Waste Characterization Plan (Draft) - RCRA Section.

- e. Particulates: Wastes containing greater than 1 weight percent fine particulate materials less-than-ten-micrometer-diameter or 15 weight percent less-than-200 micrometer diameter particles shall be immobilized or packaged in accordance with NVO-325, Revision 1, 5.5.1.1(D).

Compliance Method: Some construction/removal action waste streams will categorically fail the particulates WAC while others may require testing to complete a rigorous evaluation. Dust collector residues (MTC 062) have been documented to have greater than one percent by weight of less-than-ten-micron-diameter particles. In addition, depending on the moisture content, many of the soils on site will fail these limits. If testing is required because the waste form does not clearly meet the WAC, the waste stream will be identified as requiring testing. Testing may be conducted using a particle size impactor or some other form of particle sizing equipment. Should the waste fail the criteria for particulates and immobilization is impractical, the waste packaging will be completed by overpacking, using steel drums with 6 mil plastic liners or steel boxes in accordance with NVO-325 (Rev. 1).

- f. Gases: Contaminated construction/removal action waste streams shall be evaluated to determine if they contain any items that potentially produces pressure in the package greater than 1.5 atmospheres at 20° celsius. (NVO-325 (Rev. 1), 5.5.1.1(E))

Compliance Method: Contaminated construction/removal action wastes are evaluated for there potential to produce pressure in excess of 1.5 atmospheres at 20° C during the hazardous waste determination (SSOP-0002). The primary source of gases in this waste steam, compressed gas cylinders, will have their valves removed to demonstrate that they are at atmospheric pressure. Aerosol cans will be punctured and void of all free liquids to demonstrate that they meet the WAC.

- g. Stabilization: Where practical, contaminated construction/removal action wastes shall be treated to reduce volume and provide a more structurally and chemically stable waste form. (NVO-325 (Rev. 1), 5.5.1.1(F))

Compliance Method: WSD will identify wastes that are candidates for treatments to reduce volume and provide a structurally stable waste form. No treatment of this waste will be required to stabilize harmful gases or vapors. Free liquids will be drained per SOP 20-C-625. WC [FME] will identify all LLW streams that have potential to generate harmful gases, vapors, or liquids. Waste that fail this WAC will not be shipped to the NTS.

- h. Etiologic Agents: All contaminated construction/removal action wastes to be shipped to the NTS will not contain pathogens, infectious wastes, or other etiologic agents as defined in Title 49 CFR 173.386. (NVO-325 (Rev. 1), 5.5.1.1(G)).

Compliance Method: The only significant source of potential etiologic agents on site is from medical services. Such materials may include band aids, tongue blades, syringes, cotton balls or other materials stained with blood or other body fluids, and outdated pharmaceuticals. These materials are managed according to Ohio Infectious Waste Law/Regulation (ORC 3734 and OAC 3745-27-01 through 25) which includes segregated packaging at the point of generation. Materials are placed in a red bag in a box premarked with the international biohazard label. These boxes are then transported by a registered transporter to a licensed treatment facility. These administrative controls prevent etiologic agents from entering the contaminated construction/removal action wastes. Reference FEMP Waste Characterization Plan (Draft) - Infectious Waste Section for additional evaluation criteria.

- i. Chelating Agents: If a waste is determined to contain chelating agents above the one percent by weight limit, the waste shall not be approved for disposal at the NTS. (NVO-325 (Rev. 1), 5.5.1.1(H)).

Compliance Method: Chelating agents form coordination compounds by offering two or more chemical bonds (through ligands) to a central metal ion. The most common chelating agent is EDTA. Other common chelating agents are also aminopolyacetic acids. Excess chemicals from the on-site laboratory are the primary potential source of materials that may be identified as true chelating agents. This determination will be accomplished through the use of the MEF or RD/RC letter which will designate the waste as containing above one percent by weight chelating agents. WC [FME] has generated a list of potential chelating or complexing agents through an on-line database search and will consult this list to evaluate potential chelating or complexing agents. The waste certification official is responsible for ensuring that this material has been characterized as not containing chelating agents at concentrations greater than one percent by weight. Containers not meeting the criteria for shipment will be properly tagged. This process prevents waste that does not meet the NTS WAC from being shipped for disposal.

- j. Polychlorinated Biphenyls: PCB contaminated waste shall not be shipped for disposal at NTS in the contaminated construction/removal action waste stream unless the PCB concentration meets the municipal solid waste disposal limits. See Title 40 CFR 761.60 for PCB disposal requirements. (NVO-325 (Rev. 1), 5.5.1.1(I)).

Compliance Method: The FEMP samples wastes for PCB contamination when the waste matrix (e.g., oily material) or review of previous operations, manufacturers manuals, and previous sampling and analyses provides a reason to suspect PCB contamination. This determination is performed during the waste characterization by WC [FME]. Reference FEMP Waste Characterization Plan (Draft) -TSCA PCB Section for evaluation criteria.

- k. Explosives and Pyrophorics: Contaminated construction/removal action waste shall not contain potentially explosive or pyrophoric material in a form that may spontaneously combust if the container is breached. (NVO-325 (Rev. 1), 5.5.1.1(J)).

Compliance Method: No material in this waste stream contains potentially explosive or pyrophoric material that may spontaneously combust. This WAC is evaluated during the hazardous waste characterization and is also generally addressed in the health and safety plan for a project if there is any potential concern. This evaluation is performed in accordance with the FEMP Waste

**III. WASTE STREAM INFORMATION**

Characterization Plan (Draft). Any waste streams that potentially fails this WAC shall be identified by WC [FME] and the material will not be shipped to the NTS for disposal.

**2.3 Waste Stream General Packaging Criteria****a. Design**

Waste packaging criteria for contaminated construction/removal action waste shipped to the NTS for disposal will meet DOT Regulations, 49 CFR 173, Subpart I. Standard operating procedures listed in Table I of the Waste Certification Plan, concerning storage and off-site shipments, will be used to assure that all shipments meet DOT requirements and NTS site-specific requirements.

**b. Nuclear Safety**

The quantity of radioactive materials in contaminated construction/removal action wastes shipped to the NTS will be limited so that an infinite array of packages will remain subcritical. This quantity will be determined on the basis of a specific nuclear safety analysis, considering credible accident situations, and taking into account the actual materials in the waste and will meet 49 CFR, Parts 173.453(c)(3) and 173.453(d). Contaminated construction/removal action waste packages will not contain uranium enriched  $^{235}\text{U}$  greater than one percent by weight and with a mass of  $^{235}\text{U}$  greater than 800 grams per package. The total mass of plutonium and  $^{239}\text{Pu}$  will not exceed one percent of the mass of  $^{235}\text{U}$  in any package.

**c. Nuclear Heating**

In compliance with 49 CFR 173.442, Thermal Limitations, a Health Physics evaluation of waste packages of material to be shipped to the NTS from the FEMP will show no evidence of a heating effect above NVO-325 limits from radiological decay. Calculations from these waste streams at the FEMP show the power output from either  $^{235}\text{U}$  or  $^{239}\text{Pu}$  at maximum potential concentration in any waste package will not exceed 0.1 Watt. These calculations are based on the total alpha energy from each isotope in the waste and its associated daughters during normal radioactive decay.

**d. Radiation Levels**

In compliance with 49 CFR 173.441, Radiation Levels, the radiation exposure rate at the surface and at 1 meter from each package of contaminated construction/removal action waste will be measured and recorded in the data package. Contaminated construction/removal action waste packages that exceed 200 millirem/hr on contact will not be shipped to NTS.

**e. External Contamination**

In compliance with 49 CFR 173.443, the surface contamination of each container of contaminated asbestos containing material will be measured using instruments calibrated by Environmental Health & Safety (EH&S), Dosimetry, Instrumentation Section and recorded in the data package. If these instruments indicate that the limits of 49 CFR 173.443 are exceeded, then the package will be cleaned until it is within the limits or the contents will be transferred to a clean container.

**f. Activity Limits**

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The activity limits of Titles 49 CFR 173.421, "Limited Quantities of Radioactive Materials," and 49 CFR 173.425, "Transport Requirements for Low-Specific Activity Radioactive Materials" will be met.

In compliance with Title 49 CFR 173.421 and 173.425, strong, tight containers used for shipping Limited Quantities (LQ) and Low-Specific Activity (LSA) LLW will be constructed so they will not leak during normal transportation and handling conditions.

g. Multiple Hazards

Not applicable, the FEMP does not ship wastes with multiple hazards to the NTS.

2.4 Waste Stream Specific Package Criteria

a. Closure

All contaminated construction/removal action waste package closures will be sturdy enough to assure the closures will not be breached under normal handling conditions and will not serve as weak points for package failure.

b. Strength

Contaminated construction/removal action waste will be packaged in containers capable of supporting a uniformly distributed load of 4,000 lbs/ft<sup>2</sup>, except for waste packaged in DOE NV approved containers (drums and ISO containers).

c. Handling

All contaminated construction/removal action waste containers will have permanently attached skids, cleats, offsets, rings, handles, or other auxiliary lifting devices to allow handling by means of forklifts, cranes, or similar handling equipment. Lifting rings and other auxiliary lifting devices will be recessed, offset, or hinged in a manner that does not inhibit stacking the packages. The lifting devices will be designed to meet a 5:1 safety factor based upon the ultimate strength of the material. All rigging devices that are not permanently attached to the waste package will have a current load test based on 125 percent of the safe working load.

d. Size

The size of the containers used by the FEMP to package contaminated construction/removal action waste includes container codes: 109, 117, 119, 102, and 121 from Table I.

e. Weight

In addition to the weight limits set for specific packaging designs, a 9,000 lb. limit per box and a 1,200 lb. limit per 55-gallon drum will be maintained. Containers of contaminated construction/removal action waste exceeding the 9,000 lb. limit will be shipped in removable-top trailers, or on flatbeds.

### III. WASTE STREAM INFORMATION

f. Loading

Contaminated construction/removal action waste will be packaged to ensure that the interior volume is as efficiently and compactly loaded as practical.

g. Nonstandard Type A Packaging

The FEMP is currently using a Type 7A Container as a strong, tight container. Used for this purpose, the container does not require a DOE Type A Certification. If a Type A Container is required to ship contaminated construction/removal action waste, only containers with a DOE Type A Certification will be used.

h. Package Protection

Every FEMP contaminated construction/removal action waste package will be prepared for shipment so as to minimize damage during transit. The preshipment storage environment will be controlled to avoid adverse influence from weather or other factors on the containment capability of the waste packaging during handling, storage, and transport. FEMP will take all responsibility for preshipment storage and take all reasonable precautions to preclude the accumulation of moisture on or in packages prior to their arrival to the NTS. Tamper indicating devices are used to maintain control of the container contents once certification actions are completed.

The FEMP will package all contaminated construction/removal action waste for shipment to NTS in containers meeting DOT requirements (e.g., DOT Type 17H 55-gallon drums or other NTS approved containers). All containers will be shipped to meet DOT requirements for interstate travel and will meet the requirements of 49 CFR 173.411, 173.421, and 173.425.

i. Marking and Labeling

Contaminated construction/removal action waste shipped to the NTS will be marked and labeled as required in Title 49 CFR 172, Subparts D and E [with exceptions noted in Title 173.425 (b) and (c)]. Also, each waste container will be marked with a unique six character container identification number and eight character shipment number per NVO-325 (Rev. 1), 5.5.1.3(I,3) so that the container can be identified from another container within the shipment or from another set of containers. The approved 13 digit waste stream number (ONL000000002) will also be placed onto the waste container. Marking and labeling of the ~~Construction/removal action waste packages will be for radioactive material. The weight of the package will be marked in pounds and kilograms. Signed NV-211 labels will be attached to containers certified for shipment to the NTS.~~

j. Barcoding

Barcode labels will meet NVO-325 (Rev. 1), requirements and must be approved by DOE NV prior to use. Two barcode labels will be placed on each contaminated process area scrap waste package. The barcode labels will be placed near the top and on opposite sides of nonstandard containers. Barcode Labels on drums will be placed on the lid and one side near the top of the drum.

**k. On-site Transfer**

Only packaged contaminated construction/removal action waste is shipped from the FEMP for disposal at the NTS. The FEMP will not provide any material which will require on-site transfer of unpackaged bulk materials by the NTS.

**2.5 Additional Criteria for Mixed Waste**

None of the waste streams listed in this application are mixed waste. The FEMP will not be disposing of mixed waste at the NTS.

**2.6 Additional Criteria for Transuranic/Transuranic Mixed Waste**

None of the waste streams listed in this application contain Transuranic or Transuranic Mixed waste. The FEMP will not be disposing of Transuranic or Transuranic Mixed waste at the NTS.

**2.7 Additional Criteria for Bulk Waste**

The FEMP is not currently and does not intend to ship mixed waste to the NTS for disposal. By default, the FEMP will not be shipping mixed waste as bulk waste or mixed waste for bulk disposal.

The FEMP does ship bulk waste to the NTS for disposal in the form of scrap material (metal, wood, vehicles) that is contaminated radioactively. This material is well below the 49 CFR 173.425(c) requirement of 0.001 millicurie per square centimeter when averaged over one square meter of the material. The type of container in which the FEMP ships bulk waste is identified in the sections relating to the NTS specific packaging criteria. Approval of this application will constitute approval of continued use of this container.

**2.8 Additional Criteria for Case-by-Case Waste****2.8.1 Weight**

The FEMP is currently shipping and intends to continue to ship waste in ISO (International Shipping Organization) containers generally referred to as Sea/Land containers. These containers routinely weigh greater than 9,000 pounds and require either a large fork truck or crane for removal from the transport vehicle. The FEMP ships these containers on flat bed trailers which require no top or side wall removal. Section V contains the Exemption Request for Sea/land containers.

**2.8.2 Activity Limits**

All containers shipped from the FEMP for disposal at the NTS are within the activity limits specified in NVO-325 (Rev. 1), Section 5.5.1.2.F.

**2.8.3 Radioactively Contaminated Asbestos**

Friable asbestos will not be shipped to the NTS before securing DOE/NV approval. All radioactively contaminated regulated asbestos will be in waste stream ONL000000010, "Radioactively Contaminated Regulated Asbestos Containing Material".

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**III. WASTE STREAM INFORMATION**

**2.8.4 DOE Comparable Greater-Than-Class-C As Defined in 10 CFR 61.55**

This requirement is not applicable to the FEMP waste streams since no greater-than-Class-C waste is shipped from the FEMP for disposal at NTS.

**2.8.5 Classified Waste Streams**

This requirement is not applicable, the FEMP will not ship classified waste for disposal at the NTS under this waste stream.

**2.8.6 Radioactive Animal Carcasses**

This requirement is not applicable to the FEMP since no radioactive animal carcasses are included in the contaminated construction/removal action waste stream.

**2.8.7 Other Waste Forms**

The FEMP will secure DOE/NV approval for any waste forms that do not meet NTS requirements before shipping to the NTS.

**2.9 Packaging and Shipping Information**

Radioactively contaminated Construction Waste will be packaged and shipped according to the DOT requirements for radioactively contaminated materials, n.o.s. UN-2912 radionuclides.

**2.10 Waste Security Information**

This section is not applicable since no classified waste is shipped for disposal at the NTS in this waste stream.

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## C. Waste Stream Identification Number

ONL0000000006 Low/High Grade Residues

## 1.0 Waste Type

Low Level Waste

## 2.0 Waste Description

A waste stream is defined as a waste which is categorized by similar characterization process and/or point of generation. The criteria used for evaluating candidate LLW for shipment to the NTS, excerpted from the FEMP Waste Characterization Plan (Draft), are described on the following pages.

## 2.1 Low/High Grade Residues

Residues are stored at the FEMP as a result of the production processes within the various FEMP plants or from other DOE facilities. These residues are divided into two subgroups: low grade and high grade residues.

Low grade residues generally contain between 0.1% to 20% <sup>235</sup>U by weight and 0.2% to 2.0% <sup>235</sup>U relative to total uranium. These residues consist of uranium oxides and fluoride mixed with a wide variety of other materials such as dirt, fibers, and process area items. Low grade residues comprise approximately 70 percent of this waste stream.

## Low Grade Uranium Residues:

- Discard process residues
- Trailer cakes
- Waste slurries (dried)
- Raffinate
- Sump cake
- Dust collector residues
- Filter cakes
- Magnesium fluoride, MgF<sub>2</sub>
- Items known to be contaminated with uranium residues (includes glass, plastic, paper, etc)

High grade residues are also generated or stored at the FEMP as a result of the production processes within the various plants or other DOE facilities. High grade residues generally contain between 20% to 88% <sup>235</sup>U by weight and 0.2% to 2.0% <sup>235</sup>U relative to total uranium. These residues contain impurities or are mixtures of several uranium compounds. High grade residues comprise approximately 30 percent of this waste stream.

Many of the high grade residues are intermediate products in the uranium metal production process which do not meet the quality requirements to allow further processing and, therefore, are classified as LLW.

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## High Grade Uranium Residues:

- Uranium tetrafluoride, UF<sub>4</sub> (off-spec green salt)
- Scrap uranium oxide, U<sub>3</sub>O<sub>8</sub> (black oxide)
- Reject uranium trioxide, UO<sub>3</sub> (orange oxide)
- Items associated with high-grade residues (including glass, paper, plastic, etc)

No chemical treatment of high or low grade wastes will be completed prior to shipment for disposal. Physical treatment will be completed as required to remove free liquids. FEMP SSOP-0024 "Packaging Low Level Radioactive Waste (LLRW) for off-site disposal", is used to ensure that no free liquids are present in residue waste packages. Size reduction may also be completed on the waste prior to shipment.

All residues will be overpacked into metal boxes or overpack drums meeting strong, tight container requirements to comply with NTS WAC. All low and high grade residue drums contain less than one percent by weight <sup>235</sup>U or if greater than one percent by <sup>235</sup>U the package will have less than 800 grams <sup>235</sup>U per package. Residue packages containing uranium enriched in <sup>235</sup>U greater than one percent by weight will be packaged to insure the mass of <sup>235</sup>U is less than 800 grams per package and the package is fissile exempt. This hazard classification is contingent on the fact that the total mass of plutonium and <sup>235</sup>U does not exceed one percent of the mass of the <sup>235</sup>U.

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5. Hazardous Components (for MW): NOT APPLICABLE

- a. Basis for Identifying as MW (circle): (1) Ignitable  
(2) Reactive (3) Corrosive (4) TCLP (5) Listed Waste

b. List the applicable EPA waste code, the chemical name, the treatment performed (if applicable) and the Regulatory/Treatment Standard. Attach Standardized Data Forms.

<u>EPA Hazardous Waste No.</u>	<u>Chemical Name</u>	<u>Treatment Performed</u>	<u>Regulatory Threshold/Treatment Standard</u>
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- (1)
- (2)
- (3)
- (4)

**NOTE:** Waste characterization of materials included in this waste stream is complete using a combination of sampling and analysis and process knowledge. Process knowledge is used when the material meets one or more of the criteria of NVO-325 (Rev. 1), Section 4.1.1.A, B, and C or when process controls are well documented and controlled. (Examples of materials characterized by process knowledge includes residues generated from well controlled, well documented processes such as MgF<sub>2</sub>). The FEMP will conduct confirmatory sampling of waste stream characterized by process knowledge before shipping for disposal at the NTS.

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2.2 Waste Stream Specific Criteria

- a. Low Level Waste: Only the low/high grade residues defined as LLW per DOE Orders 5820.2A, 5400.1, and 5480.11 guidelines shall be shipped to the NTS. (NVO-325 (Rev. 1), 5.5.1).

Compliance Method: In general, wastes that originate from Controlled Areas at the FEMP are considered radioactive waste unless demonstrated otherwise through analysis or administrative controls. Further guidance on radioactive waste characterization is provided in the DOE Performance Objective (Draft). In accordance with the "Waste Minimization and Pollution Prevention Awareness Plan," the FEMP attempts to minimize waste generation whenever possible.

- b. Transuranic: The low/high grade residues shall have a TRU concentration less than 100 nCi/g (e.g., shall not be regulated as TRU waste). (NVO-325 (Rev. 1), 5.5.1.1(A)).

Compliance Method: MC&A records indicate there are no materials at the FEMP with TRU concentrations above the 100 nCi/g level. The highest TRU concentrations found with some materials determined through analysis was 93,904 dpm/g (42 nCi/g).

- c. Hazardous Waste: All low/high grade residues shall be evaluated for hazardous waste by process knowledge, analytical characterization or by identifying material(s) listed as hazardous in Title 40 CFR 261, "Identification and Listing of Hazardous Waste", or in the regulations of the state where the waste is generated. (NVO-325, Revision 1, 5.5.1.1(B)).

Compliance Method: The general procedure for the evaluation of a residue for hazardous waste characteristics is as follows:

- (1) WC [FME] is contacted by the generator of the waste for existing data/information obtained from previous evaluations;
- (2) If no information is available and characterization is required, Section I of the MEF is completed and submitted to WC [FME] for characterization;
- (3) WC [FME] completes characterization by process knowledge or sampling/analysis;
  - (a) Process knowledge is used if enough information is available about the waste generation process so that WC [FME] can firmly establish that the waste would not exhibit hazardous waste characteristics and does not contain any listed hazardous waste. This waste stream would then be determined to be nonhazardous.

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(b) WC [FME] will require that sampling and analysis of the waste if sufficient information is not available for a determination. WC [FME] will:

- specify the parameters to be determined,
- write a specific sampling plan,
- specify the approved SOP to be used (e.g., for drummed waste sampling, 20-C-805),

**Note:** All FEMP SOPs are issued as site controlled documents after the SOP has been through a review and approval process. The reviewers are selected by the SOP author based on the nature of the SOP.

- submit samples to an analytical laboratory following chain-of-custody procedures and complete analysis per SW-846 Methodology,
- complete a statistical analysis and quality assurance check on the analytical data, and
- document the final characterization on the MEF.

(4) A copy of the MEF is returned to the generator of the waste in question.

The generator will package the nonhazardous waste that meets the criteria of this application. FERMCQ Quality Certification oversees the packaging to ensure that only material specified in the MEF is packaged.

- d. Free Liquids: The low/high grade residues disposed at NTS waste management sites shall contain as little free liquids as is reasonably achievable, but in no case shall the liquid equal or exceed 0.5% by volume of the external waste container and shall meet the following criteria (NVO-325 (Rev. 1), 5.5.1.1(C)).

Compliance Method Low/high grade residues may be evaluated based on process knowledge or waste testing to determine whether the waste stream meets this criteria. Determinations based on process knowledge generally include a visual inspection. Free liquid determinations are generally completed as part of the RCRA waste characterization process. The PFLT test is performed to determine the presence of free liquids when process knowledge does not yield sufficient information to complete this determination. Reference FEMP Waste Characterization Plan (Draft) -RCRA Section.

- e. Particulates: Wastes containing greater than 1 weight percent fine particulate materials less-than-ten-micrometer-diameter or 15 weight percent less-than-200 micrometer diameter particles shall be immobilized or packaged in accordance with NVO-325 (Rev. 1), 5.5.1.1(D).

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Compliance Method Some residue waste streams will categorically fail the particulates WAC while others may require testing to complete a rigorous evaluation. Dust collector residues (MTC 062) have been documented to have greater than one percent by weight of less-than-ten-micron-diameter particles. In addition, depending on the moisture content, many of the residues on-site will fail these limits. If testing is required because the waste form does not clearly meet the WAC, the waste stream will be identified as requiring testing. Testing may be conducted using a particle size impactor or some other form of particle sizing equipment. Should the waste fail the criteria for particulates and immobilization is impractical, the waste packaging will be completed by overpacking, using steel drums with 6 mil plastic liners or steel boxes in accordance with NVO-325 (Rev. 1).

- f. Gases: Radioactive gases shall be stabilized or absorbed so that pressure in the waste package does not exceed 1.5 atmospheres at 20° celsius. Compressed gases as defined by Title 49 CFR 173.300, including unpunctured aerosol cans, shall not be shipped for disposal in the low/high grade residues Waste Stream. Aerosol cans shall have puncture disfigurements readily recognizable by real-time-radiography. Expended gas cylinders shall have the valve mechanism removed. (NVO-325 (Rev. 1), 5.5.1.1(E)).

Compliance Method: Low/high grade residues are evaluated to determine if they contain any items that potentially fail this WAC during the hazardous waste determination (SSOP-0002). Residues that fails to meet this WAC will not be shipped to the NTS.

- g. Stabilization: Where practical, low/high grade residues waste shall be treated to reduce volume and provide a more structurally and chemically stable waste form. (NVO-325 (Rev. 1), 5.5.1.1(F)).

Compliance Method: WC [FME] will identify all LLW streams that have potential to generate harmful gases, vapors, or liquids. In addition, WC [FME] will identify waste streams that are candidates for treatment to reduce volume or provide a structurally more stable waste form. Treatment of low/high grade residues is typically to remove free liquids. The compliance method for meeting this WAC is stated in Section 1.4.2.d.

- h. Etiologic Agents: Low/high grades residues to be shipped to the NTS shall not contain pathogens, infectious wastes, or other etiologic agents as defined in Title 49 CFR 173.386. (NVO-325 (Rev. 1), 5.5.1.1(G)).

Compliance Method: The only significant source of potential etiologic agents on site is from medical services. Such materials may include band aids, tongue blades, syringes, cotton balls or other materials stained with blood or other body fluids, and outdated pharmaceuticals. These materials are managed according to Ohio Infectious Waste Law/Regulation (ORC 3734 and OAC 3745-27-01 through 25) which includes segregated packaging at the point of generation. Materials are placed in a red bag in a box premarked with the international biohazard label. These boxes are then transported by a registered transporter to a licensed

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treatment facility. These administrative controls prevent etiologic agents from entering the low/high grade residues waste stream. Reference FEMP Waste Characterization Plan (Draft) - Infectious Waste Section for additional evaluation criteria.

- i. Chelating Agents: If a waste is determined to contain chelating agents above the one percent by weight limit, the waste shall not be approved for disposal at the NTS. (NVO-325 (Rev. 1), 5.5.1.1(H)).

Compliance Method: Chelating agents form coordination compounds by offering two or more chemical bonds (through ligands) to a central metal ion. The most common chelating agent is EDTA. Other common chelating agents are also aminopolyacetic acids. Excess chemicals from the on-site laboratory are the primary potential source of materials that may be identified as true chelating agents. This determination will be accomplished through the use of the MEF which will designate the waste as containing above one percent by weight chelating agents. WC [FME] has generated a list of potential chelating or complexing agents through an on-line database search and will consult this list to evaluate potential chelating or complexing agents. The MEF (example provided in this application) contains a specific section for denoting the presence of chelating agents. This information is provided to the waste certification official who is responsible for ensuring that material containing chelating agents at concentrations greater than one percent by weight are characterized and properly tagged as not meeting the criteria for shipment. This process prevents waste that does not meet the NTS WAC from being shipped for disposal.

- j. Polychlorinated Biphenyls: PCB contaminated waste shall not be shipped for disposal at NTS in the low/high grade residues waste stream unless the PCB concentration meets the municipal solid waste disposal limits. See Title 40 CFR 761.60 for PCB disposal requirements. (NVO-325 (Rev. 1), 5.5.1.1(I)).

Compliance Method: The FEMP samples wastes for PCB contamination when the waste matrix (e.g., oily material) or review of previous operations, manufacturers manuals, and previous sampling and analyses provides a reason to suspect PCB contamination. This determination is performed during the hazardous waste determination (SSOP-0002). Reference FEMP Waste Characterization Plan (Draft) - TSCA PCB Section for evaluation criteria.

- ~~k. Explosives and Pyrophorics: Low/high grade residues shall not contain potentially explosive or pyrophoric material in a form that may spontaneously combust if the container is breached. (NVO-325 (Rev. 1), 5.5.1.1(J)).~~

Compliance Method: This WAC is evaluated during the hazardous waste characterization. This evaluation is performed in accordance with SSOP-0002, Completing the Material Evaluation Form and FEMP Waste Characterization Plan (Draft). Any waste that potentially fails this WAC shall be identified by WC [FME] and the material will not be shipped to the NTS for disposal.

2.3 Waste Stream General Package Criteria

a. Design

Waste packaging criteria for low/high grade residue containers with less than 50%  $U_{\text{TOT}}$  or less than 1%  $^{235}\text{U}$  shipped to the NTS for disposal will meet DOT Regulations, 49 CFR 173, Subpart I. High grade residues containing greater than 50%  $U_{\text{TOT}}$  and greater than 1%  $^{235}\text{U}$  will be packaged according to 49 CFR 173.451 through 173.459. Standard operating procedures listed in Table I of the Waste Certification Plan, concerning storage and off-site shipments, will be used to assure that all shipments meet DOT requirements and NTS site-specific requirements.

b. Nuclear Safety

The quantity of radioactive materials in low/high grade residue shipped to the NTS will be limited so that an infinite array of packages will remain subcritical. This quantity will be determined on the basis of a specific nuclear safety analysis, considering credible accident situations, and taking into account the actual materials in the waste and will meet 49 CFR, Parts 173.453(c)(3) and 173.453(d). Low/high grade residue packages will not contain uranium enriched  $^{235}\text{U}$  greater than one percent by weight and with a mass of  $^{235}\text{U}$  greater than 800 grams per package. The total mass of plutonium and  $^{239}\text{Pu}$  will not exceed one percent of the mass of  $^{235}\text{U}$  in any package.

c. Nuclear Heating

In compliance with 49 CFR 173.442, Thermal Limitations, a Health Physics evaluation of waste packages of material to be shipped to the NTS from the FEMP will show no evidence of a heating effect above NVO-325 limits from radiological decay. Calculations from these waste streams at the FEMP show the power output from either  $^{235}\text{U}$  or  $^{239}\text{Pu}$  at maximum potential concentration in any waste package will not exceed 0.1 Watt. These calculations are based on the total alpha energy from each isotope in the waste and its associated daughters during normal radioactive decay.

d. Radiation Levels

In compliance with 49 CFR 173.441, Radiation Levels, the radiation exposure rate at the surface and at 1 meter from each package will be measured and recorded in the data package. Low/high grade residue packages that exceed 200 millirem/hr on contact will not be shipped to NTS.

e. External Contamination

In compliance with 49 CFR 173.443, the surface contamination of each container of low/high grade residue will be measured using instruments calibrated by EH&S, Dosimetry, Instrumentation Section and recorded in the data package. If these instruments indicate that the limits of 49 CFR 173.443 are exceeded, then the

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package will be cleaned until it is within the limits or the contents will be transferred to a clean container.

f. Activity Limits

The activity limits of Titles 49 CFR 173.421, "Limited Quantities of Radioactive Materials," and 49 CFR 173.425, "Transport Requirements for Low-Specific Activity Radioactive Materials" shall be met.

In compliance with Title 49 CFR 173.421 and 173.425, strong, tight containers used for shipping Limited Quantities (LQ) and Low-Specific Activity (LSA) LLW shall be constructed so they will not leak during normal transportation and handling conditions.

g. Multiple Hazards

Not applicable, the FEMP does not ship wastes with multiple hazards to the NTS.

## 2.4 Waste Stream Specific Package Criteria

a. Closure

All low/high grade residue package closures will be sturdy enough to assure the closures will not be breached under normal handling conditions and will not serve as weak points for package failure.

b. Strength

Low/high grade residue will be packaged in containers capable of supporting a uniformly distributed load of 4,000 lbs/ft<sup>2</sup>, except for waste packaged in DOE NV approved containers (drums and ISO containers).

c. Handling

All low/high grade residue containers will have permanently attached skids, cleats, offsets, rings, handles, or other auxiliary lifting devices to allow handling by means of forklifts, cranes, or similar handling equipment. ~~Lifting rings and other auxiliary lifting devices will be recessed, offset, or hinged in a manner that does not inhibit stacking the packages. The lifting devices will meet a 5:1 safety factor based upon the ultimate strength of the material. All rigging devices that are not permanently attached to the waste package will have a current load test based on 125 percent of the safe working load.~~

d. Size

FEMP low/high grade residue will be packaged in 55-gallon drums, 85-gallon drums or the recommended 4 x 4 x 7 ft. boxes including container codes: 117, and 119 from Table I.

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e. Weight

In addition to the weight limits set for specific packaging designs, a 9,000 lb. limit per box and a 1,200 lb. limit per 55-gallon and 85-gallon drums will be maintained. Low/high grade residue exceeding the 9,000 lb. limit will be shipped in removable-top trailers, or on flatbeds.

f. Loading

Low/high grade residue will be packaged to ensure that the interior volume is as efficiently and compactly loaded as practical.

g. Nonstandard Type A Packaging

The FEMP is currently using a Type 7A Container as a strong, tight container. Used for this purpose, the container does not require a DOE Type A Certification. If a Type A Container is required to ship low/high grade residues, only containers with a DOE Type A Certification will be used.

h. Package Protection

Every FEMP low/high grade residue package will be prepared for shipment so as to minimize damage during transit. The preshipment storage environment will be controlled to avoid adverse influence from weather or other factors on the containment capability of the waste packaging during handling, storage, and transport. FEMP will take all responsibility for preshipment storage and take all reasonable precautions to preclude the accumulation of moisture on or in packages prior to their arrival to the NTS. Tamper indicating devices are used to maintain control of the container once certification actions are completed.

The FEMP will package all low/high grade residue for shipment to NTS in containers meeting DOT requirements (e.g., DOT Type 17H 55-gallon drums or other NTS approved containers). All containers will be shipped to meet DOT requirements for interstate travel and will meet the requirements of 49 CFR 173.411, 173.421, and 173.425.

i. Marking and Labeling

Low/high grade residue shipped to the NTS will be marked and labeled as required in Title 49 CFR 172, Subparts D and E [with exceptions noted in Title 173.425 (b) and (c)]. Also, each waste container will be marked with a unique six character container identification number and eight character shipment number per NVO-325 (Rev. 1), 5.5.1.3(I,3) so that the container can be identified from another container within the shipment or from another set of containers. The approved 13 digit waste stream number (ONL0000000006) will also be placed onto the waste container. Marking and labeling of the low/high grade residue packages will be for radioactive material. The weight of the package will be marked in pounds and kilograms. Signed NV-211 labels will be affixed to containers certified for shipment to the NTS.

**III. WASTE STREAM INFORMATION**Revision 5.0  
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Barcode labels will meet NVO-325 (Rev. 1), requirements and must be approved by DOE NV prior to use. Two barcode labels will be placed on each low/high grade residue package. The barcode labels will be placed near the top and on opposite sides of nonstandard containers. Barcode Labels on drums will be placed on the lid and one side near the top of the drum.

**k. On-site Transfer**

Only packaged low/high grade residue is shipped from the FEMP for disposal at the NTS. The FEMP will not provide any material which will require on-site transfer of unpackaged bulk materials by the NTS.

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#### 2.5 Additional Criteria for Mixed Waste

None of the waste streams listed in this application are mixed waste. The FEMP will not be disposing of mixed waste at the NTS.

#### 2.6 Additional Criteria for Transuranic/Transuranic Mixed Waste

None of the waste streams listed in this application contain Transuranic or Transuranic Mixed waste. The FEMP will not be disposing of Transuranic or Transuranic Mixed waste at the NTS.

#### 2.7 Additional Criteria for Bulk Waste

The FEMP is not currently and does not intend to ship mixed waste to the NTS for disposal. By default, the FEMP will not be shipping mixed waste as bulk waste or mixed waste for bulk disposal.

The FEMP does ship bulk waste to the NTS for disposal in the form of scrap material (metal, wood, vehicles) that is contaminated radioactively. This material is well below the 49 CFR 173.425(c) requirement of 0.001 millicurie per square centimeter when averaged over one square meter of the material. The type of container in which the FEMP ships bulk waste is identified in the sections relating to the NTS specific packaging criteria. Approval of this application will constitute approval of continued use of this container.

#### 2.8 Additional Criteria for Case-by-Case Waste

##### 2.8.1 Weight

The FEMP is currently shipping and intends to continue to ship waste in ISO (International Shipping Organization) containers generally referred to as Sea/Land containers. These containers routinely weigh greater than 9,000 pounds and require either a large fork truck or crane for removal from the transport vehicle. The FEMP ships these containers on flat bed trailers which require no top or side wall removal.

##### 2.8.2 Activity Limits

All containers shipped from the FEMP for disposal at the NTS are within the activity limits specified in NVO-325 (Rev. 1), Section 5.5.1.2.F.

##### 2.8.3 Radioactively Contaminated Asbestos

Friable asbestos will not be shipped to the NTS before securing DOE/NV approval. All radioactively contaminated regulated asbestos will be in waste stream ONL000000010, "Radioactively Contaminated Regulated Asbestos Containing Material".

**III. WASTE STREAM INFORMATION****2.8.4 DOE Comparable Greater-Than-Class-C As Defined in 10 CFR 61.55**

This requirement is not applicable to the FEMP waste streams since no greater-than-Class-C waste is shipped from the FEMP for disposal at NTS.

**2.8.5 Classified Waste Streams**

This requirement is not applicable, the FEMP will not ship classified waste for disposal at the NTS under this waste stream.

**2.8.6 Radioactive Animal Carcasses**

This requirement is not applicable to the FEMP since no radioactive animal carcasses are included in the low/high grade residues waste stream.

**2.8.7 Other Waste Forms**

The FEMP will secure DOE/NV approval for any waste forms that do not meet NTS requirements before shipping to the NTS.

**2.9 Packaging and Shipping Information**

Low/High Grade Uranium Residues will be packaged and shipped according to the DOT requirements for Radioactive Material, Low Specific Activity materials, n.o.s. UN-2912 radionuclides.

**2.10 Waste Security Information**

This section is not applicable since no classified waste is shipped for disposal at the NTS in this waste stream.

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#### D. Waste Stream Identification Number

ONL000000007 Contaminated Trash

##### 1.0 Waste Type

Low Level Waste

##### 2.0 Waste Description

A waste stream is defined as a waste which is categorized by similar characterization process and/or point of generation. The criteria used for evaluating candidate LLW for shipment to the NTS, excerpted from the FEMP Waste Characterization Plan (Draft), are described on the following pages.

##### 2.1 Contaminated Trash

Contaminated trash is generated at the FEMP. This waste stream is currently being shipped to the NTS and consists of:

- plastic
- cardboard
- paper
- small miscellaneous metal pieces

This material is generated in the daily office operations and material unpacking operations. No treatment of this waste is completed prior to packaging. Evaluation of this waste is accomplished administratively. Controls are in place (a prohibitive materials list and SOP 20-C-604 "Control and Utilization of Contaminated Trash Dumpsters", to provide personnel with the knowledge and procedure for preventing waste which does not meet the NTS Waste Acceptance Criteria from entering this stream at the point of collection (trash dumpsters). The waste is then further evaluated with a second procedure (SOP 2-C-923 "Trash Baler Operation", when it is compacted and baled to ensure that only waste which meets the NTS WAC is packaged for disposal. This waste is not treated prior to packaging. If the waste does not meet disposal criteria in its existing form, the waste is not packaged for disposal. The waste is size reduced in a compactor prior to packaging. The final form is a bale of trash which is packaged into a container for shipment. No special handling or disposal requirements exist for this waste.

III. WASTE STREAM INFORMATION

2.1.1 Waste Stream Characterization Data Sheet

1. Waste Stream No.: 0 N L 0 0 0 0 0 0 0 0 0 7

2. Waste Description:

a. Physical Characteristics: Dry solid paper, cardboard, plastic, etc. generated by daily office and unpackaging activities within radiological controlled areas. This material is baled (volume reduction) prior to packaging.

b. Special Handling/Disposal Requirements: None  
The average radiation level on contact is .50 mrem/hr. with a range of <.50 mrem/hr. to 1.0 mrem/hr.

3. Basis for Characterization:

a. Process Knowledge:                       b. Analytical Knowledge:   
c. Both:

If B or C, provide Standard Data Reporting Forms as necessary.

4. Radioactive Characteristics:

a. Is Waste > NRC Class-C (see Title 10 CFR 61.55)?: No

b. WMIS Nuclide Category (circle): 1 (2) 3 4 5 NA 7 8

(Choose the highest predominate nuclide. The number 6 is not an option.)

c. Radioactive Constituents:

Specific Activity Range of Waste Stream

	<u>Nuclide</u>	<u>Chemical Forms</u>	<u>Low</u>	<u>Mean</u>	<u>High</u>	<u>Units(Ci/kg)</u>
(1)	U-238	*	3.36E-07	1.81E-06	3.29E-06	Ci/kg
	(0.1% to 1.0% U)					
(2)	U-235	*	4.76E-09	2.19E-07	4.34E-07	Ci/kg
	(0.2% to 2.0% on a U basis)					
(3)	U-234	*	1.38E-07	4.07E-06	8.01E-06	Ci/kg
	(0.001% to 0.01% on a U basis)					

\* Uranium oxides and salts (typically UO<sub>2</sub>, U<sub>3</sub>O<sub>8</sub>, and UF<sub>6</sub>.)

III. WASTE STREAM INFORMATION

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Page 2 of Waste Stream Characterization Data Sheet

5. Hazardous Components (for MW): NOT APPLICABLE

- a. Basis for Identifying as MW (circle): (1) Ignitable  
(2) Reactive (3) Corrosive (4) TCLP (5) Listed Waste

b. List the applicable EPA waste code, the chemical name, the treatment performed (if applicable) and the Regulatory/Treatment Standard. Attach Standardized Data Forms.

<u>EPA Hazardous Waste No.</u>	<u>Chemical Name</u>	<u>Treatment Performed</u>	<u>Regulatory Threshold/Treatment Standard</u>
--------------------------------	----------------------	----------------------------	--

- (1)
- (2)
- (3)
- (4)

**NOTE:** Waste characterization of materials included in this waste stream is predominantly completed using process knowledge because the material meets all the criteria of NVO-325 (Rev. 1), Section 4.1.1.A, B, and C. Administrative controls are also employed to preserve waste stream integrity (SOP 2-C-923, Trash Baler Operation and SOP 20-C-604, Control and Utilization of Contaminated Trash Dumpsters).

## III. WASTE STREAM INFORMATION

## 2.2 Waste Stream Specific Criteria

- a. Low Level Waste: Only the contaminated trash defined as LLW per DOE Orders 5820.2A, 5400.1, and 5480.11 guidelines shall be shipped to the NTS. (NVO-325 (Rev. 1), 5.5.1).

Compliance Method: In general, wastes that originate from Controlled Areas at the FEMP are considered radioactive waste unless demonstrated otherwise through analysis or administrative controls. Further guidance on radioactive waste characterization is provided in the DOE Performance Objective (Draft). In accordance with the "Waste Minimization and Pollution Prevention Awareness Plan," the FEMP attempts to minimize waste generation whenever possible.

- b. Transuranic: The contaminated trash shall have a TRU concentration less than 100 nCi/g (e.g., shall not be regulated as TRU waste). (NVO-325 (Rev. 1), 5.5.1.1(A)).

Compliance Method: MC&A records indicate there are no materials at the FEMP with TRU concentrations above the 100 nCi/g level. The highest TRU concentrations found as determined through analysis was 93,904 dpm/g (42 nCi/g).

- c. Hazardous Waste: All contaminated trash shall be evaluated for any characteristics of, or listed, hazardous waste as identified in Title 40 CFR 261, "Identification and Listing of Hazardous Waste," or state of generation hazardous waste regulations. (NVO-325 (Rev. 1), 5.5.1.1(B)).

Compliance Method: Through careful selection of the items to place on the prohibited materials lists wastes are excluded from the contaminated trash dumpsters that could possibly cause the contaminated trash to exhibit a hazardous waste characterization or be listed as a hazardous waste. Process area personnel are trained in their annual RCRA refresher to understand their responsibilities on following all waste management and waste characterization procedures (SOP 2-C-923 and SOP 20-C-604).

- d. Free Liquids: Contaminated trash disposed at NTS waste management sites shall contain as little free liquids as is reasonably achievable, but in no case shall the liquid equal or exceed 0.5% by volume of the external waste container and shall meet the following criteria (NVO-325 (Rev. 1), 5.5.1.1(C)):

Compliance Method Free liquids are prohibited from disposal in the contaminated trash dumpsters.

- e. Particulates: Wastes containing greater than 1 weight percent fine particulate materials less-than-ten-micrometer-diameter and or 15 weight percent less-than-200 micrometer diameter particles shall be immobilized or packaged in accordance with NVO-325 (Rev. 1), 5.5.1.1(D).

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Compliance Method: The contaminated trash waste streams will not fail the particulates WAC because fine particulates are excluded from the waste stream by procedures SOP 2-C-923 and SOP 20-C-604.

- f. Gases: Radioactive gases shall be stabilized or absorbed so that pressure in the waste package does not exceed 1.5 atmospheres at 20° celsius. Compressed gases as defined by Title 49 CFR 173.300, including unpunctured aerosol cans, will not be shipped for disposal in the contaminated trash waste stream. Aerosol cans shall have puncture disfigurements readily recognizable by real-time-radiography. Expended gas cylinders shall have the valve mechanism removed (NVO-325 (Rev. 1), 5.5.1.1(E)).

Compliance Method: Specific items that could result in generation of harmful gases are specifically prohibited for inclusion in the contaminated trash waste stream. This is accomplished via implementation of procedures SOP 20-C-604 and SOP 2-C-923.

- g. Stabilization: Where practical, contaminated trash shall be treated to reduce volume and provide a more structurally stable waste form. (NVO-325 (Rev. 1), 5.5.1.1(F)).

Compliance Method WSD will identify waste streams that are candidates for treatment to reduce volume or provide a structurally more stable waste form. No contaminated trash will be shipped to the NTS that has the potential to fail this WAC.

- h. Etiologic Agents: Contaminated trash to be shipped to the NTS shall not contain pathogens, infectious wastes, or other etiologic agents as defined in Title 49 CFR 173.386. (NVO-325 (Rev. 1), 5.5.1.1(G)).

Compliance Method The only significant source of potential etiologic agents on site is from medical services. Such materials may include band aids, tongue blades, syringes, cotton balls or other materials stained with blood or other body fluids, and outdated pharmaceuticals. These materials are managed according to Ohio Infectious Waste Law/Regulation (ORC 3734 and OAC 3745-27-01 through 25) which includes segregated packaging at the point of generation. Materials are placed in a red bag in a box premarked with the international biohazard label. These boxes are then transported by a registered transporter to a licensed treatment facility. These administrative controls prevent etiologic agents from entering the contaminated trash waste stream. Reference FEMP Waste Characterization Plan (Draft) - Infectious Waste Section for additional evaluation criteria.

- i. Chelating Agents: If a waste is determined to contain chelating agents above the one percent by weight limit, the waste shall not be approved for disposal at the NTS. (NVO-325 (Rev. 1), 5.5.1.1(H)).

## III. WASTE STREAM INFORMATION

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Compliance Method: Chelating agents are excluded from the contaminated trash waste stream. Excess chemicals from the on-site laboratory are the primary potential source of materials that may be identified as true chelating agents. This determination will be accomplished through the use of the MEF which will designate the waste as containing above one percent by weight chelating agents. WC [FME] has generated a list of potential chelating or complexing agents through an on-line database search and will consult this list to evaluate potential chelating or complexing agents. Contaminated trash waste stream feed materials is controlled by procedures which require visual inspection of all trash. This process prevents waste that does not meet the NTS WAC from being shipped for disposal.

- j. Polychlorinated Biphenyls: PCB contaminated waste shall not be shipped for disposal at NTS in the contaminated trash waste stream unless the PCB concentration meets the municipal solid waste disposal limits. See Title 40 CFR 761.60 for PCB disposal requirements. (NVO-325 (Rev. 1), 5.5.1.1(I)).

Compliance Method: SOP 20-C-604 prohibits addition of any materials that may be suspected of being contaminated by PCBs.

- k. Explosives and Pyrophorics: Contaminated trash shall not contain potentially explosive or pyrophoric material in a form that may spontaneously combust if the container is breached. (NVO-325 (Rev. 1), 5.5.1.1(J)).

Compliance Method This WAC is evaluated during the hazardous waste characterization. This evaluation is performed in accordance with SSOP-0002, Completing the Material Evaluation Form and FEMP Waste Characterization Plan (Draft). Any waste that potentially fails this WAC will be identified by WC [FME] and the material will not be shipped to the NTS for disposal.

## 2.3 Waste Stream General Package Criteria

a. Design

Waste packaging criteria for contaminated trash shipped to the NTS for disposal will meet DOT Regulations, 49 CFR 173, Subpart I. Standard operating procedures listed in Table I of the Waste Certification Plan, concerning storage and off-site shipments, will be used to assure that all shipments meet DOT requirements and NTS site-specific requirements.

b. Nuclear Safety

The quantity of radioactive materials in contaminated trash shipped to the NTS will be limited so that an infinite array of packages will remain subcritical. This quantity will be determined on the basis of a specific nuclear safety analysis, considering credible accident situations, and taking into account the actual materials in the waste and will meet 49 CFR, Parts 173.453(c)(3) and 173.453(d). Contaminated trash packages will not contain uranium enriched <sup>235</sup>U greater than one percent by weight and with a mass of <sup>235</sup>U greater than 800 grams

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per package. The total mass of plutonium and  $^{233}\text{U}$  will not exceed one percent of the mass of  $^{235}\text{U}$  in any package.

#### c. Nuclear Heating

In compliance with 49 CFR 173.442, Thermal Limitations, a Health Physics evaluation of waste packages of material to be shipped to the NTS from the FEMP will show no evidence of a heating effect above NVO-325 limits from radiological decay. Calculations from these waste streams at the FEMP show the power output from either  $^{233}\text{U}$  or  $^{235}\text{U}$  at maximum potential concentration in any waste package will not exceed 0.1 Watt. These calculations are based on the total alpha energy from each isotope in the waste and its associated daughters during normal radioactive decay.

#### d. Radiation Levels

In compliance with 49 CFR 173.441, Radiation Levels, the radiation exposure rate at the surface and at 1 meter from each package will be measured and recorded in the data package. Contaminated trash packages that exceed 200 millirem/hr on contact will not be shipped to NTS.

#### e. External Contamination

In compliance with 49 CFR 173.443, the surface contamination of each container of contaminated trash will be measured using instruments calibrated by EH&S, Dosimetry, Instrumentation Section and recorded in the data package. If these instruments indicate that the limits of 49 CFR 173.443 are exceeded, then the package shall be cleaned until it is within the limits or the contents shall be transferred to a clean container.

#### f. Activity Limits

The activity limits of Titles 49 CFR 173.421, "Limited Quantities of Radioactive Materials," and 49 CFR 173.425, "Transport Requirements for Low-Specific Activity Radioactive Materials" shall be met.

In compliance with Title 49 CFR 173.421 and 173.425, strong, tight containers used for shipping Limited Quantities (LQ) and Low-Specific Activity (LSA) LLW shall be constructed so they will not leak during normal transportation and handling conditions.

#### g. Multiple Hazards

Not applicable, the FEMP does not ship wastes with multiple hazards to the NTS.

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## 2.4 Waste Stream Specific Package Criteria

a. Closure

All contaminated trash package closures will be sturdy enough to assure the closures will not be breached under normal handling conditions and will not serve as weak points for package failure.

b. Strength

Contaminated trash will be packaged in containers capable of supporting a uniformly distributed load of 4,000 lbs/ft<sup>2</sup>, except for waste packaged in DOE NV approved containers (drums and ISO containers).

c. Handling

All contaminated trash containers will have permanently attached skids, cleats, offsets, rings, handles, or other auxiliary lifting devices to allow handling by means of forklifts, cranes, or similar handling equipment. Lifting rings and other auxiliary lifting devices will be recessed, offset, or hinged in a manner that does not inhibit stacking the packages. The lifting devices will be designed to meet a 5:1 safety factor based upon the ultimate strength of the material. All rigging devices that are not permanently attached to the waste package will have a current load test based on 125 percent of the safe working load.

d. Size

FEMP contaminated trash will be packaged typically in ISO container codes: 109 from Table I. Small quantities may be packaged in 55-gallon drums or metal boxes including container codes: 117, and 119 from Table I.

e. Weight

In addition to the weight limits set for specific packaging designs, a 9,000 lb. limit per box and a 1,200 lb. limit per 55-gallon drum will be maintained. Contaminated trash exceeding the 9,000 lb. limit will be shipped in removable-top trailers, or on flatbeds.

f. Loading

Contaminated trash shall be packaged to ensure that the interior volume is as efficiently and compactly loaded as practical.

g. Nonstandard Type A Packaging

The FEMP is currently using a Type 7A Container as a strong, tight container. Used for this purpose, the container does not require a DOE Type A Certification. If a Type A Container is required to ship contaminated trash, only containers

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with a DOE Type A Certification will be used.

#### h. Package Protection

Every FEMP contaminated trash package will be prepared for shipment so as to minimize damage during transit. The preshipment storage environment will be controlled to avoid adverse influence from weather or other factors on the containment capability of the waste packaging during handling, storage, and transport. FEMP will take all responsibility for preshipment storage and take all reasonable precautions to preclude the accumulation of moisture on or in packages prior to their arrival to the NTS. Tamper indicating devices are used to maintain control of the container contents once certification actions are completed.

The FEMP will package all contaminated trash for shipment to NTS in containers meeting DOT requirements (e.g., DOT Type 17H 55-gallon drums or other NTS approved containers). All containers will be shipped to meet DOT requirements for interstate travel and will meet the requirements of 49 CFR 173.411, 173.421, and 173.425.

#### i. Marking and Labeling

Contaminated trash shipped to the NTS will be marked and labeled as required in Title 49 CFR 172, Subparts D and E [with exceptions noted in Title 173.425 (b) and (c)]. Also, each waste container will be marked with a unique six character container identification number and eight character shipment number per NVO-325 (Rev. 1), 5.5.1.3.(I,3) so that the container can be identified from another container within the shipment or from another set of containers. The approved 13 digit waste stream number (ONL0000000007) will also be placed onto the waste container. Marking and labeling of the contaminated trash packages will be for radioactive material. The weight of the package will be marked in pounds and kilograms. Signed NV-211 labels will be attached to containers certified for shipment to the NTS.

#### j. Barcoding

Barcode labels will meet NVO-325 (Rev. 1), requirements and must be approved by DOE NV prior to use. Two barcode labels will be placed on each contaminated trash package. The barcode labels will be placed near the top and on opposite sides of nonstandard containers. Barcode Labels on drums will be placed on the lid and one side near the top of the drum.

#### k. On-site Transfer

Only packaged contaminated trash is shipped from the FEMP for disposal at the NTS. The FEMP will not provide any material which will require on-site transfer of unpackaged bulk materials by the NTS.

**III. WASTE STREAM INFORMATION**

**2.5 Additional Criteria for Mixed Waste**

None of the waste streams listed in this application are mixed waste. The FEMP will not be disposing of mixed waste at the NTS.

**2.6 Additional Criteria for Transuranic/Transuranic Mixed Waste**

None of the waste streams listed in this application contain Transuranic or Transuranic Mixed waste. The FEMP will not be disposing of Transuranic or Transuranic Mixed waste at the NTS.

**2.7 Additional Criteria for Bulk Waste**

The FEMP is not currently and does not intend to ship mixed waste to the NTS for disposal. By default, the FEMP will not be shipping mixed waste as bulk waste or mixed waste for bulk disposal.

The FEMP does ship bulk waste to the NTS for disposal in the form of scrap material (metal, wood, vehicles) that is contaminated radioactively. This material is well below the 49 CFR 173.425(c) requirement of 0.001 millicurie per square centimeter when averaged over one square meter of the material. The type of container in which the FEMP ships bulk waste is identified in the sections relating to the NTS specific packaging criteria. Approval of this application will constitute approval of continued use of this container.

**2.8 Additional Criteria for Case-by-Case Waste**

**2.8.1 Weight**

The FEMP is currently shipping and intends to continue to ship waste in ISO (International Shipping Organization) containers generally referred to as Sea/Land containers. These containers routinely weigh greater than 9,000 pounds and require either a large fork truck or crane for removal from the transport vehicle. The FEMP ships these containers on flat bed trailers which require no top or side wall removal.

**2.8.2 Activity Limits**

All containers shipped from the FEMP for disposal at the NTS are within the activity limits specified in NVO-325 (Rev. 1), Section 5.5.1.2.F.

**2.8.3 Radioactively Contaminated Asbestos**

Friable asbestos will not be shipped to the NTS before securing DOE/NV approval. All radioactively contaminated regulated asbestos will be in waste stream ONL000000010, "Radioactively Contaminated Regulated Asbestos Containing Material".

### **III. WASTE STREAM INFORMATION**

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#### **2.8.4 DOE Comparable Greater-Than-Class-C As Defined in 10 CFR 61.55**

This requirement is not applicable to the FEMP waste streams since no greater-than-Class-C waste is shipped from the FEMP for disposal at NTS.

#### **2.8.5 Classified Waste Streams**

This requirement is not applicable, the FEMP will not ship classified waste for disposal at the NTS under this waste stream.

#### **2.8.6 Radioactive Animal Carcasses**

This requirement is not applicable to the FEMP since no radioactive animal carcasses are included in the contaminated trash waste stream.

#### **2.8.7 Other Waste Forms**

The FEMP will secure DOE/NV approval for any waste forms that do not meet NTS requirements before shipping to the NTS.

### **2.9 Packaging and Shipping Information**

Radioactively Contaminated Trash will be packaged and shipped according to the DOT requirements for Radioactive Material, Low Specific Activity materials, n.o.s. UN-2912 radionuclides.

### **2.10 Waste Security Information**

This section is not applicable since no classified waste is shipped for disposal at the NTS in this waste stream.

**III. WASTE STREAM INFORMATION****E. Waste Stream Identification Number**

ONL0000000008      Low/High Grade Residues - Subcontracted

**1.0 Waste Type**

Low Level Waste

**2.0 Waste Description**

A waste stream is defined as a waste which is categorized by similar characterization process and/or point of generation. The criteria used for evaluating candidate LLW for shipment to the NTS, excerpted from the FEMP Waste Characterization Plan (Draft), are described on the following pages. This waste stream is comprised of the portion of the FEMP residue wastes which will be compacted at a subcontractor's facility prior to shipment to the NTS. All wastes will be characterized by FERMC0 prior to shipment to the subcontractor for compaction. The subcontractor will use a compactor with a 5,000 ton force to yield an average volume reduction of 3.3:1. The compaction will produce a more stable waste form and reduce the volume of waste generated at the FEMP to ultimately be disposed of at the NTS.

**2.1 Low/High Grade Residues**

Residues are stored at the FEMP as a result of the production processes within the various FEMP plants. These residues are divided into two subgroups: low grade and high grade residues. These subgroups are then further divided into groups of waste that are amenable to compaction at a subcontractor's facility. This is the only distinction between the residues contained in this waste stream and those contained in ONL0000000006.

Low grade residues generally contain between 1% to 20% <sup>235</sup>U by weight and 0.2% to 2.0% <sup>238</sup>U relative to total uranium. Low grade residues comprise approximately 70 percent of this waste stream.

Examples of low grade uranium residues include:

- Discard process residues (includes contaminated glass, plastic, paper, etc)
- Trailer cakes
- Waste slurries (dried)
- Raffinate
- Sump cake
- Dust collector residues
- Filter cakes
- Magnesium fluoride, MgF<sub>2</sub>

High grade residues are also generated or stored at the FEMP as a result of the production processes within the various plants or other DOE facilities. High

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grade residues generally contain between 20% to 88%  $^{235}\text{U}$  by weight and 0.2% to 2.0%  $^{235}\text{U}$  relative to total uranium. High grade residues comprise approximately 30 percent of this waste stream.

Many of the high grade residues are intermediate products in the uranium metal production process which do not meet the quality requirements to allow further processing and, therefore, are classified as LLW.

Examples of high grade uranium residues include:

- Discard process residues (includes contaminated glass, plastic, paper, etc.)
- Uranium tetrafluoride,  $\text{UF}_4$  (off-spec green salt)
- Scrap uranium oxide,  $\text{U}_3\text{O}_8$  (black oxide)
- Reject uranium trioxide,  $\text{UO}_3$  (orange oxide)

Treatment of this waste stream will be completed by a subcontractor (Scientific Ecology Group, Inc.) to FERMCO using their equipment and procedures. The treatment consists of compaction. Compaction will be completed as required for size reduction and/or to remove free liquids prior to shipment. Free liquids removed during compaction will not be shipped to the NTS. No chemical treatment of high or low grade wastes will be completed by SEG prior to shipment for disposal.

The compaction process at the vendors facility will prevent the mixing of FEMP wastes to be shipped to the NTS with wastes from other sources. SEG will not open any containers for treatment except overpacks used to provide secure storage and shipment of the inner container. This preserves the FEMP waste characterization and waste certification for each container shipped to the NTS. FERMCO will provide waste characterization and waste certification for the containers treated by SEG. Every container shipped to SEG for compaction will meet all NTS WAC with one possible exception for free liquids which will be met by the compaction process. SEG will provide the tracking system to support the FERMCO certification of the compacted containers/waste. FERMCO will provide waste certification personnel at the SEG facility for the duration of the waste compaction operation. SEG will complete cradle to grave tracking for each container from the FEMP through the SEG facility to delivery at the NTS.

All low/high grade residues compacted by SEG will be overpacked into 83/85-gallon drums, 89-gallon drums or metal boxes meeting strong, tight container requirements that comply with NTS WAC. All low and high grade residue drums compacted at the SEG facility will contain less than one percent by weight  $^{235}\text{U}$  or if greater than one percent by  $^{235}\text{U}$  and meets one or more of the regulatory criteria in 173.403 (n) or 173.453 shall be assigned a hazard class of, Radioactive Material, Low Specific Activity.

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## 2.1.1 Waste Stream Characterization Data Sheet

1. Waste Stream No.: 0 N L 0 0 0 0 0 0 0 0 0 8

2. Waste Description:

- a. Physical Characteristics: Dry solid residues from uranium metal production which generated off-spec residues, slurries, sump cakes, filter cakes, dust collector residues, raffinate, and magnesium fluoride. Some decanting and absorbent addition (typically dicalite®) will be performed prior to packaging this material for shipment to SEG.
- b. Special Handling/Disposal Requirements: None. The average radiation level on contact is 2.0 mrem/hr. with a range of <0.5 mrem/hr. to 10.0 mrem/hr.

3. Basis for Characterization:

- a. Process Knowledge: \_\_\_\_\_ b. Analytical Knowledge: \_\_\_\_\_  
c. Both:

If B or C, provide Standard Data Reporting Forms as necessary.

4. Radioactive Characteristics:

- a. Is Waste > NRC Class-C (see Title 10 CFR 61.55)? No
- b. WMIS Nuclide Category (circle): 1 2 3 4 5 NA 7 8

(Choose the highest predominate nuclide. The number 6 is not an option.)

0.18 0.00

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#### c. Radioactive Constituents:

#### SPECIFIC ACTIVITY RANGE of WASTE STREAM

<u>Nuclide</u>	<u>Chemical Forms</u>	<u>Low</u>	<u>Mean</u>	<u>High</u>	<u>Units(Ci/kg)</u>
(1a) U-238 (0.1% to 20% U)	* Low Grade	3.36E-07	3.31E-05	6.59E-05	Ci/kg
(b) U-238 (20% to 88% U)	* High Grade	6.71E-05	1.79E-04	2.90E-04	Ci/kg
(2) U-235 (0.2% to 2.0% on a U basis)	*	4.29E-09	1.90E-05	3.80E-05	Ci/kg
(3) U-234 (0.001% to 0.01% on a U basis)	*	1.37E-07	3.53E-04	7.05E-04	Ci/kg

\* Uranium oxides and salts (typically UO<sub>2</sub>, U<sub>3</sub>O<sub>8</sub>, and UF<sub>6</sub>)

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5. Hazardous Components (for MW): **NOT APPLICABLE**

- a. Basis for Identifying as MW (circle): (1) Ignitable  
(2) Reactive (3) Corrosive (4) TCLP (5) Listed Waste
- b. List the applicable EPA waste code, the chemical name, the treatment performed (if applicable) and the Regulatory/Treatment Standard. Attach Standardized Data Forms.

<u>EPA Hazardous Waste No.</u>	<u>Chemical Name</u>	<u>Treatment Performed</u>	<u>Regulatory Threshold/Treatment Standard</u>
--------------------------------	----------------------	----------------------------	--

- (1)  
(2)  
(3)  
(4)

**NOTE:** Waste characterization of materials included in this waste stream is completed by FERMCO using a combination of sampling and analysis and process knowledge. Process knowledge is used when the material meets one or more of the criteria of NVO-325, Revision 1, Section 4.1.1.A, B, and C or when process controls are well documented and controlled. (Examples of materials characterized by process knowledge includes residues generated from well controlled, well documented processes such as MgF<sub>2</sub>). The FEMP will conduct confirmatory sampling of waste streams characterized by process knowledge which are amenable to sampling before shipping to SEG for compaction and ultimate disposal at the NTS.

2.1.2 Waste Certification Flow Diagram

The Waste Certification Flow Diagram for low/high grade residues compacted at SEG is included as Figure 1 in the Waste Certification Program Plan, Addendum I.

## 2.2 Waste Stream Specific Criteria

- a. Low Level Waste: Only the low/high grade residues defined as LLW per DOE Orders 5820.2A, 5400.1, and 5480.11 guidelines shall be shipped to the NTS. (NVO-325, Revision 1, 5.5.1).

Compliance Method: In general, wastes that originate from Controlled Areas at the FEMP are considered radioactive waste unless demonstrated otherwise through analysis or administrative controls. Further guidance on radioactive waste characterization is provided in the DOE Performance Objective (Draft). In accordance with the "Waste Minimization and Pollution Prevention Awareness Plan," the FEMP attempts to minimize waste generation whenever possible. Compaction of wastes at the SEG facility is one waste minimization tool (volume reduction) to be utilized by the FEMP.

- b. Transuranic: The low/high grade residues shall have a TRU concentration less than 100 nCi/g (i.e., shall not be regulated as TRU waste). (NVO-325, Revision 1, 5.5.1.1(A)).

Compliance Method: MC&A records indicate there are no materials at the FEMP with TRU concentrations above the 100 nCi/g level. The highest TRU concentrations found with some materials were determined through analysis to be 93,904 dpm/g (42 nCi/g).

- c. Hazardous Waste: All low/high grade residues shall be evaluated for hazardous waste by process knowledge, analytical characterization or by identifying material(s) listed as hazardous in Title 40 CFR 261, "Identification and Listing of Hazardous Waste", or in the regulations of the state where the waste is generated. (NVO-325, Revision 1, 5.5.1.1(B)).

Compliance Method: The general procedure for the evaluation of a residue for hazardous waste characteristics is as follows:

- (1) WC [FME] is contacted by the generator of the waste for existing data/information obtained from previous evaluations;
- (2) If no information is available and characterization is required, Section I of the MEF is completed and submitted to WC [FME] for characterization;
- (3) WC [FME] completes characterization by process knowledge or sampling/analysis;
  - (a) Process knowledge is used if enough information is available about the waste generation process so that WC [FME] can firmly establish that the waste would not exhibit hazardous waste characteristics and does not contain any listed hazardous waste. This waste stream would then be determined to be nonhazardous.

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(b) WC [FME] will require that sampling and analysis of the waste if sufficient information is not available for a determination. WC [FME] will:

- specify the parameters to be determined,
- write a specific sampling plan,
- specify the approved SOP to be used (e.g., for drummed waste sampling, SOP 1-C-101),

**Note:** All FEMP SOPs are issued as site controlled documents after the SOP has been through a review and approval process. The reviewers are selected by the SOP author based on the nature of the SOP.

- submit samples to an analytical laboratory following chain-of-custody procedures and complete analysis per SW-846 Methodology,
- complete a statistical analysis and quality assurance check on the analytical data, and
- document the final characterization on the MEF.

(4) A copy of the MEF is returned to the generator of the waste in question.

The generator will package the nonhazardous waste that meets the criteria of this application. FERMO Quality Certification oversees the packaging to ensure that only material specified in the MEF is packaged.

d. Free Liquids: The low/high grade residues disposed at NTS waste management sites shall contain as little free liquids as is reasonably achievable, but in no case shall the liquid equal or exceed 0.5% by volume of the external waste container and shall meet the following criteria (NVO-325, Revision 1, 5.5.1.1(C)).

Compliance Method Low/high grade residues may be evaluated based on process knowledge or waste testing to determine whether the waste stream meets this criteria. ~~Determinations based on process knowledge generally include a visual inspection. Free liquid determinations are generally completed as part of the RCRA waste characterization process.~~ The PFLT test is performed to determine the presence of free liquids when process knowledge does not yield sufficient information to complete this determination. Reference FEMP Waste Characterization Plan (Draft) -RCRA Section. Free liquids will be removed from the containers by compaction at the SEG facility. Containers will be compacted under sufficient force to remove all free liquids. Absorbent is added to each overpack to contain any residual free liquids on the outside of compacted containers (SEG procedure OP-2.2)

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- e. Particulates: Wastes containing fine particulate materials less-than-ten-micrometer-diameter and greater than 1 weight percent or 15 weight percent less-than-200 micrometer diameter particles will be immobilized or packaged in accordance with NVO-325, Revision 1, 5.5.1.1(D).

Compliance Method Some residue waste streams will categorically fail the particulates WAC while others may require testing to complete a rigorous evaluation. Dust collector residues (MTC 062) have been documented to have greater than one percent by weight of less-than-ten-micron-diameter particles. In addition, depending on the moisture content, many of the residues on-site will fail these limits. If testing is required because the waste form does not clearly meet the WAC, the waste stream shall be identified as requiring testing. Testing may be conducted using a particle size impactor or some other form of particle sizing equipment. Should the waste fail the criteria for particulates and immobilization is impractical, the waste packaging will be completed by overpacking, using steel drums with 6 mil plastic liners or steel boxes in accordance with NVO-325, Revision 1.

- f. Gases: Radioactive gases shall be stabilized or absorbed so that pressure in the waste package does not exceed 1.5 atmospheres at 20° celsius. Compressed gases as defined by Title 49 CFR 173.300, including unpunctured aerosol cans, will not be shipped for disposal in the low/high grade residues Waste Stream. Aerosol cans shall have puncture disfigurements readily recognizable by real-time-radiography. Expended gas cylinders shall have the valve mechanism removed. (NVO-325, Revision 1, 5.5.1.1(E)).

Compliance Method: Low/high grade residues are evaluated to determine if they contain any items that potentially fail this WAC during the hazardous waste determination (SSOP-0002). Residues that fails to meet this WAC will not be shipped to the NTS.

- g. Stabilization: Where practical, low/high grade residues waste shall be treated to reduce volume and provide a more structurally and chemically stable waste form. (NVO-325, Revision 1, 5.5.1.1(F)).

Compliance Method: WC [FME] will identify all LLW streams that have potential to generate harmful gases, vapors, or liquids. In addition, WC [FME] will identify waste streams that are candidates for compaction by SEG to reduce volume and provide a structurally more stable waste form. Compaction of low/high grade residues is also to remove free liquids. The compliance method for meeting this WAC is stated in Section E.2.2.d.

- h. Etiologic Agents: Low/high grades residues to be shipped to the NTS will not contain pathogens, infectious wastes, or other etiologic agents as defined in Title 49 CFR 173.386. (NVO-325, Revision 1, 5.5.1.1(G)).

Compliance Method: The only significant source of potential etiologic agents on site is from medical services. Such materials may include band aids, tongue blades, syringes, cotton balls or other materials stained with blood or other

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body fluids, and outdated pharmaceuticals. These materials are managed according to Ohio Infectious Waste Law/Regulation (ORC 3734 and OAC 3745-27-01 through 25) which includes segregated packaging at the point of generation. Materials are placed in a red bag in a box premarked with the international biohazard label. These boxes are then transported by a registered transporter to a licensed treatment facility. These administrative controls prevent etiologic agents from entering the low/high grade residues waste stream. Reference FEMP Waste Characterization Plan (Draft) - Infectious Waste Section for additional evaluation criteria.

- i. Chelating Agents: If a waste is determined to contain chelating agents above the one percent by weight limit, the waste will not be approved for disposal at the NTS. (NVO-325, Revision 1, 5.5.1.1(H)).

Compliance Method: Chelating agents form coordination compounds by offering two or more chemical bonds (through ligands) to a central metal ion. The most common chelating agent is EDTA. Other common chelating agents are also aminopolyacetic acids. Excess chemicals from the on-site laboratory are the primary potential source of materials that may be identified as true chelating agents. This determination will be accomplished through the use of the MEF which will designate the waste as containing above one percent by weight chelating agents. WC [FME] has generated a list of potential chelating or complexing agents through an on-line database search and will consult this list to evaluate potential chelating or complexing agents. The MEF (example provided in this application) contains a specific section for denoting the presence of chelating agents. This information is provided to the waste certification official who is responsible for ensuring that material containing chelating agents at concentrations greater than one percent by weight are not shipped from FEMP to the NTS for disposal is properly tagged as not meeting the criteria for shipment. This process prevents waste that does not meet the NTS WAC from being shipped for disposal.

- j. Polychlorinated Biphenyls: PCB contaminated waste will not be shipped for disposal at NTS in the low/high grade residues waste stream unless the PCB concentration meets the municipal solid waste disposal limits. See Title 40 CFR 761.60 for PCB disposal requirements. (NVO-325, Revision 1, 5.5.1.1(I)).

Compliance Method: The FEMP samples wastes for PCB contamination when the waste matrix (e.g., oily material) or review of previous operations, manufacturers manuals, and previous sampling and analyses provides a reason to suspect PCB contamination. This determination is performed during the hazardous waste determination (SSOP-0002). Reference FEMP Waste Characterization Plan (Draft) - TSCA PCB Section for evaluation criteria.

- k. Explosives and Pyrophorics: Low/high grade residues do not contain potentially explosive or pyrophoric material in a form that may spontaneously combust if the container is breached. (NVO-325, Revision 1, 5.5.1.1(J)).

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Compliance Method: This WAC is evaluated during the hazardous waste characterization. This evaluation is performed in accordance with SSOP-0002, Completing the Material Evaluation Form and FEMP Waste Characterization Plan (Draft). Any waste that potentially fails this WAC shall be identified by WC [FME] and the material will not be shipped to the NTS for disposal.

#### 2.3 Waste Stream General Package Criteria

##### a. Design

Waste packaging criteria for low/high grade residue containers classified as LSA shipped to the NTS for disposal shall meet DOT Regulations, 49 CFR 173.411 and 173.425. Standard operating procedures listed in Table I of the Waste Certification Plan, concerning storage and off-site shipments, shall be used to assure that all shipments from the FEMP meet DOT requirements and NTS site-specific requirements. Standard operating procedure, OP-4.4Q, Radioactive Material Shipment, shall be used to assure that all shipments from SEG meet DOT requirements and NTS site-specific requirements.

##### b. Nuclear Safety

The quantity of radioactive materials in low/high grade residue shipped to the NTS shall be limited so that an infinite array of packages will remain subcritical. This quantity shall be determined on the basis of a specific nuclear safety analysis, considering credible accident situations, and taking into account the actual materials in the waste and shall meet 49 CFR, Parts 173.403(n) and 173.453.

##### c. Nuclear Heating

In compliance with 49 CFR 173.442, Thermal Limitations, a Health Physics evaluation of waste packages of material to be shipped to the NTS from the FEMP show no evidence of a heating effect above NVO-325 limits from radiological decay. Calculations from these waste streams at the FEMP show the power output from either  $^{233}\text{U}$  or  $^{235}\text{U}$  at maximum potential concentration in any waste package will not exceed 0.1 Watt. These calculations are based on the total alpha energy from each isotope in the waste and its associated daughters during normal radioactive decay.

##### d. Radiation Levels

In compliance with 49 CFR 173.441, Radiation Levels, the radiation exposure rate of each package at the surface and at 1 meter shall be measured and recorded in the Package Storage and Disposal Report. Low/high grade residue packages that exceed 200 millirem/hr on contact shall not be shipped to NTS.

## III. WASTE STREAM INFORMATION

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In compliance with 49 CFR 173.443, the surface contamination of each container of low/high grade residue to be shipped to the NTS from SEG shall be measured using instruments calibrated by the SEG Health Physics section of the C/RF/Incinerator Department and recorded on the Package Storage and Disposal Report. If these instruments indicate that the limits of 49 CFR 173.443 are exceeded, then the package shall be cleaned until it is within the limits or the compacted containers contents shall be transferred to a clean overpack.

f. Activity Limits

The activity limits of Titles 49 CFR 173.421, "Limited Quantities of Radioactive Materials," and 49 CFR 173.425, "Transport Requirements for Low-Specific Activity Radioactive Materials" shall be met.

In compliance with Title 49 CFR 173.421 and 173.425, strong, tight containers used for shipping Limited Quantities (LQ) and Low-Specific Activity (LSA) LLW shall be constructed so they will not leak during normal transportation and handling conditions.

g. Multiple Hazards

Not applicable, the FEMP does not ship wastes with multiple hazards through SEG for disposal at the NTS.

## 2.4 Waste Stream Specific Package Criteria

a. Closure

All low/high grade residue package closures will be sturdy enough to assure the closures will not be breached under normal handling conditions and will not serve as weak points for package failure.

b. Strength

Low/high grade residue will be packaged in containers capable of supporting a uniformly distributed load of 4,000 lbs/ft<sup>2</sup>, except for waste packaged in DOE NV approved containers (drums).

c. Handling

All low/high grade residue containers shall have permanently attached skids, cleats, offsets, rings, handles, or other auxiliary lifting devices to allow handling by means of forklifts, cranes, or similar handling equipment. Lifting rings and other auxiliary lifting devices shall be recessed, offset, or hinged in a manner that does not inhibit stacking the packages. The lifting devices shall be designed to meet a 5:1 safety factor based upon the ultimate strength of the material. All rigging devices that are not permanently attached to the

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waste package shall have a current load test based on 125 percent of the safe working load.

#### d. Size

FEMP low/high grade residues compacted by SEG will be packaged in 83/85-gallon drums, 89-gallon drums, or the recommended 4'x4'x7' boxes including container codes: 117, and 119 from Table I in Section K of the application. The typical size of an 89-gallon drum is 27 inches wide by 43.5 inches tall.

#### e. Weight

In addition to the weight limits set for specific packaging designs, a 6,000 pound limit per metal box (container code 117), 8,000 pound per metal box (container code 119), and a 1,200 lb. limit per 55-gallon, 83/85-gallon, and 89-gallon drums shall be maintained.

#### f. Loading

Compaction of FEMP low/high grade residues by SEG is to ensure that the interior volume is as efficiently and compactly loaded as practical.

#### g. Nonstandard Type A Packaging

FEMP waste shipped to SEG for compaction will not require DOT Type A containers for shipment to the NTS.

#### h. Package Protection

Every FEMP low/high grade residue package shall be prepared for shipment by SEG so as to minimize damage during transit. The preshipment storage environment shall be controlled to avoid adverse influence from weather or other factors on the containment capability of the waste packaging during handling, storage, and transport. SEG shall take all responsibility for preshipment storage and take all reasonable precautions to preclude the accumulation of moisture on or in packages prior to their arrival at the NTS. Tamper indicating devices are used to maintain control of the container contents once FERMCO package certification actions are completed.

SEG shall package all FEMP low/high grade residue for shipment to NTS in containers meeting DOT strong tight requirements (e.g., 83/85-gallon drums, 89-gallon drums, or other NTS approved containers). All containers shall be shipped to meet DOT requirements for interstate travel and shall meet the requirements of 49 CFR 173.411, 173.421, and 173.425.

#### i. Marking and Labeling

Low/high grade residue shipped to the NTS shall be marked and labeled as required in Title 49 CFR 172, Subparts D and E [with exceptions noted in Title 173.425 (b)]

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and (c)]. Also, each waste container shall be marked with a unique six character container identification number and eight character shipment number per NVO-325, Revision 1, 5.5.1.3(I.3) so that the container can be identified from another container within the shipment or from another set of containers. The approved 13 digit waste stream number (ONL0000000008) will also be placed onto the waste container. Marking and labeling of the low/high grade residue packages shall be for radioactive material. The gross weight of the package will be marked in pounds and kilograms. NV-211 labels signed by authorized FERMCO Waste Package Certifiers will be affixed to containers approved for shipment to the NTS.

**j. Barcoding**

Barcode labels will meet NVO-325, Revision 1 requirements and must be approved by DOE NV prior to use. Two barcode labels will be placed on each low/high grade residue package. The barcode labels will be placed near the top and on opposite sides of nonstandard containers. Barcode Labels on drums will be placed on the lid and one side near the top of the drum.

**k. On-site Transfer**

Only packaged low/high grade residue are shipped for disposal at the NTS. SEG will not ship any FEMP material which will require on-site transfer of unpackaged bulk materials by the NTS.

**2.5 Additional Criteria for Mixed Waste**

None of the waste streams listed in this application are mixed waste. SEG is not permitted to treat mixed waste. The FEMP will characterize each waste prior to compaction by SEG thereby preventing disposing of mixed waste at the NTS.

**2.6 Additional Criteria for Transuranic/Transuranic Mixed Waste**

None of the waste streams listed in this application contain Transuranic or Transuranic Mixed Waste. The FEMP will not be disposing of Transuranic or Transuranic Mixed Waste at the NTS.

**2.7 Additional Criteria for Bulk Waste**

The FEMP is not currently and does not currently ship bulk LLW residues to the NTS. All residues compacted at SEG will be containerized for disposal as identified in Sections F.2.4.d and F.2.4.e of this application. Therefore, SEG will not be shipping bulk LLW residues for disposal at the NTS.

**2.8 Additional Criteria for Case-by-Case Waste****2.8.1 Weight**

All containers shipped from the FEMP through SEG for disposal at the NTS will meet the criteria limits specified Section E.2.4.d. and e. Containers exceeding

these criteria will not be shipped without first securing DOE/NV and REECO approval.

**2.8.2 Activity Limits**

All containers shipped from the FEMP through SEG for disposal at the NTS are within the activity limits specified in NVO-325, Revision 1, Section 5.5.1.2.F.

**2.8.3 Radioactively Contaminated Asbestos**

Friable asbestos will not be shipped to the NTS before securing DOE/NV approval. This waste stream does not include radioactively contaminated regulated asbestos.

**2.8.4 DOE Comparable Greater-Than-Class-C As Defined in 10 CFR 61.55**

This requirement is not applicable to the FEMP waste streams since no greater-than-Class-C waste is shipped from the FEMP for disposal at NTS.

**2.8.5 Classified Waste Streams**

This requirement is not applicable, the FEMP will not ship classified waste for disposal at the NTS under this waste stream.

**2.8.6 Radioactive Animal Carcasses**

This requirement is not applicable to the FEMP since no radioactive animal carcasses are included in the low/high grade residues waste stream.

**2.8.7 Other Waste Forms**

The FEMP will secure DOE-NV approval for any waste forms that do not meet NTS requirements before shipping to the NTS.

**2.9 Packaging and Shipping Information**

Compacted residues will be packaged and shipped according to the DOT requirements for Radioactive Material, Low Specific Activity, n.o.s. UN-2912 radionuclides.

**2.10 Waste Security Information**

This section is not applicable since the FEMP will not ship classified waste to SEG for compaction, and by default, SEG will not be shipping classified waste to the NTS.

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## F. Waste Stream Identification Number

ONL0000000009 Metal Melt Wastes

## 1.0 Waste Type

Low Level Waste

## 2.0 Waste Description

A waste stream is defined as a waste which is categorized by similar characterization process and/or point of generation. The criteria used for evaluating candidate LLW for shipment to the NTS, excerpted from the FEMP Waste Characterization Plan (Draft), are described on the following pages.

## 2.1 Metal Melt Wastes

Radioactively contaminated scrap metal is generated at the FEMP. Remediation activities at the FEMP involve dismantling of equipment and disposal of scrap metal which has been stockpiled during FEMP operations. This remediation process generates scrap metal, equipment, and vehicles that have become radioactively contaminated. In addition, the demolition or excavation phase of a construction, maintenance, or removal action projects produces radioactively contaminated metal waste. In this waste stream, the scrap metal shipped to SEG for treatment include:

- scrap metal (location B69 Pad)
- scrap vehicles
- tanks
- heat exchangers
- equipment/machinery
- pipe metal
- construction material (structural steel)
- tools

This low level scrap metal is separated from its loose oxides (mostly rust) and melted in a state-of-the-art, 20 ton, 7200 kilowatt, high-efficiency induction furnace, which can melt almost any metal with temperatures as high as 3000 degrees Fahrenheit. The slag is skimmed from the top of the melted metal, placed in a metal box to cool, sampled (if required), and put in overpack boxes along with box(es) of the oxides separated before melting. The separation and melting process yields 6% to 7% of slag and oxides.

The final form of the metal melt waste is the rust oxides which was separated and collected before melting, and the slag, which consists of metal oxides and other impurities in the scrap metal. About 95% of the total radiological contamination is concentrated in this slag. Both the separated oxides and slag are packed together in overpack boxes for shipment to the NTS. Where practical, metal melt waste will be treated to reduce volume.



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## c. Radioactive Constituents:

SPECIFIC ACTIVITY RANGE of WASTE STREAM

<u>Nuclide</u>	<u>Chemical Forms</u>	<u>Low</u>	<u>Mean</u>	<u>High</u>	<u>Units(Ci/kg)</u>
(1) U-238 (0.01% to 2.0% U)	*	3.36E-08	3.29E-05	6.58E-05	Ci/kg
(2) U-235 (0.2% to 1.0% on a U basis)	*	4.76E-10	2.16E-06	4.32E-06	Ci/kg
(3) U-234 (0.001% to 0.01% on a U basis)	*	1.38E-08	4.29E-05	8.58E-05	Ci/kg

\* Uranium oxides and salts (typically  $UO_2$ ,  $U_3O_8$ , and  $UF_6$ )

## 5. Hazardous Components (for MW): NOT APPLICABLE

a. Basis for Identifying as MW (circle): (1) Ignitable  
(2) Reactive (3) Corrosive (4) TCLP (5) Listed Waste

b. List the applicable EPA waste code, the chemical name, the treatment performed (if applicable) and the Regulatory/Treatment Standard. Attach Standardized Data Forms.

<u>EPA Hazardous Waste No.</u>	<u>Chemical Name</u>	<u>Treatment Performed</u>	<u>Regulatory Threshold/Treatment Standard</u>
--------------------------------	----------------------	----------------------------	--

(1)

(2)

(3)

(4)

**NOTE:** Waste characterization of materials included in this waste stream is predominantly completed prior to melting using process knowledge because the material meets the criteria of NVO-325, Revision 1, Section 4.1.1.B. Material characterized by process knowledge includes metal and equipment. The FEMP will conduct confirmatory analysis of the slag in accordance with the FEMP containerized waste prototype sampling plan to verify the process knowledge waste characterization of the feed metal prior to disposal at the NTS.

## 2.2 Waste Stream Specific Criteria

- a. Low Level Waste: Only the metal melt slag wastes and metal oxides defined as LLW per DOE Orders 5820.2A, 5400.1, and 5480.11 guidelines shall be shipped to the NTS. (NVO-325, Revision 1, 5.5.1).

Compliance Method: The scrap metal originated from Controlled Areas at the FEMP are considered radioactive waste unless demonstrated otherwise through analysis or administrative controls. Further guidance on radioactive waste characterization is provided in the DOE Performance Objective (Draft). (In accordance with the "Waste Minimization and Pollution Prevention Awareness Plan", the FEMP attempts to minimize waste generation whenever possible.)

The metal melt slag/metal oxide waste will be assayed for isotopic constituents by SEG. Only waste meeting NVO-325, Rev. 1, 5.5.1 requirements will be shipped to NTS.

- b. Transuranics: Metal melt slag/oxide wastes shall have a TRU concentration less than 100 nCi/g (i.e., shall not be regulated as TRU waste). (NVO-325, Revision 1, 5.5.1.1(A)).

Compliance Method: No transuranics were generated or stored at the Fernald site at any time throughout its operation. Any low level contamination would come from depleted or slightly enriched uranium. A gamma assay, however, will be completed by SEG to verify TRU absence before shipping to NTS.

- c. Hazardous Waste: All scrap metal shall be evaluated for hazardous waste analytically and/or identified as hazardous if any component is listed in Title 40 CFR 261, "Identification and Listing of Hazardous Waste", or in the regulations of the state where the waste is generated. (NVO-325, Revision 1, 5.5.1.1(B)).

Compliance Method: Only metal free of RCRA adhering materials are shipped to SEG. Each container of radioactively contaminated scrap metal is inspected for RCRA constituents prior to shipment to SEG by completing inspection form FS-F-3464, "FEMP Low-Level Radioactive Waste Materials Evaluation and Container Information - Metal", from SOP 20-C-625 "Evaluating Low Level Radioactive Waste (LLRW) Bulk Waste Streams". Lead based paint is accepted provided it sufficiently adheres to the metal and the paint thickness is  $\leq 1/16$  of an inch.

All scrap metal generated from construction, maintenance, and removal actions are evaluated by WC [FME] to determine if these materials are regulated as hazardous waste as follows:

- (1) During the planning phase of the project, the project engineer identifies all potential hazardous waste that may be generated.

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- (2) A project walkdown following FERMC0 SSOP - 0044 is then conducted to collect information on the waste to be generated and the generation process (e.g., excavate or dismantle).
- (3) Using process knowledge, WC [FME] classifies the scrap metal.
- (4) The characterization is documented using either the General MEF or by issuing a RCRA Determination/Radiological Characterization (RD/RC) letter.

Due to the nature of scrap metal and the high melting temperatures used to melt the metal, the slag waste will not exhibit the ignitable, reactivity, or corrosive hazardous waste characteristics. Confirmatory sampling and analysis of the slag will be completed for toxic characterized metals to meet the requirements of NVO-325 (Rev.1).

As each box is filled with the pretreated, separated metal oxides, representative samples will be taken and analyzed to confirm that no hazardous waste characteristics are associated with that box of waste.

- d. Free Liquids: Metal melt slag waste disposed at NTS waste management sites shall contain as little free liquids as is reasonably achievable, but in no case shall the liquid equal or exceed 0.5% by volume of the external waste container and shall meet the NVO-325, Revision 1, 5.5.1.1(C) criteria.

Compliance Method: Free liquids in metal melt slag wastes are evaluated based on process knowledge or waste testing to determine if the waste stream meets this criteria. Any water will be driven off by the high temperatures reached during the melting process. In order for the loose oxides to separate from the scrap metal when unloading at SEG, it needs to be dry. As each box is filled with these oxides, it will be visually evaluated for free liquid content to ensure compliance to the NVO-325 (Rev.1) criteria.

The containerized slag and oxides are protected from the elements during storage to minimize any contact with water. The compaction process when used will also eliminate any water that may have accumulated.

- e. Particulates: ~~Wastes containing greater than 1 weight percent fine particulate materials less than ten micrometer diameter or 15 weight percent less than 200 micrometer diameter particles shall be immobilized or packaged in accordance with NVO-325, Revision 1, 5.5.1.1(D).~~

Compliance Method: The metal melt slag waste stream will meet this NVO-325, Revision 1, WAC requirement based on the nature of its solid matrix. It is packaged in metal boxes to contain particles generated by compaction.

Testing is required to clearly determine if the separated metal oxide meets the WAC. This testing will be conducted using polarized light microscopy. Should the waste fail the criteria for particulates, immobilization is achieved by

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packaging. The metal oxides will be packaged in metal boxes in accordance with NVO-325, Revision 1, Section 5.5.5.3.

- f. Gases: Radioactive gases shall be stabilized or absorbed so that pressure in the waste package does not exceed 1.5 atmospheres at 20° celsius. Compressed gases as defined by Title 49 CFR 173.300, including unpunctured aerosol cans, shall not be shipped for disposal in the metal melt waste stream. Aerosol cans shall have puncture disfigurements readily recognizable by real-time-radiography. Expanded gas cylinders shall have the valve mechanism removed. (NVO-325, Revision 1, 5.5.1.1(E)).

Compliance Method: The metal melt waste stream will always meet this NVO-325, Revision 1, WAC requirement based on the nature of the slag's and metal oxide's solid matrix. In no case will the slag produce pressure in the package greater than 1.5 atmospheres at 20° celsius.

- g. Stabilization: Where practical, metal melt waste shall be treated to reduce volume and provide a more structurally and chemically stable waste form. (NVO-325, Revision 1, 5.5.1.1(F)).

Compliance Method: The volume of the waste scrap metal is reduced 90% - 95% by the metal melt process. Separating the oxides/rust, melting the scrap metal, separating the slag, which contains a majority of the contamination, and compacting (when practical) the slag accomplishes the stabilization objectives.

- h. Etiologic Agents: Metal melt wastes to be shipped to the NTS shall not contain pathogens, infectious wastes, or other etiologic agents as defined in Title 49 CFR 173.386. (NVO-325, Revision 1, 5.5.1.1(G)).

Compliance Method: The only significant source of potential etiologic agents at the FEMP site is from medical services. Syringes and other metal devices can come from this area. The dry nature of the loose oxidized metal/rust material and the high melting temperatures, which will destroy any etiologic agents, and the non-organic nature of the slag material does not allow for any microbial activity. No pathogens, infectious wastes, or other etiologic agents as defined in Title 49 CFR 173.386 will exist in this waste stream shipped to NTS.

- i. Chelating Agents: If a waste is determined to contain chelating agents above the one percent by weight limit, the waste shall not be approved for disposal at the NTS. (NVO-325, Revision 1, 5.5.1.1(H)).

Compliance Method: Chelating agents form coordination compounds by offering two or more chemical bonds (through ligands) to a central metal ion. The most common chelating agent is EDTA. Other common chelating agents are also aminopolyacetic acids. Excess chemicals from the on-site laboratory are the primary potential source of materials that may be identified as true chelating agents. This determination will be accomplished through the use of the MEF which will designate the waste as containing above one percent by weight chelating agents.

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WC [FME] has generated a list of potential chelating or complexing agents through an on-line database search and will consult this list to evaluate potential chelating or complexing agents. The MEF (example provided in this application) contains a specific section for denoting the presence of chelating agents. This information is provided to the waste certification official who is responsible for ensuring that material containing chelating agents at concentrations greater than one percent by weight are properly tagged as not meeting the criteria for shipment. This process prevents waste that does not meet the NTS WAC from being shipped for disposal.

Due to the high temperatures experienced through the melting process, organic compounds, which make up chelating agents, would be destroyed in the slag waste process.

- j. Polychlorinated Biphenyls: PCB contaminated waste shall not be shipped for disposal at NTS in the metal melt waste stream unless the PCB concentration meets the municipal solid waste disposal limits. See Title 40 CFR 761.60 for PCB disposal requirements. (NVO-325, Revision 1, 5.5.1.1(I)).

Compliance Method: The FEMP samples wastes for PCB contamination when the waste matrix (e.g., oily material) or review of previous operations, manufacturers manuals, and previous sampling and analyses provides a reason to suspect PCB contamination. This waste stream going to SEG contains no oily material and no additional process knowledge exists to provide any reason to suspect PCB contamination.

- k. Explosives and Pyrophorics: Metal melt waste shall not contain potentially explosive or pyrophoric material in a form that may spontaneously combust if the container is breached. (NVO-325, Revision 1, 5.5.1.1(J)).

Compliance Method: None of the materials that comprise the basic scrap metal waste stream matrix, including the metal oxides, are considered explosive or pyrophoric. After exposure to the high melting temperatures, no remaining components of the slag will be explosive or pyrophoric.

## 2.3 Waste Stream General Package Criteria

a. Design

Waste packaging criteria for metal melt waste shipped to the NTS for disposal will meet DOT Regulations, 49 CFR 173, Subpart I. Standard operating procedures listed in Table I of the Waste Certification Plan, Appendix I, concerning storage and off-site shipments, will be used to assure that all shipments meet DOT requirements and NTS site-specific requirements.

b. Nuclear Safety

The quantity of radioactive materials in metal melt waste shipped to the NTS will be limited so that an infinite array of packages will remain subcritical. This

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quantity will be determined on the basis of a specific nuclear safety analysis, considering credible accident situations, and taking into account the actual materials in the waste and will meet 49 CFR, Parts 173.453(c)(3) and 173.453(d). Metal melt waste packages will not contain uranium enriched  $^{235}\text{U}$  greater than one percent by weight and with a mass of  $^{235}\text{U}$  greater than 800 grams per package. The total mass of plutonium and  $^{239}\text{Pu}$  will not exceed one percent of the mass of  $^{235}\text{U}$  in any package.

c. Nuclear Heating

In compliance with 49 CFR 173.442, Thermal Limitations, a Health Physics evaluation of waste packages of material to be shipped to the NTS from the FEMP will show no evidence of a heating effect above NVO-325 limits from radiological decay. Calculations from these waste streams at the FEMP show the power output from either  $^{235}\text{U}$  or  $^{239}\text{Pu}$  at maximum potential concentration in any waste package will not exceed 0.1 Watt. These calculations are based on the total alpha energy from each isotope in the waste and its associated daughters during normal radioactive decay.

d. Radiation Levels

In compliance with 49 CFR 173.441, Radiation Levels, the radiation exposure rate at the surface and at 1 meter of each package of metal melt waste will be measured and recorded in the data package. Metal melt waste packages that exceed 200 millirem/hr on contact will not be shipped to NTS.

e. External Contamination

In compliance with 49 CFR 173.443, the surface contamination of each container of metal melt slag waste to be shipped to the NTS from SEG shall be measured using instruments calibrated by the SEG Health Physics section of the C/RF/Incinerator Department and recorded on the Package Storage and Disposal Report. If these instruments indicate that the limits of 49 CFR 173.443 are exceeded, then the package shall be cleaned until it is within the limits or the compacted containers contents shall be transferred to a clean overpack.

f. Activity Limits

The activity limits of Titles 49 CFR 173.421, "Limited Quantities of Radioactive Materials," and 49 CFR 173.425, "Transport Requirements for Low-Specific Activity Radioactive Materials" will be met.

In compliance with Title 49 CFR 173.421 and 173.425, strong, tight containers used for shipping Limited Quantities (LQ) and Low-Specific Activity (LSA) LLW will not leak during normal transportation and handling conditions.

g. Multiple Hazards

Not applicable, the FEMP will not ship wastes in this waste stream with multiple

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hazards to the NTS.

## 2.4 Waste Stream Specific Package Criteria

a. Closure

All metal melt waste package closures will be sturdy enough to assure the closures will not be breached under normal handling conditions and will not serve as weak points for package failure.

b. Strength

Metal melt waste will be packaged in containers capable of supporting a uniformly distributed load of 4,000 lbs/ft<sup>2</sup>, except for waste packaged in DOE NV approved containers (drums).

c. Handling

All metal melt waste containers will have permanently attached skids, cleats, offsets, rings, handles, or other auxiliary lifting devices to allow handling by means of forklifts, cranes, or similar handling equipment. Lifting rings and other auxiliary lifting devices will be recessed, offset, or hinged in a manner that does not inhibit stacking the packages. The lifting devices will be designed to meet a 5:1 safety factor based upon the ultimate strength of the material. All rigging devices that are not permanently attached to the waste package will have a current load test based on 125 percent of the safe working load.

d. Size

FEMP metal melt waste will be packaged in the recommended metal boxes (Table 1 of this application).

e. Weight

Metal melt waste will not exceed the 9,000 lb. per metal box per NVO-325, Revision 1, (5.5.5.1).

f. Loading

Metal melt waste will be packaged to ensure that the interior volume is as efficiently and compactly loaded as practical.

g. Nonstandard Type A Packaging

Currently metal melt slag waste generated at SEG does not require a DOE Type A Certification. If a Type A Container is required to ship metal melt waste, only containers with a DOE Type A Certification will be used.

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#### h. Package Protection

Every metal melt waste package will be prepared for shipment so as to minimize damage during transit. The preshipment storage environment will be controlled to avoid adverse influence from weather or other factors on the containment capability of the waste packaging during handling, storage, and transport. SEG will take all responsibility for preshipment storage and take all reasonable precautions to preclude the accumulation of moisture on or in packages prior to their arrival to the NTS. Tamper indicating devices are used to maintain control of the contents once certification actions are completed.

SEG will package all metal melt waste for shipment to NTS in containers meeting DOT requirements (Table 1 describes containers). All containers shall be shipped to meet DOT requirements for interstate travel and shall meet the requirements of 49 CFR 173.411, 173.421, and 173.425.

#### i. Marking and Labeling

Metal melt waste shipped to the NTS will be marked and labeled as required in Title 49 CFR 172, Subparts D and E [with exceptions noted in Title 173.425 (b) and (c)]. Also, each waste container will be marked with a unique six character container identification number and eight character shipment number per NVO-325, Revision 1, 5.5.1.3(I,3) so that the container can be identified from another container within the shipment or from another set of containers. The approved 13 digit waste stream number (ONL000000009) will also be placed onto the waste container. Marking and labeling of the thorium waste packages will be for radioactive material. The weight of the package will be marked in pounds and kilograms. Signed NV-211 labels will be attached to containers certified for shipment to the NTS.

#### j. Barcoding

Barcode labels will meet NVO-325, Revision 1 requirements and must be approved by DOE NV prior to use. Barcode labels will be placed on each metal melt waste package. The barcode labels will be placed near the top and on opposite sides of nonstandard containers.

#### k. On-site Transfer

Only packaged metal melt waste is shipped from SEG for disposal at the NTS. SEG will not provide any material which will require on-site transfer of unpackaged bulk materials by the NTS.

### 2.5 Additional Criteria for Mixed Waste

None of the waste streams listed in this application are mixed waste. The FEMP will not be disposing of mixed waste at the NTS.

**III. WASTE STREAM INFORMATION**Revision 5.0  
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None of the waste streams listed in this application contain Transuranic or Transuranic Mixed waste. The FEMP will not be disposing of Transuranic or Transuranic Mixed waste at the NTS.

**2.7 Additional Criteria for Bulk Waste**

The FEMP is not currently and does not currently ship bulk LLW residues to the NTS. All wastes shipped from SEG will be containerized for disposal as identified in Sections E.2.4.d and E.2.4.e of this application. Therefore, SEG will not be shipping bulk LLW residues for disposal at the NTS.

**2.8 Additional Criteria for Case-by-Case Waste****2.8.1 Weight**

SEG is currently packaging metal melt waste in approved metal boxes (Table 1). No containers will weigh greater than 9,000 pounds and require either a large fork truck or crane for removal from the transport vehicle.

**2.8.2 Activity Limits**

All containers shipped from SEG for disposal at the NTS are within the activity limits specified in NVO-325, Revision 1, Section 5.5.1.2.F.

**2.8.3 Radioactively Contaminated Asbestos**

Friable asbestos will not be shipped to the NTS before securing DOE/NV approval. This waste stream does not contain radioactively contaminated regulated asbestos.

**2.8.4 DOE Comparable Greater-Than-Class-C As Defined in 10 CFR 61.55**

This requirement is not applicable to the FEMP/SEG waste streams since no greater-than-Class-C waste is shipped from the SEG for disposal at NTS.

**2.8.5 Classified Waste Streams**

This requirement is not applicable, the FEMP/SEG will not ship classified waste for disposal at the NTS under this waste stream.

**2.8.6 Radioactive Animal Carcasses**

This requirement is not applicable to the FEMP/SEG waste streams since no radioactive animal carcasses are included in the metal melt waste stream.

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#### **2.8.7 Other Waste Forms**

The FEMP will secure DOE-NV approval for any waste forms that do not meet NTS requirements before shipping to the NTS.

#### **2.9 Packaging and Shipping Information**

Metal Melt Waste will be packaged and shipped according to the DOT requirements for Radioactive Material, Low Specific Activity, n.o.s. UN-2912 radionuclides.

#### **2.10 Waste Security Information**

This section is not applicable since the FEMP will not ship classified waste to SEG for treatment, and by default, SEG will not ship classified waste to the NTS.

**III. WASTE STREAM INFORMATION****G. Waste Stream Identification Number**

ONL000000010 Radioactively Contaminated Regulated Asbestos Containing Material

**1.0 Waste Type**

Low Level Waste

**2.0 Waste Description**

A waste stream is defined as a waste which is categorized by similar characterization process and/or point of generation. The criteria used for evaluating candidate LLW for shipment to the NTS, excerpted from the FEMP Waste Characterization Plan (Draft), are described on the following pages.

**2.1 Contaminated Regulated Asbestos Containing Materials**

Radioactively contaminated asbestos containing materials are generated at the FEMP during the course of renovation, demolition, and remediation activities. Asbestos containing material (ACM) is defined as material containing greater than one percent asbestos. Regulated asbestos containing material (RACM) is a subset of ACM which is subject to specific disposal requirements under 40 CFR 61, Subpart M. RACMs are defined as the following types of materials:

1. ACM that is friable (i.e., when dry, can be crumbled, pulverized, or reduced to powder by hand pressure); or
2. Category I, ACM (e.g., packaging, gaskets, resilient floor coverings, or asphalt roofing products) that has become friable; or
3. Category I, ACM that has or will be subject to sanding, grinding, cutting, or abrading; or
4. Category II, non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by hand pressure, or reduced to powder by the forces expected to act on it in the course of demolition or renovation operations.

The FEMP will generate the following types of RACMs for disposal at the NTS under this waste stream:

- pipe insulation,
- friable transite, and
- non-friable transite with high probability of becoming friable.

The FEMP may also generate materials under this waste stream that are either mixed with, or contain, RACM such that the entire material must be managed as RACM. The FEMP will segregate RACM from non-regulated ACM to the extent practicable provided the segregation is cost effective and does not pose a health

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and safety concern (i.e., give rise to undue hazards or conflict with ALARA precepts or OSHA exposure limits for asbestos). Examples of materials that may be mixed with or contain RACM for management under this waste stream include:

- rocks, gravel, and soil containing RACM;
- paper, plastic, PPE, respirator cartridges, etc. commingled with RACM;
- equipment, metal, wood, pipes, ductwork, and other building materials with RACM insulation; and
- glove box frames.

The FEMP may manage radiologically contaminated, non-regulated ACM (e.g., floor tiles, non-friable transite) which are not subject to special disposal requirements under waste streams ONL0000000001 and ONL0000000002 of this application.

To ensure that all ACMs at the FEMP are managed in accordance with the Clean Air Act (CAA) National Emission Standards for Hazardous Air Pollutants (NESHAP) of 40 CFR Part 61, all potential ACM is identified prior to project start-up.

Asbestos abatement procedures require wetting of this material before removal. Treatment of this waste is completed at the time of packaging. The treatment includes double wrapping the waste in six mil plastic and adding adequate absorbent during overpacking to contain the water used to wet the asbestos for removal. If the waste does not meet the disposal criteria in its existing form, the waste is not packaged for disposal. The final form of the waste is demolition waste typical of asbestos abatement projects (e.g., steel pipe, broken pieces of wood, and miscellaneous construction materials). The waste is packaged directly into containers for disposal. Specific handling requirements exist for this waste stream.

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## 2.1.1 Waste Stream Characterization Data Sheet

1. Waste Stream No.: 0 N L 0 0 0 0 0 0 0 1 0

2. Waste Description:

a. Physical Characteristics: Solid demolition materials from construction, maintenance, and/or removal action activities which generate asbestos, soil, metal, wood, paper, plastic, and asphalt containing asbestos. (Absorbent is added to contain free liquid at the time of packaging.)

b. Special Handling/Disposal Requirements: None

The average radiation levels on contact is .50 mrem/hr. with a range of <.50 mrem/hr. to 1.5 mrem/hr.

3. Basis for Characterization:

a. Process Knowledge:  b. Analytical Knowledge:   
c. Both:

If b or c, provide Standard Data Reporting Forms as necessary.

4. Radioactive Characteristics:

a. Is Waste > NRC Class-C (see Title 10 CFR 61.55)?: No

b. WMIS Nuclide Category (circle): 1 (2) 3 4 5 NA 7 8

(Choose the highest predominate nuclide. The number 6 is not an option.)

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Page 2 of Waste Stream Characterization Data Sheet

c. Radioactive Constituents:

SPECIFIC ACTIVITY RANGE of WASTE STREAM

<u>Nuclide</u>	<u>Chemical Forms</u>	<u>Low</u>	<u>Mean</u>	<u>High</u>	<u>Units(Ci/kg)</u>
(1) U-238	*3.36E-071.68E-053.33E-05 (0.1% to 1.0% U)				Ci/kg
(2) U-235	*4.76E-091.08E-062.16E-06 (0.2% to 1.0% on a U basis)				Ci/kg
(3) U-234*	1.38E-072.15E-054.29E-05 (0.001% to 0.01% on a U basis)				Ci/kg

\* Uranium oxides and salts (typically UO<sub>2</sub>, U<sub>3</sub>O<sub>8</sub>, and UF<sub>6</sub>.)

5. Hazardous Components (for MW): NOT APPLICABLE

- a. Basis for Identifying as MW (circle):
- (1) Ignitable
  - (2) Reactive
  - (3) Corrosive
  - (4) TCLP
  - (5) Listed Waste

b. List the applicable EPA waste code, the chemical name, the treatment performed (if applicable) and the Regulatory/Treatment Standard. Attach Standardized Data Forms.

<u>EPA Hazardous Waste No.</u>	<u>Chemical Name</u>	<u>Treatment Performed</u>	<u>Regulatory Threshold/Treatment Standard</u>
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- (1)
- (2)
- (3)
- (4)

NOTE: Waste characterization of materials included in this waste stream is completed using a combination of process knowledge and sampling and analysis. Process knowledge is used when the material meets one or more of the criteria of NVO-325, Revision 1, Section 4.1.1.A, B, and C. (Materials characterized by process knowledge includes metal, wood and other construction/demolition debris, and equipment.) Sampling and analysis of the coatings on ACMs may be required to support process knowledge.

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## 2.2 Waste Stream Specific Criteria

- a. Low Level Waste: Only contaminated RACMs defined as LLW per DOE Orders 5820.2A, 5400.1, and 5480.11 guidelines shall be shipped to the NTS. (NVO-325, Revision 1, 5.5.1).

Compliance Method: In general, wastes that originate from Controlled Areas at the FEMP are considered radioactive waste unless demonstrated otherwise through analysis or administrative controls. Further guidance on radioactive waste characterization is provided in the DOE Performance Objective (Draft). (In accordance with the "Waste Minimization and Pollution Prevention Awareness Plan," the FEMP attempts to minimize waste generation whenever possible.)

- b. Transuranics: Contaminated RACMs shall have a TRU concentration less than 100 nCi/g (i.e., shall not be regulated as TRU waste). (NVO-325, Revision 1, 5.5.1.1(A)).

Compliance Method: Materials Control & Accountability (MC&A) records indicate there are no materials at the FEMP with TRU concentrations above the 100 nCi/g level. The highest TRU concentration for any material at the FEMP as determined by analysis is 93,904 dpm/g (42 nCi/g).

- c. Hazardous Waste: All contaminated RACMs shall be evaluated for hazardous waste by analytical characterization or by identifying material(s) listed as hazardous in Title 40 CFR 261, "Identification and Listing of Hazardous Waste", or in the regulations of the state where the waste is generated. (NVO-325, Revision 1, 5.5.1.1(B)).

Compliance Method: All RACM residue waste generated from construction, maintenance, and removal actions are evaluated by WC [FME] to determine if these wastes are regulated as hazardous waste as follows:

- (1) During the planning phase of the project, the project engineer identifies all potential RACM waste that may be generated.
- (2) A project walkdown is then conducted to collect information on the waste to be generated and the generation process (e.g., excavate or dismantle).
- (3) Using process knowledge, WC [FME] classifies the waste.
- (4) The characterization is documented using either the General MEF or by issuing a RCRA Determination/Radiological Characterization (RD/RC) letter.

All ACM waste generated from construction, maintenance, and removal actions are handled as specified in NVO-325, Revision 1, 5.5.5.3. All regulated asbestos that is friable or otherwise capable of giving off friable asbestos dust is wetted with a water and surfactant mix and stored in two plastic bags whose individual thickness equals at least 6 mil. The plastic bags are overpacked in a leak-resistant wood or metal container that meets shipping requirements for the

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radioactive content of the package involved. Sharp edges and corners within the package are padded or otherwise protected to prevent damage to the plastic inner wrap during handling, shipping, and disposal. Because the asbestos must be wetted during abatement activities, an absorbent is added to the overpack container to ensure compliance with the free liquid requirement, see Section 5.5.1.1.C.

All LLW containing regulated asbestos is packaged, marked, and labeled in accordance with the requirements of 40 CFR 61.150.

- d. Free Liquids: Contaminated RACMs disposed at NTS waste management sites shall contain as little free liquids as is reasonably achievable. In no case shall the liquid equal or exceed 0.5% by volume of the external waste container and shall meet NVO-325, Revision 1, 5.5.1.1(C) criteria.

Compliance Method: During the removal of ACM, wetting of the material is often preformed as prescribed by 40 CFR 61 to reduce personal and environmental exposure. This wetting is preformed in such a manner as to provide protection without compromising the NVO-325 requirements to have less than 0.5% by volume of free liquid.

Free liquids in contaminated RACMs are evaluated based on process knowledge or waste testing to determine if the waste stream meets this criteria. Determinations based on process knowledge generally include a visual inspection. Working fluids from equipment/piping will be determined to contain no free liquids when the chamber containing the liquid has been drained completely and no dripping is observed. Chambers will be plugged or sealed and the equipment tagged as being drained. Free liquid determinations are generally completed as part of the RCRA waste characterization process. (Reference FEMP Waste Characterization Plan (Draft) - RCRA Section.) Absorbent is added into the overpack container at the time of packaging to fix the water used to control dust during asbestos abatement.

- e. Particulates: Wastes containing greater than 1 weight percent fine particulate materials less-than-ten-micrometer-diameter or 15 weight percent less-than-200 micrometer diameter particles shall be immobilized or packaged in accordance with NVO-325, Revision 1, 5.5.1.1(D).

Compliance Method: Some contaminated RACM streams will categorically fail the particulates WAC while others may require testing to complete a rigorous evaluation. Friable ACMs have been defined to have greater than one percent by weight of less-than-ten-micron-diameter particles, depending on the moisture content. Testing is required to clearly determine if the asbestos containing material meets the WAC. This testing will be conducted using polarized light microscopy. Should the waste fail the criteria for particulates, immobilization is achieved by packaging. RACM will be double wrapped in plastic with a combined thickness equaling at least six mil. Wrapped RACM is packaged using steel drums, wooded crates, or steel boxes, in accordance with NVO-325, Revision 1, Section 5.5.5.3.

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- f. Gases: Contaminated asbestos containing material streams shall be evaluated to determine if they contain any items that potentially produces pressure in the package greater than 1.5 atmospheres at 20° celsius. (NVO-325, Revision 1, 5.5.1.1(E))

Compliance Method: Contaminated RACMs are evaluated for the potential to produce pressure in excess of 1.5 atmospheres at 20° C during the hazardous waste determination (SSOP-0002). The primary source of gases in this waste steam, compressed gas cylinders, shall have their valves removed to demonstrate that they are at atmospheric pressure. Aerosol cans shall be punctured and void of all free liquids to demonstrate that they meet the WAC.

- g. Stabilization: Where practical, contaminated RACMs shall be treated to reduce volume and provide a more structurally and chemically stable waste form. (NVO-325, Revision 1, 5.5.1.1(F))

Compliance Method: The FEMP will identify wastes that are candidates for treatments to reduce volume and provide a structurally stable waste form. No treatment of this waste will be required to stabilize harmful gases or vapors. Free liquids will be drained per SOP 20-C-625. WC [FME] will identify all LLW streams that have potential to generate harmful gases, vapors, or liquids. Waste that fail this WAC will not be shipped to the NTS.

- h. Etiologic Agents: All contaminated RACMs to be shipped to the NTS shall not contain pathogens, infectious wastes, or other etiologic agents as defined in Title 49 CFR 173.386. (NVO-325, Revision 1, 5.5.1.1(G)).

Compliance Method: The only significant source of potential etiologic agents on site is from medical services. Such materials may include band aids, tongue blades, syringes, cotton balls, outdated pharmaceuticals, or other materials stained with blood or other body fluids. These materials are managed according to Ohio Infectious Waste Law/Regulation (ORC 3734 and OAC 3745-27-01 through 25) which includes segregated packaging at the point of generation. Materials are placed in a red bag in a box premarked with the international biohazard label. These boxes are then transported by a registered transporter to a licensed treatment facility. These administrative controls prevent etiologic agents from entering the contaminated ACMs. Reference FEMP Waste Characterization Plan (Draft) - Infectious Waste Section for additional evaluation criteria.

- i. Chelating Agents: If a waste is determined to contain chelating agents above the one percent by weight limit, the waste shall not be approved for disposal at the NTS. (NVO-325, Revision 1, 5.5.1.1(H)).

Compliance Method: Chelating agents form coordination compounds by offering two or more chemical bonds (through ligands) to a central metal ion. The most common chelating agent is EDTA. Other common chelating agents are also aminopolyacetic acids. Excess chemicals from the on-site laboratory are the primary potential source of materials that may be identified as true chelating agents. This determination will be accomplished through the use of the MEF or RD/RC letter which will designate the waste as containing above one percent by weight

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chelating agents. WC [FME] has generated a list of potential chelating or complexing agents through an on-line database search and will consult this list to evaluate potential chelating or complexing agents. The waste certification official is responsible for ensuring that this material has been characterized as not containing chelating agents at concentrations greater than one percent by weight. Containers that do not meet the criteria are properly tagged. This process prevents waste that does not meet the NTS WAC from being shipped for disposal.

- j. Polychlorinated Biphenyls: PCB contaminated waste shall not be shipped for disposal at NTS in the contaminated asbestos containing material stream unless the PCB concentration meets the municipal solid waste disposal limits. See Title 40 CFR 761.60 for PCB disposal requirements. (NVO-325, Revision 1, 5.5.1.1(I)).

Compliance Method: The FEMP samples wastes for PCB contamination when a reason to suspect PCB contamination is provided by:

- a likely waste matrix (e.g., oily material),
- a review of previous operations,
- a review of manufacturers manuals,
- previous sampling and analyses data.

This determination is performed during the hazardous waste determination (SSOP-0002). Reference FEMP Waste Characterization Plan (Draft) -TSCA PCB Section for evaluation criteria.

- k. Explosives and Pyrophorics: Contaminated regulated asbestos containing material shall not contain potentially explosive or pyrophoric material in a form that may spontaneously combust if the container is breached. (NVO-325, Revision 1, 5.5.1.1(J)).

Compliance Method: This WAC is evaluated during the hazardous waste characterization and is also generally addressed in the health and safety plan for a project if there is any concern. This evaluation is performed in accordance with the FEMP Waste Characterization Plan (Draft). Any waste that potentially fails this WAC will be identified by WC [FME] and the material will not be shipped to the NTS for disposal.

#### 2.3 Waste Stream General Packaging Criteria

##### a. Design

Waste packaging criteria for contaminated asbestos containing material shipped to the NTS for disposal will meet DOT Regulations, 49 CFR 173, Subpart I. Standard operating procedures listed in Table I of the Waste Certification Program Plan, concerning storage and off-site shipments, will be used to assure that all shipments meet DOT requirements and NTS site-specific requirements.

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The quantity of radioactive materials in contaminated RACMs shipped to the NTS will be limited so that an infinite array of packages will remain subcritical. This quantity will be determined on the basis of a specific nuclear safety analysis, considering credible accident situations, and taking into account the actual materials in the waste. Contaminated asbestos containing material packages will not contain uranium enriched  $^{235}\text{U}$  greater than one percent by weight and with a mass of  $^{235}\text{U}$  greater than 800 grams per package. The total mass of plutonium and  $^{239}\text{U}$  will not exceed one percent of the mass of  $^{235}\text{U}$  in any package.

c. Nuclear Heating

In compliance with 49 CFR 173.442, Thermal Limitations, a Health Physics evaluation of waste packages of material to be shipped to the NTS from the FEMP will show no evidence of a heating effect above NVO-325 limits from radiological decay. Calculations from these waste streams at the FEMP show the power output from either  $^{235}\text{U}$  or  $^{239}\text{U}$  at maximum potential concentration in any waste package will not exceed 0.1 Watt. These calculations are based on the total alpha energy from each isotope in the waste and its associated daughters during normal radioactive decay.

d. Radiation Levels

In compliance with 49 CFR 173.441, Radiation Levels, the radiation exposure rate at the surface and at 1 meter from each package of contaminated asbestos containing material will be measured and recorded in the data package. Contaminated asbestos containing material packages that exceed 200 mrem/hr on contact will not be shipped to NTS.

e. External Contamination

In compliance with 49 CFR 173.443, the surface contamination of each container of contaminated asbestos containing material will be measured using instruments calibrated by Environmental Health & Safety (EH&S), Dosimetry, Instrumentation Section and recorded in the data package. If these instruments indicate that the limits of 49 CFR 173.443 are exceeded, then the package will be cleaned until it is within the limits or the contents will be transferred to a clean container.

f. Activity Limits

The activity limits of Titles 49 CFR 173.421, "Limited Quantities of Radioactive Materials," and 49 CFR 173.425, "Transport Requirements for Low-Specific Activity Radioactive Materials" will be met.

In compliance with Title 49 CFR 173.421 and 173.425, strong, tight containers used for shipping Limited Quantities (LQ) and Low-Specific Activity (LSA) LLW will not leak during normal transportation and handling conditions.

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#### g. Multiple Hazards

All ACM waste generated from construction, maintenance, and removal actions are handled as specified in NVO-325, Revision 1, 5.5.5.3. All regulated asbestos that is friable or otherwise capable of giving off friable asbestos dust is wetted with a water and surfactant mix and stored in two plastic bags whose combined thickness equals at least 6 mil. The plastic bags are overpacked in a leak-resistant wood or metal container that meets applicable shipping requirements for the radioactive content of the package involved. Sharp edges and corners within the package are padded or otherwise protected to prevent damage to the plastic inner wrap during abatement activities, an absorbent is added to ensure compliance with the free liquid requirement for LLW, see Section 5.5.1.1.C.

#### 2.4 Waste Stream Specific Package Criteria

##### a. Closure

All contaminated RACM package closures will be sturdy enough to ensure the closures will not be breached under normal handling conditions and will not serve as weak points for package failure.

##### b. Strength

Contaminated RACM will be packaged in containers capable of supporting a uniformly distributed load of 4,000 lbs/ft<sup>2</sup>, except for waste packaged in DOE NV approved containers (drums and ISO containers). An Exemption Request is included in this application in Section V of this application for Sea/land<sup>o</sup> containers destined for Area 5 disposal.

##### c. Handling

All contaminated RACM containers will have permanently attached skids, cleats, offsets, rings, handles, or other auxiliary lifting devices to allow handling by means of forklifts, cranes, or similar handling equipment. Lifting rings and other auxiliary lifting devices will be recessed, offset, or hinged in a manner that does not inhibit stacking the packages. The lifting devices will be designed to meet a 5:1 safety factor based upon the ultimate strength of the material. All rigging devices that are not permanently attached to the waste package will have a current load test based on 125 percent of the safe working load.

##### d. Size

The size of the containers used by the FEMP to package contaminated RACM includes container codes: 109, 117, 119, 102, and 121 from Table I. Additional containers will be used only with the DOE/NV and REECO concurrence and identified container codes.

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In addition to the weight limits set for specific packaging designs, a 9,000 lb. limit per box and a 1,200 lb. limit per 55-gallon drum will be maintained. Containers of contaminated RACM exceeding the 9,000 lb. limit will be shipped in removable-top trailers, or on flatbeds.

f. Loading

Contaminated RACM will be packaged to ensure that the interior volume is as efficiently and compactly loaded as practical.

g. Nonstandard Type A Packaging

The FEMP is currently using a Type 7A Container as a strong, tight container. Used for this purpose, the container does not require a DOE Type A Certification. If a Type A Container is required to ship contaminated asbestos containing material, only containers with a DOE Type A Certification will be used.

h. Package Protection

Every FEMP contaminated RACM package will be prepared for shipment so as to minimize damage during transit. The preshipment storage environment will be controlled to avoid adverse influence from weather or other factors on the containment capability of the waste packaging during handling, storage, and transport. FEMP will take all responsibility for preshipment storage and take all reasonable precautions to preclude the accumulation of moisture on or in packages prior to their arrival to the NTS. Tamper indicating devices are used to maintain control of the container contents once certification actions are completed.

The FEMP will package all contaminated RACM for shipment to NTS in containers meeting DOT requirements (e.g., DOT Type 17H 55-gallon drums or other NTS approved containers). All containers will be shipped to meet DOT requirements for interstate travel and will meet the requirements of 49 CFR 173.411, 173.421, and 173.425. Sharp edges and corners of RACM within the package will be protected to prevent damage to the plastic liner during handling, shipping, and disposal.

i. Marking and Labeling

Contaminated RACM shipped to the NTS will be marked and labeled as required in Title 40 CFR 61.15072, as well as 49 CFR 172, Subparts D and E [with exceptions noted in Title 173.425 (b) and (c)]. Also, each waste container will be marked with a unique six character container identification number and eight character shipment number per NVO-325, Revision 1, 5.5.1.3(I,3) so that the container can be identified from another container within the shipment or from another set of containers. The approved 13 digit waste stream number (ONL000000010) will also be placed onto the waste container. The contaminated RACM packages will be

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marked and labeled as radioactive material. The weight of the package will be marked in pounds and kilograms. Signed NV-211 labels will be attached to containers certified for shipment to the NTS.

#### j. Barcoding

Barcode labels will meet NVO-325, Revision 1 requirements and must be approved by DOE/NV prior to use. Barcode labels will be placed on each package of contaminated process area scrap waste. The barcode labels will be placed near the top and on opposite sides of nonstandard containers. Barcode Labels on drums will be placed on the lid and one side near the top of the drum.

#### k. On-site Transfer

Only packaged contaminated ACM is shipped from the FEMP for disposal at the NTS. The FEMP will not provide any material which will require on-site transfer of unpackaged bulk materials by the NTS.

### 2.5 Additional Criteria for Mixed Waste

None of the waste streams listed in this application are mixed waste. The FEMP will not be disposing of mixed waste at the NTS.

### 2.6 Additional Criteria for Transuranic/Transuranic Mixed Waste

None of the waste streams listed in this application contain Transuranic or Transuranic Mixed waste. The FEMP will not be disposing of Transuranic or Transuranic Mixed waste at the NTS.

### 2.7 Additional Criteria for Bulk Waste

The FEMP does ship bulk waste to the NTS for disposal in the form of RACM scrap material (metal, wood, equipment) that is radioactively contaminated. This material is well below the 49 CFR 173.425(c) requirement of 0.001 millicurie per square centimeter when averaged over one square meter of the material. The type of container in which the FEMP ships bulk waste is identified in the sections relating to the NTS specific packaging criteria. An Exemption Request for the continued use of Sea/land containers is provided in Section V of this application.

### 2.8 Additional Criteria for Case-by-Case Waste

#### 2.8.1 Weight

The FEMP is currently shipping and intends to continue to ship waste in ISO containers generally referred to as Sea/land containers. These containers routinely weigh greater than 9,000 pounds and require either a large fork truck

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or crane for removal from the transport vehicle. The FEMP ships these containers on flat bed trailers which require no top or side wall removal. Section V contains the Exemption Request for Sea/land container use in Area 5.

**2.8.2 Activity Limits**

All containers shipped from the FEMP for disposal at the NTS will be within the activity limits specified in NVO-325, Revision 1, Section 5.5.1.2.F.

**2.8.3 Radioactively Contaminated Asbestos**

Radioactively contaminated asbestos containing materials with regulated asbestos levels exceeding 1.0% will only be shipped in waste stream ONL000000010. Contaminated RACM will be treated and packaged as required in NVO-325, (Revision 1), Section 5.5.5.3.

**2.8.4 DOE Comparable Greater-Than-Class-C As Defined in 10 CFR 61.55**

This requirement is not applicable to the FEMP waste streams since no greater-than-Class-C waste is shipped from the FEMP for disposal at NTS.

**2.8.5 Classified Waste Streams**

This requirement is not applicable, the FEMP will not ship classified waste for disposal at the NTS under this waste stream.

**2.8.6 Radioactive Animal Carcasses**

This requirement is not applicable to the FEMP since no radioactive animal carcasses are included in the contaminated RACM stream.

**2.8.7 Other Waste Forms**

The FEMP will secure DOE/NV approval for any waste forms that do not meet NTS requirements before shipping to the NTS.

**2.9 Packaging and Shipping Information**

~~Radioactively contaminated RACM will be packaged and shipped according to the DOT requirements for Radioactive Material/Asbestos Containing Materials, Low Specific Activity, n.o.s. UN-2912 radionuclides.~~

**2.10 Waste Security Information**

This section is not applicable since no classified waste is shipped for disposal at the NTS in this waste stream.

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#### H. Waste Stream Identification Number

ONL0000000011 Thorium Residues and Wastes Not Amenable to Sampling

##### 1.0 Waste Type

Low Level Waste

##### 2.0 Waste Description

A waste stream is defined as a waste which is categorized by similar characterization process and/or point of generation. The criteria used for evaluating candidate LLW for shipment to the NTS, excerpted from the FEMP Waste Characterization Plan (Draft), are described on the following pages.

##### 2.1 Thorium Wastes

This waste stream contains thorium which is characterized through process knowledge. The waste is generated from well defined and documented processes.

- A. The first process is the thorium production process which occurred in the late 1960's and early 1970's. This waste consists primarily of thorium metal, oxide, hydroxide, tetrafluoride, oxalate, and uranium. The production process was well understood and controlled, and the contents of these waste materials are well known. No treatment of these materials was performed prior to packaging. Process knowledge with limited sampling and analysis support is considered sufficient to characterize this waste stream.

This process has generated thorium metal, oxide, hydroxide, oxalate, and tetrafluoride whose matrices are not amenable to sampling.

- B. The second process to generate thorium for this waste stream is the remediation activities of the thorium production site. This remediation process generates plastic, wood pallets, anti-contamination clothing, crushed concrete, broken pieces of wood, and other construction media during the demolition phase of a construction, maintenance, or removal action project. No treatment is done prior to packaging. If waste does not meet the disposal criteria in its existing form, the waste is not packaged for disposal.

Due to the heterogeneous composition and/or its physical nature, this material is not amenable to sampling. Process knowledge with very limited sampling and analysis is used to characterize these waste materials.

Scrap wastes contaminated with thorium and which are either heterogeneous or have matrices not amenable to sampling include:

- rocks, gravel, concrete
- plastic and wood pallets
- trash (plastic, cardboard, paper, etc)
- glass
- metal
- wood

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## 2.1.1 Waste Stream Characterization Data Sheet

1. Waste Stream No.: 0 N L 0 0 0 0 0 0 0 1 1

2. Waste Description:

a. Physical Characteristics: Thorium metal, thorium oxide and hydroxide generated during thorium oxide production. Small amounts of thorium oxalate and thorium tetrafluoride are also present. Dry solid demolition materials from removal action which generates gravel, concrete, metal, wood, paper, plastic, and glass.

No treatment of this material was performed prior to packaging.

b. Special Handling/Disposal Requirements: This material has an average radioactive level on contact of 50 mrem/hr. with a range of <25 mrem/hr. to 105 mrem/hr. Time, distance, and shielding techniques should be employed to reduce exposure.

c. Basis for Characterization:

a. Process Knowledge: b. Analytical Knowledge: c. Both: 

If b or c, provide Standard Data Reporting Forms as necessary.

4. Radioactive Characteristics:

a. Is Waste > NRC Class-C (see Title 10 CFR 61.55)?: No

b. WMIS Nuclide Category (circle): 1 (2) 3 4 5 NA 7 8

(Choose the highest predominate nuclide. The number 6 is not an option.)

000109

Page 2 of Waste Stream Characterization Data Sheet

c. Radioactive Constituents:

SPECIFIC ACTIVITY RANGE of WASTE STREAM

<u>Nuclide</u>	<u>Chemical Forms</u>	<u>Low</u>	<u>Mean</u>	<u>High</u>	<u>Units(Ci/kg)</u>
(1) Th-232 (0.1% to 100% Th)	*	1.09E-07	5.46E-05	1.09E-04	Ci/kg
(2) Th-228 Natural abundance	*	1.09E-07	5.46E-05	1.09E-04	Ci/kg
(3) Th-230 (Activity = 10% Th-232 activity)	*	1.09E-08	5.46E-06	1.09E-05	Ci/kg
(4) U-238 (0.1% to 2.0% Total U)	**	3.34E-07	3.51E-06	6.68E-06	Ci/kg
(5) U-235 Natural Abundance	**	1.43E-08	1.62E-07	3.10E-07	Ci/kg
(6) U-234	**	3.56E-07	3.74E-06	7.12E-06	Ci/kg

\* Thorium metal, oxide, hydroxide, oxalate, and tetrafluoride.

\*\* Uranium oxides and salts (typically UO<sub>2</sub>, U<sub>3</sub>O<sub>8</sub>, and UF<sub>6</sub>)

5. Hazardous Components (for MW): NOT APPLICABLE

- a. Basis for Identifying as MW (circle): (1) Ignitable  
(2) Reactive (3) Corrosive (4) TCLP (5) Listed Waste

b. List the applicable EPA waste code, the chemical name, the treatment performed (if applicable) and the Regulatory/Treatment Standard. Attach Standardized Data Forms.

<u>EPA Hazardous Waste No.</u>	<u>Chemical Name</u>	<u>Treatment Performed</u>	<u>Regulatory Threshold/Treatment Standard</u>
--------------------------------	----------------------	----------------------------	--

(1)

(2)

(3)

(4)

NOTE: Waste characterization of materials included in this waste stream is predominantly completed using process knowledge because the material meets the criteria of NVO-325, Revision 1, Section 4.1.1.B. Materials characterized by process knowledge includes metal, wood, demolition debris, and process equipment. The FEMP has conducted visual inspection, and limited confirmatory analysis for waste amenable to sampling to support the process knowledge waste characterization for disposal at the NTS.

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## 2.2 Waste Stream Specific Criteria

- a. Low Level Waste: Only the thorium wastes defined as LLW per DOE Orders 5820.2A, 5400.1, and 5480.11 guidelines shall be shipped to the NTS. (NVO-325, Revision 1, 5.5.1).

Compliance Method: In general, waste that originate from Controlled Areas at the FEMP are considered radioactive waste unless demonstrated otherwise through analysis or administrative controls. Further guidance on radioactive waste characterization is provided in the DOE Performance Objective (Draft). (In accordance with the "Waste Minimization and Pollution Prevention Awareness Plan", the FEMP attempts to minimize waste generation whenever possible.)

- b. Transuranics: Thorium wastes shall have a TRU concentration less than 100 nCi/g (i.e., shall not be regulated as TRU waste). (NVO-325, Revision 1, 5.5.1.1(A)).

Compliance Method: Materials Control & Accountability (MC&A) records indicate there are no materials at the FEMP with TRU concentrations above the 100 nCi/g level. The highest TRU concentration for any FEMP material as determined through analysis is 93,904 dpm/g (42 nCi/g).

- c. Hazardous Waste: All thorium wastes are evaluated for hazardous waste by analytical characterization, by identifying the material(s) listed as hazardous in Title 40 CFR 261, "Identification and Listing of Hazardous Waste", or in the regulations of the state where the waste is generated. (NVO-325, Revision 1, 5.5.1.1(B)).

Compliance Method: When thorium residue waste is considered for shipment to NTS, the following steps are taken to determine the presence of hazardous waste:

- (1) The generator contacts the responsible FERMCO WC [FME] organization to obtain any hazardous waste evaluation data available for the thorium waste considered.
- (2) If no evaluation exists and characterization is required, the generator completes Section 1 of the MEF and submits the form to WC [FME] for characterization.
- (3) If enough information is known about the process by which the waste was generated and WC [FME] is able to firmly establish that the waste would not exhibit hazardous waste characteristics or contain a listed hazardous waste, a process knowledge determination would be made that the waste is nonhazardous.
- (4) If sufficient information about the generation process is not available, WC [FME] requires that sampling and analysis be completed on the waste.
- (5) A copy of the MEF is returned to the generator who packages the nonhazardous waste that meets the criteria of this application.

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All thorium residue waste generated from demolition, maintenance, and removal actions are evaluated by WC [FME] to determine if these wastes are regulated as hazardous waste as follows:

- (1) During the planning phase of the project, the project engineer identifies all potential thorium waste that may be generated.
  - (2) A project walkdown is then conducted to collect information on the waste to be generated and the generation process (e.g., excavate or dismantle).
  - (3) Using process knowledge, WC [FME] classifies the waste.
  - (4) The characterization is documented using either the General MEF or by issuing a RCRA Determination/Radiological Characterization (RD/RC) letter.
- d. Free Liquids: Thorium wastes disposed at NTS waste management sites shall contain as little free liquids as is reasonably achievable, but in no case shall the liquid equal or exceed 0.5% by volume of the external waste container and shall meet the NVO-325, Revision 1, 5.5.1.1(C) criteria.

Compliance Method: Free liquids in thorium wastes are evaluated based on process knowledge or waste testing to determine if the waste stream meets this criteria. The thorium waste will be packaged according to SOP 20-C-625 to assure that the level of free liquid will be less than 0.5% by volume of the external waste container. These packaged containers are stored protected from the elements in order to minimize contact with water. The Percent Free Liquid Test (PFLT) may be performed to determine the presence of free liquids when process knowledge does not provide sufficient information to complete this determination. Reference FEMP Waste Characterization Plan (Draft) - RCRA Section.

- e. Particulates: Wastes containing greater than 1 weight percent fine particulate materials less-than-ten-micrometer-diameter or 15 weight percent less-than-200 micrometer diameter particles shall be immobilized or packaged in accordance with NVO-325, Revision 1, 5.5.1.1(D).

Compliance Method: The thorium waste stream may categorically fail the particulates WAC. This material is packaged in steel boxes as specified by NVO-325, Revision 1.

- f. Gases: Radioactive gases shall be stabilized or absorbed so that pressure in the waste package does not exceed 1.5 atmospheres at 20° celsius. Compressed gases as defined by Title 49 CFR 173.300, including unpunctured aerosol cans, shall not be shipped for disposal in the thorium waste stream. Aerosol cans shall have puncture disfigurements readily recognizable by real-time-radiography. Expended gas cylinders shall have the valve mechanism removed. (NVO-325, Revision 1, 5.5.1.1(E)).

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Compliance Method: The thorium waste packages were evaluated to determine if they contain any items that potentially fail this WAC during the hazardous waste determination (SSOP-0002).

- g. Stabilization: When practical, Thorium waste shall be treated to reduce volume and provide a more structurally and chemically stable waste form. (NVO-325, Revision 1, 5.5.1.1(F)).

Compliance Method: Waste Characterization [FME] reviewed the thorium waste stream during the hazardous waste evaluation for potential harmful gas, vapor, or liquid generation. No treatment of the thorium waste stream was required to meet the WAC for this waste stream.

- h. Etiologic Agents: Thorium wastes to be shipped to the NTS shall not contain pathogens, infectious wastes, or other etiologic agents as defined in Title 49 CFR 173.386. (NVO-325, Revision 1, 5.5.1.1(G)).

Compliance Method: The only significant source of potential etiologic agents on site is from medical services. Such materials may include band aids, tongue blades, syringes, cotton balls, outdated pharmaceuticals, or other materials stained with blood or other body fluids. These materials are managed according to Ohio Infectious Waste Law/Regulation (ORC 3734 and OAC 3745-27-01 through 25) which includes segregated packaging at the point of generation. Materials are placed in a red bag in a box premarked with the international biohazard label. These boxes are then transported by a registered transporter to a licensed treatment facility. These administrative controls prevent etiologic agents from entering the process area scrap waste stream. Reference FEMP Waste Characterization Plan (Draft) - Infectious Waste Section for additional evaluation criteria.

- i. Chelating Agents: If a waste is determined to contain chelating agents above the one percent by weight limit, the waste shall not be approved for disposal at the NTS. (NVO-325, Revision 1, 5.5.1.1(H)).

Compliance Method: Chelating agents form coordination compounds by offering two or more chemical bonds (through ligands) to a central metal ion. The most common chelating agent is EDTA. Other common chelating agents are also aminopolyacetic acids. Chemicals from the on-site laboratory are the primary potential source of materials that may be identified as true chelating agents. This determination will be accomplished through the use of the MEF which will designate the waste as containing above one percent by weight chelating agents. WC [FME] has generated a list of potential chelating or complexing agents through an on-line database search and will consult this list to identify potential chelating or complexing agents. The MEF (example provided in this application) contains a specific section for denoting the presence of chelating agents. This information is provided to the waste certification official who is responsible for ensuring that material containing chelating agents at concentrations greater than one percent are properly tagged as not meeting the criteria for shipment. This process prevents waste that does not meet the NTS WAC from being shipped.

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- j. Polychlorinated Biphenyls: PCB contaminated waste shall not be shipped for disposal at NTS in the thorium waste stream unless the PCB concentration meets the municipal solid waste disposal limits. See Title 40 CFR 761.60 for PCB disposal requirements. (NVO-325, Revision 1, 5.5.1.1(I)).

Compliance Method: The FEMP samples wastes for PCB contamination when a reason to suspect PCB contamination is provided by:

- a likely waste matrix (e.g., oily material),
- a review of previous operations,
- a review of manufacturers manuals,
- previous sampling and analyses data.

This waste stream contains no oily material and no additional process knowledge exists to provide any reason to suspect PCB contamination. This determination is performed during the hazardous waste determination (SSOP-0002). Reference FEMP Waste Characterization Plan (Draft) -TSCA PCB Section for evaluation criteria.

- k. Explosives and Pyrophorics: The waste shall not contain potentially explosive or pyrophoric material in a form that may spontaneously combust if the container is breached. (NVO-325, Revision 1, 5.5.1.1(J)).

Compliance Method: This WAC is evaluated during the hazardous waste characterization. This evaluation is performed in accordance with SSOP-0002, Completing the Material Evaluation Form and FEMP Waste Characterization Plan (Draft). Any waste that potentially fails this WAC will be identified by WC [FME] and the material will not be shipped to the NTS for disposal.

#### 2.3 Waste Stream General Package Criteria

##### a. Design

Waste packaging criteria for thorium waste shipped to the NTS for disposal shall meet DOT Regulations, 49 CFR 173, Subpart I. Standard operating procedures listed in Table I of the Waste Certification Program Plan, concerning storage and off-site shipments, will be used to assure that all shipments meet DOT requirements and NTS site-specific requirements.

##### b. Nuclear Safety

The quantity of radioactive materials in thorium waste shipped to the NTS will be limited so that an infinite array of packages will remain subcritical. This quantity will be determined on the basis of a specific nuclear safety analysis, considering credible accident situations, and taking into account the actual materials in the waste and shall meet 49 CFR, Parts 173.453(c)(3) and 173.453(d). Thorium waste packages will not contain uranium enriched <sup>235</sup>U greater than one percent by weight. No packages contain <sup>233</sup>U in this waste stream.

## III. WASTE STREAM INFORMATION

Revision 5.0  
June 1993c. Nuclear Heating

In compliance with 49 CFR 173.442, Thermal Limitations, a Health Physics evaluation of waste packages of material to be shipped to the NTS from the FEMP will show no evidence of a heating effect above NVO-325 limits from radiological decay. Calculations from these waste streams at the FEMP show the power output from  $^{232}\text{Th}$  at maximum potential concentration in any waste package will not exceed 0.1 Watt. These calculations are based on the total alpha energy from each isotope in the waste and its associated daughters during normal radioactive decay.

d. Radiation Levels

In compliance with 49 CFR 173.441, Radiation Levels, the radiation exposure rate at the surface and at 1 meter from each package of thorium waste shall be measured and recorded in the data package. Thorium waste packages that exceed 200 millirem/hr on contact will not be shipped to NTS.

e. External Contamination

In compliance with 49 CFR 173.443, the surface contamination of each container of thorium waste will be measured using instruments calibrated by Environmental Health & Safety (EH&S), Dosimetry, Instrumentation Section and recorded in the data package. If these instruments indicate that the limits of 49 CFR 173.443 are exceeded, then the package will be cleaned until it is within the limits or the contents will be transferred to a clean container.

f. Activity Limits

The activity limits of Titles 49 CFR 173.421, "Limited Quantities of Radioactive Materials," and 49 CFR 173.425, "Transport Requirements for Low-Specific Activity Radioactive Materials" will be met.

In compliance with Title 49 CFR 173.421 and 173.425, strong, tight containers used for shipping Limited Quantities (LQ) and Low-Specific Activity (LSA) LLW will be constructed so they will not leak during normal transportation and handling conditions.

g. Multiple Hazards

Not applicable, the FEMP will not ship thorium wastes with multiple hazards to the NTS.

2.4 Waste Stream Specific Package Criteria

a. Closure

All thorium waste package closures will be sturdy enough to assure the closures will not be breached under normal handling conditions and will not serve as weak points for package failure.

b. Strength

Thorium waste will be packaged in containers capable of supporting a uniformly distributed load of 4,000 lbs/ft<sup>2</sup>, except for waste packaged in DOE NV approved containers (drums). The thorium waste packaged in containers that do not meet the strength requirement will be disposed in Area 5 and will require an exemption (see Section V.).

c. Handling

All Thorium waste containers will have permanently attached skids, cleats, offsets, rings, handles, or other auxiliary lifting devices to allow handling by means of forklifts, cranes, or similar handling equipment. Lifting rings and other auxiliary lifting devices will be recessed, offset, or hinged in a manner that does not inhibit stacking the packages. The lifting devices will be designed to meet a 5:1 safety factor based upon the ultimate strength of the material. All rigging devices that are not permanently attached to the waste package will have a current load test based on 125 percent of the safe working load.

d. Size

FEMP thorium waste will be packaged in 55-gallon or 85-gallon drums, Sea/land<sup>®</sup> containers for disposal in Area 3, and in the recommended 4 x 4 x 7 ft. metal boxes.

e. Weight

Thorium waste will not exceed the 1,200 lb. per 55-gallon drum or 9,000 lbs/metal box per NVO-325, Revision 1. Sea/land containers of thorium contaminated waste exceeding the 9,000 lb. limit will be shipped in removable-top trailers, or on flatbeds.

f. Loading

Thorium waste will be packaged to ensure that the interior volume is as efficiently and compactly loaded as practical.

## III. WASTE STREAM INFORMATION

g. Nonstandard Type A Packaging

The FEMP is currently using a Type 7A Container as a strong, tight container. Used for this purpose, the container does not require a DOE Type A Certification. If a Type A Container is required to ship thorium waste, only containers with a DOE Type A Certification will be used.

h. Package Protection

Every FEMP thorium waste package will be prepared for shipment so as to minimize damage during transit. The preshipment storage environment will be controlled to avoid adverse influence from weather or other factors on the containment capability of the waste packaging during handling, storage, and transport. FEMP will take all responsibility for preshipment storage and take all reasonable precautions to preclude the accumulation of moisture on or in packages prior to their arrival to the NTS. Tamper indicating devices are used to maintain control of the container contents once certification actions are completed.

The FEMP will package all thorium waste for shipment to NTS in containers meeting DOT requirements (e.g., DOT Type 17H 55-gallon drums and other NTS approved containers listed in Table I, Section III. K., of this application). All containers shall be shipped to meet DOT requirements for interstate travel and will meet the requirements of 49 CFR 173.411, 173.421, and 173.425.

i. Marking and Labeling

Thorium waste shipped to the NTS will be marked and labeled as required in Title 49 CFR 172, Subparts D and E [with exceptions noted in Title 173.425 (b) and (c)]. Also, each waste container will be marked with a unique six character container identification number and eight character shipment number per NVO-325, Revision 1, 5.5.1.3(1,3) so that the container can be identified from another container within the shipment or from another set of containers. The approved 13 digit waste stream number (ONL000000011) will also be placed onto the waste container. The thorium waste packages will be marked and labeled as radioactive material. The weight of the package will be marked in pounds and kilograms. Signed NV-211 labels will be attached to containers certified for shipment to the NTS.

j. Barcoding

Barcode labels will meet NVO-325, Revision 1 requirements and must be approved by DOE NV prior to use. Barcode labels will be placed on each thorium waste package. The barcode labels will be placed near the top and on opposite sides of nonstandard containers. Barcode Labels on drums will be placed on the lid and one side near the top of the drum.

k. On-site Transfer

Only packaged thorium waste is shipped from the FEMP for disposal at the NTS.

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The FEMP will not provide any material which will require on-site transfer of unpackaged bulk materials by the NTS.

#### 2.5 Additional Criteria for Mixed Waste

None of the waste streams listed in this application are mixed waste. The FEMP will not be disposing of mixed waste at the NTS.

#### 2.6 Additional Criteria for Transuranic/Transuranic Mixed Waste

None of the waste streams listed in this application contain Transuranic or Transuranic Mixed waste. The FEMP will not be disposing of Transuranic or Transuranic Mixed waste at the NTS.

#### 2.7 Additional Criteria for Bulk Waste

The FEMP is not currently and does not intend to ship mixed waste to the NTS for disposal. By default, the FEMP will not be shipping mixed waste as bulk waste or mixed waste for bulk disposal.

The FEMP will ship bulk waste to the NTS for disposal in the form of scrap material (e.g. metal, wood, equipment) that is radioactively contaminated. This material is well below the 49 CFR 173.425(c) requirement of 0.001 millicurie per square centimeter when averaged over one square meter of the material. The type of container in which the FEMP ships bulk waste is identified in the sections relating to the NTS specific packaging criteria.

#### 2.8 Additional Criteria for Case-by-Case Waste

##### 2.8.1 Weight

The FEMP is currently shipping thorium waste in 55-gallon and 85-gallon drums. Thorium Sea/land containers destined for Area 3 will weigh more than 9,000 pounds and require either a large fork truck or crane for removal from the transport vehicle.

##### 2.8.2 Activity Limits

All containers shipped from the FEMP for disposal at the NTS are within the activity limits specified in NVO-325, Revision 1, Section 5.5.1.2.F.

##### 2.8.3 Radioactively Contaminated Asbestos

Friable asbestos will not be shipped to the NTS before securing DOE/NV approval. All radioactively contaminated regulated asbestos will be in waste stream ONL000000010, "Radioactively Contaminated Regulated Asbestos Containing Material".

**III. WASTE STREAM INFORMATION****2.8.4 DOE Comparable Greater-Than-Class-C As Defined in 10 CFR 61.55**

This requirement is not applicable to the FEMP waste streams since no greater-than-Class-C waste is shipped from the FEMP for disposal at NTS.

**2.8.5 Classified Waste Streams**

This requirement is not applicable, the FEMP will not ship classified waste is shipped for disposal at the NTS under this waste stream.

**2.8.6 Radioactive Animal Carcasses**

This requirement is not applicable to the FEMP since no radioactive animal carcasses are included in the thorium waste stream.

**2.8.7 Other Waste Forms**

The FEMP will secure DOE-NV approval for any waste forms that do not meet NTS requirements before shipping to the NTS.

**2.9 Packaging and Shipping Information**

Thorium waste will be packaged and shipped according to the DOT requirements for radioactively contaminated material (n.o.s. Class 7, UN-2912).

**2.10 Waste Security Information**

This section is not applicable since classified waste will not be shipped to the NTS in this waste stream.

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#### I. Waste Stream Identification Number

ONL0000000012 Thorium Residues

##### 1.0 Waste Type

Low Level Waste

##### 2.0 Waste Description

A waste stream is defined as a waste which is categorized by similar characterization process and/or point of generation. The criteria used for evaluating candidate LLW for shipment to the NTS, excerpted from the FEMP Waste Characterization Plan (Draft), are described on the following pages.

##### 2.1 Thorium Residue Wastes

This waste stream contains thorium which is characterized by process knowledge and confirmatory sampling and analysis. This includes approximately one-third of the thorium inventory stored at the FEMP which was shipped from other facilities. FEMP has served since 1972 as the US DOE storage repository for thorium. This thorium is comprised of boxes and drums of thorium oxide, hydroxide, oxalate, and tetrafluoride.

The final form of this material is dry thorium residues packaged in drums overpacked in metal boxes. Thorium Residue Waste consists of:

- Thorium oxide
- Thorium hydroxide
- Thorium oxalate
- Thorium tetrafluoride

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## 2.1.1 Waste Stream Characterization Data Sheet

1. Waste Stream No.: 0 N L 0 0 0 0 0 0 0 0 1 2

## 2. Waste Description:

- a. Physical Characteristics: Dry thorium oxide and hydroxide generated during thorium oxide production. Small amounts of thorium oxalate and tetrafluoride are also present. No treatment of this material was performed prior to packaging.
- b. Special Handling/Disposal Requirements: This material has an average radioactive level on contact of 50 mrem/hr with a range of 25 mrem/hr to 105 mrem/hr. Time, distance, and shielding techniques should be employed to reduce exposure.

## 3. Basis for Characterization:

- a. Process Knowledge: \_\_\_\_\_ b. Analytical Knowledge: \_\_\_\_\_
- c. Both:  \_\_\_\_\_

If b or c, provide Standard Data Reporting Forms as necessary.

## 4. Radioactive Characteristics:

a. Is Waste > NRC Class-C (see Title 10 CFR 61.55)?: No

b. WMIS Nuclide Category (circle): 1 (2) 3 4 5 NA 7 8

(Choose the highest predominate nuclide. The number 6 is not an option.)

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Page 2 of Waste Stream Characterization Data Sheet

c. Radioactive Constituents:

SPECIFIC ACTIVITY RANGE of WASTE STREAM

<u>Nuclide</u>	<u>Chemical Forms</u>	<u>Low</u>	<u>Mean</u>	<u>High</u>	<u>Units(Ci/kg)</u>
(1) Th-232 (0.1% to 100% Th)	*	1.09E-07	5.46E-05	1.09E-04	Ci/kg
(2) Th-228 Natural abundance	*	1.09E-07	5.46E-05	1.09E-04	Ci/kg
(3) Th-230 (Activity = 10% Th-232 activity)	*	1.09E-08	5.46E-06	1.09E-05	Ci/kg
(7) U-233 (0.0013% on a Th basis)	**	5.69E-08	2.85E-05	5.69E-05	Ci/kg

\* Thorium oxide, hydroxide, oxalate, and tetrafluoride  
\*\* Uranium oxides (typically UO<sub>2</sub>, UO<sub>3</sub>, and U<sub>3</sub>O<sub>8</sub>)

5. Hazardous Components (for MW): **NOT APPLICABLE**

a. Basis for Identifying as MW (circle): (1) Ignitable  
(2) Reactive (3) Corrosive (4) TCLP (5) Listed Waste

b. List the applicable EPA waste code, the chemical name, the treatment performed (if applicable) and the Regulatory/Treatment Standard. Attach Standardized Data Forms.

<u>EPA Hazardous Waste No.</u>	<u>Chemical Name</u>	<u>Treatment Performed</u>	<u>Regulatory Threshold/Treatment Standard</u>
(1)			
(2)			
(3)			
(4)			

NOTE: Waste characterization of materials included in this waste stream is completed using a combination of process knowledge and confirmatory sampling and analysis. Process knowledge is used when the material meets one or more of the criteria of NVO-325, Revision 1, Section 4.1.1.A, B, C. (Examples of materials characterized by process knowledge includes intermediate and final products from various thorium production processes. Sampling and analysis is needed to support process knowledge for materials not processed at FEMP and for residue materials.

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## 2.2 Waste Stream Specific Criteria

- a. Low Level Waste: Only the thorium wastes defined as LLW per DOE Orders 5820.2A, 5400.1, and 5480.11 guidelines shall be shipped to the NTS. (NVO-325, Revision 1, 5.5.1).

Compliance Method: In general, wastes that originate from Controlled Areas at the FEMP are considered radioactive waste unless demonstrated otherwise through analysis or administrative controls. Further guidance on radioactive waste characterization is provided in the DOE Performance Objective (Draft). (In accordance with the "Waste Minimization and Pollution Prevention Awareness Plan", the FEMP attempts to minimize waste generation whenever possible.)

- b. Transuranics: Thorium wastes shall have a TRU concentration less than 100 nCi/g (i.e., shall not be regulated as TRU waste). (NVO-325, Revision 1, 5.5.1.1(A)).

Compliance Method: Materials Control & Accountability (MC&A) records indicate there are no materials at the FEMP with TRU concentrations above the 100 nCi/g level. The highest TRU concentration for any FEMP material as determined through analysis is 93,904 dpm/g (42 nCi/g).

- c. Hazardous Waste: All thorium wastes shall be evaluated for hazardous waste by analytical characterization or by identifying the material(s) listed as hazardous in Title 40 CFR 261, "Identification and Listing of Hazardous Waste", or in the regulations of the state where the waste is generated. (NVO-325, Revision 1, 5.5.1.1(B)).

Compliance Method: When thorium residue waste is considered for shipment to NTS, the following steps are taken to determine the presence of hazardous waste:

- (1) The generator contacts the responsible FERMCO WC [FME] organization for waste characterization to obtain any hazardous waste evaluation data available for the thorium waste considered.
- (2) If no evaluation exists and characterization is required, the generator completes Section 1 of the MEF and submits the form to WC [FME] for characterization.
- (3) If enough information is known about the process by which the waste was generated and WC [FME] is able to firmly establish that the waste would not exhibit hazardous waste characteristics or contain a listed hazardous waste, a process knowledge determination would be made that the waste is nonhazardous.
- (4) If sufficient information about the generation process is not available, WC [FME] requires that sampling and analysis be completed on the waste. WC [FME] will specify the parameters to be analyzed, a waste specific sampling plan will be written, and the waste will be sampled per approved SOP 20-C-805.

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- (5) The sample will be submitted to an analytical laboratory following chain-of-custody procedures and analyses will be completed per SW-846 methodology.
  - (6) A statistical analysis and quality assurance check will be completed on the analytical data.
  - (7) The data will be forwarded to WC [FME] where the final characterization will be completed and documented on the MEF.
  - (8) A copy of the MEF is returned to the generator.
- d. Free Liquids: Thorium wastes disposed at NTS waste management sites shall contain as little free liquids as is reasonably achievable, but in no case shall the liquid equal or exceed 0.5% by volume of the external waste container and shall meet the NVO-325, Revision 1, 5.5.1.1(C) criteria.

Compliance Method: Free liquids in thorium wastes are evaluated based on process knowledge or waste testing to determine if the waste stream meets this criteria. Determinations based on process knowledge generally include a visual inspection of at least 10% of a container population (e.g., during a visual inspection or sampling episode). Free liquid determinations are generally completed as part of the RCRA waste characterization process. The Percent Free Liquid Test (PFLT) is performed to determine the presence of free liquids when process knowledge does not yield sufficient information to complete this determination. Reference FEMP Waste Characterization Plan (Draft) - RCRA Section.

- e. Particulates: Wastes containing greater than 1 weight percent fine particulate materials less-than-ten-micrometer-diameter and or 15 weight percent less-than-200 micrometer diameter particles shall be immobilized or packaged in accordance with NVO-325, Revision 1, 5.5.1.1(D).

Compliance Method: This thorium waste stream may categorically fail the particulates WAC. This material is packaged in steel drums and overpacked into metal boxes meeting NVO-325, Revision 1 requirements.

- f. Gases: Radioactive gases shall be stabilized or absorbed so that pressure in the waste package does not exceed 1.5 atmospheres at 20° celsius. Compressed gases as defined by Title 49 CFR 173.300, including unpunctured aerosol cans, shall not be shipped for disposal in the thorium waste stream. Aerosol cans shall have puncture disfigurements readily recognizable by real-time-radiography. Expended gas cylinders shall have the valve mechanism removed. (NVO-325, Revision 1, 5.5.1.1(E)).

Compliance Method: The thorium waste packages were evaluated to determine if they contain any items that potentially fail this WAC during the hazardous waste determination (SSOP-0002).

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- g. Stabilization: When practical, Thorium waste shall be treated to reduce volume and provide a more structurally and chemically stable waste form. (NVO-325, Revision 1, 5.5.1.1(F)).

Compliance Method: Waste Characterization [FME] reviewed the thorium waste stream during the hazardous waste evaluation for potential harmful gas, vapor, or liquid generation. No treatment of the thorium waste stream was required to meet the WAC for this waste stream.

- h. Etiologic Agents: Thorium wastes to be shipped to the NTS shall not contain pathogens, infectious wastes, or other etiologic agents as defined in Title 49 CFR 173.386. (NVO-325, Revision 1, 5.5.1.1(G)).

Compliance Method: The only significant source of potential etiologic agents on site is from medical services. Such materials may include band aids, tongue blades, syringes, cotton balls, outdated pharmaceuticals, or other materials stained with blood or other body fluids. These materials are managed according to Ohio Infectious Waste Law/Regulation (ORC 3734 and OAC 3745-27-01 through 25) which includes segregated packaging at the point of generation. Materials are placed in a red bag in a box premarked with the international biohazard label. These boxes are then transported by a registered transporter to a licensed treatment facility. These administrative controls prevent etiologic agents from entering the thorium residue waste stream. Reference FEMP Waste Characterization Plan (Draft) - Infectious Waste Section for additional evaluation criteria.

- i. Chelating Agents: If a waste is determined to contain chelating agents above the one percent by weight limit, the waste shall not be approved for disposal at the NTS. (NVO-325, Revision 1, 5.5.1.1(H)).

Compliance Method: Chelating agents form coordination compounds by offering two or more chemical bonds (through ligands) to a central metal ion. The most common chelating agent is EDTA. Other common chelating agents are also aminopolyacetic acids. Excess chemicals from the on-site laboratory are the primary potential source of materials that may be identified as true chelating agents. This determination will be accomplished through the use of the MEF which will designate the waste as containing above one percent by weight chelating agents. WC [FME] has generated a list of potential chelating or complexing agents through an on-line database search and will consult this list to identify potential chelating or complexing agents. The MEF (example provided in this application) contains a specific section for denoting the presence of chelating agents. This information is provided to the waste certification official who is responsible for ensuring that material containing chelating agents at concentrations greater than one percent by weight are properly tagged as not meeting the criteria for shipment. This process prevents waste that does not meet the NTS WAC from being shipped for disposal.

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- j. Polychlorinated Biphenyls: PCB contaminated waste shall not be shipped for disposal at NTS in the thorium waste stream unless the PCB concentration meets the municipal solid waste disposal limits. See Title 40 CFR 761.60 for PCB disposal requirements. (NVO-325, Revision 1, 5.5.1.1(I)).

Compliance Method: The FEMP samples wastes for PCB contamination when a reason to suspect PCB contamination is provided by:

- a likely waste matrix (e.g., oily material),
- a review of previous operations,
- a review of manufacturers manuals,
- previous sampling and analyses data.

This waste stream contains no oily material and no additional process knowledge exists to provide any reason to suspect PCB contamination. This determination is performed during the hazardous waste determination (SSOP-0002). Reference FEMP Waste Characterization Plan (Draft) -TSCA PCB Section for evaluation criteria.

- k. Explosives and Pyrophorics: The waste shall not contain potentially explosive or pyrophoric material in a form that may spontaneously combust if the container is breached. (NVO-325, Revision 1, 5.5.1.1(J)).

Compliance Method: This WAC is evaluated during the hazardous waste characterization. This evaluation is performed in accordance with SSOP-0002, Completing the Material Evaluation Form and FEMP Waste Characterization Plan (Draft). Any waste that potentially fails this WAC will be identified by WC [FME] and the material will not be shipped to the NTS for disposal.

#### 2.3 Waste Stream General Package Criteria

##### a. Design

Waste packaging criteria for thorium waste shipped to the NTS for disposal will meet DOT Regulations, 49 CFR 173, Subpart I. Standard operating procedures listed in Table I of the Waste Certification Program Plan, concerning storage and off-site shipments, will be used to assure that all shipments meet DOT requirements and NTS site-specific requirements.

##### b. Nuclear Safety

The quantity of radioactive materials in thorium waste shipped to the NTS will be limited so that an infinite array of packages will remain subcritical. This quantity will be determined on the basis of a specific nuclear safety analysis, considering credible accident situations, and taking into account the actual materials in the waste and will meet 49 CFR, Parts 173.453(c)(3) and 173.453(d). Thorium waste packages will not contain uranium enriched <sup>235</sup>U greater than one

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percent by weight and with a mass of  $^{235}\text{U}$  greater than 800 grams per package. The total mass of plutonium and  $^{235}\text{U}$  will not exceed one percent of the mass of  $^{235}\text{U}$  in any package.

#### c. Nuclear Heating

In compliance with 49 CFR 173.442, Thermal Limitations, a Health Physics evaluation of waste packages of material to be shipped to the NTS from the FEMP will show no evidence of a heating effect above NVO-325 limits from radiological decay. Calculations from these waste streams at the FEMP show the power output from  $^{232}\text{Th}$  at maximum potential concentration in any waste package will not exceed 0.1 Watt. These calculations are based on the total alpha energy from each isotope in the waste and its associated daughters during normal radioactive decay.

#### d. Radiation Levels

In compliance with 49 CFR 173.441, Radiation Levels, the radiation exposure rate at the surface and at 1 meter from each package of thorium waste will be measured and recorded in the data package. Thorium waste packages that exceed 200 millirem/hr on contact will not be shipped to NTS.

#### e. External Contamination

In compliance with 49 CFR 173.443, the surface contamination of each container of thorium waste will be measured using instruments calibrated by Environmental Health & Safety (EH&S), Dosimetry, Instrumentation Section and recorded in the data package. If these instruments indicate that the limits of 49 CFR 173.443 are exceeded, then the package will be cleaned until it is within the limits, or the contents shall be transferred to a clean container.

#### f. Activity Limits

The activity limits of Titles 49 CFR 173.421, "Limited Quantities of Radioactive Materials", and 49 CFR 173.425, "Transport Requirements for Low-Specific Activity Radioactive Materials" shall be met.

~~In compliance with Title 49 CFR 173.421 and 173.425, strong, tight containers used for shipping Limited Quantities (LQ) and Low-Specific Activity (LSA) LLW will be constructed so they will not leak during normal transportation and handling conditions.~~

Two hundred boxes of thorium residue have  $^{235}\text{U}$  levels averaging 13ppm and cannot be considered "LSA" as defined by 49 CFR 173.403(kk). An exception provided in 49 CFR 173.453(e) allows these containers to be shipped in accordance with 49 CFR 173.425. These packages, however, will not be marked "LSA".

g. Multiple Hazards

Not applicable, the FEMP will not ship thorium wastes with multiple hazards to the NTS.

2.4 Waste Stream Specific Package Criteria

a. Closure

All thorium waste package closures will be sturdy enough to ensure the closures will not be breached under normal handling conditions and will not serve as weak points for package failure.

b. Strength

Thorium waste will be packaged in containers capable of supporting a uniformly distributed load of 4,000 lbs/ft<sup>2</sup>, except for waste packaged in DOE NV approved containers (drums). The thorium waste packaged in Sea/land containers will be disposed in Area 3 and will not required this strength test.

c. Handling

All Thorium waste containers will have permanently attached skids, cleats, offsets, rings, handles, or other auxiliary lifting devices to allow handling by means of forklifts, cranes, or similar handling equipment. Lifting rings and other auxiliary lifting devices will be recessed, offset, or hinged in a manner that does not inhibit stacking the packages. The lifting devices will be designed to meet a 5:1 safety factor based upon the ultimate strength of the material. All rigging devices that are not permanently attached to the waste package will have a current load test based on 125 percent of the safe working load.

d. Size

FEMP thorium waste will be packaged in 55-gallon or 85-gallon drums, Sea/land containers, and the recommended 4 x 4 x 7 ft. metal boxes.

e. Weight

Thorium waste will not exceed the 1,200 lb. per 55-gallon drum or 9,000 lbs/metal box per NVO-325, Revision 1. Sea/land containers of thorium waste exceeding the 9,000 lb. limit will be shipped in removable-top trailers, or on flatbeds.

f. Loading

Thorium waste will be packaged to ensure that the interior volume is as efficiently and compactly loaded as practical.

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g. Nonstandard Type A Packaging

The FEMP is currently using a Type 7A Container as a strong, tight container. Used for this purpose, the container does not require a DOE Type A Certification. If a Type A Container is required to ship thorium waste, only containers with a DOE Type A Certification will be used.

h. Package Protection

Every FEMP thorium waste package will be prepared for shipment so as to minimize damage during transit. The preshipment storage environment will be controlled to avoid adverse influence from weather or other factors on the containment capability of the waste packaging during handling, storage, and transport. FEMP will take all responsibility for preshipment storage and take all reasonable precautions to preclude the accumulation of moisture on or in packages prior to their arrival to the NTS. Tamper indicating devices are used to maintain control of the container contents once certification actions are completed.

The FEMP will package all thorium waste for shipment to NTS in containers meeting DOT requirements (e.g., DOT Type 17H 55-gallon drums or other NTS approved containers). All containers will be shipped to meet DOT requirements for interstate travel and will meet the requirements of 49 CFR 173.411, 173.421, and 173.425.

i. Marking and Labeling

Thorium waste shipped to the NTS will be marked and labeled as required in Title 49 CFR 172, Subparts D and E [with exceptions noted in Title 173.425 (b) and (c)]. Also, each waste container will be marked with a unique six character container identification number and eight character shipment number per NVO-325, Revision 1, 5.5.1.3(I,3) so that the container can be identified from another container within the shipment or from another set of containers. The approved 13 digit waste stream number (ONL000000012) will also be placed onto the waste container. The thorium waste packages will be marked and labeled as radioactive material. The weight of the package will be marked in pounds and kilograms. Signed NV-211 labels will be attached to containers certified for shipment to the NTS.

j. Barcoding

Barcode labels will meet NVO-325, Revision 1 requirements and must be approved by DOE NV prior to use. Barcode labels will be placed on each thorium waste package. The barcode labels will be placed near the top and on opposite sides of nonstandard containers. Barcode Labels on drums will be placed on the lid and one side near the top of the drum.

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**k. On-site Transfer**

Only packaged thorium waste is shipped from the FEMP for disposal at the NTS. The FEMP will not provide any material which will require on-site transfer of unpackaged bulk materials by the NTS.

**2.5 Additional Criteria for Mixed Waste**

None of the waste streams listed in this application are mixed waste. The FEMP will not be disposing of mixed waste at the NTS.

**2.6 Additional Criteria for Transuranic/Transuranic Mixed Waste**

None of the waste streams listed in this application contain Transuranic or Transuranic Mixed waste. The FEMP will not be disposing of Transuranic or Transuranic Mixed waste at the NTS.

**2.7 Additional Criteria for Bulk Waste**

The FEMP is not currently and does not intend to ship mixed waste to the NTS for disposal. By default, the FEMP will not be shipping mixed waste as bulk waste or mixed waste for bulk disposal.

The FEMP does ship bulk waste to the NTS for disposal in the form of scrap material (metal, wood, vehicles) that is radioactively contaminated. This material is well below the 49 CFR 173.425(c) requirement of 0.001 millicurie per square centimeter when averaged over one square meter of the material. The type of container in which the FEMP ships bulk waste is identified in the sections relating to the NTS specific packaging criteria. Approval of this application will constitute approval of continued use of this container.

**2.8 Additional Criteria for Case-by-Case Waste**

**2.8.1 Weight**

The FEMP is currently shipping thorium waste in 55-gallon and 85-gallon drums. No thorium containers will weigh more than 9,000 pounds and require either a large fork truck or crane for removal from the transport vehicle.

**2.8.2 Activity Limits**

All containers shipped from the FEMP for disposal at the NTS are within the activity limits specified in NVO-325, Revision 1, Section 5.5.1.2.F.

**2.8.3 Radioactively Contaminated Asbestos**

Friable asbestos will not be shipped to the NTS before securing DOE/NV approval. None of the waste included in this waste stream contains radioactively contaminated regulated asbestos.

**III. WASTE STREAM INFORMATION**Revision 5.0  
June 1993**2.8.4 DOE Comparable Greater-Than-Class-C As Defined in 10 CFR 61.55**

This requirement is not applicable to the FEMP waste streams since no greater-than-Class-C waste is shipped from the FEMP for disposal at NTS.

**2.8.5 Classified Waste Streams**

This requirement is not applicable, the FEMP will not ship classified waste for disposal at the NTS under this waste stream.

**2.8.6 Radioactive Animal Carcasses**

This requirement is not applicable to the FEMP since no radioactive animal carcasses are included in the thorium waste stream.

**2.8.7 Other Waste Forms**

The FEMP will secure DOE-NV approval for any waste forms that do not meet NTS requirements before shipping to the NTS.

**2.9 Packaging and Shipping Information**

Thorium residues will be packaged and shipped according to the DOT requirements for radioactively contaminated material (n.o.s. Class 7, UN-2912).

**2.10 Waste Security Information**

This section is not applicable since classified waste will not be shipped to the NTS in this waste stream.



**III. WASTE STREAM INFORMATION**Revision 5.0  
June 1993**L. Three-Year Waste Shipment Forecast**

The FEMP estimated three-year waste shipment forecast for Fiscal Years 1994 through 1996 are provided on the following pages. These forecasts are subject to change due to budget impact and FEMP priorities. FEMP waste forecasts will be updated every six months and submitted to DOE/NV and REECo/DWMD by February 15 and August 15.

III. WASTE STREAM INFORMATION

Revision 5.0  
June 1993

THREE - YEAR WASTE SHIPMENT FORECAST

GENERATOR: Fernald Environmental Management Project PREPARED BY: J. G. Rowe DATE: DRAFT

FORECAST PERIOD	WASTE STREAM NUMBER	WASTE TYPE	CONTAINER			NUMBER OF SHIPMENTS	TOTAL VOLUME (meters <sup>3</sup> )
			TYPE	SIZE	NUMBER		
FY-1994 10/01-12/31	ONL0000000001	LLW	Sea/Land	8' x 8' x 20'	12	9	436
01/01-03/31	ONL0000000001	LLW	Sea/Land	8' x 8' x 20'	13	10	472
04/01-06/30	ONL0000000001	LLW	Sea/Land	8' x 8' x 20'	21	18	762
07/01-09/30	ONL0000000001	LLW	Sea/Land	8' x 8' x 20'	13	10	472
FY-1995	ONL0000000001	LLW	Sea/Land	8' x 8' x 20'	41	28	1488
FY-1996	ONL0000000001	LLW	Sea/Land	8' x 8' x 20'	50	40	1815

REMARKS:

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III. WASTE STREAM INFORMATION

Revision 5.0  
June 1993

THREE - YEAR WASTE SHIPMENT FORECAST

GENERATOR: Fernald Environmental Management Project PREPARED BY: J. G. Rowe DATE: DRAFT

FORECAST PERIOD	WASTE STREAM NUMBER	WASTE TYPE	CONTAINER		NUMBER OF SHIPMENTS	TOTAL VOLUME (meters <sup>3</sup> )
			TYPE	SIZE		
FY-1994 10/01-12/31	ONL0000000002	LLW	Sea/Land	8'x 8'x 20'	20	725
			Metal Box	4'x 4'x 7'	384	387
01/01-03/31	ONL0000000002	LLW	Sea/Land	8'x 8'x 20'	25	908
			Metal Box	4'x 4'x 7'	702	2247
04/01-06/30	ONL0000000002	LLW	Sea/Land	8'x 8'x 20'	30	1089
			Metal Box	4'x 4'x 7'	1126	3603
07/01-09/30	ONL0000000002	LLW	Sea/Land	8'x 8'x 20'	20	726
			Metal Box	4'x 4'x 7'	560	1792
FY-1995	ONL0000000002	LLW	Sea/Land	8'x 8'x 20'	95	3449
			Metal Box	4'x 4'x 7'	2800	8960
FY-1996	ONL0000000002	LLW	Sea/Land	8'x 8'x 20'	100	3630
			Metal Box	4'x 4'x 7'	1000	3208

REMARKS:

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III. WASTE STREAM INFORMATION

Revision 5.0  
June 1993

THREE - YEAR WASTE SHIPMENT FORECAST

GENERATOR: Fernald Environmental Management Project PREPARED BY: J. G. Rowe DATE: DRAFT

FORECAST PERIOD	WASTE STREAM NUMBER	WASTE TYPE	CONTAINER		NUMBER OF SHIPMENTS	TOTAL VOLUME (meters <sup>3</sup> )
			TYPE	SIZE		
FY-1994 10/01-12/31	ONL00000000006	LLW	Drums	85-Gallon	1000	3964E-01
			Metal Box	4'x 4'x 7'	200	640
01/01-03/31	ONL00000000006	LLW	Drums	85-Gallon	1000	3964E-01
			Metal Box	4'x 4'x 7'	200	640
04/01-06/30	ONL00000000006	LLW	Drums	85-Gallon	1000	3964E-01
			Metal Box	4'x 4'x 7'	200	640
07/01-09/30	ONL00000000006	LLW	Drums	85-Gallon	1000	3964E-01
			Metal Box	4'x 4'x 7'	200	640
FY-1995	ONL00000000006	LLW	Drums	85-Gallon	2000	7928E-01
			Metal Box	4'x 4'x 7'	200	640
FY-1996	ONL00000000006	LLW	Drums	85-Gallon	500	1982E-01
			Metal Box	4'x 4'x 7'	150	480

REMARKS:

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III. WASTE STREAM INFORMATION

Revision 5.0  
June 1993

THREE - YEAR WASTE SHIPMENT FORECAST

GENERATOR: Fernald Environmental Management Project PREPARED BY: J. G. Rowe DATE: DRAFT

FORECAST PERIOD	WASTE STREAM NUMBER	WASTE TYPE	CONTAINER		NUMBER OF SHIPMENTS	TOTAL VOLUME (meters <sup>3</sup> )
			TYPE	SIZE		
FY-1994 10/01-12/31	ONL00000000007	LLW	Sea/Land	8'x 8'x 20'	1	36
			Metal Box	4'x 4'x 7'	6	6
01/01-03/31	ONL00000000007	LLW	Sea/Land	8'x 8'x 20'	1	36
			Metal Box	4'x 4'x 7'	6	6
04/01-06/30	ONL00000000007	LLW	Sea/Land	8'x 8'x 20'	1	36
			Metal Box	4'x 4'x 7'	6	6
07/01-09/30	ONL00000000007	LLW	Sea/Land	8'x 8'x 20'	1	36
			Metal Box	4'x 4'x 7'	6	6
FY-1995	ONL00000000007	LLW	Sea/Land	8'x 8'x 20'	4	145
			Metal Box	4'x 4'x 7'	6	6
FY-1996	ONL00000000007	LLW	Sea/Land	8'x 8'x 20'	4	145
			Metal Box	4'x 4'x 7'	6	6

REMARKS:

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III. WASTE STREAM INFORMATION

Revision 5.0  
June 1993

THREE - YEAR WASTE SHIPMENT FORECAST

GENERATOR: Fernald Environmental Management Project PREPARED BY: J. G. Rowe DATE: DRAFT

FORECAST PERIOD	WASTE STREAM NUMBER	WASTE TYPE	CONTAINER			NUMBER OF SHIPMENTS	TOTAL VOLUME (meters <sup>3</sup> )
			TYPE	SIZE	NUMBER		
FY-1994 10/01-12/31	ONL00000000008	LLW	Drums	85-Gallon	0	0	0
			Metal Box	4'x 4'x 7'	0	0	0
01/01-03/31	ONL00000000008	LLW	Drums	85-Gallon	4000	55	15,856E-01
04/01-06/30	ONL00000000008	LLW	Metal Box	4'x 4'x 7'	0	0	0
			Drums	85-Gallon	3500	50	13,874E-01
07/01-09/30	ONL00000000008	LLW	Metal Box	4'x 4'x 7'	0	0	0
			Drums	85-Gallon	3000	40	11,892E-01
FY-1995	ONL00000000008	LLW	Metal Box	4'x 4'x 7'	0	0	0
			Drums	85-Gallon	0	0	0
FY-1996	ONL00000000008	LLW	Metal Box	4'x 4'x 7'	0	0	0
			Drums	85-Gallon	0	0	0
			Metal Box	4'x 4'x 7'	0	0	0

REMARKS:

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III. WASTE STREAM INFORMATION

Revision 5.0  
June 1993

THREE - YEAR WASTE SHIPMENT FORECAST  
 GENERATOR: Fernald Environmental Management Project PREPARED BY: J. G. Rowe DATE: DRAFT

FORECAST PERIOD	WASTE STREAM NUMBER	WASTE TYPE	CONTAINER			NUMBER OF SHIPMENTS	TOTAL VOLUME (meters <sup>3</sup> )
			TYPE	SIZE	NUMBER		
FY-1994 0/01-12/31	ONL0000000009	LLW	Metal Box	4'x 4'x 7'	8	2	26
01/01-03/31	ONL0000000009	LLW	Metal Box	4'x 4'x 7'	8	2	26
04/01-06/30	ONL0000000009	LLW	Metal Box	4'x 4'x 7'	0	0	0
07/01-09/30	ONL0000000009	LLW	Metal Box	4'x 4'x 7'	0	0	0
FY-1995	ONL0000000009	LLW	Metal Box	4'x 4'x 7'	0	0	0
FY-1996	ONL0000000009	LLW	Metal Box	4'x 4'x 7'	0	0	0

REMARKS:

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IV. WASTE CERTIFICATION PROGRAM

Revision 5.0  
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THREE - YEAR WASTE SHIPMENT FORECAST

GENERATOR: Fernald Environmental Management Project PREPARED BY: J. G. Rowe DATE: DRAFT

FORECAST PERIOD	WASTE STREAM NUMBER	WASTE TYPE	CONTAINER			NUMBER OF SHIPMENTS	TOTAL VOLUME (meters <sup>3</sup> )
			TYPE	SIZE	NUMBER		
FY-1994 10/01-12/31	ONL00000000010	LLW	Drums	55-Gallon	98	10	20
			Metal Box	4'x 4'x 7'	50	40	161
			Sea/Land	8'x 8'x 20'	20	10	363
01/01-03/31	ONL00000000010	LLW	Drums	55-Gallon	198	20	40
			Metal Box	4'x 4'x 7'	50	5	161
			Sea/Land	8'x 8'x 20'	20	10	363
04/01-06/30	ONL00000000010	LLW	Drums	55-Gallon	98	2	20
			Metal Box	4'x 4'x 7'	20	2	64
			Sea/Land	8'x 8'x 20'	1	1	36
07/01-09/30	ONL00000000010	LLW	Drums	55-Gallon	250	4	99
			Metal Box	4'x 4'x 7'	20	2	64
			Sea/Land	8'x 8'x 20'	1	1	36
FY-1995	ONL00000000010	LLW	Metal Box	4'x 4'x 7'	20	2	64
			Sea/Land	8'x 8'x 20'	4	2	145
			Metal Box	4'x 4'x 7'	15	2	48
FY-1996	ONL00000000010	LLW	Sea/Land	8'x 8'x 20'	4	2	145
			Metal Box	4'x 4'x 7'	15	2	48
			Sea/Land	8'x 8'x 20'	4	2	145

REMARKS:

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IV. WASTE CERTIFICATION PROGRAM

Revision 5.0  
June 1993

THREE - YEAR WASTE SHIPMENT FORECAST

GENERATOR: Fernald Environmental Management Project PREPARED BY: J. G. Rowe DATE: DRAFT

FORECAST PERIOD	WASTE STREAM NUMBER	WASTE TYPE	CONTAINER		NUMBER OF SHIPMENTS	TOTAL VOLUME (meters <sup>3</sup> )
			TYPE	SIZE		
FY-1994 10/01-12/31	ONL000000000011	LLW	Sea/Land	8'x 8'x 20'	3	109
			Metal Box	4'x 4'x 7'	45	45
01/01-03/31	ONL000000000011	LLW	Sea/Land	8'x 8'x 20'	3	109
			Metal Box	4'x 4'x 7'	45	45
04/01-06/30	ONL000000000011	LLW	Sea/Land	8'x 8'x 20'	3	109
			Metal Box	4'x 4'x 7'	45	45
07/01-09/30	ONL000000000011	LLW	Sea/Land	8'x 8'x 20'	3	109
			Metal Box	4'x 4'x 7'	45	45
FY-1995	ONL000000000011	LLW	Sea/Land	8'x 8'x 20'	4	145
			Metal Box	4'x 4'x 7'	45	32
FY-1996	ONL000000000011	LLW	Sea/Land	8'x 8'x 20'	4	145
			Metal Box	4'x 4'x 7'	45	32

REMARKS:

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IV. WASTE CERTIFICATION PROGRAM

Revision 5.0  
June 1993

THREE - YEAR WASTE SHIPMENT FORECAST

GENERATOR: Fernald Environmental Management Project PREPARED BY: J. G. Rowe DATE: DRAFT

FORECAST PERIOD	WASTE STREAM NUMBER	WASTE TYPE	CONTAINER		NUMBER OF SHIPMENTS	TOTAL VOLUME (meters <sup>3</sup> )
			TYPE	SIZE		
FY-1994 10/01-12/31	ONL000000000012	LLW	Sea/Land	8'x 8'x 20'	5	181
			Metal Box	4'x 4'x 7'	200	202
01/01-03/31	ONL000000000012	LLW	Metal Box	4'x 4'x 7'	200	202
04/01-06/30	ONL000000000012	LLW	Metal Box	4'x 4'x 7'	200	202
07/01-09/30	ONL000000000012	LLW	Metal Box	4'x 4'x 7'	200	202
FY-1995	ONL000000000012	LLW	Metal Box	4'x 4'x 7'	400	404
FY-1996	ONL000000000012	LLW	Metal Box	4'x 4'x 7'	0	0

REMARKS:

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**IV. WASTE CERTIFICATION PROGRAM**

Revision 5.0  
June 1993

**A. Waste Certification Program Plan**

The FEMP WCPP is included as Appendix I of this application.

**B. Certification Related Procedures**

See Appendix I.

## V. EXEMPTION REQUEST

Revision 5.0  
June 1993

### A. Standardized Data Reporting Forms

#### 1. Exemption

Noncompliance: Standardized Data Reporting Forms are not available as required by Section 4.3.4 of NVO-325 (Rev. 1) for the nine FEMP waste streams. All LLW in the nine waste streams identified in this application fall within the scope of the Waste Characterization Program.

Circumstance: For purposes of characterization, the FEMP definition of a Waste Stream is much more discrete than what is identified by the nine waste streams provided in Section III (Waste Stream Identification) of this application. At the FEMP a waste stream could be defined by a single 55-gallon container, or several hundred box containers depending on the method of generation and the time period during which the waste is generated. For purposes of characterization at the FEMP, a waste stream is identified by an MEF in a discrete characterization file. For purposes of disposal at the NTS, a waste stream is identified as one of the nine waste streams listed in Section III of this application. Therefore, there are individual characterization files for each waste stream which comprises the waste streams listed in Section III of this application.

Each individual waste stream is evaluated against the Waste Acceptance Criteria of NVO-325, Revision 1, for the nine waste streams listed in this application. This is necessary due to the wide variety of waste generated during the years the FEMP was in production. All wastes meeting the waste stream specific criteria are grouped into one of the nine streams listed in this application. With this large amount of individual FEMP waste stream characterization being performed, the amount of analytical data generated for each waste stream in the application is quite voluminous. The current contract with the laboratories does not require that analytical results be reported in this format. The analytical results and equivalent quality assurance methods are provided by alternate means. These results could be transcribed on to standardized data reporting forms; however, the amount of data to be transcribed forces the FEMP to reserve this action for specific analytical results requests from DOE/NV.

#### 2. Duration

The new contract currently being placed with subcontract laboratories requires the laboratories to submit results using standardized data reporting forms. This contract is targeted to be in effect by September, 1993. Sample analysis results submitted after this date will be reported on the Standardized Data Reporting Forms. The Standardized Data Reporting Forms exemption is requested for all sample analysis completed prior to the initiation of the new laboratory contract. This exemption request will be reevaluated during the next DOE/NV Application Audit.

## V. EXEMPTION REQUEST

Revision 5.0  
June 1993

## 3. Corrective Action

The Standardized Data Reporting Forms will be required in future laboratory contracts. Analytical results completed prior to the initiation of the new contract could be transcribed on to standardized data reporting forms; however, the amount of data to be transcribed forces the FEMP to reserve this action for specific analytical results requests from DOE/NV. The exemption request will be reevaluated at the time of the next DOE/NV Application Audit.

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V. EXEMPTION REQUEST

Revision 5.0  
June 1993

B. Sea/Land® Containers for Area 3 at NTS

1. Exemption

Noncompliance: The FEMP requests an exemption to use Sea/land containers for the disposal of radioactively contaminated regulated asbestos containing materials (RACMs) in Area 5 of the NTS. Sea/lands are currently used for bulk shipments destined for Area 3 at the NTS. These containers do not meet the requirements of Section 5.5.1.3.B, NVO-325 (Rev. 1) to support a uniformly distributed load of 4,000 lbs/ft<sup>2</sup> requirement.

Circumstance: The FEMP has approximately 20 Sea/land containers packed with radioactively contaminated RACMs. Sea/lands are used in accordance with ALARA because size reduction of large RACM increases the potential for personal exposure to both asbestos and radioactive contamination.

2. DURATION

This exemption is requested for the duration of this application. The situation will be re-evaluated at the time of the next application revision. The continued use of Sea/land containers is required for the disposal of large RACM.

3. CORRECTIVE ACTION

The FEMP will investigate packaging for RACMs that meets all NVO-325 (Rev.1) requirements for future radioactively contaminated ACM generated.

## V. EXEMPTION REQUEST

Revision 5.0  
June 1993

## C. Metal Shipping Boxed for Area 5 RWMS

## 1. Exemption

Noncompliance: The Metal Shipping Box, Code 113, (Table I) is presently being used for storage of thorium waste at the FEMP. This container does not meet the NVO-325, (Rev. 1) Section 5.5.1.3 package strength requirements for disposal at Area 5 RWMS.

Note: The drawing, No. 30A-5500-M-00059-0, appears after Sections VI of this application.

Circumstance: There are approximately 40 of these metal boxes of this type containing thorium LLW in drums packaged for shipment to NTS. Shipping these containers as is would be in accordance with ALARA because repackaging increases personnel exposure to radioactivity.

This metal box fails the strength test by itself when it alone provides the only structural support. In this circumstance, however, these metal boxes are used as an overpack container. The packed drums inside the boxes provide additional support and together with the metal box are possibly adequate to prevent subsidence when stacked or buried. The combined strength of the drums and metal box has not been tested.

REECO will be able to segregate these properly identified containers into stacks surrounded (nested) by other containers meeting the strength requirement.

## 2. Duration

This exemption is requested for the duration of this application. Approximately 40 boxes with thorium waste drums are considered in this exemption.

## 3. Corrective Action

This exemption only applies to metal boxes previously packaged and stored at the FEMP. Current packages meet all NVO-325 (Rev. 1) requirements.

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**VI. PROCEDURES AND SUPPORTING DOCUMENTATION**

Revision 5.0  
June 1993

The procedures listed below have been provided in the SOP section of this application.

SSOP 0002 - Completing the Material Evaluation Form

SSOP 0075 - Packaging Low Level Radioactive Waste (LLRW) in Drums for Offsite Disposal

SSOP 0078 - Packaging Low Level Radioactive Waste (LLRW) into ISO Containers for Offsite Disposal

SSOP 0079 - Packaging Low Level Radioactive Waste (LLRW) in Metal Boxes for Offsite Disposal

SOP 2-C-923 - Trash Baler Operation

SOP 20-C-604 - Control and Utilization of Contaminated Trash Dumpsters

SOP 20-C-625 - Evaluating Low Level Radioactive Waste Bulk Waste Streams for Shipment

SOP 20-C-805 - Sampling Drummed Waste for Hazardous Determinations

**List of Acronyms**

ACM	Asbestos Containing Materials
ALARA	As Low As Reasonably Achievable
ASTM	American Society for Testing of Materials
CAO	Conditions Adverse to Quality
CAR	Corrective Action Report
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
Ci/kg	Curries per Kilogram
CWCO	Chief Waste Certification Official
DCAR	Deviation and Corrective Action Reporting
DOE	U.S. Department of Energy
DOE/NV	U.S. Department of Energy/Nevada Field Office
DOT	U.S. Department of Transportation
DR	Deviation Report
DWMD	DOE Waste Management Division
EC&QA	Environmental Compliance & Quality Assurance
EPA	U.S. Environmental Protection Agency
FEMP	Fernald Environmental Management Project
FERMCO	Fernald Environmental Restoration Management Corporation
FME	Facilities and Materials Evaluation
IIR	Incident Investigation Report
IRS&T	Industrial Radiological Safety & Training
ISO	International Shipping Organization

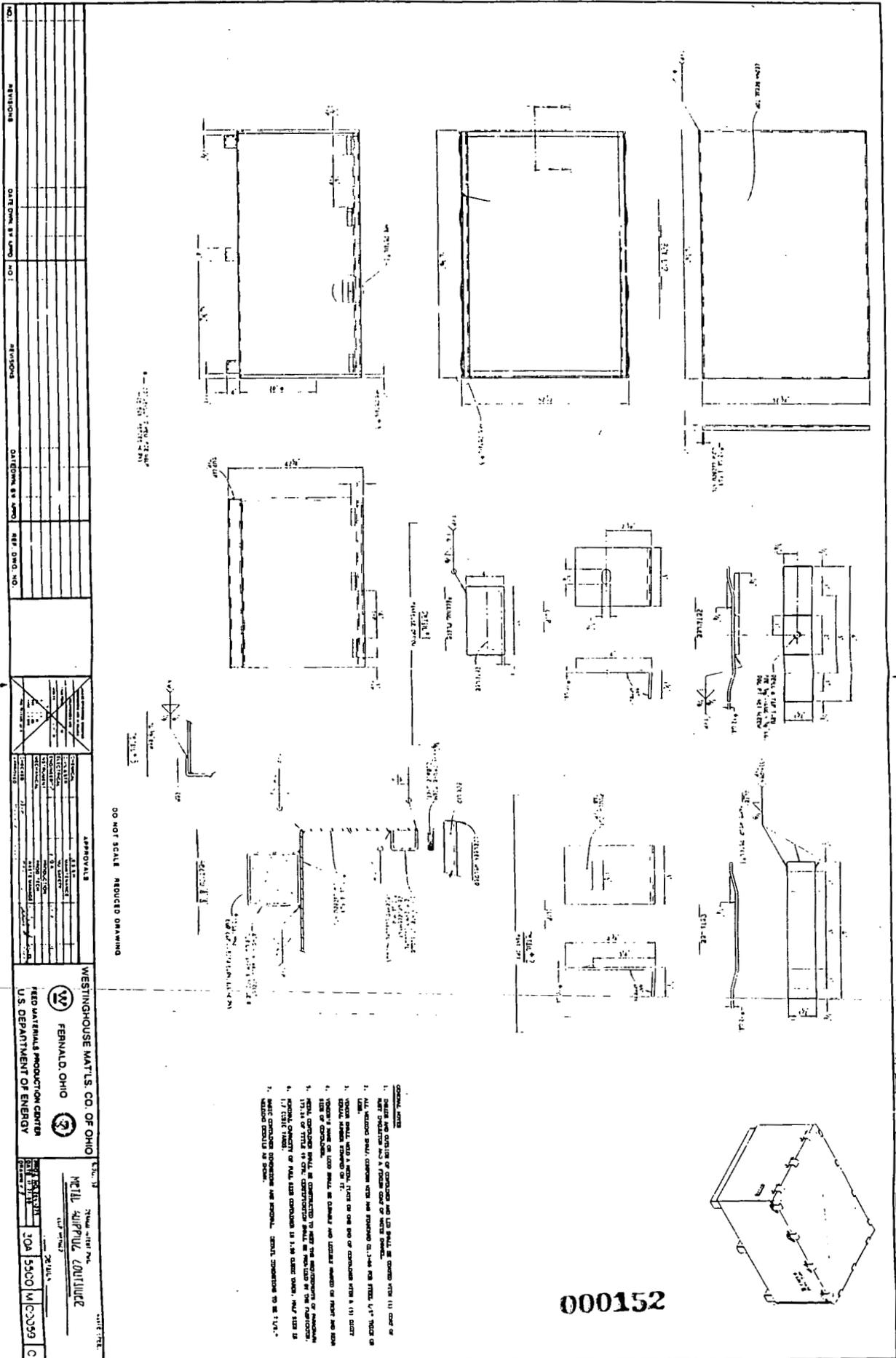
## VI. PROCEDURES AND SUPPORTING DOCUMENTATION

Revision 5.0  
June 1993

LLW	Low Level Waste
LLRW	Low Level Radioactive Waste
LQ	Limited Quantity
LSA	Low-Specific Activity
MC&A	Materials Control & Accountability
MEF	Material Evaluation Form
MSDS	Material Safety Data Sheet
MW	Mixed Waste
nCi/g	Nanocuries per gram
NIST	National Institute of Standard and Technology
NPDES	National Pollution Discharge Elimination System
NRC	Nuclear Regulatory Commission
NTS	Nevada Test Site
OAC	Ohio Administrative Code
OR	Occurrence Report
PCB	Polychlorinated Biphenyls
PFLT	Percent Free Liquid Test
PLM	Polarized Light Microscopy
PPE	Personal Protective Equipment
PS&D	Package Storage & Disposal
QA	Quality Assurance
QAP	Quality Assurance Program
QC	Quality Control
RACM	Regulated Asbestos Containing Material
RCRA	Resource Conservation and Recovery Act

## VI. PROCEDURES AND SUPPORTING DOCUMENTATION

RD/RC	RCRA Characterization/Radiological Determination
REECo	Reynolds Electrical & Engineering Co., Inc.
RSP&I	Resource Planning, Scheduling and Integration
S&A	Sample and Analysis
S&TIL	Safety and Training Instrument Laboratory
SCAQ	Significant Conditions Adverse to Quality
SDR	Supplier Disposition Requests
SOP	Standard Operating Procedure
TA	Test Authorization
TC	Toxicity Characteristic
Th	Thorium
TRU	Transuranic
TRUMW	Transuranic Mixed Waste
TSCA	Toxic Substances Control Act
TSDF	Treatment, Storage, and Disposal Facility
U	Uranium
VOC	Volatile Organic Compound
WAC	Waste Acceptance Criteria
WC	Waste Certification
WCO	Waste Certification Official
WCPP	Waste Certification Program Plan
WMIS	Waste Management Information System
WPC	Waste Package Certifier
WSD	Waste Storage and Disposition



- GENERAL NOTES**
1. ALL DIMENSIONS SHALL BE TO FACE UNLESS OTHERWISE SPECIFIED.
  2. ALL MATERIALS SHALL BE AS SPECIFIED IN THE BILL OF MATERIALS.
  3. ALL MATERIALS SHALL BE OF GRADE AND CONDITION AS SPECIFIED IN THE BILL OF MATERIALS.
  4. ALL MATERIALS SHALL BE OF GRADE AND CONDITION AS SPECIFIED IN THE BILL OF MATERIALS.
  5. ALL MATERIALS SHALL BE OF GRADE AND CONDITION AS SPECIFIED IN THE BILL OF MATERIALS.
  6. ALL MATERIALS SHALL BE OF GRADE AND CONDITION AS SPECIFIED IN THE BILL OF MATERIALS.
  7. ALL MATERIALS SHALL BE OF GRADE AND CONDITION AS SPECIFIED IN THE BILL OF MATERIALS.
  8. ALL MATERIALS SHALL BE OF GRADE AND CONDITION AS SPECIFIED IN THE BILL OF MATERIALS.
  9. ALL MATERIALS SHALL BE OF GRADE AND CONDITION AS SPECIFIED IN THE BILL OF MATERIALS.
  10. ALL MATERIALS SHALL BE OF GRADE AND CONDITION AS SPECIFIED IN THE BILL OF MATERIALS.

DESIGN	ENGINEER	DATE	BY
PROJECT	NO.	REV.	DATE
<p>WESTINGHOUSE MATERIALS CO. OF OHIO                  FERNALD, OHIO                  FEDERAL MATERIALS PRODUCTION CENTER                  U.S. DEPARTMENT OF ENERGY</p>			
<p>METAL SUPPLY CONTINUED</p>			

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 1 of 18 <b>6053</b>
Title: COMPLETING THE MATERIAL EVALUATION FORM		DOCUMENT NO: SSOP-0002 REVISION NO. 3
Authorization: <i>W. H. Britton</i> 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.)

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- 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 ≤ 2 or ≥ 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 sulfid) 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.

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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 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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## 6.0 PROCEDURE

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### 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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## 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 required for the classification (refer to Item 7 of Section IV), forward the form to Environmental Engineering as 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 substeps:
  - 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.)

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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:

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#### 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.

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6.0 PROCEDURE (cont.)

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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"

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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 <sup>(1)</sup> .  b) List sources of information utilized for identifying the suspect substances indicated.

<sup>(1)</sup> Attach a copy of the MSDS as applicable.

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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 <sup>(2)</sup> .
20	Record the flashpoint of liquid material or liquid phase <sup>(2)</sup> .
21	If the material is a wet solid (sludge) and a paint filter test has been completed, specify test results (solid or liquid) <sup>(2)</sup> .
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. <sup>(2)</sup>
	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.

<sup>(2)</sup> Attach results if available. Identify source, such as a sample plan.

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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 261.1(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 RO hazardous substance. If yes, list the RO 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.

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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.

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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.

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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 <sup>(1)</sup>
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 <sup>(1)</sup>

<sup>(1)</sup> These references are included for information, not for operational use.

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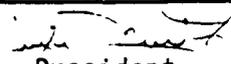
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RECORD OF ISSUE/REVISIONS

<u>DATE</u>	<u>REV. NO</u>	<u>DESCRIPTION AND AUTHORITY</u>
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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Authorization:  H. F. Daugherty, President	Supersedes: SSOP-0044I, Dated 02-19-92	Effective Date: 06-19-92

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**1.0 PURPOSE**

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.

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### 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.

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### 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.

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#### 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.

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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.

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#### 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.

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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

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## 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.

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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.

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7.0 PROCEDURE (cont.)

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**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.

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## 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.

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7.0 PROCEDURE (cont.)

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**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.

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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.

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7.0 PROCEDURE (cont.)

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**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.

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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.

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7.0 PROCEDURE (cont.)

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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"

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## 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"

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TABLE 1  
CONTAMINATED WASTE PACKAGING REQUIREMENTS

MATERIALS <sup>(1)</sup>	METAL CONTAINERS	DRUMS	INTERNATIONAL SHIPPING ORGANIZATION (ISO)	CONTAMINATED DUMPSTERS
Metal refuse	Yes	N/A	Yes <sup>(2)</sup>	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 <sup>(2)</sup>
Floor sweepings/dust collector residues	N/A	Yes <sup>(2)</sup>	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.

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

MATERIAL	MAXIMUM CONCENTRATION <sup>(1)</sup>	
	Category 1	Category 2
Depleted uranium	≤ 100	> 100
Enriched uranium	≤ 100	> 100
Thorium	≤ 50	> 50

<sup>(1)</sup> 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

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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 preparations will be completed with in connection with this work.)

Emergency Telephone Nos.: _____	Plant Shift Superintendent: _____
ISSUED TO: _____	WEMCO NO.: _____
PROJECT TITLE: _____	PLANT (W.O.) 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, vented, purged and tagged			
2. Pipelines under pressure, tagged (describe on back sheet)			
3. Machinery and equipment safe for work to proceed			
4. Construction excavator/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. Ample and appropriate 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 flameproof covers			
c. Welding blankets required			
d. Fire watch required			
e. Fire Department standby required			
ELECTRICAL		YES	NO
1. Circuits de-energized 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)			
* No answer required if Survey is for "Design Purposes"			
A. For Design Purposes - The undersigned believe that the information provided in this 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. For Posting - The undersigned certify that the work area has been cleared for the work indicated. This Construction ESH 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: DATE: _____	SAFETY & FIRE: DATE: _____	HAZARDOUS WASTE: DATE: _____	INDUSTRIAL HYGIENE: DATE: _____
SIGNATURE: _____	SIGNATURE: _____	SIGNATURE: _____	SIGNATURE: _____
GENERAL PROJECT ENGINEER: DATE: _____	INDUSTRIAL HYGIENE: DATE: _____	INDUSTRIAL HYGIENE: DATE: _____	INDUSTRIAL HYGIENE: DATE: _____
SIGNATURE: _____	SIGNATURE: _____	SIGNATURE: _____	SIGNATURE: _____

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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 (Not covered on ESH work permit form.) \_\_\_\_\_

---

GENERAL ITEM NO.: \_\_\_\_\_

---

FIRE PREVENTION ITEM NO.: \_\_\_\_\_

---

ELECTRICAL ITEM NO.: \_\_\_\_\_

---

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.			

73-F-2717 Revised (REV 4/20/92)



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Fernald Site  
CONTROLLER - GENERAL ACCOUNTING  
PROPERTY DISPOSAL REQUEST

JOURNAL VOUCHER NO		CONTROL NO	
FOR GENERAL ACCOUNTING USE ONLY			
C O S T	Basic .....		
	Other .....		
	Accumulated Depreciation .....		
	Net Book Cost .....		
Acquisition Date:		R.U. No.	
Estimated Cost:			

Date: \_\_\_\_\_

**SECTION - A**

DESCRIPTION		LOCATION	
D NO.		MANAGE NO	
MANUFACTURER		EQUIPMENT NO	
MODEL NO. <small>(If Serial No. is shown, use Serial No.)</small>		DOES UNIT CONTAIN PRECIOUS OR CRITICAL MATERIALS?	
SERIAL NO.		<input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, TYPE	
MFG NO. (MATERIAL EVALUATION FORM)		CHECK ONE YES: NO NA	
SIZE OR CAPACITY		Are spare parts available? .....	
		Are manuals available? .....	
		Are spare parts to be excessed? .....	
		Material Evaluation Form .....	
		Material Safety Data Sheet .....	

SURPLUS  NON-SURPLUS

**SECTION - B**

PHYSICAL CLASSIFICATION	DISPOSAL CONDITION CODE									1 = Unused - good	4 = Used - good	7 = Repairs Required - good
	Excess	1	2	3	4	5	6	7	8	9	2 = Unused - fair	5 = Used - fair
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:			<input type="checkbox"/> Information Erased from Hard Disk						<input type="checkbox"/> 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.

PS-F-485 (REV. 11/78/91)

PROPERTY DISPOSAL REQUEST  
FORM FMPC-CONST-563  
Figure 3

000194

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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)							Archive		
			1	2	3	4	5	6	7			
Concrete/Asphalt	Drum	Drum										
Soil	Tank	Tank										
Surface	Sump	Sump										
1 ft	6 ft	Pit										
2 ft	7 ft	Basin										
3 ft	8 ft	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 Received: _____			Scheduled Start Date: _____			Scheduled Completion Date: _____						

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<p><b>TABLE 1 TCLP (Full Spectrum)</b></p> <p><b>METALS</b></p> <p>Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver</p> <p><b>PESTICIDE/HERBICIDE</b></p> <p>Chlorodane 2,4 - D Endrin Lindane Methoxychlor Toxaphene 2,4,5 - TP Acid - (Solvent)</p> <p><b>VOLATILES</b></p> <p>Benzene Carbon Tetrachloride Chlorobenzene Chloroform 2 - Butane 1,1 - Dichloroethane 1,2 - Dichloroethane Tetrachloroethylene Vinyl Chloride</p>	<p><b>SEMI VOLATILES</b></p> <p>1,4 - Dichlorobenzene 2,4 - Dinitrobenzene Hexachlorobenzene Hexachlorocyclohexane Hexachloro - 1,3 - Butadiene Nitrobenzene Pentachlorophenol 2,4,5 - Trichlorophenol 2,4,6 - Trichlorophenol o - Cresol m - Cresol p - Cresol Pyridine</p>	<p><b>TABLE 4 VOA/SEMI VOA _ TCLP _ TOTALS</b></p> <p><b>VOLATILES</b></p> <p>Benzene Carbon Tetrachloride Chlorobenzene Chloroform 2 - Butane 1,1 - Dichloroethane 1,2 - Dichloroethane Tetrachloroethylene Trichloroethylene Vinyl Chloride</p> <p><b>SEMI VOLATILES</b></p> <p>1,4 - Dichlorobenzene 2,4 - Dinitrobenzene Hexachlorobenzene Hexachlorocyclohexane Hexachloro - 1,3 - Butadiene Nitrobenzene Pentachlorophenol 2,4,5 - Trichlorophenol 2,4,6 - Trichlorophenol o - Cresol m - Cresol p - Cresol Pyridine</p>	<p><b>TABLE 5 RAD</b></p> <p>- 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</p>	<p><b>TABLE 6 TOTAL VOA</b></p> <p>Acetone Benzene Carbon Disulfide Carbon Tetrachloride Chloroacetylene Chlorobenzene Chloroethane Chloroform 1,1 - Dichloroethane 1,2 - Dichloroethane Trans - 1,2 - Dichloroethane o - Dichlorobenzene 2 - Ethoxyethanol 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</p>
	<p><b>TABLE 2 METALS _ TCLP _ TOTALS</b></p> <p><b>METALS</b></p> <p>Arsenic Lead Barium Mercury Cadmium Selenium Chromium Silver</p>		<p><b>TABLE 7</b></p> <p>- Paint Filter Liquid Test (PFLT) - pH (if PFLT fails) - Flash Point (if PFLT fails) - HSL - Full - Expanded - Abbreviated</p>	
	<p><b>TABLE 3 PEST/HERB _ TCLP _ TOTALS</b></p> <p><b>PESTICIDE/HERBICIDE</b></p> <p>Chlorodane 2,4 - D Methoxychlor Endrin Toxaphene Lindane 2,4,5 - TP Acid - (Solvent)</p>			

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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.: \_\_\_\_\_

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CARD XX ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION 159791

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE			SHIFT	BADGE NO.	PACKAGE NO.
					MO	DAY	YEAR			
SEAL NUMBER		SEAL DATE		PACKAGE PHYSICAL CERTIFICATION			PLANT	PROD. MBA		
		MONTH/ DAY / YEAR		YES NO						
				EMPTY CONTAINER AT START						
				RUST HOLES OR DENTS						
				MATERIAL IS AS CODED			PLANT TO	MBA TO		
WASTE DESCRIPTION AND COMMENTS				PROHIBITED MATERIALS					GROSS WEIGHT	
				LIQUIDS IN CONTAINER						
PACKAGE TYPE				MINIMUM OF VOID SPACE					TARE WEIGHT	
PACKAGE SIZE				PACKAGE SECURED						
				DRAIN PLUG SECURED					NET WEIGHT	
GENERATOR SIGNATURE						SUPERVISOR SIGNATURE				
FMPC-CONT-1945-XX (REV 12-19-88)						DATE				

U.S. GPO 1980-751-419

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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.

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## 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.

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## 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.

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RECORD OF ISSUE/REVISIONS

<u>DATE</u>	<u>REV. NO</u>	<u>DESCRIPTION AND AUTHORITY</u>
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.

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Controlled Copy No. \_\_\_\_\_  
SITE STANDARD OPERATING PROCEDURE  
DOCUMENT NO. SSOP-0075  
REVISION NO. 0

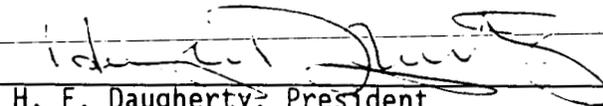
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# PACKAGING LOW LEVEL RADIOACTIVE WASTE (LLRW) IN DRUMS FOR OFFSITE SHIPMENT

SSOP-0075

Effective Date: 12-14-92

AUTHORIZED BY:

  
H. F. Daugherty, President

11/30/92  
Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

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RECORD OF ISSUE/REVISIONS

<u>DATE</u>	<u>REV. NO</u>	<u>DESCRIPTION AND AUTHORITY</u>
12-14-92	0	Separate procedure written, using information from SSOP-0024, for packaging LLRW in drums per Request No. S92-123, initiated by M. Hundley. SSOP-0075, SSOP-0078, and SSOP-0079 replaces SSOP-0024.

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## 1.0 PURPOSE

This procedure provides the instructions for packaging low level radioactive waste (LLRW) in drums for shipment off-site from the Fernald Environmental Management Project (FEMP).

## 2.0 SCOPE

This procedure outlines the steps for (1) inspecting the waste to be packaged, (2) inspecting empty drums, (3) filling drums, (4) weighing filled drums, and (5) securing and labeling the drums.

The packaging operation is applicable to FEMP personnel (including subcontractors) responsible for packaging LLRW into open-head drums at any packaging location of the FEMP site. The packaging operation originates upon approval from DOE for a specific waste stream.

## 3.0 DEFINITIONS

Drum - A cylindrical, metal open-head container which meets Department of Transportation (DOT) and Environmental Protection Agency (EPA) requirements, and Nevada Test Site (NTS) acceptance criteria.

Free Liquid - Any free flowing liquid or any liquid that readily separates from the solid portion of a waste under ambient temperature and pressure conditions. Ice is also considered a free liquid.

Low-Level Radioactive Waste (LLRW) - All radioactive waste not classified as high-level waste, spent nuclear fuel, TRU waste, uranium mill tailings, or MW. Low-level waste can contain TRU nuclides in concentrations not greater than 100 nanocuries per gram, where TRU means transuranic and MW means mixed waste.

Packaging Location - Any area where waste is stored or generated.

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, documentation and proper management of hazardous wastes.

## 4.0 RESPONSIBILITIES

### Environmental Compliance & Quality Assurance (EC&QA)

- Ensures waste is not a prohibited material.
- Provides documentation supporting characterization results as needed.

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#### 4.0 RESPONSIBILITIES (cont.)

- Overviews packaging operation to ensure compliance with this procedure.

##### Industrial, Radiological Safety & Training (IRS&T)

- Provides a Radiological Safety Technician, as requested.
- Determines appropriate respiratory equipment and any other employee protection.

Logistics Administration specifies the drum type.

Materials Control and Accountability (MC&A) provides bar-code labels.

##### Motor Vehicle Operator (MVO) of Facilities and Warehousing (F&W)

- Transports packaged waste to the applicable storage area.
- Delivers empty drums to designated areas.
- Supports packager when performing scale inspection/test.

##### Packager

- Inspects waste per this procedure.
- Packages waste per this procedure.
- Complies with any additional requirements specified by Industrial, Radiological Safety and Training (IRS&T).

##### Supervisor

- Specifies applicable scale procedures and standard tare weight of packages.
- Ensures packaging materials are available for packagers.
- Ensures that trained personnel package waste material.
- Determines disposition of waste material identified in this procedure.
- Ensures that personnel package waste for shipment to meet applicable Nevada Test Site (NTS), Department of Transportation (DOT), and Environmental Protection Agency (EPA) regulations.

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#### 4.0 RESPONSIBILITIES (cont.)

- Contacts Industrial, Radiological Safety and Training (IRS&T) to determine the appropriate respiratory protection for the process being performed and the radiological surveys required for materials moving in and out of regulated areas.
- Provides packagers with the required respiratory protection and other personal protective equipment.
- Ensures the lid on an unfilled waste container is secured when no packaging is occurring to prevent addition of unknown materials.
- Ensures waste packages are weather-protected.
- Contacts IRS&T prior to opening any drum of unknown radioactive material.

#### 5.0 GENERAL

None

#### 6.0 PREREQUISITES

##### 6.1 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

- Safety glasses with side shields shall be worn unless other eye protection is specified by IRS&T.
- Respiratory protection provided by the supervisor shall be worn when required.
- ~~Leather-palm-gloves shall be worn when handling drums, operating equipment, and handling rough, sharp-edged, or contaminated material.~~
- HEPA type filter vacuum cleaners or a vacuum system approved by IRS&T with a current DOP test label properly affixed to vacuum shall be used for cleaning.
- A minimum of two packagers shall package waste.

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## 6.0 PREREQUISITES (cont.)

- Any circumstance which could have resulted in an employee inhaling, ingesting or absorbing radioactive materials shall immediately be reported to a supervisor. The supervisor shall immediately report the possibility of radioactive materials intake to IRS&T Radiological Safety Section. The involved employee(s) shall report to the FEMP Urine Sampling Station at the end of their shift to complete an "Incident Investigation Report" (IIR), Form FMPC-ES&H-1458 and submit an incident urine sample. The involved employee(s) shall also report to the Urine Sampling Station at the start of their next shift to submit a follow-up urine sample. Employees shall be held accountable for complying with additional requirements as specified by IRS&T.

### 6.2 PACKAGING SUPPLIES

- Obtain the following items/supplies prior to preparing drums and packaging waste:
  - indelible ink marker
  - black paint, red paint, white paint (as applicable)
  - 15/16 inch combination wrench
  - calibrated torque wrench
  - wire and wire pullers
  - applicable drum labels
  - lab label tape and dispenser

### 6.3 POSTING REQUIREMENTS

- A "Prohibited Materials List" (see Figure 1) shall be displayed in the packaging area.

### 6.4 WASTE CHARACTERIZATION

- A Material Evaluation Form (MEF), FS-F-3252, shall be completed to categorize the material as RCRA or Non-RCRA.

**NOTE:** A numbered MEF may be obtained from Waste Management Records and initiated per SSOP-0002, "Completing the Material Evaluation Form".

- Additional documentation supporting the characterization results shall be provided by Environmental Compliance.

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## PACKAGING GUIDELINES FOR WASTE GENERATOR

Package has been properly prepared for closing:

No liquids of any kind have been placed in container

Heavy/bulky items have been secured within container

All available space has been utilized efficiently

Prohibited materials have been excluded (see below)

Packaging has not been damaged during loading

Liner is in place and properly lapped and sealed

---

## PROHIBITED MATERIALS

Compressed Gases (unpunctured aerosol cans included)

Explosives

---

Free liquids

Fine particulates (respirable fines)

Hazardous Waste (suspect RCRA materials included)

Corrosive materials

Etiologic agents

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## 6.0 PREREQUISITES (cont.)

- A sample of the waste for Toxicity Characteristic Leaching Procedure (TCLP) may be required as requested by Facilities and Material Evaluation (FME).
- A sample may be required for major radionuclides and other suspected nuclides as determined by supervision.

## 7.0 PROCEDURE

**NOTE:** Within this section, Warnings and Cautions precede the step to which they apply. Notes follow the step to which they apply.

### 7.1 INSPECTING THE WASTE

#### EC&QA AND PACKAGER

1. Ensure the waste to be packaged is not on the "Prohibited Materials List" (see Figure 1).

#### PACKAGER

- a. If the waste is listed on the "Prohibited Materials List", do not package this waste. Notify supervisor for disposition.
2. As required, notify supervisor that a Radiological Safety Technician (RST) is needed.

**WARNING**

**AN RST SHALL BE PRESENT PRIOR TO OPENING ANY CONTAINER OF UNKNOWN RADIOACTIVE MATERIAL.**

3. As applicable, remove container lid. Visually check waste for free liquid.
  - a. If free liquid is present or material is wet, notify supervisor.
4. When recent weather conditions have occurred that could cause ice, carefully inspect waste for ice.
  - a. If ice is present in waste, notify supervisor.

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## 7.1 INSPECTING THE WASTE (cont.)

**PACKAGER**

5. Complete a "Visual Inspection of Drummed Material", Form FS-F-3570 (see Figure 2), as applicable and transmit to supervisor.
6. Fill out an "Item Production/Certification/Identification", XX card, Form FS-F-1945-XX (see Figure 3) as follows:
  - a. Record the FEMP Lot Marking Code per "FEMP Lot Marking and Color-Coding System", RM-0005, in the areas titled "P.O. No.", "Source", "Material Class", and "Material Type".
  - b. Record a general description of the waste in the area titled "Waste Description and Comments".

## 7.2 PREPARING EMPTY DRUMS

**SUPERVISOR**

1. Notify Facilities and Warehousing (F&W) to deliver appropriate type of drum(s) to the designated packaging area.

**NOTE:** The specific drum type shall be determined by Logistics Administration.

**PACKAGER**

2. Visually inspect the drum interior and exterior for damage, such as corrosion, dents, holes, or other defects (refer to Tables 1 and 2).
  - a. If the drum is damaged, mark the lid or side with a red "X" and refer to Tables 1 and 2 for corrective action, as applicable.
3. Visually inspect the interior to ensure the drum is empty.
  - a. If material is present in the drum, notify supervisor.
4. Using indelible ink, mark the lot and drum number per the "FEMP Lot Marking and Color Coding System", RM-0005, on the lid and side of the drum (see Figure 4).

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**FEMP  
VISUAL INSPECTION OF DRUMS**

INSPECTOR'S NAME:		BADGE NUMBER:	DATE:
INVENTORY NUMBER:	FEMP LOT NUMBER:		DRUM NUMBER:
DESCRIPTION OF MATERIAL: <input type="checkbox"/> Solid <input type="checkbox"/> Liquid <input type="checkbox"/> Damp    Color _____		FREE-STANDING LIQUID/ICE: <input type="checkbox"/> Yes <input type="checkbox"/> No	
AMOUNT OF MATERIAL IN DRUM: <input type="checkbox"/> Empty <input type="checkbox"/> 1/4 Full <input type="checkbox"/> 1/2 Full <input type="checkbox"/> 3/4 Full <input type="checkbox"/> Full		IS IT O.P., IF SO WHAT SIZE:	
WEIGHTS ON DRUM: G _____    T _____    N _____		pH, IF LIQUID:	

COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

\_\_\_\_\_  
 PACKAGER DATE

FS-F-3570 (8/17/92)

Figure 2 - VISUAL INSPECTION OF DRUMMED MATERIAL  
Form FS-F-3570

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CARD 65-1 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION											INV. NO.:	
P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE			SHIFT	BADGE NO.	CONT. NO.	SERIAL NO.	
					MO	DAY	YEAR					
SEAL NUMBER		SEAL DATE			PACKAGE PHYSICAL CERTIFICATION			PLANT	PROD. MBA	MEF NO.		
		MONTH	DAY	YEAR	YES NO							
					EMPTY CONTAINER AT START			DCAR	SURV. NO.	GROSS WEIGHT		
					RUST HOLES OR DENTS							
					MATERIAL IS AS CODED					TARE WEIGHT		
					PROHIBITED MATERIALS							
					LIQUIDS IN CONTAINER					NET WEIGHT		
					MINIMUM OF VOID SPACE							
PACKAGE TYPE					PACKAGE SECURED							
PACKAGE SIZE					DRAIN PLUG SECURED							
PROJECT					OVERPACK							
					REPACK							
GENERATOR SIGNATURE						SUPERVISOR SIGNATURE						DATE
FS-F-1945-1 (REV. 11/20/92)												

Figure 3 - ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION CARD  
Form FS-F-1945-XX

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**TABLE 1  
CORROSION INSPECTION CATEGORIES**

CATEGORY	CHARACTERISTIC	COULD CAUSE LOSS OF DRUM INTEGRITY		CORRECTIVE ACTION
		YES	NO	
<b>A</b>	Severe corrosion with deep pitting and/or metal flaking	X		1. Notify supervisor.  <b>NOTE:</b> The drum requires disposition as directed by supervision within 24 hours.
<b>B</b>	Corrosion with shallow pitting and/or mild metal flaking		X	1. Proceed as directed by the supervisor.  <b>NOTE:</b> Disposition shall be determined by the supervisor following review of completed inspection form.
<b>C</b>	Surface rust with no pitting and mild paint flaking which exposes bare metal		X	1. Proceed as directed by the supervisor. Repainting shall be scheduled by supervisor.

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**TABLE 2  
LLRW DRUM INSPECTION**

INSPECTION ITEM	INSPECTION CRITERIA	CORRECTIVE ACTION REQUIRED
<b>Hole</b>	An opening in the container including breach, gouge, puncture or leak.	Notify supervisor of condition and request disposition instructions.
<b>Dent</b>	A crease, depression or hollow made by blow or pressure; a concave distortion which jeopardizes the integrity of the container. A dent in the top or bottom rim.	Notify supervisor of condition and request disposition instructions.
<b>Bulge</b>	A swollen area, a convex distortion, an outward bend which jeopardizes the integrity of the container.	Notify supervisor of condition and request disposition instructions.

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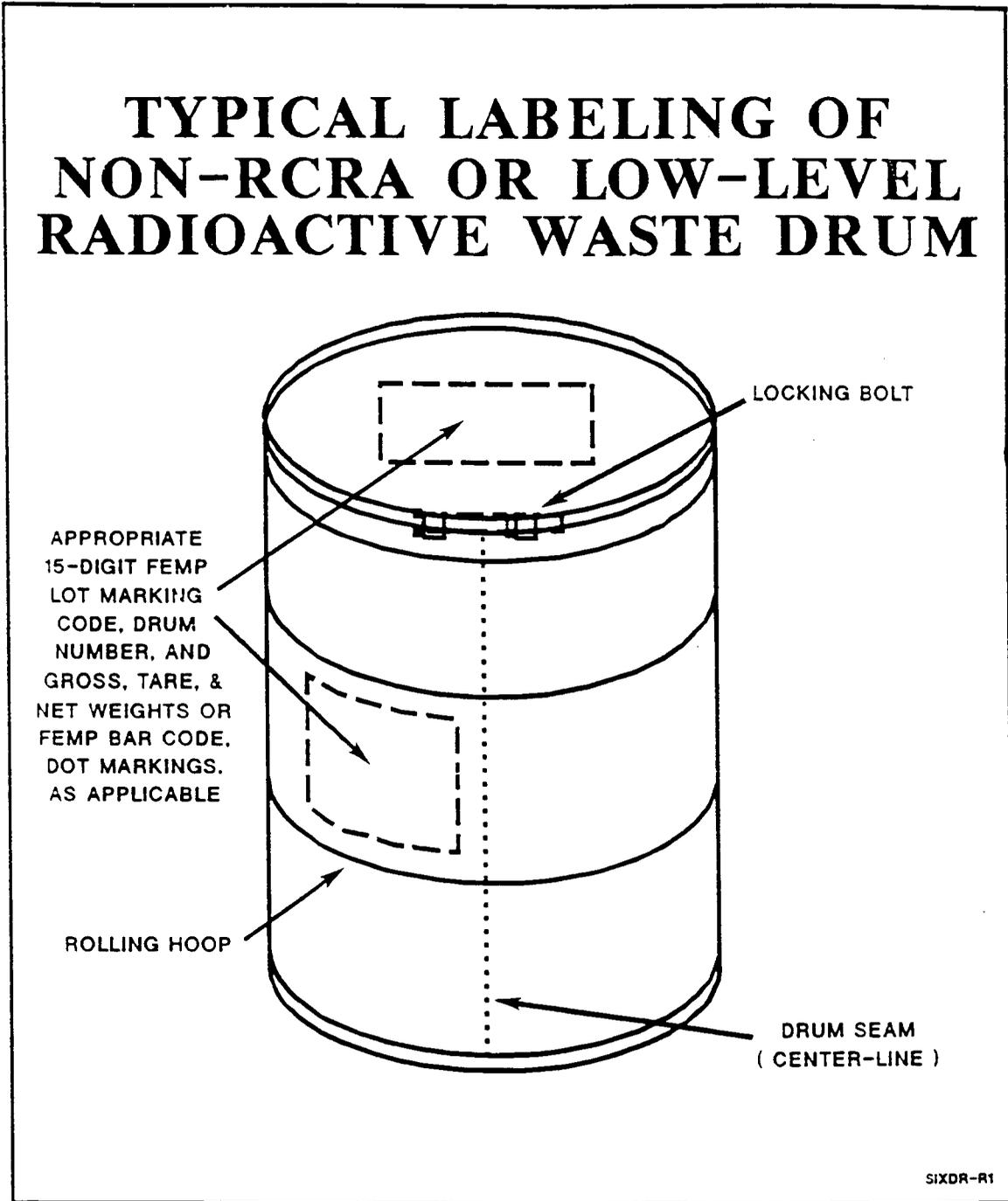


Figure 4 - LOCATIONS FOR LLRW DRUM LABELING

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## 7.2 PREPARING EMPTY DRUMS (cont.)

**PACKAGER**

5. On the XX Card (see Figure 3), record the type of container in the area titled "Package Size" and fill out the "Package Physical Certification" area excluding the last two items.

**SUPERVISOR**

6. Specify the scale for weighing and the method of transporting the drum to the scale.

**PACKAGER**

7. Inspect the scale to be used per the scale procedure applicable to the area.
8. Using method specified by supervisor, place drum on scale.
9. Tare weigh every twentieth drum for each drum type per the scale procedure applicable to the area.
10. Insert the XX card into the scale printer to record tare weight.
11. Using method specified by supervisor, remove drum from scale.
12. Move drum to loading area as directed by the supervisor.

## 7.3 FILLING DRUMS WITH WASTE MATERIAL

**EC&QA**

1. Oversee filling of drums to ensure compliance with this procedure.
  - a. If a nonconformance is identified, document and evaluate for corrective action per applicable department procedure.

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### 7.3 FILLING DRUMS WITH WASTE MATERIAL (cont.)

**CAUTION**

**RESPIRATORS AND OTHER PERSONAL PROTECTIVE EQUIPMENT PROVIDED BY THE SUPERVISOR SHALL BE WORN PRIOR TO FILLING DRUMS.**

#### PACKAGER

2. Manually remove lock ring and lid from empty drum.
3. Using method specified by supervisor, fill drum with LLRW ensuring the waste level remains three inches below top of drum.

**NOTE:** Because the density varies according to waste type, the volume of waste to be packed will vary.

4. Place lid on drum ensuring gasket is seated to maintain a tight seal.
5. Install bolt-type lock ring on lid.

### 7.4 WEIGHING FILLED DRUMS

#### SUPERVISOR

1. Specify scale for weighing and the method of transporting drum to scale.

#### PACKAGER

2. Inspect scale to be used per the applicable scale procedure.

#### MVO

3. Using equipment specified by supervisor, move drum onto scale.

#### PACKAGER

4. Using the applicable scale procedure, weigh drum and note scale indication of gross weight.

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## 7.4 WEIGHING FILLED DRUMS (cont.)

**PACKAGER**

5. If drum gross weight is over specified limit (refer to Table 3), then proceed as follows:

**TABLE 3  
WEIGHT LIMITATIONS**

DRUM SIZE	MAXIMUM GROSS WEIGHT
30 gallons	700 pounds
55 gallons	1,200 pounds
85 gallons	1,000 pounds

- a. On the scale, remove lock ring and lid from the drum.
  - b. Gradually transfer waste from drum into approved container until the scale indicates gross weight of drum is within limits in Table 3.
- NOTE:** The removed material may be included in an underweight drum of the same lot or packaged in another drum of the same lot.
- c. Place lid on drum and install bolt-type lock ring on lid.

**MVO**

6. Using equipment specified by supervisor, remove the drum from the scale.

**PACKAGER**

7. Using indelible ink, mark the gross weight on the lid and side of the drum in the area shown in Figure 4.
8. Calculate net weight.
9. Complete XX Card including gross weight, net weight, lot sequence number, badge number, and signature.
10. Transmit XX Card to supervisor.

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#### 7.4 WEIGHING FILLED DRUMS (cont.)

##### **SUPERVISOR**

11. Sign XX card and transmit XX card to MC&A.

##### **MC&A**

12. Using XX card data, print required bar-code labels and submit to supervisor.

#### 7.5 SECURING AND LABELING DRUMS

##### **PACKAGER**

1. Visually inspect drum for corrosion and dirt.
  - a. If drum is not clean, wipe drum exterior with a rag and dispose of rag in a designated container.
  - b. If corrosion is present, notify supervisor.
2. Using a combination wrench and a torque wrench, tighten lock ring bolt to a minimum of  $45 \pm 5$  pounds.
3. Secure lid by completing the following steps:
  - a. Manually thread wire through bolt holes.
  - b. Using wire pullers, clamp wire and pull away from bolt.
 

**NOTE:** The wire should twist together when pulled.
  - c. Remove wire pullers from wire.
  - d. Manually grasp twisted wire and bend underneath the bolt.
4. Using red paint, apply dot on bolt.
5. Using bar-code labels provided by supervisor, affix labels to the lid and side of drum as shown in Figure 4.

**NOTE:** For drums requiring immediate shipment, labels do not require the positioning (in relation to the seam) shown in Figure 4.

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## 7.5 SECURING AND LABELING DRUMS (cont.)

**MVO**

6. Using a hoist/crane and barrel grab or equipment specified by supervisor, place the drum with bolt of lock ring facing outward on pallet.

**PACKAGER**

7. Notify supervisor the waste has been packaged.

**SUPERVISOR**

8. Request MVO to move pallet(s) to a designated storage area or to the designated waste staging area.

**MVO**

9. Strap drum(s) and move pallet(s) to the storage area or the waste staging area specified by the supervisor.

8.0 APPLICABLE DOCUMENTS

## 8.1 DRIVERS

NVO-325, "Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements"

## 8.2 REFERENCES

~~RM-0005, "FEMP Lot Marking and Color-Coding System"~~

SSOP-0002, "Completing the Material Evaluation Form"

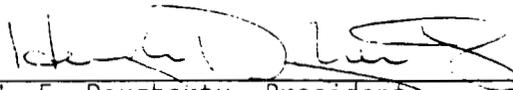
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# PACKAGING LOW LEVEL RADIOACTIVE WASTE (LLRW) INTO ISO CONTAINERS FOR OFFSITE SHIPMENT

SSOP-0078

Effective Date: 12-14-92

AUTHORIZED BY:

  
H. F. Daugherty, President

11/30/92  
Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Westinghouse Environmental Management Company of Ohio

P. O. Box 398704  
Cincinnati, Ohio 45239-8704

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RECORD OF ISSUE/REVISIONS

<u>DATE</u>	<u>REV. NO</u>	<u>DESCRIPTION AND AUTHORITY</u>
12-14-92	0	New procedure required for shipping LLRW in ISO containers per Request S92-175, initiated by M. Hundley. SSOP-0079, SSOP-0075, and SSOP-0078 replace SSOP-0024.

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### 1.0 PURPOSE

This procedure provides the instructions for packaging low level radioactive waste (LLRW) into ISO containers for shipment offsite from the Fernald Environmental Management Project (FEMP).

### 2.0 SCOPE

This procedure outlines the steps for (1) preparing the empty ISO container, (2) inspecting the waste to be packaged, (3) filling container with waste, (4) weighing container, and (5) labelling container.

The packaging operation is applicable to FEMP personnel (including subcontractors) responsible for packaging LLRW in ISO containers at any packaging location of the FEMP site. This operation originates upon approval by DOE for a specific waste stream. LLRW may be packaged at any designated packaging location at the FEMP.

### 3.0 DEFINITIONS

Free Liquid - Any free flowing liquid or any liquid that readily separates from the solid portion of a waste under ambient temperature and pressure conditions. Ice is also considered a free liquid.

ISO Container - An Intermodal container (Dry Cargo Type). Those used at the FEMP typically measure 8-1/2 feet high X 8 feet wide X 20 feet long with two doors on the end. Although frequently referred to as a "Sea/Land" container at the FEMP, an ISO container may be, but is not necessarily, a Sea-Land container.

Low Level Radioactive Waste (LLRW) - Waste that contains radioactivity and is not classified as high level waste, transuranic waste, spent nuclear fuel or 11e(2) byproduct material as defined by DOE Order 5820.2A. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may be classified as low-level waste, provided the concentration of transuranic is less than 100 nCi/g.

Packaging Location - Any area where waste is stored or generated.

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, documentation and proper management of hazardous wastes.

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### 3.0 DEFINITIONS (cont.)

Toxicity Characteristic Leaching Process (TCLP) - A RCRA term referring to wastes, the extracts from which contain the contaminants listed in Table 1 of 40 CFR 261.24, at a concentration equal to or greater than the respective value given in the table.

### 4.0 RESPONSIBILITIES

Checker fills out weight ticket.

Environmental Management (Facilities & Material Evaluation) provides documentation supporting characterization results as needed.

Industrial, Radiological Safety & Training (IRS&T)

- Provides a Radiological Safety Technician, as requested.
- Determines appropriate respiratory equipment and any other employee protection.

Logistics Administration specifies the required waste container.

Materials Control and Accountability (MC&A) provides bar-code labels.

Packager

- Inspects waste and container per this procedure.
- Packages waste per this procedure.
- Complies with any additional requirements specified by IRS&T.

Quality Assurance (QA) overviews packaging operation to ensure compliance with this procedure.

Supervisor of the waste generation area or packager

- Specifies applicable scale procedures and standard tare weight of packages.
- Ensures packaging materials are available for packagers.
- Ensures that trained personnel package waste material.
- Determines disposition of waste material identified in this procedure.

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#### 4.0 RESPONSIBILITIES (cont.)

- Ensures that personnel package waste for shipment to meet applicable Nevada Test Site (NTS), Department of Transportation (DOT), and Environmental Protection Agency (EPA) regulations.
- Contacts Industrial, Radiological Safety and Training (IRS&T) to determine the appropriate respiratory protection for the process being performed and the radiological surveys required for materials moving in and out of regulated areas.
- Contacts Radiological Safety for a radiological work permit or other safety permits and ensures permits are obtained and signed prior to performing work.
- Provides packagers with the required respiratory protection and other personal protective equipment.
- Ensures the doors on an unfilled waste containers are secured when no packaging is occurring thereby preventing addition of unknown materials.
- Ensures waste packages are weather-protected.
- Contacts IRS&T prior to opening any container of unknown radioactive material.

#### 5.0 GENERAL

- 5.1 The determination to package a waste stream is based on approval by DOE and a completed Material Evaluation Form.
- 5.2 On-site movement of waste shall be completed per PP-0314.

#### 6.0 PREREQUISITES

##### 6.1 INDUSTRIAL SAFETY AND HEALTH REQUIREMENTS

Safety glasses with side shields shall be worn unless other eye protection is specified.

Respiratory protection provided by the supervisor shall be worn when required.

Leather-palm gloves shall be worn when handling containers, operating equipment and when handling rough, sharp-edged, or contaminated material.

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## 6.0 PREREQUISITES (cont.)

### 6.1 INDUSTRIAL SAFETY AND HEALTH REQUIREMENTS

Neoprene rubber gloves shall be worn when handling HEPA type filter vacuum cleaners, or a vacuum system approved by IRS&T with a current DOP test label properly affixed to vacuum shall be used for cleaning.

A Radiation Work Permit must be approved and current.

Face shields shall be worn when removing lids or bungs of containers filled with liquids or during operations where the possibility exists that personnel could be splashed with liquids.

Any circumstance that could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a follow-up urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

### 6.2 TOOLS AND MATERIALS REQUIRED

Obtain the following items/supplies prior to performing the packaging operation:

- appropriate safety protective equipment
- silicone caulk
- caulk gun
- absorbent pads
- 1/4 inch x 4 foot x 8 foot plywood sheets (all grades)
- plastic liner (6 mil)
- utility knife
- clean rags
- indelible marker
- 1-1/2 inch black bands, clips, and banding equipment

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## 6.0 PREREQUISITES (cont.)

### 6.3 WASTE CHARACTERIZATION REQUIREMENTS

A Material Evaluation Form (MEF), FMPC-OPR-3252 shall be initiated to determine if the material is RCRA/Non-RCRA. The packaging operation may be started before the characterization results are received.

**NOTE:** A numbered MEF may be obtained from Waste Management Records and initiated per SSOP-0002.

Additional documentation supporting the characterization results shall be provided by Facilities and Material Evaluation (F&ME).

A sample of the waste for Toxicity Characteristic Leaching Process (TCLP) may be required as requested by Hazardous & Solid Waste Compliance.

A sample may be required for major radionuclides and other suspected nuclides as determined by supervision.

### 6.4 PERSONNEL REQUIREMENTS

A minimum of two personnel are required to package waste.

Packagers shall be certified in use of Personal Protective Equipment (PPE).

## 7.0 PROCEDURE

### 7.1 PREPARING EMPTY ISO CONTAINER

#### **SUPERVISOR**

1. Notify Facilities and Warehousing (F&W) to deliver an empty ISO container to the designated packaging area.

**NOTE:** The specific ISO container type will be determined by Logistics Administration.

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## 7.1 PREPARING EMPTY ISO CONTAINER (cont.)

**PACKAGER**

2. After the container is delivered, open ISO container doors and visually inspect the container interior and exterior for damage, such as dents, holes, or other defects.
  - a. If the container is damaged or shows evidence of leakage, notify supervisor.
3. Visually inspect interior to ensure the container is empty.
  - a. If material is present in the container, notify supervisor.

**SUPERVISOR**

4. Specify the scale for weighing and method of transporting the container to the scale.

**PACKAGER**

5. Inspect the scale to be used per the scale procedure applicable to the area.

**HEO**

6. As directed by the supervisor, move the container onto the scale.

**PACKAGER**

7. Tare weigh every twentieth container per the applicable department scale procedure applicable to the area.
8. Calculate tare weight by adding 350 lbs to weight of container.

**NOTE:** The weight of 350 lbs represents the materials used to prepare the container.

9. Initiate an Item Production/Certification/Identification XX card, Form FS-F-1945 by recording the tare weight (see Figure 1).

**HEO**

10. Using the method specified by supervisor, remove the container from the scale.

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7.1 PREPARING EMPTY ISO CONTAINER (cont.)

**PACKAGER**

11. Caulk seams, air vents, welded patches, and any other container openings.

**NOTE:** Seams closed with a continuous weld need not be caulked.

- a. If a breach or hole is present, notify supervisor.

**NOTE:** Supervisor shall contact Maintenance to complete repair.

12. Completely cover floor of container with two layers of absorbent pads permitting no gaps. Allow padding to extend three inches,  $\pm$  one inch, upward along each wall.

**NOTE:** Doorway edge shall remain free of padding at this time.

13. Apply silicone caulk, approximately 4 feet,  $\pm$  6 inches high, along the three walls of the container to hold liner in place.
14. Starting at the back of the container, unroll plastic liner over floor to the front of the container, ensuring plastic is up a minimum of 4 feet, along each wall.
15. Using a utility knife, cut off excess liner extending beyond front of container.
16. Drape and press remaining sections of liner to the three caulked walls of the container.
17. Place one layer of absorbent pads over liner on container floor, allowing pad to extend approximately three inches,  $\pm$  one inch, upward along the three walls.
18. Starting at the back of container, place plywood sheets over the pads, overlapping, across the container floor to the doorway.
19. Lean three plywood sheets along each container side and one plywood sheet along the back wall.

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## 7.1 PREPARING EMPTY ISO CONTAINER (cont.)

**PACKAGER**

20. Adhere the "Prohibited Materials List" (see Figure 2) to interior side of door.
21. Notify supervisor the container preparation is complete.

**NOTE:** Supervisor shall notify QA that the container has been prepared.

**QA**

22. Inspect container preparation per applicable department procedure for compliance with this procedure.

## 7.2 INSPECTING THE WASTE

**PACKAGER**

1. Ensure the waste to be packaged is not on the "Prohibited Materials List" (see Figure 2).
  - a. If the waste is listed on the "Prohibited Materials List", do not package this waste. Notify supervisor for disposition.
2. When weather conditions occur that could cause ice, carefully inspect waste for ice.
  - a. If ice is present in waste, notify supervisor.
3. Record the following data on the XX Card (see Figure 1) for each container as follows:
  - a. Determine the FEMP Lot Marking Code per RM-0005, "FEMP Lot Marking and Color-Coding System" and record code in the areas titled "P.O. No.", "Source", "Class", and "Material Type".
  - b. Record a general description of the waste in the area titled "Waste Description and Comments".

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INTO ISO CONTAINERS FOR OFFSITE SHIPMENT**

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REVISION NO. 0

Authorization:  
H. F. Daugherty, President

Replaces: SSOP-0024,  
Dated 10-14-91, Rev. 0

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CARD 65-1 **ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION**

INV. NO.:

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE			SHIFT	BADGE NO.	CONT. NO.	SERIAL NO.
					MO	DAY	YEAR				
SEAL NUMBER	SEAL DATE			PACKAGE PHYSICAL CERTIFICATION				PLANT	PROD. MBA	MEF NO.	
	MONTH	DAY	YEAR	YES NO							
WASTE DESCRIPTION AND COMMENTS				EMPTY CONTAINER AT START				DCAR	SURV. NO.	GROSS WEIGHT	
				RUST HOLES OR DENTS							
PACKAGE TYPE				MATERIAL IS AS CODED				TARE WEIGHT			
				PROHIBITED MATERIALS							
PACKAGE SIZE				LIQUIDS IN CONTAINER				NET WEIGHT			
				MINIMUM OF VOID SPACE							
PROJECT				PACKAGE SECURED							
				DRAIN PLUG SECURED							
				OVERPACK							
				REPACK							

\_\_\_\_\_  
GENERATOR SIGNATURE  
FS-F-1945-1 (REV. 11/20/92)

\_\_\_\_\_  
SUPERVISOR SIGNATURE      DATE

Figure 1 - Item Production/Certification/Identification (Form FS-F-1945)

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## PACKAGING GUIDELINES FOR WASTE GENERATOR

Package has been properly prepared for closing:

No liquids of any kind have been placed in container

Heavy/bulky items have been secured within container

All available space has been utilized efficiently

Prohibited materials have been excluded (see below)

Packaging has not been damaged during loading

Liner is in place and properly lapped and sealed

---

## PROHIBITED MATERIALS

Compressed Gases (unpunctured aerosol cans included)

Explosives

Free liquids

Fine particulates (respirable fines)

Hazardous Waste (Suspect RCRA materials included)

Corrosive materials

Etiologic agents

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7.3 FILLING ISO CONTAINERS WITH WASTE MATERIAL

**PACKAGER**

1. Maintain communication with QA to permit QA to overview filling of containers in accordance with applicable QA department procedure.

**QA**

2. If a nonconformance is identified, document and evaluate for corrective action per applicable department procedure.

**PACKAGER**

<p><b><u>CAUTION</u></b></p> <p><b>A RESPIRATOR AND OTHER PERSONAL PROTECTIVE EQUIPMENT PROVIDED BY THE SUPERVISOR SHALL BE WORN PRIOR TO FILLING CONTAINERS.</b></p>
---

3. As specified by supervisor, load waste into container as tightly as possible.

7.4 SECURING ISO CONTAINER

**QA**

1. Perform final examination of contents and complete documentation for verification of materials packaged.

**NOTE:** This documentation may include photographs.

**PACKAGER**

2. If directed by supervisor, place two sheets of plywood vertically in front of container doorway for shoring.
3. Roll absorbent pads (double-thick) together and place evenly along the floor (maintaining continuous contact with floor) in front of the plywood sheets.
4. Caulk door frame interior and inside edges of each door.
5. Close the container doors.

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## 7.4 SECURING ISO CONTAINER (cont.)

**PACKAGER**

6. Close and latch doors ensuring all latching mechanisms are engaged.
7. Band doors securely together with 1-1/4 inch bands spaced approximately 2 feet apart around the center locking bars at mid-height of the container.
8. Secure each band with two double-crimp seals.

## 7.5 WEIGHING FILLED ISO CONTAINERS

**SUPERVISOR**

1. Contact Logistics Administration for weight limits.
2. Notify Heavy Equipment Supervisor to move container to the appropriate scale.

**NOTE:** The scale shall be a currently calibrated accountability scale.

**HEO**

3. Move container on to scale.

**CHECKER**

4. Fill out weight ticket and transmit to Shipping Coordinator.
  - a. If the box is over the specified weight limit, notify supervisor and proceed as directed.

**HEO**

5. Remove container from the scale.

**PACKAGER**

6. Complete the XX card, Form FS-F-1945 (see Figure 1) and transmit card to supervisor.

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7.5 WEIGHING FILLED ISO CONTAINERS (cont.)

**SUPERVISOR**

7. Sign XX card and transmit to MC&A.

**MC&A**

8. Using XX card data, print required bar-code labels.
9. Submit bar-code labels to supervisor.

7.6 LABELLING AND INSPECTING FILLED CONTAINERS

**PACKAGER**

1. Affix the bar-code labels, provided by MC&A, to sides of ISO container as shown in Figure 3.
2. Using paint, touch up container exterior. If paint is flaking, scrape container and paint over bare metal.
3. Using as "ISO Final Inspection Checklist" (see Figure 4), perform a final visual inspection of container and fill out checklist.
4. Transmit completed checklist to supervisor.

**SUPERVISOR**

5. Review checklist for unacceptable inspection items.
  - a. If an item is unacceptable, complete appropriate corrective action.
  - b. If container is acceptable, contact Heavy Equipment Supervisor to move box to designated staging area.

8.0 APPLICABLE DOCUMENTS

8.1 DRIVERS

- NVO-325, "Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements"

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## 8.0 APPLICABLE DOCUMENTS (cont.)

### 8.2 REFERENCES

- RM-0005, "FEMP Lot Marking and Color-Coding System"
- SSOP-0002, "Completing the Material Evaluation Form"
- PP-0314, "Packaging, On-Site Movement, and Off-Site Shipment of Material"

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SITE STANDARD OPERATING  
PROCEDURE

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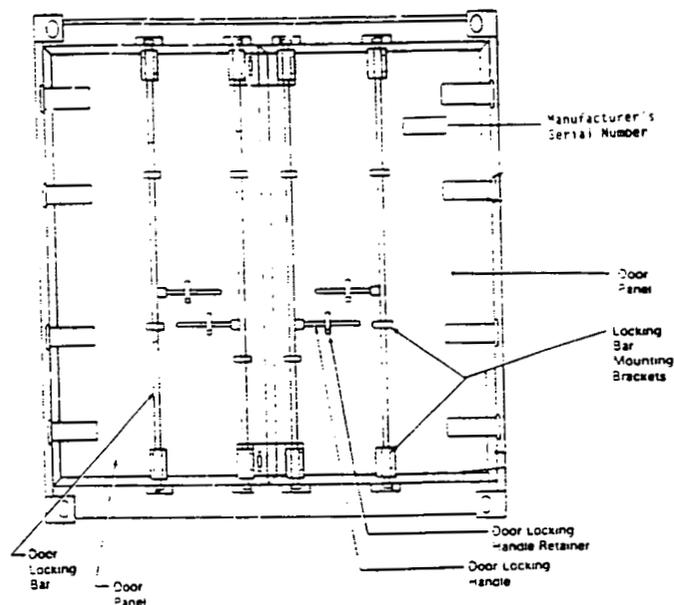
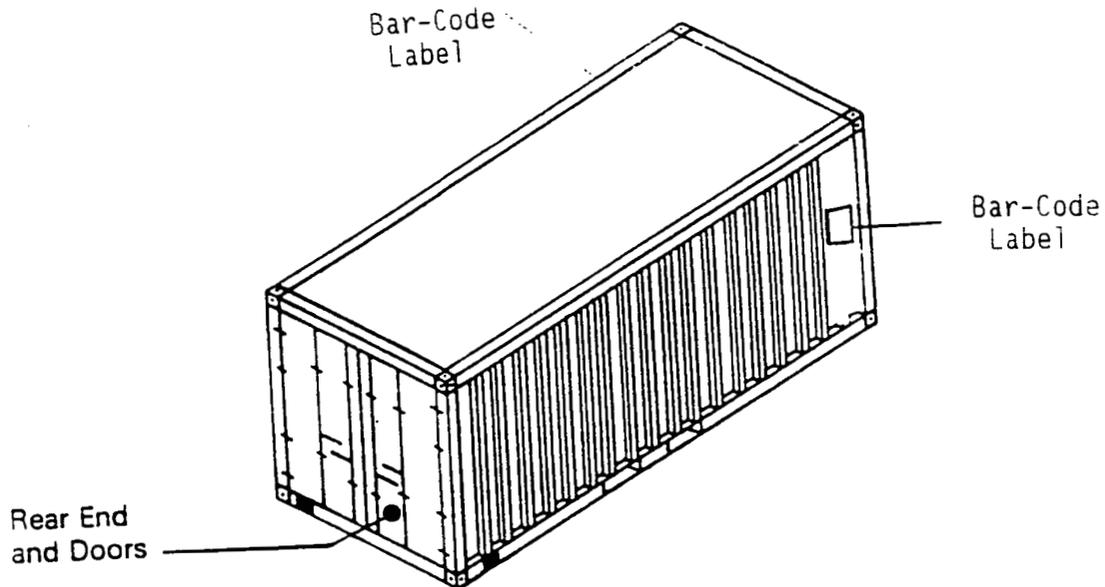
Title: **PACKAGING LOW LEVEL RADIOACTIVE WASTE (LLRW)  
INTO ISO CONTAINERS FOR OFFSITE SHIPMENT**

DOCUMENT NO: SSOP-0078  
REVISION NO. 0

Authorization:  
H. F. Daugherty, President

Replaces: SSOP-0024,  
Dated 10-14-91. Rev. 0

Effective Date: 12-14-92



TYPICAL REAR END AND DOOR STRUCTURE

Figure 3 - Diagram of LLRW ISO Container Labeling

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ISO FINAL INSPECTION CHECKSHEET

ISO SHIPMENT NO: \_\_\_\_\_

NUMBER OF CONTAINERS IN SHIPMENT \_\_\_\_\_

NAME: \_\_\_\_\_  
BADGE NO: \_\_\_\_\_  
DATE OF INSPECTION: \_\_\_\_\_

NAME: \_\_\_\_\_  
BADGE NO: \_\_\_\_\_  
DATE OF INSPECTION: \_\_\_\_\_

INSPECTION ITEM	PLACE INITIALS BELOW IF ACCEPTABLE
1. Doors and vents caulked. Caulking visible around entire door and vent area	
2. Doors banded with two bands and two clips. Banding is tight.	
3. All erroneous markings blacked out.	
4. Container in good condition (no holes or structrually affecting dents)	
5. Container clean - free of debris and loose dirt.	
6. Labels are placed on two sides of container, not doors.	
7. Labels are placed on two sides of container, not doors.	

Inspector's Signature \_\_\_\_\_ Date \_\_\_\_\_

Inspectors's Signature \_\_\_\_\_ Date \_\_\_\_\_

Figure 4 - ISO Final Inspection Checksheet

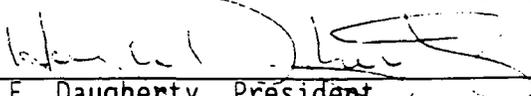
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# PACKAGING LOW-LEVEL RADIOACTIVE WASTE (LLRW) IN METAL BOXES FOR OFFSITE SHIPMENT

SSOP-0079

Effective Date: 12-14-92

AUTHORIZED BY:

  
H. F. Daugherty, President

11/30/92  
Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Westinghouse Environmental Management Company of Ohio

P. O. Box 398704

Cincinnati, Ohio 45239-8704

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RECORD OF ISSUE/REVISIONS

<u>DATE</u>	<u>REV. NO</u>	<u>DESCRIPTION AND AUTHORITY</u>
12-14-92	0	Separate procedure written for packaging LLRW in boxes per Request No. S92-176, initiated by M. Hundley. SSOP-0079, SSOP-0075, and SSOP-0078 replace SSOP-0024.

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### 1.0 PURPOSE

This procedure provides the instructions for packaging low level radioactive waste (LLRW) in metal boxes for shipment offsite from the Fernald Environmental Management Project (FEMP).

### 2.0 SCOPE

The procedure outlines the steps for (1) inspecting the waste to be packaged, (2) inspecting and preparing empty boxes, (3) filling boxes with waste, (4) weighing filled boxes, (5) closing and labeling boxes, and (6) final inspection of boxes.

The packaging operation is applicable to FEMP personnel (including subcontractors) responsible for packaging noncontained LLRW in metal boxes. This activity originates upon approval by DOE for a specific waste stream. LLRW may be packaged at any designated packaging location at the FEMP.

### 3.0 DEFINITIONS

Free Liquid - Any free flowing liquid or liquid that readily separates from the solid portion of a waste under ambient temperature and pressure conditions. Ice is also considered a free liquid.

Low Level Radioactive Waste (LLRW) - Waste that contains radioactivity and is not classified as high level waste, transuranic waste, spent nuclear fuel or 11e(2) byproduct material as defined by DOE Order 5820.2A. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may be classified as low-level waste, provided the concentration of transuranic is less than 100 nano curies per gram.

Packaging Location - Any area where waste is stored or generated.

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, documentation and proper management of hazardous wastes.

### 4.0 RESPONSIBILITIES

#### Packager

- Inspects waste per this procedure.
- Packages waste per this procedure.

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#### 4.0 RESPONSIBILITIES (cont.)

- Complies with any additional requirements specified by Industrial, Radiological Safety and Training (IRS&T).

##### Supervisor of the waste generation area or packager

- Specifies applicable scale procedures and standard tare weight of packages.
- Ensures packaging materials are available for packagers.
- Ensures that trained personnel package waste material.
- Determines disposition of waste material identified in this procedure.
- Ensures that personnel package waste for shipment to meet applicable Nevada Test Site (NTS), Department of Transportation (DOT), and Environmental Protection Agency (EPA) regulations.
- Contacts Industrial, Radiological Safety and Training (IRS&T) to determine the appropriate respiratory protection for the process being performed and the radiological surveys required for materials moving in and out of regulated areas.
- Contacts Radiological Safety for a radiological work permit or other safety permits and ensures permits are obtained and signed prior to performing.
- Provides packagers with the required respiratory protection and other personal protective equipment.
- Ensures the lid on an unfilled waste container is secured when no packaging is occurring thereby preventing addition of unknown materials.
- Ensures waste packages are weather-protected.

Logistics Administration specifies the required waste container.

##### Motor Vehicle Operator (MVO) of Facilities and Warehousing

- Delivers empty boxes to designated packaging area.
- Supports packager as needed per this procedure.

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4.0 RESPONSIBILITIES (cont.)

Industrial, Radiological Safety & Training (IRS&T)

- Provides a Radiological Safety Technician, as requested.
- Determines appropriate respiratory equipment and any other employee protection.

Quality Assurance (QA) overviews packaging operation to ensure compliance with this procedure.

Environmental Compliance (EC) provides documentation supporting characterization results as needed.

Materials Control and Accountability (MC&A) provides bar-code labels.

5.0 GENERAL

None

6.0 PREREQUISITES

6.1 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

Safety glasses with side shields shall be worn unless other eye protection is specified.

Respiratory protection provided by the supervisor shall be worn when required.

Leather-palm gloves shall be worn when handling boxes, operating equipment, and handling rough, sharp-edged, or contaminated material.

Neoprene rubber gloves shall be worn when handling hazardous chemical substances where skin contact is possible.

A Radiation Work Permit must be approved and current.

Face shields shall be worn when removing lids of containers filled with liquids or during operations where the possibility exists that personnel could be splashed with liquids.

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## 6.0 PREREQUISITES (cont.)

Any circumstance that could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a follow-up urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

### 6.2 TOOLS AND MATERIALS REQUIRED

Obtain the following materials and tools, as needed, prior to performing the packaging operation:

- Appropriate safety protective equipment
- Foam-strip gasket (size appropriate for box)
- Diatomaceous earth
- Indelible marker
- Hammer and screw driver, as applicable
- Wrench and channel locks, as applicable
- Clear lab label tape and dispenser
- Clean rags
- Electric drill
- Ink/paint as required
- Calibrated torque wrench

### 6.3 POSTING REQUIREMENTS

A "Prohibited Materials List" (see Figure 1) shall be displayed in the packaging area or on the container.

### 6.4 WASTE CHARACTERIZATION

A Material Evaluation Form (MEF) shall be initiated to determine the waste as RCRA/Non-RCRA. The packaging operation may be started before the characterization results are received.

For bulk waste streams, complete evaluation per SOP 20-C-625.

**NOTE:** A numbered MEF may be obtained from Waste Management Records and initiated per SSOP-0002.

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## PACKAGING GUIDELINES FOR WASTE GENERATOR

Package has been properly prepared for closing:

- No liquids of any kind have been placed in container
- Heavy/bulky items have been secured within container
- All available space has been utilized efficiently
- Prohibited materials have been excluded (see below)
- Packaging has not been damaged during loading
- Liner is in place and properly lapped and sealed

---

### PROHIBITED MATERIALS

- Compressed Gases (unpunctured aerosol cans included)
- Explosives
- Free liquids
- Fine particulates (respirable fines)
- Hazardous Waste (Suspect RCRA materials included)
- Corrosive materials
- Etiologic agents

Figure 1 - Prohibited Materials List

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## 6.0 PREREQUISITES (cont.)

Additional documentation supporting the characterization results shall be provided by Facilities and Material Evaluation (F&ME)

A sample of the waste for Toxic Characteristic Leaching Process (TCLP) may be required as requested by F&ME.

A sample may be required for major radionuclides and other suspected nuclides as determined by supervision.

## 6.5 PERSONNEL REQUIREMENTS

A minimum of two personnel are required to package waste.

Packagers shall be certified in use of Personal Protective Equipment (PPE).

## 7.0 PROCEDURE

**NOTE:** Within this section, Warnings and Cautions precede the step to which they apply. Notes follow the step to which they apply.

### 7.1 INSPECTING THE WASTE

**NOTE:** The determination to package a waste stream is based on approval by DOE and a completed MEF.

#### PACKAGER

1. Ensure the waste to be packaged is not on the "Prohibited Materials List" (see Figure 1).
  - a. If the waste is listed on the "Prohibited Materials List", do not package this waste. Notify supervisor for disposition.
2. Ensure the waste has been characterized.
  - a. If the waste has not been characterized, package waste per this procedure and transfer box to a controlled holding area per SSOP-0008.

#### QA

3. Perform periodic surveillance of waste per applicable department procedure.

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7.1 INSPECTING THE WASTE (cont.)

**PACKAGER**

4. Visually check waste for free liquid.
  - a. If free liquid is present or material is wet, write "FREE LIQUID-DON'T SHIP" on box exterior and notify supervisor.

**SUPERVISOR**

- b. Take appropriate action to absorb free liquid.
6. Fill out an "Item Production/Certification/Identification", XX Card (see Figure 2) for each box as follows:
  - a. Record the FEMP Lot Marking Code per "FEMP Lot Marking and Color-Coding System", RM-0005, in the areas titled "P.O. No.", "Source", "Class", and "Material Type".
  - b. Record a general description of the waste in the area titled "Waste Description and Comments" or attach a list of the items packaged for content documentation.

7.2 PREPARING EMPTY BOX

**SUPERVISOR**

1. Notify Facilities and Warehousing (F&W) to deliver empty metal box to the designated packaging area.
 

**NOTE:** The specific box type shall be determined by Logistics Administration.

**PACKAGER**

2. Visually inspect the box for interior and exterior damage, such as corrosion, dents, holes, or other defects (refer to Tables 1 and 2).
  - a. If the box is damaged, mark the lid or side with a red "X" and complete corrective action per Table 1.
3. Visually inspect interior to ensure the box is empty.
  - a. If material is present in the box, notify supervisor.

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CARD 65-2 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION											INV. NO.:
P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE			SHIFT	BADGE NO.	CONT. NO.	SERIAL NO.
					MO	DAY	YEAR				
SEAL NUMBER		SEAL DATE			PACKAGE PHYSICAL CERTIFICATION			PLANT	PROD. MBA	MEF NO.	
		MONTH	DAY	YEAR	YES NO						
					EMPTY CONTAINER AT START			DCAR	SURV. NO.	GROSS WEIGHT	
					RUST HOLES OR DENTS						
					MATERIAL IS AS CODED						
WASTE DESCRIPTION AND COMMENTS					PROHIBITED MATERIALS						
					LIQUIDS IN CONTAINER						
PACKAGE TYPE					MINIMUM OF VOID SPACE					TARE WEIGHT	
PACKAGE SIZE					PACKAGE SECURED						
PROJECT					DRAIN PLUG SECURED						
					OVERPACK						
					REPACK					NET WEIGHT	

\_\_\_\_\_ GENERATOR SIGNATURE  
 FS-F-1945-2 (REV. 11/20/92)

\_\_\_\_\_ SUPERVISOR SIGNATURE      DATE

Figure 2 - Item Production/Certification/Identification Card, FS-F-1945-XX

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**TABLE 1  
CORROSION INSPECTION CATEGORIES**

CATEGORY	CHARACTERISTIC	COULD CAUSE LOSS OF BOX INTEGRITY		CORRECTIVE ACTION
		YES	NO	
<b>A</b>	Severe corrosion with deep pitting and/or metal flaking	X		1. Notify supervisor.  <b>NOTE:</b> The box requires disposition as directed by supervision within 24 hours.
<b>B</b>	Corrosion with shallow pitting and/or mild metal flaking		X	1. Proceed as directed by the supervisor.  <b>NOTE:</b> Disposition shall be determined by the supervisor following review of completed inspection form.
<b>C</b>	Surface rust with no pitting and mild paint flaking which exposes bare metal		X	1. Proceed as directed by the supervisor. Repainting shall be scheduled by supervisor.

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**TABLE 2  
LLRW CONTAINER INSPECTION CRITERIA**

INSPECTION ITEM	INSPECTION CRITERIA	CORRECTIVE ACTION REQUIRED
Hole	An opening in the container including breach, gouge, puncture or leak.	Notify supervisor of condition and request disposition instructions.
Dent	A crease, depression or hollow made by blow or pressure; a concave distortion which jeopardizes the integrity of the container. A dent in the top or bottom rim.	Notify supervisor of condition and request disposition instructions.
Bulge	A swollen area, a convex distortion, an outward bend which jeopardizes the integrity of the container.	Notify supervisor of condition and request disposition instructions.

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7.2

PREPARING EMPTY BOX (cont.)

**PACKAGER**

4. If the bottom of the box has a drain plug, ensure plug is securely in place.
5. On the XX Card (Figure 2), record the type of container in the area titled "Type of Container", fill out the "Package Physical Certification" area excluding the last two items, and record box dimensions in area titled "Package Size".

**SUPERVISOR**

6. Specify the scale for weighing and method of transporting the box to the scale.

**NOTE:** The scale shall be a currently calibrated accountability scale.

**PACKAGER**

7. Inspect the scale to be used per the scale procedure applicable to the area.

**MVO/PACKAGER**

8. As directed by supervisor, move the box onto the scale.

**PACKAGER**

9. Tare weigh every twentieth box per the scale procedure applicable to the area.
10. Record the weight on the XX card.

**MVO/PACKAGER**

11. Remove the box from the scale.

**PACKAGER**

12. Remove lid and place in a designated location to prevent damage.
13. Using the method specified by supervisor, place one layer of pallets in the bottom of the box.

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7.2 PREPARING EMPTY BOX (cont.)

**PACKAGER**

14. Manually pour 1/2 to 1 inch of diatomaceous earth evenly over the pallets.

7.3 FILLING BOX WITH WASTE MATERIAL

**PACKAGER**

1. Check with supervisor for weight limitation of box.

**QA**

2. Overview filling of boxes per applicable department procedure to ensure compliance with this procedure.
  - a. If a nonconformance is identified, document and evaluate for corrective action per applicable department procedure.

**PACKAGER**

**WARNING**

**A RESPIRATOR AND OTHER PERSONAL PROTECTIVE EQUIPMENT PROVIDED BY THE SUPERVISOR SHALL BE WORN PRIOR TO FILLING DRUMS.**

3. As specified by supervisor, load waste into box as tightly as possible ensuring the waste level remains at least three inches below the top of the box, the box weight is within the specified limitation, and the load is balanced to prevent tipping.
4. When the box is full, place lid on box and secure as directed by supervisor.
5. Notify supervisor the box is ready to be weighed.

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7.4 WEIGHING FILLED BOXES

**SUPERVISOR**

1. Specify the scale and the method of transporting the box to the scale.

**PACKAGER**

2. Inspect the scale to be used per the applicable scale procedure.
3. Per the method specified by supervisor, move the box on to the scale.
4. Using the applicable scale procedure, weigh the box including box pins and other hardware to obtain gross weight of the box.
  - a. If the box is over the specified weight limit, notify supervisor and proceed as directed.

**PACKAGER OR QA**

5. For a box requiring temporary storage, apply a tamper-proof seal, lock, and other device to secure lid and prevent unauthorized additions.

**PACKAGER**

6. Using indelible ink, mark the gross weight and shipping number on the front side of box.
7. Complete XX Card (see Figure 2), including weights, and send card to supervisor.

**SUPERVISOR**

8. Sign XX card for accuracy and completeness and send card to MC&A.

**MC&A**

9. Using XX card data, print required bar-code labels and submit to supervisor.
10. Remove box from scale as directed by supervisor.

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7.5 FINAL CLOSURE, LABELLING, AND INSPECTION

**PACKAGER**

1. Manually remove hardware and lid, as directed by supervisor, and place in designated area to prevent damage.
2. Using a clean rag, wipe top edge of box. Place rag in disposal container.
3. Peel protective paper from foam-strip gasket and carefully apply gasket to box edge and/or to channel of lid underside, as directed by supervisor.
4. Place lid on box as directed by supervisor.
5. Using appropriate hardware and tools, secure lid on the box in accordance with the manufacturer's recommendations.
6. Inspect exterior of box, excluding bottom, for damage such as corrosion, dents, holes, or other defects (refer to Tables 1 and 2).
7. Using a calibrated torque wrench, torque closure bolts to  $45 \pm 5$  ft lbs.
8. Using paint, cover scratched areas on box.

**SUPERVISOR**

9. Contact QA for examination and certification of package.

**NOTE:** ~~QA shall perform an examination and certification per applicable department procedures.~~

10. Determine if the box will fit on the inspection stand.

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WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 17 of 20
Title: <b>PACKAGING LOW-LEVEL RADIOACTIVE WASTE (LLRW) IN METAL BOXES FOR OFFSITE SHIPMENT</b>		DOCUMENT NO: SSOP-0079 REVISION NO. 0
Authorization: H. F. Daugherty, President	Replaces: SSOP-0024, Dated 10-14-91, Rev. 0	Effective Date: 12-14-92

2700 7.5 FINAL CLOSURE, LABELLING, AND INSPECTION (cont.)

**PACKAGER**

11. If the box will fit on the stand, notify MVO to move box to inspection stand and direct Packager to proceed as follows:
  - a. Visually inspect runners for drain holes.
    - (1) If holes are not in runners, drill one hole with electric drill through underside of each runner and proceed to step 11, substep b.
    - (2) If holes are present in runners, proceed to step 11, substep b.
  - b. Using indelible ink, place a check mark next to red or black dot to indicate the runners have been checked.
  - c. Visually inspect bottom of box for damage, such as corrosion, dents, holes or other defects in accordance with Tables 1 and 2.
  - d. Inspect bottom of box for drain plug.
    - (1) If drain plug is present, tighten the plug and paint a red dot on opposite sides of box to indicate plug has been tightened.
    - (2) If drain plug is not present, paint a black dot on opposite sides of the box to indicate that box has been checked for drain plug.

**MVO**

12. Remove box from stand per applicable department procedure.

**PACKAGER**

13. If the box will not fit on the inspection stand, drill holes through the lower edge of runner.
14. Affix the bar-code labels provided by supervisor to the sides of box as shown in Figure 3 and cover labels with clear label tape.
15. Wrap two banding straps around box, position straps within outer feet of box, and secure straps with banding clip.

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WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 18 of 20
Title: <b>PACKAGING LOW-LEVEL RADIOACTIVE WASTE (LLRW) IN METAL BOXES FOR OFFSITE SHIPMENT</b>		DOCUMENT NO: SSOP-0079 REVISION NO. 0
Authorization: H. F. Daugherty, President	Replaces: SSOP-0024, Dated 10-14-91, Rev. 0	Effective Date: 12-14-92

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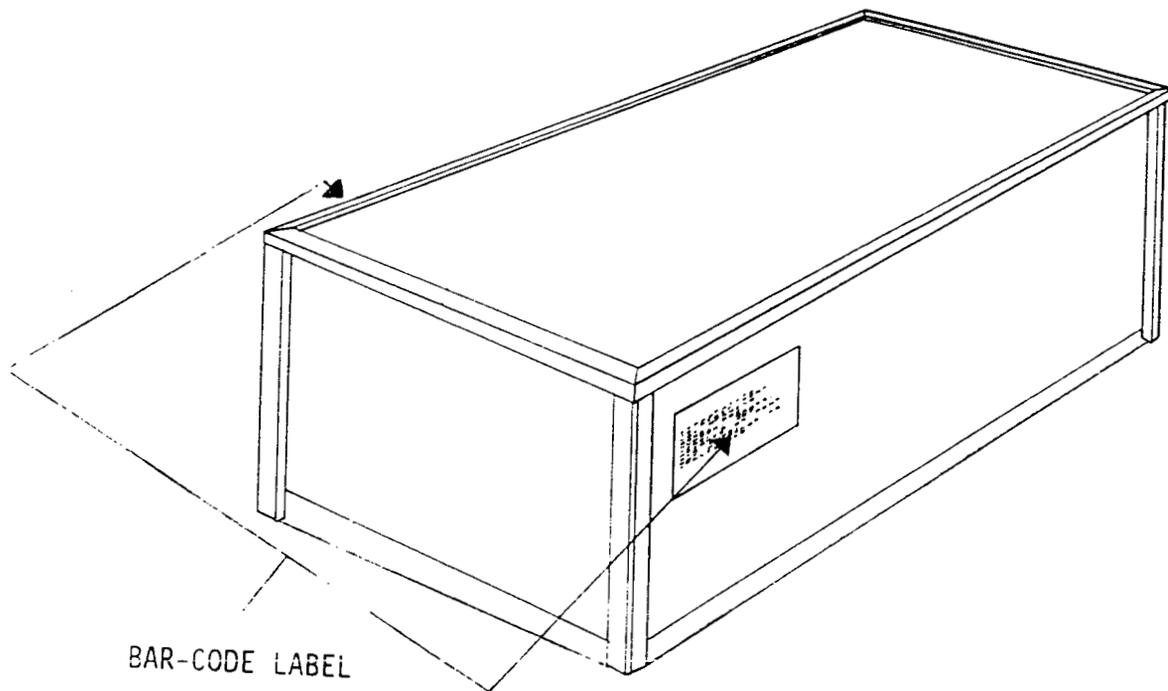


Figure 3 - LLRW Box Labeling

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WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 19 of 20
Title: <b>PACKAGING LOW-LEVEL RADIOACTIVE WASTE (LLRW) IN METAL BOXES FOR OFFSITE SHIPMENT</b>		DOCUMENT NO: SSOP-0079 REVISION NO. 0
Authorization: H. F. Daugherty, President	Replaces: SSOP-0024, Dated 10-14-91, Rev. 0	Effective Date: 12-14-92

7.5 FINAL CLOSURE, LABELLING, AND INSPECTION (cont.)

**PACKAGER**

16. Using a "Box Final Inspection Checklist" (see Figure 4), perform an inspection of box and record inspection results on checklist.
17. When inspection is complete, submit checklist to supervisor.
18. Review inspection checklist.
  - a. If the inspection results are acceptable, request MVO to transport box to designated staging area.
  - b. If the inspection results are not acceptable, complete appropriate corrective action.

**8.0 APPLICABLE DOCUMENTS**

**8.1 DRIVERS**

- NVO-325, "Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements"

**8.2 REFERENCES**

- SOP 20-C-625, "Evaluating Low Level Radioactive (LLRW) Bulk Waste Streams for Shipment"
- RM-0005, "FEMP Lot Marking and Color-Coding System"
- SSOP-0002, "Completing the Material Evaluation Form"
- SSOP-0008, "Preparing and Transferring Uncharacterized Waste to the Controlled Holding Area"

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 20 of 20
Title: <b>PACKAGING LOW-LEVEL RADIOACTIVE WASTE (LLRW) IN METAL BOXES FOR OFFSITE SHIPMENT</b>		DOCUMENT NO: SSOP-0079 REVISION NO. 0
Authorization: H. F. Daugherty, President	Replaces: SSOP-0024, Dated 10-14-91, Rev. 0	Effective Date: 12-14-92

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**BOX FINAL INSPECTION CHECKLIST**

WHITE METAL BOX SHIPMENT NO. \_\_\_\_\_

NUMBER OF CONTAINERS IN SHIPMENT \_\_\_\_\_

NAME: \_\_\_\_\_  
BADGE NO: \_\_\_\_\_  
DATE OF INSPECTION: \_\_\_\_\_

NAME: \_\_\_\_\_  
BADGE NO: \_\_\_\_\_  
DATE OF INSPECTION: \_\_\_\_\_

INSPECTION ITEM	ITEM ACCEPTABLE	
	YES	NO
1. Box in good condition (no holes or structurally affecting dents or rust.)		
2. Boxes clean - free of debris and loose dirt.		
3. Boxes touched up and erroneous markings whited out.		
4. Red or black dot on box.		
5. Pins locked in place & flush against box. Nuts & bolts tight.		
6. Banding tight.		
7. Bar-Code label located on both sides of box.		

\_\_\_\_\_  
Inspector's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Inspector's Signature

\_\_\_\_\_  
Date

Figure 4 - Box Final Inspection Checklist

**000262**

Fernald Environmental Management Project Fernald Environmental Restoration Management Corp. REMIEDIATION SUPPORT OPERATIONS DOCUMENT PROGRAM		Page 1 of 10 Revision No. 2 Revision Date: 02-05-93
REMIEDIATION SUPPORT OPERATIONS PROCEDURE	INSPECTION AND EVALUATION OF CONTAINERIZED LOW-LEVEL RADIOACTIVE WASTE (LLRW)	SOP 1-C-604  Area: As Applicable
(Signature On File) Authorization: R.L. Gardner Facilities & Waste Operations Mgr.	Supersedes: 1-C-604 Dated: 09-07-89	Issue Date: 12-05-91

1.0 PURPOSE

The purpose of this document is to provide the procedure for inspecting and evaluating containerized low-level radioactive waste (LLRW) designated for shipment offsite.

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2.0 APPLICABILITY

This procedure is applicable to LLRW storage areas and LLRW designated for the Plant 1 sampling line.

3.0 RESPONSIBILITIES

3.1 The Supervisor shall be responsible for the following:

- 3.1.1 Designating the material to be inspected or sampled.
- 3.1.2 Supplying the packaging materials.
- 3.1.3 Coordinating and notifying supporting organizations when assistance is required.
- 3.1.4 Ensuring that packaged material is labeled in accordance with the FEMP Lot Marking and Color-Coding System.
- 3.1.5 Designating holding areas as specified by this SOP.
- 3.1.6 Contacting Industrial Hygiene to determine the appropriate respiratory protection for the processing performed.
- 3.1.7 Issuing the required respiratory protection to operators.
- 3.1.8 Ensuring that personnel are qualified per the established training requirements identified by the Division Manager.
- 3.1.9 Obtaining and posting a "Radiation Work Permit" (RWP) when required.
- 3.1.10 Reviewing applicable Material Safety Data Sheets (MSDS) with operators.
- 3.2 Materials Control and Accountability shall be responsible for maintaining and reconciling the inventory records of Plant 1 nuclear waste materials.
- 3.3 Operators shall be responsible for complying with this SOP.



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### 3.0 RESPONSIBILITIES (cont.)

Radiological Safety shall be responsible for issuing a "Radiation Work Permit" (RWP) and ensuring radiological safety requirements are met when a container is opened.

### 4.0 DEFINITIONS

4.1 Deteriorated Container - A container having rust, holes, or dents which could jeopardize the integrity of the container.

4.2 Net Weight - Gross weight minus the tare weight of the container.

4.3 Overpack - A container enclosing one or more smaller containers.

4.4 Respirable Fines - Particulates and vapors capable of being inhaled.

4.5 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 wastes.

4.6 Toxicity Characteristic Leaching Procedure (TCLP) - A RCRA term referring to a method for determining the hazardous properties of waste extract.

### 5.0 APPLICABLE DOCUMENTS

#### 5.1 Drivers

- R 5.1.1 10 CFR 71 series, "Packaging and Transporting of Radioactive Material"
- R 5.1.2 40 CFR 261 series, "Identification and Listing of Hazardous Wastes"
- R 5.1.3 40 CFR 265 series, "Interim Status Standards For Owners and Operators of Hazardous Waste TSD Facilities"
- R 5.1.4 49 CFR 171-173, "General Information, Regulations, and Definitions -  
R Shippers General Requirements For Shipment and Packagings"
- R 5.1.5 OAC 3745-54 series, "New Facility Standards"
- R 5.1.6 OAC 3745-65 series, "Interim-Facility Standards"
- R 5.1.7 DOE 5400 series, "Environmental Safety and Health"
- R 5.1.8 DOE 5820.2A, "Radioactive Waste Management"
- 5.1.9 PO-D-026, "Site Services Document Program"
- 5.1.10 FEMP Conduct of Operations Manual

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5.2 References

- 5.2.1 SOP 20-C-902, "Liquid Propane Gas (LPG) Powered Handstackers and Tuggers"
- 5.2.2 SOP 1-C-916, "Plant 1 Hoists and Cranes"
- 5.2.3 SOP 20-C-912, "Checking Scale Operation"
- 5.2.4 SOP 1-C-101, "Sampling Residue and Waste Materials"
- 5.2.5 SOP 20-C-600, "Overpacking Deteriorated Containers"
- 5.2.6 SOP 1-C-602, "Low Level Radioactive Waste (LLRW) Shipment Preparation"
- 5.2.7 SOP 20-C-615, "Controlled Holding Area"
- 5.2.8 SOP 20-C-905, "Ventilation Flow Indicators"
- 5.2.9 SSOP-0024, "Packaging Low Level Radioactive Waste (LLRW) for Offsite Disposal"
- 5.2.10 RM-0005, "FEMP Lot Marking and Color Coding System"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

- 6.1 A defined safety system is not involved.
- 6.2 Safety glasses with side shields shall be worn unless other eye protection is specified by the supervisor, ES&H, or posted signs.
- R 6.3 A two-way communications device and emergency response equipment shall be  
R available to personnel performing this procedure.
- 6.4 Respiratory protection issued by the supervisor shall be worn when required.
- 6.5 Leather-palm gloves shall be worn over plastic gloves with cotton inserts while handling drums/containers, operating equipment, and when handling rough, sharp-edge, or contaminated material.
- 6.6 HEPA type filter vacuum cleaners or an ES&H approved vacuum system with a current DOP test label properly affixed to vacuum shall be used for cleaning.
- 6.7 Face shields with chemical cover goggles shall be worn when removing lids or bungs on containers filled with liquids or during operations where a liquid splash could occur.
- 6.8 Radiological Safety shall be provided with a detailed work scope before opening any container so that radiological safety requirements can be specified in an RWP.
- 6.9 A rubber apron shall be worn if there is a possibility of being splashed with a chemical that could cause injury to the skin.

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## 6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

- 0 Operators shall have reviewed and be familiar with the MSDSs for hazardous materials/equipment that may be used or encountered.
- 6.11 In case of contact with a chemical, contaminated clothing shall be removed immediately and the affected body area flushed a minimum of 15 minutes with water in an eye bubbler/safety shower. Injured personnel shall report to Medical.
- 6.12 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion, or absorption shall immediately be reported to a Supervisor. The Supervisor shall immediately report the circumstance of possible radioactive materials intake to ES&H Radiological Control Department for evaluation. When the suspect isotope is uranium, the involved personnel shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form No. FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a follow up urine sample. When the suspect isotope is other than uranium, the involved personnel shall report to the Dosimetry Section of the Radiological Control Department for further determination of actions. Employees are responsible for complying with additional requirements as specified by the Radiological Control Section.
- 6.13 Any situation which could have resulted in the inhalation, ingestion, or absorption of a hazardous material shall immediately be reported to a Supervisor or to the Assistant Emergency Duty Officer (AEDO), who will immediately report the circumstances to Medical and Industrial Hygiene. The involved personnel shall be directed by the Supervisor or AEDO as to when and where to report for medical evaluation, completion of an Incident Investigation Report (IIR) (Form No. FMPC-ES&H-1458), and submitting bioassay samples (e.g. blood, urine). Employees are responsible for complying with any additional requirements as specified by ES&H.

## 7.0 GENERAL

- 7.1 Warnings, Cautions, and Notes precede the Step or Item to which they apply.

## 8.0 PROCEDURE

### 8.1 Inspecting and Evaluating Drummed Residues at the Plant I Sample Line

- 8.1.1 Initiate a Material Evaluation Form (MEF) per SSOP-0002.

**NOTE:** The supervisor shall obtain a Radiation Work Permit to establish radiological controls.

- 8.1.2 Notify the supervisor that drums are ready for inspection.

- 8.1.3 Check drum for deterioration.

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**8.0 PROCEDURE (cont.)**

- 8.1.3.1 If drum is deteriorated, place drum in an overpack per SOP 20-C-600.
- 8.1.3.2 If overpacking is not feasible, position a GRIFLON bag, or equivalent, over the drum.
- 8.1.3.3 Fasten the bag.
- 8.1.3.4 Move deteriorated drums to a staging area near Plant 1 sample line.
- 8.1.4 Using the scale specified by the supervisor, perform a scale check per SOP 20-C-912.

**NOTE:** The supervisor shall specify an ES&H approved barrel grab/lifting device to be used.

- 8.1.5 Inspect the barrel grab for damage.

**CAUTION**

Do not use a damaged barrel grab.

- 8.1.5.1 If the barrel grab is damaged, notify supervisor.
- 8.1.6 Inspect forklift (used with barrel grab) per SOP 20-C-902.
- 8.1.7 Using barrel grab attached to forklift, move the drum onto the scale.
- 8.1.8 Obtain the gross weight of the drum.

**WARNING**

**Maximum weight of drums shall be 700 pounds for a 30 gallon overpack; 1,200 pounds for 55 gallon overpacks, 55 gallon singlepack, and 85 gallon overpacks. Maximum weight of 85 gallon singlepacks shall be 1,000 pounds.**

- 8.1.8.1 If drum weight exceeds maximum weight, remove material until weight requirement is met.
- 8.1.8.2 Place the removed material in a designated/labeled container.
- 8.1.9 Using the barrel grab, move drum from scale to ventilated sampling station.
- 8.1.10 Check the Ventilation Flow Indicator (VFI) per SOP 20-C-905 to ensure the sampling station ventilation system is in operation.

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8.0 PROCEDURE (cont.)**WARNING**

Sampling station shall not be operated if the VFI reading is less than the posted pressure.

8.1.10.1 If the VFI indicates low pressure, notify the supervisor.

**WARNING**

Bung(s) and lid(s) shall be removed slowly to release possible pressure.

8.1.11 Slowly remove lock ring and lid from the drum.

8.1.12 Obtain sample of material per SOP 1-C-101 for a RCRA/Non-RCRA determination and analysis to determine major radionuclides and other suspected nuclides.

8.1.13 Visually inspect drum per the "Package Physical Certification" section of the "Item Production/Certification/Identification" (65 card), Form FMPC-CONT-1945-XX (See Figure 1).

8.1.14 Indicate inspection condition on card.

8.1.15 If liquid is observed, proceed as follows:

1.15.1 If 1/2 inch or more of free standing liquid is present on the top of the material, move the drum to the designated holding area for additional processing.

**NOTE 1:** The amount of absorbent material added shall be a minimum quantity of twice the calculated volume of liquid.

**NOTE 2:** If the material is suspected of being hazardous, absorbent shall not be added until material has been characterized.

8.1.15.2 If less than 1/2 inch of free standing liquid is present on the top of the material, add uncalcined diatomaceous earth to absorb the liquid.

8.1.16 If material is dry, loose, and respirable, request analysis for particulate size.

8.1.16.1 Notify the supervisor.

8.1.17 When the visual inspection and sampling operation are completed, install lock ring and lid on drum.

8.1.18 Place the drum in the designated holding area as directed by supervision until the RCRA determination and analysis results are received.

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8.0 PROCEDURE (cont.)

8.1.18.1 If the analysis results identify material as RCRA, complete the required forms.

8.1.18.2 Package the material per SOP 20-C-615.

8.1.19 If the material is non-RCRA, complete the 65 card per analysis results.

8.1.20 Forward a copy of the analysis result to F & WO.

8.1.21 Install a seal on the level ring.

8.1.21.1 Record the seal number on the 65 card.

8.1.22 Place drum in the applicable overpack per SOP 20-C-600.

8.2 Inspecting and Evaluating Containerized LLRW at Storage Areas

8.2.1 Check that a "Radiation Work Permit" is posted.

8.2.1.1 If not, notify the supervisor.

8.2.2 Place container in designated inspection area.

**NOTE:** The supervisor shall contact ES&H and request an inspection for organic vapor to ensure respiratory protection is adequate.

8.2.3 If the container lid is to be removed outside of ventilated enclosed area, notify the supervisor.

8.2.4 Remove the lid from the container.

8.2.5 Obtain a sample of material per SOP 1-C-101.

8.2.6 Send the sample to the laboratory for RCRA determination (TCLP) and analysis to detect major radionuclides.

8.2.7 Visually inspect container per the "Package Physical Certification" section of the "Item Production/Certification/Identification" card, form FMPC-CONT-1945-XX.

8.2.8 Indicate inspection condition on card.

8.2.9 If water is present, proceed as follows:

8.2.9.1 If 1/2 inch or more of free standing liquid is present on the top of the material, move the drum to the designated holding area for additional processing.

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**8.0 PROCEDURE (cont.)**

**NOTE 1:** If material is suspected of being hazardous, absorbent shall not be added until material has been characterized.

**NOTE 2:** The amount of absorbent material added shall be a minimum quarterly of twice the calculated volume of liquid.

8.2.9.2 If less than 1/2 inch of free standing liquid is present on the top of the material, add uncalcined diatomaceous earth to absorb the liquid.

8.2.10 If material is dry, loose, and respirable, proceed as follows:

8.2.10.1 Request analysis for particulate size.

8.2.10.2 Notify supervisor.

8.2.10.3 If an excessive void space is present, add additional material per SSOP-0024.

8.2.11 When inspection and sampling are complete, lid the container per SOP 1-C-602.

8.2.12 Place container in designated holding area as directed by supervision until analysis results are received.

8.2.12.1 If the analysis results identify material as RCRA, complete the required forms.

8.2.12.2 Package the material per SOP 20-C-615.

8.2.13 If RCRA determination is negative, complete the "Item Production/Certification/Identification" card, Form FMPC-CONT-1945-XX (See Figure 1) per analysis results.

8.2.14 Send a copy of the analysis to F & WO.

8.2.15 Move container to a designated holding area for shipment preparation.

**9.0 APPLICABLE FORMS**

~~9.1 FMPC-CONT-1945-XX, "Item Production/Certification/Identification"~~

000270

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345-42A  
438  
111 & 419  
4-2078 807  
E-488

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

P. O. NO.	SOURCE	CLASS	MATERIAL TYPE	LOT SEQUENCE NO.	DATE			SHIFT	BADGE NO.	PACKAGE NO.	
					MO	DAY	YEAR				
SEAL NUMBER		SEAL DATE			PACKAGE PHYSICAL CERTIFICATION			PLANT	PROD. MBA	GROSS WEIGHT	
		MONTH	DAY	YEAR	YES NO		PLANT TO				MBA TO
WASTE DESCRIPTION AND COMMENTS				EMPTY CONTAINER AT START							
				RUST HOLES OR DENTS							
PACKAGE TYPE				MATERIAL IS AS CODED					NET WEIGHT		
				PACKAGE SIZE				PROHIBITED MATERIALS			
								LIQUIDS IN CONTAINER			
								MINIMUM OF VOID SPACE			
								PACKAGE SECURED			
								DRAIN PLUG SECURED			

\_\_\_\_\_  
GENERATOR SIGNATURE  
FMPC-CONT-1945-XX (REV 12/9/88)

\_\_\_\_\_  
SUPERVISOR SIGNATURE      DATE

ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION  
FMPC-CONT-1945-XX  
Figure 1

000271

RECORD OF ISSUE/REVISIONS**6053**

	<u>REV. NO.</u>	<u>DESCRIPTION AND AUTHORITY</u>
09-07-89	0	Procedure required to replace CIO C88-175 per Request No. P89-097.
12-05-91	0	Reissued to include sampling requirements for RCRA determination and change applicability to low-level radioactive waste per Request No. P89-461, initiated by K. Dunbar.
12-08-92	1	Revised to incorporate CIO C92-108 (P92-285) and update to current procedure program requirements.
02-05-93	2	Revised to incorporate C92-109 per Request P92-235.

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FEMP WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE SERVICES DOCUMENT PROGRAM		Page 1 of 11 Revision No. 0
SITE SERVICES PROCEDURE	TRASH BALER OPERATION	SOP 2-C-923 AREA: Plant 2/3
Authorization: R. L. Gardner, Facilities and Warehousing	Supersedes: None	Issue Date: 10-14-91

1.0 PURPOSE

The purpose of this document is to establish the procedure for handling contaminated trash for off-site disposal.

2.0 APPLICABILITY

This procedure applies to the SELCON Trash Baler in the Incinerator Bldg.

3.0 RESPONSIBILITIES

3.1 The supervisor shall be responsible for the following:

- 3.1.1 Ensuring that personnel are qualified per the established training requirements identified by the Department/Staff Manager.
- 3.1.2 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection for the process being performed.
- 3.1.3 Providing operators with the required respiratory protection.

3.2 Operators shall be responsible for complying with this SOP.

4.0 DEFINITIONS

4.1 Platen - Pressure plate of the baler.

5.0 REFERENCES

5.2 PP-FMPC-719, "Energy Control (Lockout and Tagout)"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

- 6.1 A defined safety system is not involved.
- 6.2 Safety glasses with side shields shall be worn at all times unless other protection is specified by the supervisor, IRS&T, or posted signs.
- 6.3 Leather-palm gloves shall be worn when loading or conveying trash.
- 6.4 When making adjustments or cleaning the baler, personnel shall comply with the "Energy Control (Lockout and Tagout)", procedure PP-FMPC-719.
- 6.5 Respiratory protection provided by the supervisor shall be worn when specified by IRS&T, the supervisor, or posted signs.

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FEMP WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE SERVICES DOCUMENT PROGRAM		Page 2 of 11 Revision No. 0
SITE SERVICES PROCEDURE	TRASH BALER OPERATION	SOP 2-C-923 AREA: Plant 2/3
Authorization: R. L. Gardner, Facilities and Warehousing	Supersedes: None	Issue Date: 10-14-91

## 6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.6 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a followup urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.

## 7.0 PROCEDURE

### 7.1 Trash Receiving

- 7.1.1 Move away from the incinerator bin and conveyor while the Transportation Driver is emptying material from the dumpster.
- 7.1.2 Check dumpster while bottom is open to ensure that all trash has been deposited in the bin.
- 7.1.2.1 If trash remains inside the dumpster, use a rake and pull the material from the dumpster.
- 7.1.3 Complete a "Trash Baler Operation Log", Form FMPC-PRO-2887.
- 7.1.4 Visually inspect the trash to determine if prohibited items or categories of waste (Refer to Table 1) are contained in the trash.
- 7.1.4.1 If prohibited items are found, remove the items from the trash.

#### NOTE

Prohibited waste types shall be separated by container (such as paint cans in one, glass in another).

- 7.1.4.2 Segregate each item in a container or plastic bag designated for that type of waste.
- 7.1.4.3 Label each bag/container with the waste description.

# CHANGE IN OPERATION

## SITE SERVICES DEPARTMENT

DOCUMENT NO.: 2-C-923	AFFECTED DOCUMENT PAGE NO.: 2	DEPARTMENT: Site Services
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OPERATION & AREA AFFECTED: Safety/Plant 2/3	AUTHORIZATION: R.L. Gardner, Facilities & Warehousing 
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TITLE:  
Trash Baler Operation

CHANGE:

1) Step 7.1.4.1 is revised to read as follows:

**WARNING: APPROPRIATE PROTECTIVE CLOTHING SHALL  
BE WORN WHILE REMOVING ITEMS.**

7.1.4.1 If prohibitive items are found, remove the items from the trash.

FILING INSTRUCTIONS: File facing page 2 of SOP 2-C-923  
(Issue Date: 10-14-91, Revision No. 0)

FEMP WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE SERVICES DOCUMENT PROGRAM		Page 3 of 11 Revision No. 0
SITE SERVICES PROCEDURE	TRASH BALER OPERATION	SOP 2-C-923
		AREA: Plant 2/3
Authorization: R. L. Gardner, Facilities and Warehousing		Supersedes: None Issue Date: 10-14-91

7.0 PROCEDURE (cont.)

TABLE 1  
WASTE PROHIBITED FROM CONTAMINATED TRASH DUMPSTERS

Item No.	DESCRIPTION
1	Any liquid
2	Non-radioactive materials
3	Pressurized containers/spray cans
4	Explosive materials
5	Gaseous radioactive materials
6	High-level radioactive waste
7	Pyrophoric materials
8	Hazardous waste materials
9	Flammable substances
10	Alkaline metals
11	Reactive or oxidizing materials
12	Ashes, dry powders, or dusts
13	Immobilized or ionized waste with pH less than 4
14	Asbestos containing materials
15	Glass
16	Heavy metal objects
17	Soft drink/juice cans

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		AREA: Plant 2/3
Authorization: R. L. Gardner, Facilities and Warehousing	Supersedes: None	Issue Date: 10-14-91

7.0 PROCEDURE (cont.)

**NOTE**

Supervisor shall notify the Facility Owner and Waste Operations of prohibited items found.

**NOTE**

Prohibited items shall be returned to the area where the items were picked up.

7.1.4.3 Notify the supervisor of prohibited items found.

**NOTE**

The Trash Baler supervisor and operator, as generator, shall sign the 1945-XX Card.

7.1.5 Complete and sign an "Item Production/Certification/Identification card", Form FMPC-CONT-1945-XX.

7.1.6 Ensure that the bale removal chain at the rear of the baler is unhooked from the platen (See Figure 1).

**NOTE**

Trash Baler will not operate in the automatic mode unless the door is positioned against limit switches and latched.

7.1.7 Ensure that the bale removal door is closed and securely latched.

7.1.8 Check the scaffold to be used to ensure the platform is free of loose items.

7.1.9 Position the scaffold platform against the bale removal door.

7.1.10 Lock the scaffold wheels in place.

7.1.11 Latch scaffolding chain locks onto the baler frame.

7.1.12 Place moveable walkway between the scaffolding and the platform.

7.1.13 Position the south swinging gate between the angle iron and scaffolding.

7.1.14 Chain and lock the north swinging gate to the scaffolding.

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### 7.0 PROCEDURE (cont.)

#### 7.2 Baler Operation (See Figure 1)

- 7.2.1 Raise the safety gate.
- 7.2.2 Cover the bale chamber floor with a large sheet of trash cardboard.
- 7.2.3 Place trash bags in the bale chamber.

#### NOTE

Automatic operation of baler is not possible unless the safety gate is latched closed.

- 7.2.4 Pull down the safety gate until the gate is latched.

#### NOTE

The baler will automatically compact the contents, then return to the UP position, when the DOWN button is pressed.

- 7.2.5 At the control panel, press the DOWN button.
- 7.2.6 Repeat steps 7.2.1 thru 7.2.5 until the bale is nearly complete.
- 7.2.7 Before compaction is complete, add a large cardboard sheet to top of bale.

#### NOTE

When bale is completed, the indicator at the control panel will light and the baler automatically shut off in the DOWN position.

- 7.2.8 Repeat steps 7.2.1 thru 7.2.5 and complete the bale.
- 7.2.9 Record the bale number on the "Trash Baler Operation Log", Form FMPC-PRO-2887.

#### 7.3 Bale Removal

- 7.3.1 Check the scaffold to ensure that loose items have been removed from the platform.
- 7.3.2 Unlock scaffold platform wheels.
- 7.3.3 Move the platform away from the bale removal door.

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7.0 PROCEDURE (cont.)

- 7.3.4 Open the bale removal door using the gradual tension release latch.
- 7.3.5 Insert four or more wires through the slots in the floor of the baling chamber.
- 7.3.6 Wrap the wires around bale and then back through the slots in the ram of the baler.
- 7.3.7 Insert the end of each wire through the end loop.
- 7.3.8 Wrap each end of the wire at least four times above the end loop.
- 7.3.9 At the rear of the baler, hook bale removal chains onto the platen.
- 7.3.10 Operate the hand stacker or forklift to be used without a load to ensure safe conditions.
- 7.3.11 Complete "Operator Checklist," Form FMPC-ADMS-2414 or "Electric Truck Operator's Daily Checklist," Form FMPC-ADMS-2415 as applicable.
- 7.3.12 Using the hand stacker or forklift, position a wood skid at bale removal door.
- 7.3.13 Ensure that the baler safety gate is in the closed position.

NOTE

Only one bale shall be placed on a skid.

- 7.3.14 On the control panel, press and hold the UP button until bale rolls out onto the skid.
- 7.3.15 Using the hand stacker or forklift, move the skid away from the baler.

NOTE

Use bale number "W050-240-P-027-XXXX." The last four numbers shall be in sequence, starting with 0001.

- 7.3.16 Mark the bale with the date and bale number.
- 7.3.17 Record the bale number on the log sheet.
- 7.3.18 On the baler, close and latch the bale removal door.

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AREA: Plant 2/3		

#### 7.0 PROCEDURE (cont.)

- 7.3.19 At control panel, press and hold the DOWN button.
- 7.3.20 When the baler platen reaches the lowest position, ensure that bale removal chains automatically unhook from rear of platen.
- 7.3.21 If chains fail to unhook proceed as follows:
  - 7.3.21.1 Release the DOWN button.
  - 7.3.21.2 Press the EMERGENCY STOP button at the control panel.
  - 7.3.21.3 Manually unhook the chains.
  - 7.3.21.4 Turn the EMERGENCY STOP button head.
  - 7.3.21.5 Ensure that the baler cycle completes with the baler ram in the UP position.
- 7.2.22 Release the down button and ensure that baler returns to the UP position.
- 7.2.23 Move completed bale to the designated storage area.

#### 7.4 Monthly Inspection

- 7.4.1 At the start of the first day shift each month, inspect contaminated trash dumpsters per the "Contaminated Trash Dumpster Monthly Checksheet", Form FMPC-OPR-3258.

#### NOTE

The supervisor shall report problems to the facility owner of the building where the dumpster is located.

- 7.4.2 Notify the supervisor of discrepancies.
- 7.4.3 Turn in the completed checksheet to the supervisor.

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## 7.0 PROCEDURE (cont.)

7.5 Trouble Shooting (Refer to Table 2)

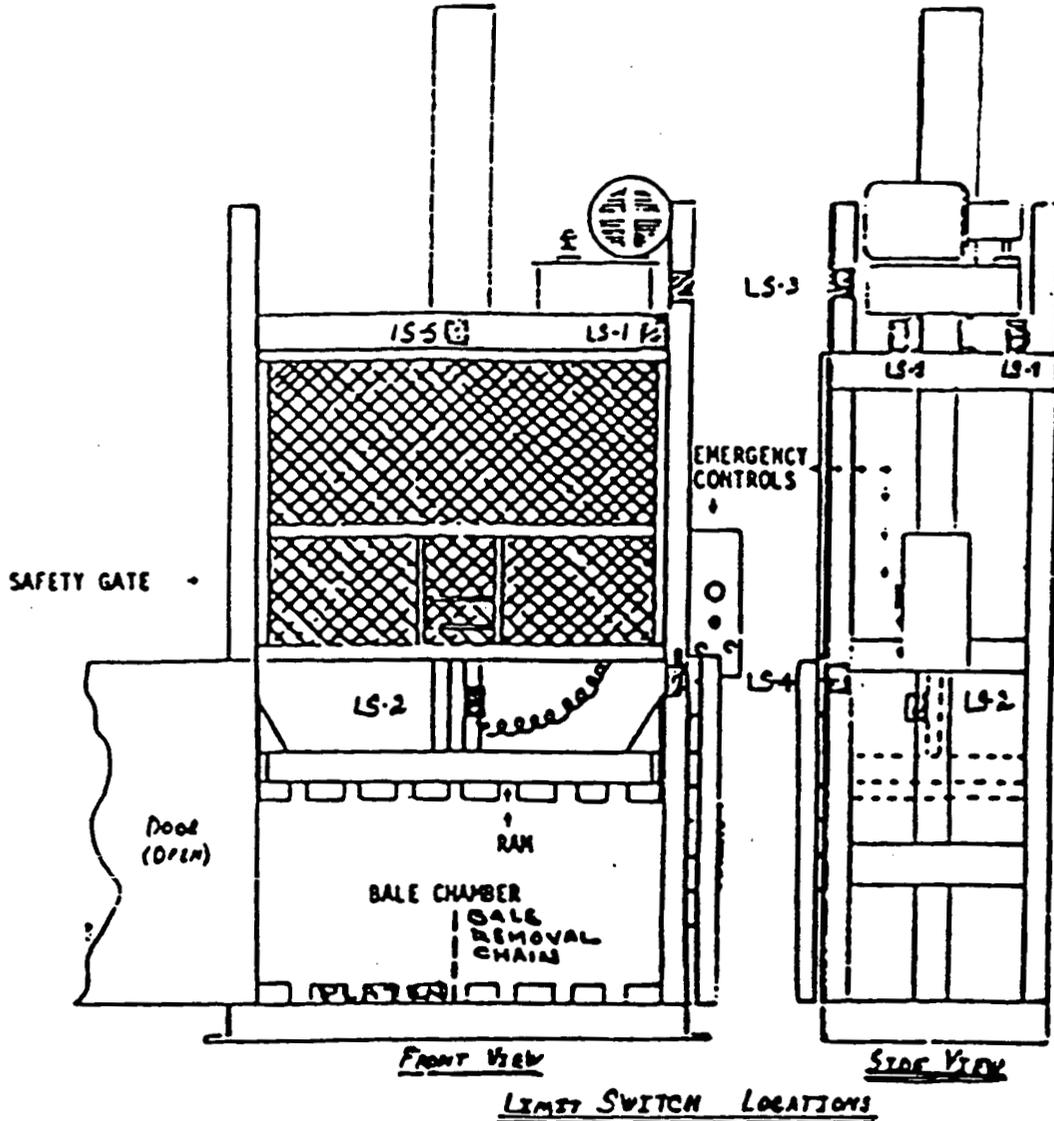
TABLE 2 Baler Trouble Shooting		
Problem	Cause	Corrective Action
1. Baler will not start.	A. Bale removal door/latch open. B. Safety Gate Open C. EMERGENCY STOP Switch activated.	A. Close removal door and latch. B. Close safety gate. C. Turn EMERGENCY STOP push button head to release the locking device.
2. Baler Shuts Down	A. Safety gate raised faster than ram. B. Releasing the UP push button during the ejection cycle.	A. Allow ram to move up before activating safety gate. B. Press and hold the UP button.

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8.0 APPLICABLE FORMS

- 8.1 FMPC-PRO-2887, "Trash Baler Operation Log"
- 8.2 FMPC-CONT-1945-XX, "Item Production/Certification/Identification"
- 8.3 FMPC-ADMS-2414, "Gas, LPG or Diesel Fueled Equipment Operator's Checklist"
- 8.4 FMPC-ADMS-2415, "Electric Truck Operator's Daily Checklist"
- 8.5 FMPC-OPR-3258, "Contaminated Dumpster Monthly Checksheet"

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- LS-1 - UP STOP
- LS-2 - GATE-PLATEN INTERLOCK
- LS-3 - GATE CLOSE
- LS-4 - BALE CHAMBER DOOR
- LS-5 - BALE SIZE

TRASH BALER CONFIGURATION  
 Figure 1

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RECORD OF ISSUE/REVISIONS

<u>DATE</u>	<u>REV. NO</u>	<u>DESCRIPTION AND AUTHORITY</u>
10-21-87	N/A	Preparation of procedure for Baling Trash per Request No. P86-168, initiated by B. Perkins.
06-19-89	N/A	Revised to incorporate C89-002 per Request No. P89-098.
09-01-89	1	Revised to incorporate CIO Nos. C89-065 (P89-352), C89-066 (P89-372), and C89-005 (P89-100). Revision program changed from "Page Revision Date" to "Revision No.".
10-14-91	0	Reissued to update technical content per Request P91-270 initiated by M. Jackson and to incorporate CIOs C90-058, (P91-095), and C90-062 (P91-112).

Fernald Environmental Management Project WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE SERVICES DOCUMENT PROGRAM		Page 1 of 11 Revision No. 0 Revision Date: N/A	<b>99-0701</b>
SITE SERVICES PROCEDURE	EVALUATING LOW LEVEL RADIOACTIVE WASTE (LLRW) BULK WASTE STREAMS FOR SHIPMENT	SOP 20-C-625	
		Area: As Applicable	
Authorization: R. L. Gardner Facilities & Warehousing Manager		Supersedes: 20-C-625 Date: 06-26-92	Issue Date: 11-17-92

**1.0 PURPOSE**

The purpose of this procedure is to allow waste generators to evaluate bulk waste streams designated as Low Level Radioactive Waste (LLRW). The waste streams must be evaluated to ensure the material is properly characterized as non hazardous (as defined by the Resource Conservation and Recovery Act) prior to packaging and shipment for disposal.

**2.0 APPLICABILITY**

This document is applicable to plastic, rubber, paper, fiberglass, rope, scrap wood, scrap metal, and scrap vehicles (including light/medium duty vehicles and forklifts) waste streams being packaged (excluding wastes associated with a Hazardous Waste Management Unit) for disposal as low level radioactive waste.

**3.0 RESPONSIBILITIES**

3.1 Supervisors shall be responsible for the following:

3.1.1 Ensuring that only trained personnel perform this procedure.

3.1.2 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection requirements.

3.1.3 Providing waste generator with the required respiratory protection.

3.2 Waste generators shall be responsible for submissions of Material Evaluation Forms (MEF) and associated characterizations per site procedures.

3.3 Logistics Administration shall be responsible for transporting material to the packaging area upon request.

3.4 Centralized Training shall be responsible for supporting the training and maintaining training records supplied by Site Services.

**4.0 DEFINITIONS**

4.1 Low Level Radioactive Waste - Radioactive waste that is not classified as high level waste, transuranic waste, spent nuclear fuel, or by product material as defined by DOE order 5820.2A. However, test specimens of fissionable material irradiated for research and development purposes only, and not for the production of power or plutonium, may be classified as low level radioactive waste provided the activity of transuranic material is less than 100 nCi/g.

4.2 Waste Generator - Organization (point of generation) at which waste originates.

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#### 4.0 DEFINITIONS (cont.)

- 4.3 RCRA (Resource Conservation Recovery Act) - The federal statute which established safe and environmentally acceptable management practices for specific wastes. RCRA requires strict "cradle to grave" control and proper management of solid and hazardous wastes
- 4.4 Entrapped Liquids - Collected fluids that have accumulated by exposure to elements.
- 4.5 Internal Fluids - Liquid within equipment which functioned as a working component of the equipment.
- 4.6 Waste Streams - For the purpose of this procedure, this term is defined as wood, metal, light/medium duty vehicles or fork lifts designated as Low Level Radioactive Waste.
- 4.7 Hazardous Waste Management Unit - Any unit/facility where hazardous waste is currently controlled or an empty unit which held hazardous waste (e.g. treatment, storage or disposal).
- 4.8 Empty - A container is considered "Empty" of hazardous waste residues as defined by OAC 3745-51-07 in lieu of 40 CFR 261.7.

#### 5.0 APPLICABLE DOCUMENTS

##### 5.1 Drivers

- 5.1.1 DOE 5820.2A, Radioactive Waste Treatment
- 5.1.2 OAC 3745-51-07, Residues of Hazardous Waste in Empty Containers
- 5.1.3 40 CFR 262.11, Hazardous Waste Determination
- 5.1.4 PO-D-0026, "Site Services Document Program"
- 5.1.5 FEMP Conduct of Operations Manual

##### 5.2 References

- 5.2.1 SSOP-0002, "Completing the Material Evaluation Form"
- 5.2.2 SOP 20-C-605, "Establishment and Control of Satellite Accumulation Areas"

#### 6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

- 6.1 Safety glasses with side shields shall be worn unless other eye protection is specified by IRS&T.
- 6.2 Respiratory protection provided by the supervisor shall be worn when required by IRS&T.
- 6.3 Leather-palmed gloves shall be worn to protect hands from rough material and contamination.
- 6.4 HEPA type filter vacuum cleaners or an IRS&T approved vacuum shall be used for cleaning.

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## 6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

- 6.5 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete an Incident Investigation Report (IIR) (Form No. FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a follow-up urine sample. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section.
- 6.6 Use proper lifting techniques when manually lifting wood or metal material. Heavy objects shall be lifted with mechanical lifting devices.
- 6.7 Do not work under a suspended load unless load has been blocked or supported with jack stands.

## 7.0 PROCEDURE

### 7.1 General

- 7.1.1 Warnings, Cautions, and Notes in this procedure precede the step to which they apply.

- 7.1.2 Generators inspect/prepare and evaluate scrap wood per Step 7.2 using checklist Form No. FS-F-3465, scrap metal per Step 7.3 using checklist Form No. FS-F-3464, scrap vehicles per Step 7.4 using checklist Form No. FS-F-3472, and plastic, rubber, paper, fiberglass and rope per Step 7.5 using checklist Form No. FS-F-3580.

### 7.2 Evaluating Scrap Wood Waste Stream

- 7.2.1 Visually inspect and evaluate every item to be packaged for disposal using the criteria of Section I of Materials Evaluation and Container Information-Wood, Form No. FS-F-3465 (See Figure 1).
- 7.2.2 Check the "YES," "NO," and "N/A" boxes as appropriate for all criteria listed in Section I. If one answer to items 1 through 5 is "NO", the item being evaluated must be set aside - not packaged - and a Material Evaluation Form (MEF) completed for that item. Contact Facilities and Material Evaluation (FME) Dept. for guidance. A "NO" to one of items 1 through 5 checked on a form causes rejection of the package for shipment by quality assurance.
- 7.2.3 Complete Section II of Form No. FS-F-3465 as material is packaged.
- 7.2.3.1 List the type of material packaged into the container and the material origin as determined by the packager in the MATERIAL ORIGIN/DESCRIPTION block (block 1) of Section II.
- 7.2.3.2 List the MEF number of any material placed into the package that was not evaluated using Section I of Form No. FS-F-3465, but is approved for shipment based on an existing and approved MEF in the MEF NUMBER block (block 8) of Section II.

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## 7.0 PROCEDURE (cont.)

- 7.2.4 The completed Form No. FS-F-3465 must be signed by the waste packager, the packager's supervisor, and then sent to quality assurance for approval.
- 7.2.5 Quality assurance verifies there are no questionable materials listed in Section II, question 1 and that questions 1-5 in Section I are all checked "YES" or "N/A".
- 7.2.6 Distribute form as required by the distribution block in the lower left corner of each form.

## 7.3 Evaluating Scrap Metal Waste Stream

- 7.3.1 Evaluate every item to be packaged for disposal using the criteria of Section I of Materials Evaluation and Container Information - Metal, Form No. FS-F-3464 (See Figure 2).
- 7.3.2 Check the "YES," "NO," and "N/A" boxes as appropriate for all criteria listed in Section I. If one answer to items 1 through 5 is "NO", the item being evaluated must be set aside - not packaged - and a Material Evaluation Form (MEF) completed for that item. Contact Facilities and Material Evaluation (FME) Dept. for guidance. A "NO" checked on items 1 through 5 of a form causes rejection of the package for shipment by quality assurance.
- 7.3.3 Complete Section II of Form No. FS-F-3464 as material is packaged.
- 7.3.3.1 List the type of material packaged into the container and the material origin as determined by the packager in the MATERIAL ORIGIN/DESCRIPTION block (block 1) of Section II.
- 7.3.3.2 List the MEF number of any material placed into the package that was not evaluated using Section I of Form No. FS-F-3464, but is approved for shipment based on an existing and approved MEF in the MEF NUMBER block (block 8) of Section II.
- 7.3.4 The completed Form No. FS-F-3464 must be signed by the waste packager's supervisor and the operator, and then sent to quality assurance for approval.
- 7.3.5 Quality assurance verifies there are no questionable materials listed in Section II, question 1 and that questions 1-5 in Section I are all checked "YES" or "N/A".
- 7.3.6 Distribute the form as required by the distribution block in the lower left corner of each form.

## 7.4 Evaluating Scrap Vehicles and Forklifts Waste Stream

**NOTE:** Only light/medium duty vehicles and forklifts are to be evaluated per this procedure. This document is not applicable to heavy equipment.

- 7.4.1 Evaluate every vehicle to be packaged for disposal using the criteria of Section I of Evaluation and Container Information - Scrap Vehicle, Form No. FS-F-3472 (See Figure 3).

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## 7.0 PROCEDURE (cont.)

- 7.4.2 Check the "YES," "UNKNOWN," "NO," and "N/A" boxes as appropriate for all criteria listed in Section I. If the appropriate answer to the criteria is "NO", the vehicle being evaluated cannot be packaged and a Material Evaluation Form (MEF) must be completed for that vehicle. Contact Facilities and Material Evaluation Dept. for guidance. A "NO" checked on a form causes rejection of the package for shipment by quality assurance.
- 7.4.3 Complete Section II of Form No. FS-F-3472 as material is packaged.
- 7.4.3.1 List the type of material packaged into the container and the material origin as determined by the packager in the MATERIAL ORIGIN/DESCRIPTION block (block 1) of Section II.
- 7.4.3.2 List the MEF number of any material placed into the package that was not evaluated using Section I of Form No. FS-F-3472, but is approved for shipment based on an existing and approved MEF in the MEF NUMBER block (block 8) of Section II.
- 7.4.4 The completed Form No. FS-F-3472 must be signed by the waste packager's supervisor and the operator. Send Form to Quality Assurance for approval.
- 7.4.5 Quality assurance verifies there are no questionable materials listed in Section II, question 1 and that questions 1-12 in Section I are all checked "YES" or "N/A".
- 7.4.6 Distribute form as required by the distribution block in the lower left corner of each form.
- 7.5 Evaluating Scrap, Plastic, Paper, Fiberglass & Rope Waste Stream
- 7.5.1 Visually inspect and evaluate every item to be packaged for disposal using the criteria of Section I of Materials Evaluation and Container Information-plastic, rubber, paper, fiberglass and rope, Form No. FS-F-3580 (See Figure 4).
- 7.5.2 Check the "YES," "NO," and "N/A" boxes as appropriate for all criteria listed in Section I. If one answer to items 1 through 7 is "NO", the item being evaluated must be set aside - not packaged - and a Material Evaluation Form (MEF) completed for that item. Contact Facilities and Material Evaluation (FME) Dept. for guidance. A "NO" to one of items 1 through 7 checked on a form causes rejection of the package for shipment by quality assurance.
- 7.5.3 Complete Section II of Form No. FS-F-3580 as material is packaged.
- 7.5.3.1 List the type of material packaged into the container and the material origin as determined by the packager in the MATERIAL ORIGIN/DESCRIPTION block (block 1) of Section II.
- 7.5.3.2 List MEF number of any material placed into the package that was not evaluated using Section I of Form No. FS-F-3580, but is approved for shipment based on an existing and approved MEF in the MEF NUMBER block (block 8) of Section II.

**6053****7.0 PROCEDURE (cont.)**

- 7.5.4 The completed Form No. FS-F-3580 must be signed by the waste packager, the packager's supervisor, and then sent to quality assurance for approval.
- 7.5.5 Quality assurance verifies there are no questionable materials listed in Section II, question 1 and that questions 1-7 in Section I are all checked "YES" or "N/A".
- 7.5.6 Distribute form as required by the distribution block in the lower left corner of each form.

**8.0 APPLICABLE FORMS**

- 8.1 Form No. FS-F-3465, "Materials Evaluation and Container Information - Wood"
- 8.2 Form No. FS-F-3464, "Materials Evaluation and Container Information - Metal"
- 8.3 Form No. FS-F-3472, "Evaluation and Container Information - Scrap Vehicle"
- 8.4 Form No. FS-F-3580, "Materials Evaluation and Container Information - Plastic, Rubber, Paper, Fiberglass, Rope"

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FEMP

Reference MEF # 905

LOW-LEVEL RADIOACTIVE WASTE

MATERIALS EVALUATION AND CONTAINER INFORMATION - WOOD

SECTION I				
WASTE EVALUATION		YES	NO	N/A
1. Treated:	a. Material free from creosote treatment			
2. Residues:	a. Free from process or waste residues			
3. Stains:	a. Stains cover less than 10% of wood surface or Stain covers more than 10% of wood surface caused by green salt, black oxide, white salt, or orange oxide.			
4. Paint:	a. Free from lead-based paint or Paint covers less than 10% of material			
5. Plastic/Rubber:	a. Material consists of less than 20% by volume other materials and does not contain any oil, solid residues, or entrapped liquids (e.g. plastic or rubber parts/hardware)			
6. Metal:	a. Metal constitutes more than 10% by volume (If yes, then metal's checklist (FS-F-3464) must also be used.)			

SECTION II - CONTAINER INFORMATION			
1. MATERIAL ORIGIN/DESCRIPTION			
2. PACKAGING START DATE		PACKAGING FINISH DATE	
3. OPERATOR(S) SIGNATURE:		DATE:	
4. CONTAINER NUMBER:		5. CONTAINER TYPE:	
		<input type="checkbox"/> S/L <input type="checkbox"/> WHITE METAL BOX	
6. 66 CARD NUMBER:		7. LOCATION PACKAGED:	
8. MEF NUMBER:		9. % COMBUSTIBLE:	
APPROVED BY:		APPROVED BY:	
SUPERVISOR(S) SIGNATURE/DATE		QA SIGNATURE/DATE	

\* When materials are packaged that do not meet the criteria established in Section I, but have an approved MEF number, the MEF number and material must be recorded.

GENERATOR TO MAKE DISTRIBUTION:		
1	Original to Facilities and Material Evaluation	MS46
2	Copy to Waste Shipping	MS63
3	Copy to Environmental Compliance	MS65
4	Copy to Materials Control and Accountability	MS28

FS-F-3465 (REV. 4/7/92)

LLRW MATERIALS EVALUATION AND CONTAINER INFORMATION-WOOD

Form No. FS-F-3465

Figure 1

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**FEMP**  
**LOW-LEVEL RADIOACTIVE WASTE**  
**MATERIALS EVALUATION AND CONTAINER INFORMATION - METAL**

Reference MEF # 1088

**6053**

SECTION I			
WASTE EVALUATION	YES	NO	N/A
1. Free from the following:			
a. Grease/oils .....			
b. Solid residues .....			
c. Entrapped liquids .....			
d. Internal fluids .....			
2. Material tagged as drained .....			
3. Paint: Material free from lead-based paint or Paint covers less than 10% of materials or Material is greater than 1/16 inch thick .....			
4. Electrical Equipment:			
a. Ballasts removed .....			
b. Starter caps removed .....			
c. Mercury switches removed .....			
d. Dielectric fluid removed .....			
5. Plastic/Rubber: Material consists of less than 20% other materials by volume and meets the criteria set in #1 (e.g. plastic, or rubber parts/hardware) .....			
6. Wood: a. Constitutes more than 20% by volume (If yes, then wood checklist (FS-F-3465) must also be used.) .....			

SECTION II - CONTAINER INFORMATION			
1. MATERIAL ORIGIN/DESCRIPTION:			
2. PACKAGING START DATE		3. OPERATOR(S) SIGNATURE	
PACKAGING FINISH DATE		DATE	
4. CONTAINER NUMBER		5. CONTAINER TYPE	
6. 66 CARD NUMBER		7. LOCATION PACKAGED	
8. MEF NUMBER		9. % COMBUSTIBLE	
APPROVED BY:		APPROVED BY:	
SUPERVISOR(S) SIGNATURE/DATE		QA SIGNATURE/DATE	

\* When materials are packaged that do not meet the criteria established in Section I, but have an approved MEF number, the MEF number and material must be recorded.

GENERATOR TO MAKE DISTRIBUTION		
1	Original to Facilities and Material Evaluation	MS48
2	Copy to Waste Shipping	MS63
3	Copy to Environmental Compliance	MS65
4	Copy to Materials Control and Accountability	MS28

FS-F-3464 (REV 4/7/92)

**LOW-LEVEL RADIOACTIVE WASTE  
EVALUATION AND CONTAINER INFORMATION - SCRAP VEHICLE**

SECTION I					
WASTE EVALUATION		YES	UNKNOWN	NO	N/A
1. Free from the following fluids:	a. Anti-freeze				
	b. Brake fluid				
	c. Gasoline				
	d. Transmission fluid				
	e. Engine oil				
	f. Power steering				
	g. Differential fluid (rear end)				
	h. Windshield Wiper Fluid				
2. Removed:	a. Radios				
	b. Distributor coils and amplifiers				
	c. Alternators				
	d. Electronic fuel injector circuit				
3. Fuel tank removed					
4. Propane tank removed					
5. Tires Deflated					
6. Tire valve stem removed					
7. Freon pumped/contained for recycling					
8. Auxiliary Hydraulic Unit removed or drained					
9. Oil filter removed					
10. Oil filter drained					
11. Oil filter replaced in vehicle or discarded and oil line capped					
12. Batteries removed					

SECTION II - CONTAINER INFORMATION			
1. MATERIAL ORIGIN/DESCRIPTION			
2. PACKAGING START DATE		3. OPERATOR(S) SIGNATURE	
4. CONTAINER NUMBER		5. CONTAINER TYPE	
6. 65 CARD NUMBER		7. LOCATION PACKAGED	
8. MEF NUMBER		9. % COMBUSTIBLE	

GENERATOR TO MAKE DISTRIBUTION:		
1	Original to Facilities and Material Evaluation	MS46
2	Copy to Waste Shipping	MS63
3	Copy to Environmental Compliance	MS65
4	Copy to Materials Control and Accountability	MS28

APPROVED BY \_\_\_\_\_  
SUPERVISOR'S SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

\* When materials are packaged that do not meet the criteria established in Section I, but have an approved MEF number, the MEF number and material must be recorded.



RECORD OF ISSUE/REVISIONS8:00  
DATE

<u>DATE</u>	<u>REV. NO.</u>	<u>DESCRIPTION AND AUTHORITY</u>
06-26-92	0	Requirement for procedure Evaluating Low Level Radioactive Waste (LLRW) per Request No. P92-106, initiated by M. J. Krauss.
11-05-92	0	Reissue procedure to include the addition of plastic, rubber, paper, fiberglass and rope waste streams per Request No. P92-226, initiated by P. Philpot.

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SITE SERVICES PROCEDURE	SAMPLING DRUMMED WASTE FOR HAZARD IDENTIFICATION	SOP 20-C-805	
		Area: As Applicable	
Authorization: <i>R. L. Gardner</i> Facilities & Warehousing Manager		Supersedes: None	Issue Date: 04-10-92

1.0 PURPOSE

NON-CONTROLLED COPY

The purpose of this document is to establish the procedure for sampling drummed waste.

2.0 APPLICABILITY

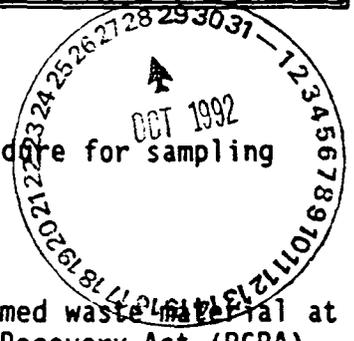
This procedure is applicable to taking samples of drummed waste material at drum sampling locations and Resource Conservation and Recovery Act (RCRA) facilities.

3.0 RESPONSIBILITIES

3.1 Supervisors shall be responsible for the following:

- 3.1.1 Contacting Industrial Hygiene and/or Radiological Safety to determine the appropriate respiratory protection for the process being performed.
- 3.1.2 Providing operators with the required respiratory protection.
- 3.1.3 Ensuring that personnel are qualified per the established training requirements identified by the Department/Staff Manager.
- 3.1.4 Reviewing applicable Material Safety Data Sheets (MSDS) with operators.
- 3.1.5 Obtaining and posting a "Radiation Work Permit."
- 3.1.6 Obtaining and posting a "Hazardous Material Permit."
- 3.1.7 Obtaining specific drum storage location(s) from MC&A.
- 3.1.8 Notifying Materials Control & Accountability (MC&A) prior to moving drums.
- 3.1.9 Notifying the Transportation representative to move the drums to a diked sampling area.
- 3.1.10 Notifying Radiological Safety prior to moving drums in and out of Radiological Zones.

3.2 Operators and Supervisors shall be responsible for complying with this procedure.



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### 3.0 RESPONSIBILITIES (CONT.)

3.3 Environmental Management (EM) shall be responsible for the following:

- 3.3.1 Preparing "Sampling Request" forms for RCRA or suspect RCRA materials.
- 3.3.2 Performing statistical analysis on data received from on-site and off-site laboratories.
- 3.3.3 Performing hazardous waste determination.

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

- 3.4.1 Assigning a representative to areas where drums are being moved.
- 3.4.2 Furnishing material identification data.

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

- 3.5.1 Monitoring vehicles and drums entering and exiting Radiological Zones.
- 3.5.2 Issuing Radiation Work Permits.

### 4.0 DEFINITIONS

- 4.1 Equipment Blank Sample - Specimens of analyte-free media poured over previously cleaned sample equipment and accompanies the actual samples to the laboratory.
- 4.2 Composite Sample - Specimen derived by combining equal numbers of random samples obtained from the same waste stream.
- 4.3 Multi-Phase - A material consisting of liquid and a solid in any combination of 2 or more.
- 4.4 Random Sample - A representative sample of waste material taken from a drum chosen from a group of drums that had equal probability of being selected.
- 4.5 Trip Blank - A specimen of deionized water that accompanies the sample to the laboratory.

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#### 4.0 DEFINITIONS (cont.)

- 4.6 Wash Water Blank Sample - A specimen of clean rinseate water that accompanies actual samples to the laboratory.
- 4.7 Contact Waste - Unwanted material that has come into contact with a RCRA Waste or Suspect RCRA Waste during sampling.

#### 5.0 REFERENCES

- 5.1 SOP 20-C-605, "Establishment and Control of Satellite Accumulation Areas"
- 5.2 SOP 20-C-909, "Portable Ventilation Unit Operation"
- 5.3 SOP 20-C-912, "Checking Scale Operation"
- 5.4 SSOP-0018, "Processing Site Wide Analysis Request/Custody Record for Sample Control"
- 5.5 SSOP-0024, "Packaging of Low Level Radioactive Waste (L-LRW) for Off-Site Disposal"

#### 6.0 INDUSTRIAL HEALTH & SAFETY REQUIREMENTS

- 6.1 A defined safety system is not involved.
- 6.2 Portable ventilation devices shall be used per SOP 20-C-909 when collecting samples from drums containing dry materials or volatile compounds.
- 6.3 Operators shall wear respiratory protection provided by the supervisor.
- 6.4 Leather-palm gloves shall be worn when handling drums, locking rings, lids, sharp or abrasive material, or when using tools.
- 6.5 Safety glasses shall be worn unless a full face respirator is used.
- 6.6 Face shields, neoprene gloves, aprons, and chemical cover goggles shall be worn when taking samples of caustic material, acid slurries, or liquids.
- 6.7 Gloves shall be leaked checked by water immersion prior to use. Leaking gloves or gloves contaminated on the inside shall be discarded.
- 6.8 Employees shall have reviewed, and be familiar with, the information contained in the MSDS for the chemical/hazardous materials that may be used or encountered.

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## 6.0 INDUSTRIAL HEALTH & SAFETY REQUIREMENTS (cont.)

- 6.9 Specified personal protective equipment (PPE) (including booties), which are specified on Work Permits and this procedure, shall be worn before entering a sample area.
- 6.10 Personnel shall have access to communications devices and emergency response equipment.
- 6.11 Industrial Hygiene shall be contacted to measure volatile organic compounds for all drums classified as containing organic liquids. Results of monitoring along with personal protective equipment requirements shall be communicated to supervision on a "Hazardous Chemical Work Permit".
- 6.12 Fire and Safety Inspectors shall be contacted to check for flammable vapors from all drums classified as containing organic liquids. Flammable liquids identified by Fire and Safety shall only be sampled at the flammable liquid sampling line using explosion proof electrical equipment and non-sparking tools.
- 6.13 All persons will remain clear of aisle-ways while forklifts and handstackers are in use.
- 6.14 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion, or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section for evaluation. The involved personnel shall report to the Urine Sampling Station at the end of their shift to complete a Incident Investigation Report (IIR) (Form FMPC-ES&H-1458), and submit an incident urine sample. The involved personnel shall also report to the Urine Sampling Station at the start of their next shift to submit a followup urine sample.

## 7.0 PROCEDURE

### 7.1 General

- 7.1.1 Warnings, cautions, and notes precede the Item or Step to which they apply.
- 7.1.2 Any deviation from the Sampling Plan shall be noted in the "Sampling Log Book."
- 7.1.3 To prevent contamination, only one drum per sampling line shall be opened, unless a composite sample is required.

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7.0 PROCEDURE (cont.)

7.1.4 Volatile organic compounds (VOC) and combustible materials being sampled or staged shall be segregated from other materials. See Item 6.11 for identification and sampling of flammable liquids.

7.1.5 When samples are requested for volatile organic analysis, the samples shall be taken and the sample container and drum closed and sealed as quickly as possible.

7.2 Preparation for Sampling

NOTE: Contact supervisor if there are questions pertaining to the Sampling Request Form.

7.2.1 Obtain the "Sampling Request Form" from the supervisor.

7.2.1.1 Take Sampling Request Form to Material Control and Accountability where a lot number and location will be placed on the form.

7.2.1.2 Obtain the Lot Marking System Number for rinseate and trash cans containing contact waste from MC&A.

7.2.2 Check that a "Radiation Work Permit" and/or "Hazardous Material Permit" are posted and current with each new Sample Request Form.

7.2.2.1 If no permit(s) is/are posted, notify the supervisor.

NOTE: Scales shall be checked at the start of each operating shift or before the first use each day.

7.2.3 If not already completed, check the scales to be used per SOP 20-C-912.

NOTE: VOC and flammable/combustible material shall be moved to respectively designated area identified by the supervisor.

7.2.4 Using a handstacker, move skids of material into the designated sampling or staging areas.

NOTE: Two five gallon containers shall be used unless a composite sample is to be prepared and then three containers are required.

7.2.5 Prepare containers (for cleaning sampling equipment and disposal of trash) as follows:

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7.0 PROCEDURE (cont.)

7.2.5.1 Tare weigh the empty, clean, color-coded 5-gallon containers.

7.2.5.2 Stencil the containers with the tare weight and the Lot Marking System Number according to RM-0005, Lot Marking and Color Coding System.

7.2.5.3 Install plastic liners in the five gallon containers.

NOTE: The equipment to be used for sampling is identified in the Sample Request Form.

7.2.6 Obtain sampling equipment that has a "Clean Equipment" tag attached.

7.2.6.1 If clean equipment is not available, obtain dirty equipment and clean per Item 7.8.

7.2.7 Obtain a box of clean, lidded sampling jars.

7.2.7.1 If the box of jars was not labeled, "Clean," process the jars per Item 7.8.

7.2.8 Tare weigh each sample jar (with lid).

7.2.8.1 Mark the tare weight on a piece of marking tape and place on the jar.

7.2.9 Complete the Sample Label, mark the tare weight on the Sample Label, Form 144, M-145, or M-160 to be used (Refer to Figure 1).

7.2.10 Fill out the applicable portions of a "Solid Waste Analysis Request/Custody Request" (SWAR/CR) form per SSOP-0018.

7.2.11 Place an absorbent pad that is applicable for material to be sampled (water/oil) under the sample jars(s).

7.2.12 Using the Log Book Stamps, imprint the "Sampling Log Book."

7.2.13 Fill out the log book with the information required by the stamp.

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7.0 PROCEDURE (cont.)

7.3 SAMPLING

**CAUTION: ONLY NON-SPARKING TOOLS AND EXPLOSION-PROOF EQUIPMENT SHALL BE USED IN THE VICINITY OF FLAMMABLE OR COMBUSTIBLE MATERIAL SAMPLING LINES.**

- 7.3.1 Remove the locking ring and drum lid from the drum to be sampled.
- 7.3.2 Visually inspect the waste material to be sampled to determine the physical characteristics (liquid, solid, dry, or moist).

**NOTE: HEPA ventilation devices shall have current DOP Test Labels. DOP Test Labels must be unbroken and legible.**

- 7.3.2.1 If the material is dry, install a HEPA filtered ventilation system per SOP 20-C-602.
- 7.3.3 Check that the drum contents corresponds with the Material Type Code (MTC) on the drum and the Sample Request Form.

**NOTE: The supervisor shall inform Site Media Sampling.**

- 7.3.3.1 If the material does not match the form, notify the supervisor.
- 7.3.4 If a drum contains solid and liquid phases, proceed as follows:
  - 7.3.4.1 Measure the amount of liquid (in inches) in the drum using a COLIWASA.
  - 7.3.4.2 Measure the amount of solid (in inches) using an Auger or Pipe Sampler.
  - 7.3.4.3 Record the percent liquid and solid in the "Sampling Log Book."

**NOTE 1: If the liquid or solid phase is less than five percent of the total volume of the material in the drum, the material is considered single phase and the phase that constitutes less than five percent does not require sampling.**

**NOTE 2: When each phase is equal to or greater than five percent of the total volume of material in the drum, the drum content is considered multi-phase. Both phases shall be sampled individually.**

7.3.4.4 Using a clean COLIWASA, sample the liquid per Item 7.6.

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## 7.0 PROCEDURE (cont.)

- 7.3.4.5 Deposit the sample into a collection jar or can.
- 7.3.4.6 If the "Sampling Request" form specifies Volatile Organic Analysis, perform Item 7.10.
- 7.3.4.7 Transfer collection jar with sample to ventilation enclosure.
- 7.3.4.8 Fill sample jars from material in the collection jar or can.
- 7.3.4.9 Dispose of excess sample material in the container from which the sample was taken.
- 7.3.4.10 Place the lid on sample jar.
- 7.3.4.11 After the required samples have been taken, clean the exterior of the filled sample jars with either a dry or wet cloth and dispose of the cloth per Item 7.8.7.1.
- 7.3.4.12 Affix the label(s) to sample jar(s).
- 7.3.4.13 Seal the jar lid with a "Tamper Proof Seal" (Refer to Figure 2).
- 7.3.4.14 Using a Pipe Sampler or Auger, take a sample of the solid material per Item 7.4 or 7.5.
- 7.3.4.15 Deposit the sample into a collection jar or can.
- 7.3.4.16 Transfer the collection jar with sample to ventilation enclosure.
- 7.3.4.17 Fill sample jars from material in the collection jar or can.
- 7.3.4.18 Dispose of excess sample material in the container from which the sample was taken.
- 7.3.4.19 Place the lid on sample jar.
- 7.3.4.20 After the required samples have been taken, clean the exterior of the filled sample jars.
- 7.3.4.21 Affix the label(s) to sample jar(s).
- 7.3.4.22 Seal the jar lid with a "Tamper Proof Seal" (Refer to Figure 2).
- 7.3.4.23 Clean samples per Item 7.8.

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7.0 PROCEDURE (cont.)

7.3.5 If the waste material is a single solid phase, proceed as follows:

- 7.3.5.1 Using an Auger Sampler or Pipe Sampler, take a sample per Item 7.4 or 7.5.
- 7.3.5.2 Deposit the sample into a collection jar or can.
- 7.3.5.3 Transfer the collection jar with sample to ventilation enclosure.
- 7.3.5.4 Fill sample jars from material in the collection jar or can.
- 7.3.5.5 Dispose of excess sample material in the container from which the sample was taken.
- 7.3.5.6 Place the lid on sample jar.
- 7.3.5.7 After the required samples have been taken, clean the exterior of the filled sample jars.
- 7.3.5.8 Affix the label(s) to sample jar(s).
- 7.3.5.9 Seal the jar lid with a "Tamper Proof Seal" (See Figure 2).
- 7.3.5.10 Clean the sampler per Item 7.8.

7.3.6 If the waste material is a single liquid phase, proceed as follows:

- 7.3.6.1 Using a clean COLIWASA, take a sample per Item 7.6.
- 7.3.6.2 If the "Sampling Request Form" specifies Volatile Organic Analysis, perform 7.10.
- 7.3.6.3 Deposit the sample into a collection jar or can.
- 7.3.6.4 Transfer collection jar with sample to ventilation enclosure.
- 7.3.6.5 Fill sample jars from material in the collection jar or can.
- 7.3.6.6 Dispose of excess sample material in the container from which the sample was taken.
- 7.3.6.7 Place the lid on sample jar.
- 7.3.6.8 After the required samples have been taken, clean the exterior of the filled sample jars.

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7.0 PROCEDURE (cont.)

7.3.6.9 Affix the label(s) to sample jar(s).

7.3.6.10 Seal the jar lid with a "Tamper Proof Seal" (See Figure 2).

7.3.6.11 Clean the sampler per Item 7.8.

7.3.7 If a composite sample is to be taken from drums of multi-phase material, record the Lot Marking System Numbers of the drums making up the composite in the Log Book and proceed as follows:

7.3.7.1 Notify the supervisor.

7.3.7.2 Obtain drums that are color coded and identified the same as the drum to be sampled.

7.3.7.3 Using a clean portable pump, transfer the liquid to the empty drum(s).

7.3.7.4 Using an clean Auger Sampler or Pipe Sampler, take samples of the solid material in the drums per Item 7.4 or 7.5.

7.3.7.5 If there is not enough material to fill the samples, take a second sample from each drum.

7.3.7.6 Using a clean stainless steel spatula, mix the contents of the sample can to blend the sample material.

7.3.7.7 Using a scoop, take a sample of the blended composite.

7.3.7.8 Deposit the sample into a collection jar or can.

7.3.7.9 Transfer collection jar with sample to ventilation enclosure.

7.3.7.10 Fill sample jars from material in the collection jar or can.

7.3.7.11 Dispose of excess sample material in the container from which the sample was taken.

7.3.7.12 Place the lid on sample jar.

7.3.7.13 After the required samples have been taken, clean the exterior of the filled sample jars.

7.3.7.14 Affix the label(s) to sample jar(s).

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7.0 PROCEDURE (cont.)

- 7.3.7.15 Seal the jar lid with a "Tamper Proof Seal" (See Figure 2).
- 7.3.7.16 Lid the composite sample can.
- 7.3.7.17 Mark the can with the same Material Type and Source Code as the drums that were sampled.
- 7.3.7.18 Clean the sampler per Item 7.8.
- 7.3.7.19 Using a COLIWASA, sample the liquid from the drums per Item 7.6.
- 7.3.7.20 If the "Sampling Request Form" specifies Volatile Organic Analysis, perform 7.10.
- 7.3.7.21 Deposit the sample into a collection jar or can.
- 7.3.7.22 Transfer collection jar with sample to ventilation enclosure.
- 7.3.7.23 Fill sample jars from material in the collection jar or can.
- 7.3.7.24 Dispose of excess sample material in the container from which the sample was taken.
- 7.3.7.25 Place the lid on sample jar.
- 7.3.7.26 After the required samples have been taken, clean the exterior of the filled sample jars.
- 7.3.7.27 Affix the label(s) to sample jar(s).
- 7.3.7.28 Seal the jar lid with a "Tamper Proof Seal" (See Figure 2).
- 7.3.7.29 Mark the can with the same Material Type and Source Code as the drums that were sampled.
- 7.3.7.30 Clean the sampler per Item 7.8.
- 7.3.7.31 Prepare the appropriate blank per Item 7.7.
- 7.3.8 If a composite sample is to be taken from drums of single phase solid material, perform Steps 7.3.7.4 thru 7.3.7.18.
- 7.3.9 If a composite sample is to be taken from drums of single phase liquid material, perform Steps 7.3.7.19 thru 7.3.7.31.

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7.0 PROCEDURE (cont.)

- 7.3.10 Place the sample jars and blanks in the lockable refrigerator.
- 7.3.11 Contact MC&A for storage of the drums, Composite Sample Cans, and Trash Containers.
- 7.3.12 Complete a "Chain-of-Custody Record," Form FMPC-SS-3361 (see Figure 3).
  - 7.3.12.1 If the samples will remain in the area overnight, place the custody record form in the top drawer of the sampling area desk.
  - 7.3.12.2 Lock the desk drawer containing the custody record form.
- 7.3.13 Lock the refrigerator.
  - NOTE 1: The supervisor shall arrange to have the samples and "Chain-of-Custody Record" form delivered to the laboratory.
  - NOTE 2: All sample containers and trash bags shall be surveyed by a Radiation Technician prior to exiting a regulated area.
- 7.3.14 At the end of the shift, or when sampling is complete, notify the supervisor that samples and blanks require delivery to the Analytical Laboratory.
- 7.3.15 Ensure that the custody record form accompanies samples being transferred.

7.4 Using the Auger Sampler

- 7.4.1 Insert the sampler into the material being sampled.
- 7.4.2 Press down and rotate the sampler T-handle.
- 7.4.3 Withdraw the sampler from the drum of material.
- 7.4.4 Check that a complete core sample was taken.
  - 7.4.4.1 If a complete core was not taken, empty the sampler into the drum the material was taken from and return to Step 7.4.1.
- 7.4.5 Using a clean spatula, push the sample out of the sampler and into a collection jar or can.

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## 7.0 PROCEDURE (cont.)

### 7.5 Using the Pipe Sampler

**NOTE:** The pipe sampler shall be long enough to reach the bottom of the container being sampled.

- 7.5.1 Insert the pipe sampler diagonally through the contents of the drum.
- 7.5.2 Rotate the pipe sampler once or twice to cut a core of material.
- 7.5.3 Ensure that the slot is face up.
- 7.5.4 Slowly withdraw the pipe sampler from the drum.
- 7.5.5 Check that the entire length of pipe contains material.
- 7.5.6 If part of the pipe is empty, proceed as follows:
  - 7.5.6.1 Empty the sampler into the drum the material was taken from.
  - 7.5.6.2 Repeat Steps 7.5.1. thru 7.5.5 until a representative sample is obtained.

### 7.6 Using a COLIWASA SAMPLER

- 7.6.1 Check to ensure that the inner tubing and the outer sheath are not cracked.
  - 7.6.1.1 If the sampler is cracked, obtain a new, clean, intact sampler.
- 7.6.2 Insert the inner tubing inside the sheath.
- 7.6.3 Raise the ground glass end of tube several inches above the hole in the bottom of the sheath.

**NOTE:** The COLIWASA shall be lowered so that the levels of liquid inside and outside the sampler tube remain even. If the liquid level in the sampler tube is lower than the level outside the sampler, the rate is too fast and will result in a nonrepresentative sample.

- 7.6.4 Slowly lower the COLIWASA vertically into the drum, keeping the ground glass end away from the hole in the bottom of the sheath.
- 7.6.5 When the sheath hits the bottom of the drum, push the inner tube downward so that the ground glass end seals the sheath.

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7.0 PROCEDURE (cont.)

NOTE: The ground glass end shall seal the tube bottom.

- 7.6.6 Slowly withdraw the COLIWASA sampler with one hand while wiping the outside of the sampler with a clean disposable cloth.
- 7.6.7 Place the disposable cloth in a plastic bag that is labelled for the type of material being sampled.
- 7.6.8 Dispose of trash bags containing non-RCRA waste per SOP 20-C-601.
- 7.6.9 Dispose of trash bags containing RCRA, or suspected RCRA, waste per SOP 20-C-605.

NOTE: The analyses listed on the "Sampling Request" form should also be performed on blank samples.

7.7 Taking Blanks

NOTE: Wash Water Blanks are taken weekly, alternating with Equipment Blanks and Trip Blanks.

7.7.1 Wash Water Blanks

- 7.7.1.1 Using a clean (per item 7.8) pressurized hand pump, decant the clean rinseate from the Wash Water Container into the appropriate numbered sample jars.

NOTE: Taken on alternating weeks with Wash Water and Trip Blanks and Equipment Blanks.

7.7.2 Equipment Blank

- 7.7.2.1 Using a clean (per Item 7.8) pressurized hand pump and deionized water, rinse the clean sampling equipment.
- 7.7.2.2 Collect the rinseate in a clean (per Item 7.8) one-gallon sample container.
- 7.7.2.3 Transfer the water from the container into clean sample jars.
- 7.7.3 Lid the sample jars.

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		Area: As Applicable	
Authorization: R. L. Gardner, Facilities & Warehousing Manager		Supersedes: None	Issue Date: 04-10-92

7.0 PROCEDURE (cont.)

**NOTE:** Trip Blanks are prepared by Site Media Sampling.

**NOTE:** Trip Blanks shall only be obtained when volatile organic analysis is required for the material being sampled.

**NOTE:** Trip Blanks are used to measure cross-contamination of volatile organics during transport, and are taken on alternating weeks with Wash Water and Equipment Blanks.

7.7.4 Trip Blanks

7.7.4.1 Contact Site Media Sampling to obtain blanks.

7.7.5 Complete the applicable "Sample Label" (Refer to Step 7.2.9).

7.7.6 Affix the label(s) to the sample jar(s).

7.8 Cleaning Sampling Equipment

**NOTE:** Cleaning and rinsing shall be performed over the five-gallon container marked with the appropriate 15-digit FEMP Lot Markings (Refer to Step 7.2.5).

7.8.1 Position the five gallon container in the area where cleaning will be performed.

**NOTE:** A bottle brush shall be used as necessary to remove particulate matter, films, or other dirt.

**NOTE:** ALQUINOX or LIQUINOX (or equivalent) may be used as the cleaning detergent.

7.8.2 Using a phosphate free liquid detergent solution, wash the sampling equipment thoroughly.

7.8.3 Rinse the sampling equipment with water.

7.8.4 Drain excess water off the sampling equipment.

**NOTE:** Pesticide grade isopropanol is below laboratory grade isopropanol.

7.8.5 Rinse the sampling equipment with pesticide grade isopropanol and, if necessary, dry with a clean dry cloth.

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## 7.0 PROCEDURE (cont.)

**CAUTION: THE LID SHALL BE KEPT ON THE CONTAINER OF USED WASH AND/OR RINSE SOLUTION WHEN NOT IN USE.**

7.8.6 Lid the container of used wash/rinse solution.

7.8.7 If the sampler will not be used immediately, proceed as follows:

7.8.7.1 Place the clean sampler in a clean plastic bag or wrap with a plastic sheet.

7.8.7.2 Complete a "Clean Equipment" tag, Form FMPC-PRO-3128, (See Figure 6).

7.8.7.3 Attach the tag to the clean equipment.

7.8.7.4 Store the sampler per Item 7.9.

7.8.8 When the wash/rinse container is full, process the contents as RCRA waste per SOP 20-C-605.

7.8.9 Dispose of absorbent cloths or trash bags which have not come in contact with RCRA waste or suspected RCRA waste per SSOP-0024.

## 7.9 Storing Sampling Equipment

7.9.1 Seal the plastic bag with tape.

7.9.2 Place the samplers in a clean, protected area.

## 7.10 Liquid Organic Analysis Sampling

7.10.1 Obtain a septum bottle.

**NOTE: The liquid shall reach slightly above the lip of the bottle.**

7.10.2 Carefully fill the septum bottle with the sample liquid.

7.10.3 Place the teflon septum (with teflon side down) on top of the bottle.

7.10.4 Screw the plastic lid on the bottle.

7.10.5 Check the liquid for air bubbles by turning the bottle upside down.

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7.0 PROCEDURE (cont.)

**NOTE:** Organic analysis requires that no air bubbles be present in the septum bottle.

7.10.6 If air bubbles are present, empty the bottle and repeat Steps 7.10.2 through 7.10.5 until no air bubbles are present.

7.10.7 Label the septum bottle.

8.0 APPLICABLE FORMS

- 8.1 M-144, M-145, M-160, "Sample Label"
- 8.2 No Form Number, "Tamper Proof Seal"
- 8.3 FMPC-SS-3361, "Chain of Custody Record"
- 8.4 FMPC-PRO-3128, "Clean Equipment Tag"

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Green on White  
 For Enrichment  
 Less Than 0.71

**FMPC-SAMPLE LABEL/RCRA MATERIAL-DEPLETED**

SAMPLING LOCATION		P.O. NO./ENRICHMENT
COLLECTOR		
TYPE OF MATERIAL		
TYPE OF SAMPLE		
LOT NUMBER OR IDENT		
DATE	TIME	NET WT
FMPC FORM-306 M-144 (REV. 11-29-89)		

Red on White  
 For Enrichment  
 Greater Than  
 0.71

**FMPC-SAMPLE LABEL/RCRA MATERIAL-ENRICHED**

SAMPLING LOCATION		P.O. NO./ENRICHMENT
COLLECTOR		
TYPE OF MATERIAL		
TYPE OF SAMPLE		
LOT NUMBER OR IDENT		
DATE	TIME	NET WT
FMPC FORM-306 M-145 (REV. 11-29-89)		

(Grams)      Gross:      Tare:

Black on Yellow  
 For Enrichment  
 Equal to 0.71

**FMPC-SAMPLE LABEL/RCRA MATERIAL-NORMAL**

SAMPLING LOCATION		P.O. NO. ENRICHMENT
COLLECTOR		
TYPE OF MATERIAL		
TYPE OF SAMPLE		
LOT NUMBER OR IDENT		
DATE	TIME	NET WT
FMPC FORM-306 M-160 (REV. 11-29-89)		

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**If Seal is broken or  
package damaged  
check contents before  
signing receipt.**

SITE SERVICES PROCEDURE	SAMPLING DRUMMED WASTE FOR HAZARD IDENTIFICATION	SOP 20-C-80.
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Authorization: R. L. Gardner, Facilities & Warehousing Manager	Supersedes: None	Issue Date: 04-10-92

FMPC  
 PRODUCTION OPERATIONS  
 CHAIN-OF-CUSTODY RECORD

Request No \_\_\_\_\_  
 Company's Name \_\_\_\_\_ Phone No \_\_\_\_\_ Carrier Way Bill No \_\_\_\_\_ Lab Destination \_\_\_\_\_  
 and Address \_\_\_\_\_

Name of Sampler(s): \_\_\_\_\_ Phone No \_\_\_\_\_ Badge No \_\_\_\_\_

SAMPLE NUMBER	SAMPLE LOCATION AND DESCRIPTION (Waste Type)	SAMPLED		SAMPLE TYPE	CONTAINER TYPE	ANALYSES REQUESTED				SAMPLE COND ON RECEIPT	TYPES OF ANALYSES	
		DATE	TIME			(PLEASE REFER TO LIST COLUMN)						
												1 Contingency
												2 Test M
												3 Test T6
												4 EP Toxicity
												5 HCB
												6 T6-220
												7 T6-222
												8 T6-225
												9 Volatile Solvent
												10 Chlorinated
												11 Volatile Solvent
												12 Chlorinated
												13
												14
												15

Field Information: \_\_\_\_\_  
 Possible Sample Hazards: \_\_\_\_\_

SIGNATURES:

1 Relinquished By: _____	SIGNATURE _____	TITLE _____	COMPANY _____	INCLUSIVE DATES _____	Received By: _____
2 Relinquished By: _____	SIGNATURE _____	TITLE _____	COMPANY _____	INCLUSIVE DATES _____	Received By: _____
3 Relinquished By: _____	SIGNATURE _____	TITLE _____	COMPANY _____	INCLUSIVE DATES _____	Received By: _____
4 Relinquished By: _____	SIGNATURE _____	TITLE _____	COMPANY _____	INCLUSIVE DATES _____	Received By: _____

NO.	DISTRIBUTION OF COPIES
1	To Accompany Samples
2	Field Copy

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CLEANED BY: \_\_\_\_\_

DATE: \_\_\_\_\_

Cleaned according to sop : \_\_\_\_\_

FMPC-OPR-3128 (6/22/88)

CLEAN EQUIPMENT  
FMPC-PRO-3128  
Figure 4

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RECORD OF ISSUE/REVISION

<u>DATE</u>	<u>REV. NO.</u>	<u>DESCRIPTION AND AUTHORITY</u>
04-10-92	0	Procedure required for taking samples from drums of waste material per Request No. P92-049, initiated by J. Hey.

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