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PLANT 7 DISMANTLING REMOVAL ACTION 19 WORK PLAN JUNE 1993 REVISION 1

06/29/93

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WORK PLAN

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Plant 7 Dismantling Removal Action 19 Work Plan

Fernald Environmental Management Project
June 1993
Revision No. 1

Submitted by:
U.S. Department of Energy
Fernald Office
P.O. Box 398705
Cincinnati, Ohio 45239-8705

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Fernald Environmental Restoration Management Corporation

Fluor Daniel Environmental
FERMCO
Restoration Management Corporation

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Plant 7 Dismantling
Removal Action 19 Work Plan

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LIST OF ACRONYMS AND ABBREVIATIONS

ACM	Asbestos Containing Material
AFD	Air Filtration Devices
AHERA	Asbestos Hazard Emergency Response Act
ARAR	Applicable or Relevant and Appropriate Requirement
CA	Consent Agreement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CRU	CERCLA/RCRA Unit
D&D	Decontamination and Dismantling
DEI	Diagnostic Engineering, Inc.
DOE	United States Department of Energy
DOT	United States Department of Transportation
DQO	Data Quality Objective
FEMP	Fernald Environmental Management Project
FERMCO	Fernald Environmental Restoration Management Corporation
FMPC	Feed Materials Production Center
HEPA	High Efficiency Particulate Air
HVAC	Heating, Ventilation and Air Conditioning
kV	kilo Volt
kVA	kilo Volt Amp
LSA	Low Specific Activity
MEF	Materials Evaluation Form
NAAQS	National Ambient Air Quality Standards
NCP	National (Oil and Hazardous Substance Pollution) Contingency Plan
NLO	National Lead of Ohio
NPL	National Priorities List
NRC	United States Nuclear Regulatory Commission
OAC	Ohio Administrative Code
Ohio EPA	Ohio Environmental Protection Agency
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PPE	Personal Protective Equipment
QA	Quality Assurance
QAPD	Quality Assurance Program Description
RACM	Regulated Asbestos Containing Material

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

RAWP	Removal Action Work Plan
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
RSE	Removal Site Evaluation
SCQ	Sitewide CERCLA Quality Assurance Project Plan
TBC	To Be Considered
TCLP	Toxicity Characteristic Leaching Procedure
TSI	Thermal System Insulation
UF_4	uranium tetrafluoride
UF_6	uranium hexafluoride
U-Natural	Uranium Natural
US EPA	United States Environmental Protection Agency
WEMCO	Westinghouse Environmental Management Company of Ohio

EXECUTIVE SUMMARY

The United States Department of Energy (DOE) conducted a Removal Site Evaluation (RSE) at the Fernald Environmental Management Project (FEMP) for Plant 7, which is in OU-3, by the authority delegated to the agency under Section 106(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), through Executive Order 12580 and the Amended Consent Agreement. The RSE was performed to determine whether the conditions present at and within Plant 7 warrant a removal action under CERCLA, consistent with Section 300.410 of the National (Oil and Hazardous Substance Pollution) Contingency Plan (NCP). The RSE concluded that this removal action is appropriate. The objective of the proposed removal action is to eliminate the potential for release of contaminants from Plant 7 and dismantle it to grade level.

The activities associated with this removal action are described in this work plan. The work plan is being submitted to the United States Environmental Protection Agency (US EPA) for approval in accordance with the requirements of the 1990 CERCLA Consent Agreement between the DOE and the US EPA, as amended in September 1991, in which this removal action was identified as Removal Action 19.

The proposed action will remove all aboveground surface structures and equipment down to the existing concrete slab at grade level including:

1) The structural steel and equipment
2) Associated piping
3) Asbestos Containing Materials (ACMs)
4) Heating, Ventilation, and Air Conditioning (HVAC) duct work
5) Electrical equipment and substations
6) Above grade level concrete

As the various building materials are disassembled, they will be packaged in accordance with Site Procedure PP-0314, Packaging, On-Site Movement, and Off-Site Shipment of Materials, as well as the requirements identified in Department of Transportation regulations. The material streams resulting from this removal action are identified in Subsection 6.5. Of these materials, a portion (e.g., concrete, miscellaneous metal, and transite) will be segregated for use in bench-scale treatability studies which will be detailed in the Treatability Study Work Plan for the OU-3 RI/FS. These bench-scale studies using the segregated materials from the Plant 7 Dismantling Removal Action will form the Plant 7 demonstration project. Ultimately, one of the goals of the demonstration project will be to determine the feasibility of decontaminating various materials to levels that meet the free release criteria identified in site procedures. Under the Plant 7 demonstration project, various decontamination techniques will be evaluated, utilized, and documented. The results of this project in concert with the bench-scale studies, to be performed

later, and the Feasibility Study (FS) for OU-3 will assist in determining disposition options for future OU 3 remediation projects at the FEMP.

This removal action will eliminate the potential for release of radioactive contamination, asbestos fiber biological hazards (from the presence of bird droppings), and chemical hazards to include UF_6, UF_4, UO_2, UO_2F_2, HF (aqueous and anhydrous), ammonia, and nickel from Plant 7. In addition, the removal action will contribute to the long-term remedial actions proposed for the FEMP site. This removal action shall commence with the Safe Shutdown program removing all existing materials/debris in accordance with the US EPA-approved Safe Shutdown procedural compilation. The containerized material/debris will be relocated to an on-site storage area. The potential locations include Buildings 30, 67, and 68.

SECTION 1

INTRODUCTION

This work plan describes the Plant 7 Dismantling, Removal Action 19, and provides insight into the Plant 7 Demonstration project. This removal action involves dismantling Plant 7 and reducing the potential hazards (radiological, chemical, biological, and safety) associated with it. This removal action shall, to the extent practicable, contribute to the efficient performance of any anticipated long-term remedial action with respect to the release or threatened release concerned. The proposed action is authorized by the DOE under authority of Section 106(a) of CERCLA, through Executive Order 12580 and the Amended Consent Agreement. As required by the Amended Consent Agreement between the US EPA and the DOE, this work plan, outlining the proposed Plant 7 Dismantling Removal Action, is being submitted to the US EPA for review and approval. A Removal Site Evaluation (RSE) was performed to determine whether the conditions present at and/or within Plant 7 warrant a removal action under CERCLA, consistent with Section 300.410 of the National Contingency Plan (NCP). The justification for this removal action is summarized in Section 5. Based on the information in the RSE, it has been determined that a Non-Time Critical Removal Action is appropriate. An engineering evaluation/cost analysis has been completed for this project (EE/CA for Removal Action 27 - *Management of Contaminated Structures* [December 1992]). The proposed removal action will protect human health and the environment and will be conducted in accordance with all CERCLA requirements and identified ARARs.

This work plan outlines the approach to dismantle Plant 7 and the bridge crane down to the grade level of the concrete slab surface. The work will include removal of ACM, dismantling, size reducing, segregating, decontamination (surface cleaning to remove radiological contamination), packaging, certification, placing materials in interim storage, and off-site disposal. The work will also include the Plant 7 demonstration project. The OU-3 Treatability Study Work Plan will detail how the segregated aliquots of concrete, transite, and miscellaneous metals from the Plant 7 D&D project will be evaluated to provide data from bench-scale studies. Ultimately, the data from the bench-scale studies will provide valuable data in order to evaluate: (1) the effectiveness and efficiency of the decontamination technology, and (2) a Cost-Benefit Analysis which evaluates the cost of the decontamination process as compared with other means of disposition (e.g., transportation to an off-site disposal facility). The evaluation of the data collected via the Treatability Study Work Plan will be performed in the FS for OU-3.

All project activities will be completed in strict accordance with the requirements defined in applicable FEMP procedures, the NCP, CERCLA, ARARs, pertinent DOE Orders, the Quality Assurance Program Description, Sitewide CERCLA Quality Assurance Project Plan (SCQ), and the Amended Consent Agreement. While adhering to these standards, the work will be performed in an expedient and prudent manner to remove the potential hazards associated with Plant 7.

All activities will be conducted within a controlled environment to prevent the spread of contamination. Some work areas will be isolated with critical barriers and a ventilated containment system. The ventilated air will be filtered through pre-filters and High Efficiency Particulate Air (HEPA) filters. FEMP standards for worker safety will be observed throughout the project. A task-specific health and safety plan as identified in Section 10 will supplement the formal Health and Safety Program at the FEMP. This plan will address the specific requirements for this removal action.

SECTION 2

FEMP SITE BACKGROUND

The Fernald Environmental Management Project (FEMP) formerly the Feed Materials Production Center (FMPC) was a DOE site that produced high-quality uranium metals for military defense. The facility is a 1,050-acre site located in southwest Ohio. The process area is situated on approximately 136 acres toward the center of the site. Production was halted in July 1989, and later that year the facility was placed on the National Priorities List (NPL). The DOE is currently conducting a Remedial Investigation/Feasibility Study (RI/FS) and other response actions under the Amended Consent Agreement between the US EPA and the DOE.

Since the early 1950s, various chemical and metallurgical processes at the facility have been used to manufacture uranium products for the defense complex. In addition to uranium, thorium was processed in small amounts. Substantial quantities and varieties of waste materials were generated during production operations. The current waste inventory contains radioactive, organic, and inorganic waste constituents.

SECTION 3

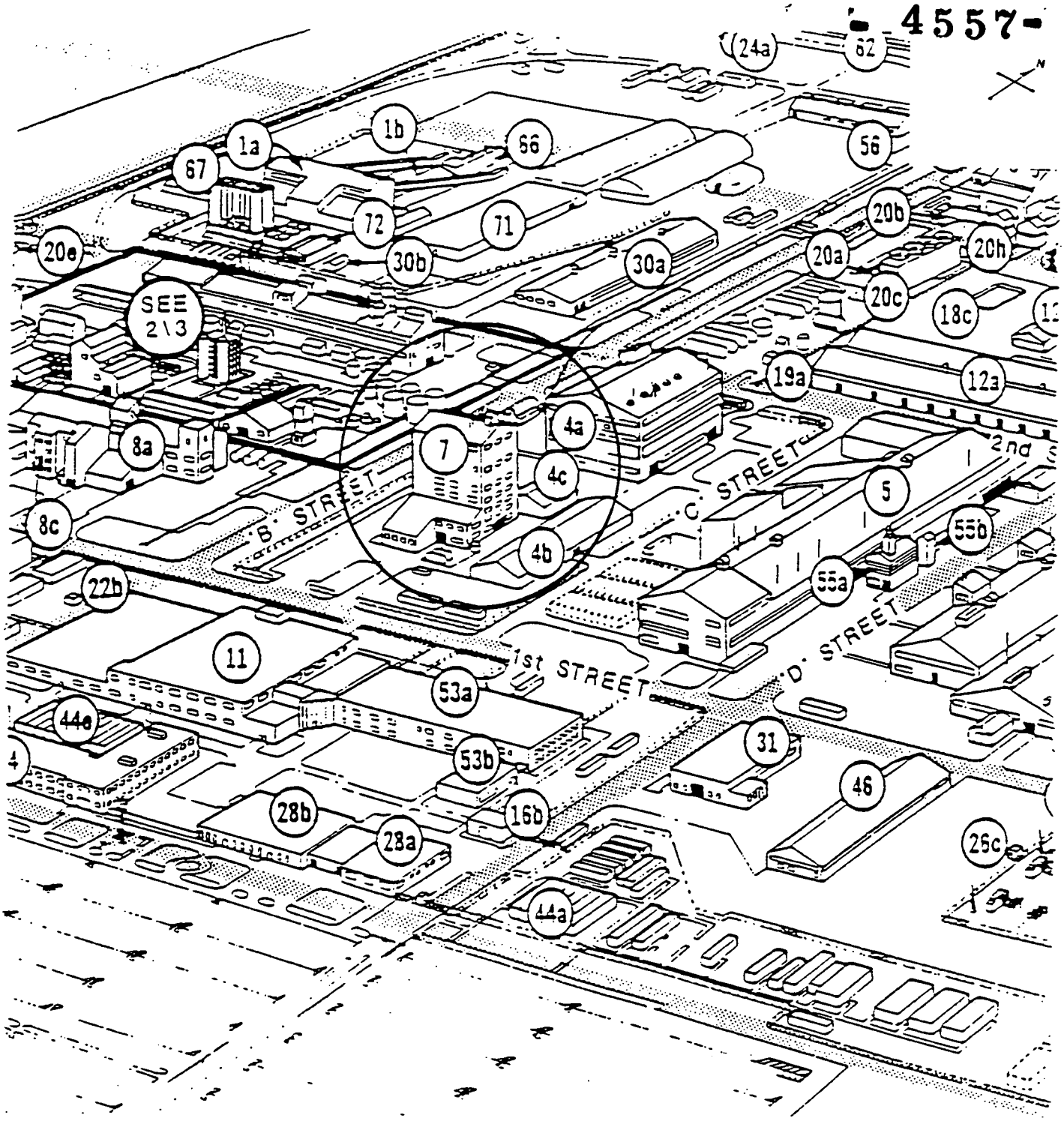
PLANT 7 BACKGROUND

Plant 7 was constructed in the southeast quadrant of the FEMP site in May 1953 to house the processes involved in the reduction of uranium hexafluoride (UF_6) to uranium tetrafluoride (UF_4). Upon completion of construction in May 1954, the Plant 7 "Hexafluoride Reduction Plant" was operated by National Lead of Ohio's (NLO) Technical Division. It was designed to an established production rate converting 12 tons of UF_6 to UF_4 per 24-hour period. Production operations were initiated in June 1954. Plant 7's production life was short and the plant has been idle since 1956, when its production processes were halted.

Plant 7's dimensions are approximately 80 feet x 110 feet x 110 feet high (7 stories). The outside wall is a single layer of transite (ACM) siding secured with steel pins and lead caps. The roof is constructed with a double layer of transite panels. Interior walls are composed of flat transite. A mineral fiber batting insulation (non asbestos containing) exists between the interior and exterior transite walls. The first and second floors contain several offices and labs located along the exterior walls. The walls for these rooms are transite. There is an opening near the center of the building in a shaft configuration from grade to the fifth floor. The sixth and seventh floors have removable floor plates covering the shaft opening. The balance of each floor is an open bay arrangement. The first floor is a concrete slab, which will remain intact. The floor composition on levels two through seven is primarily 5/16-inch steel plate. These floors are supported by structural steel.

About 15 feet to the north of Plant 7 is the Plant 4 Maintenance Shop (see Figure 3-1). The Plant 4 warehouse is located about 40 feet to the east of Plant 7. This warehouse (Plant 4B) currently stores drums of green salt. As a result of the proximity, the increased background activity interferes with direct in-place radiological measurements (beta-gamma). However, direct reading field instruments will be used within Plant 7. If the background activity interferes with the sampling, then shielded probes will be utilized. To the south is an open area covered with gravel providing access to First Street. A concrete pad borders the west side of Plant 7, which contains the overhead bridge crane with rail siding and fence restricting access from "B" Street.

A 1,000 KVA, 13.2/480-Kv electrical substation is located on the south end of the main building at grade level which provided power to the reduction process and adjacent buildings.



LEGEND

Building Identification Number:

4a - Green Salt Plant

4b - Plant 4 Warehouse

4c - Plant 4 Maintenance Shop

7 - Plant 7

Figure 3-1 - Schematic of Plant 7 and Surrounding Facilities

In 1967 the UF_6 reduction process was declared obsolete, and the majority of the equipment and process piping were dismantled and removed. The ammonia separation process, two approximately 75,000 cfm blower units and associated ducting, and several motor control centers were abandoned in place. In 1975 all utilities were disconnected at the exterior wall of the building and capped. The substation has been retained and currently provides service to two adjacent buildings via two 480V circuits.

All process equipment, utility conduit, ductwork, and piping were originally abandoned in place. Later, a majority of the processing equipment was removed.

Individual floor maps depicting process operations and remaining equipment are presented in Figures 3-2 through 3-8. The photographs in Figures 3-9 through 3-16 depict current conditions of Plant 7.

Plant 7 is now used to store drums of intermediate product (UF_4) on the first and second floors, and empty 5 gallon containers on the third, fourth, and sixth floors. These five gallon containers were purchased to hold UF_4 but were never used. They were identified as surplus and stored in Plant 7 for future use. Prior to the start of dismantling activities, the Safe Shutdown program will clear out Plant 7 by relocating all stored materials and debris to alternate storage areas such as buildings 30, 67, and 68. The use of this building to store low-level radioactive materials, as well as the previous process operations, have resulted in the corresponding presence of radiological contamination. Also, the following factors were considered in recommending the removal of this building: (1) the presence of ACM (e.g., transite panels, TSI, fire brick, and floor tile); (2) the presence of biological hazards in the form of bird droppings on the seventh floor; and (3) the presence of chemical hazards, such as UF_6, UF_4, UO_2, UO_2F_2, HF (aqueous and anhydrous), ammonia, and nickel. As a result of the identified hazards, access to Plant 7 requires a radiological work permit, and full anti-contamination clothing (e.g., tyvek suit, booties, shoe covers, outer work gloves, etc.) and personnel dosimeters must be worn. Prior to the start of dismantling activities, safe shutdown will clear out Plant 7 through the removal of all stored materials and debris.

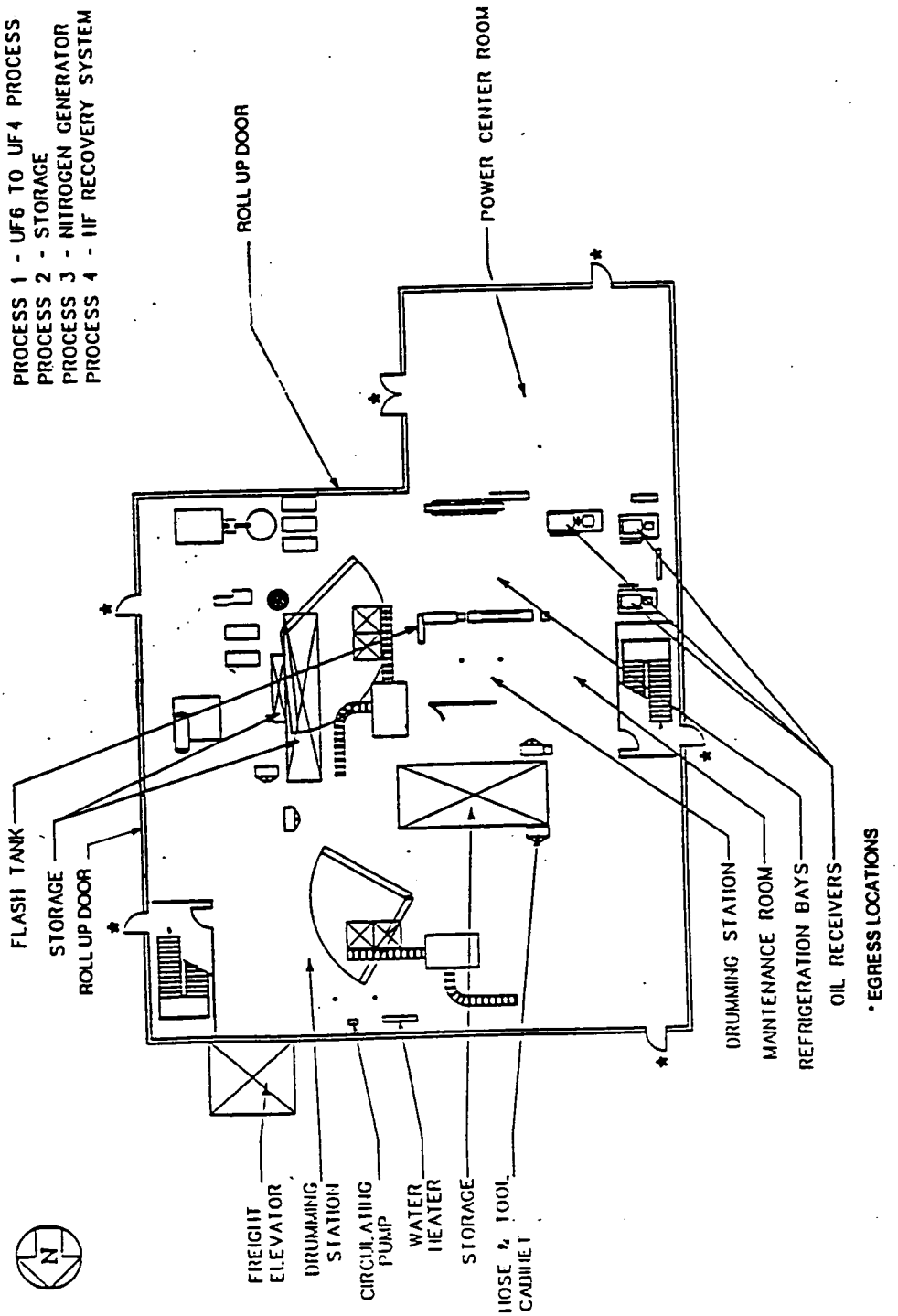


Figure 3-2 - Plant 7 Layout, First Floor

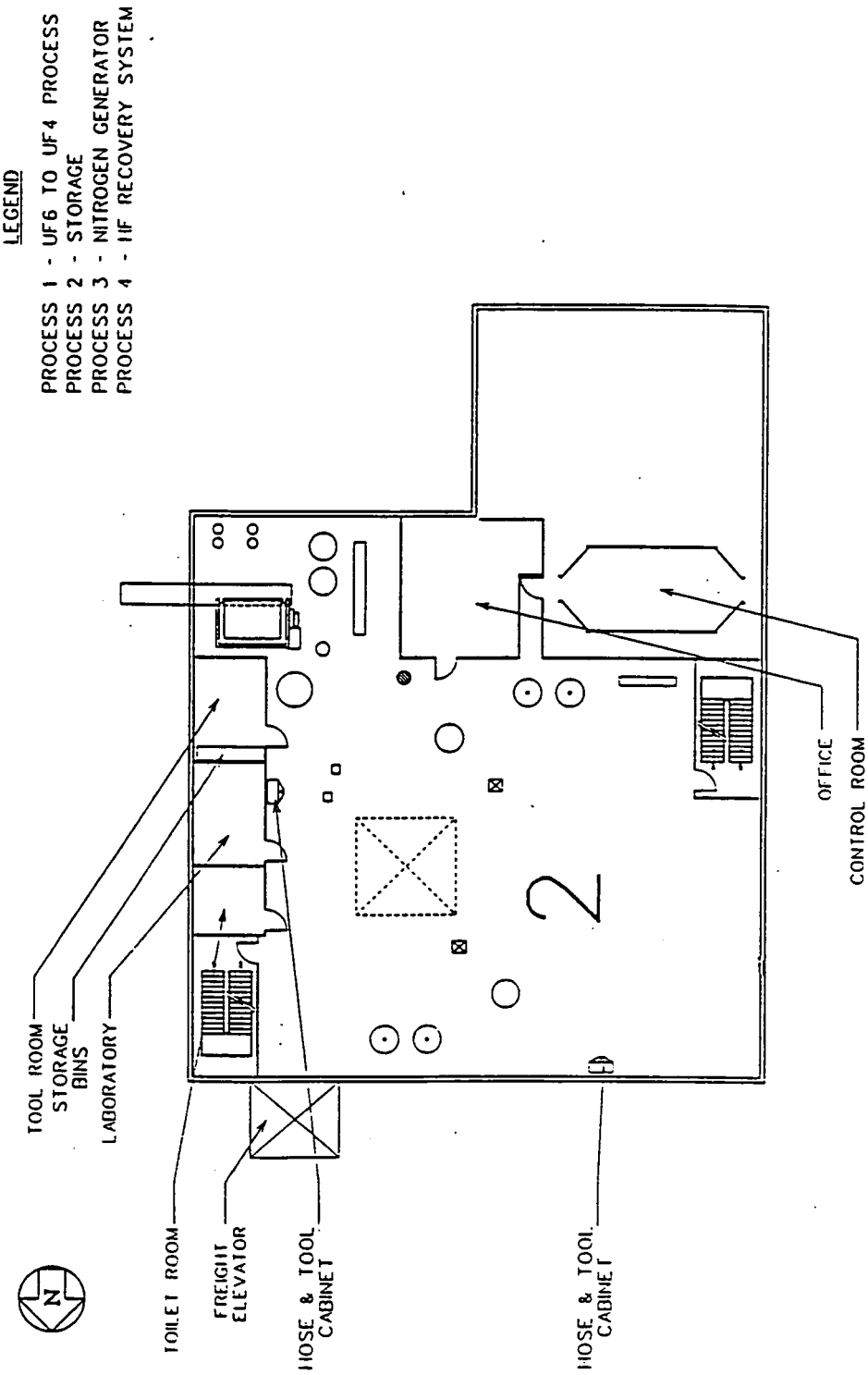


Figure 3-3 - Plant 7 Layout, Second Floor

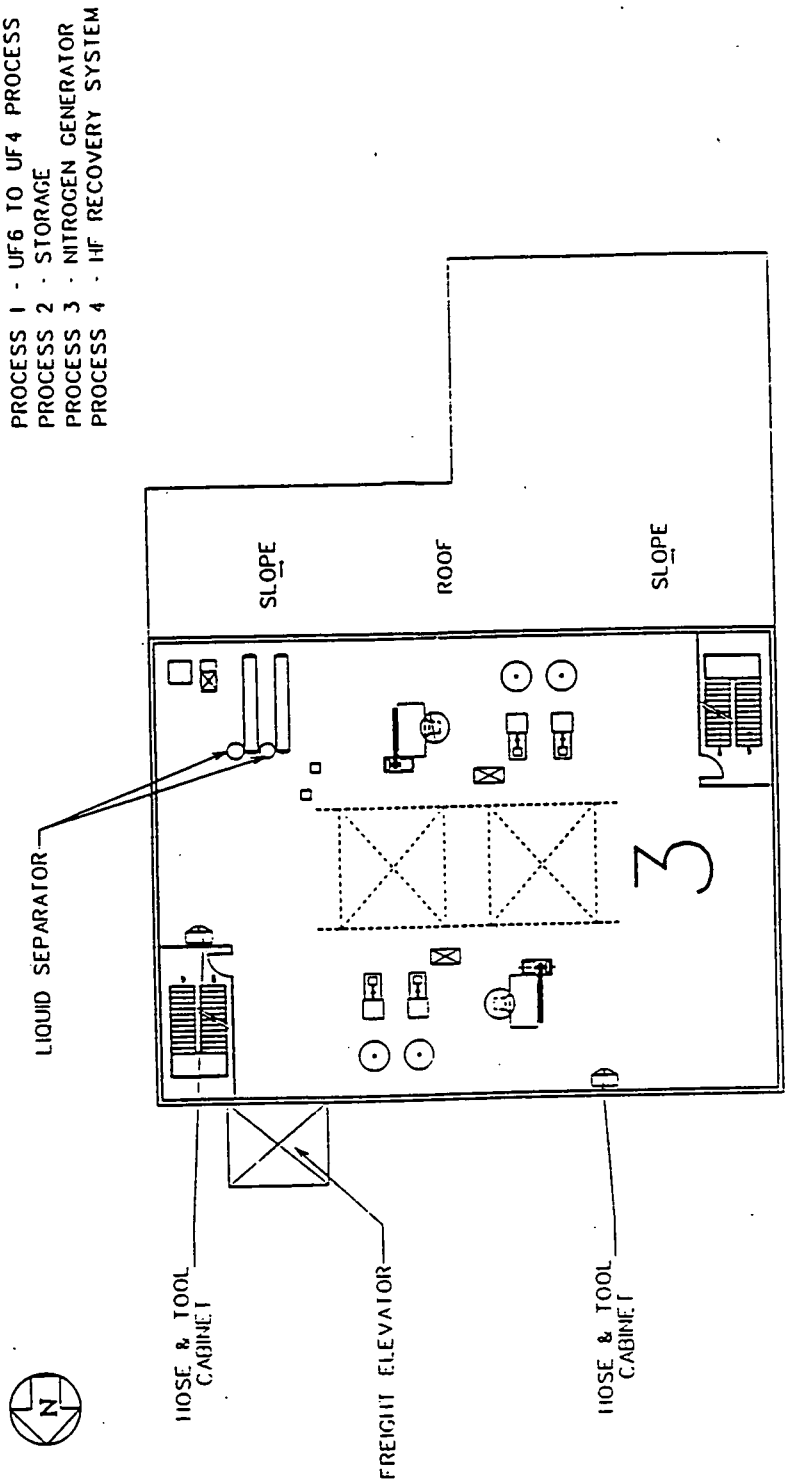


Figure 3-4 - Plant 7 Layout, Third Floor

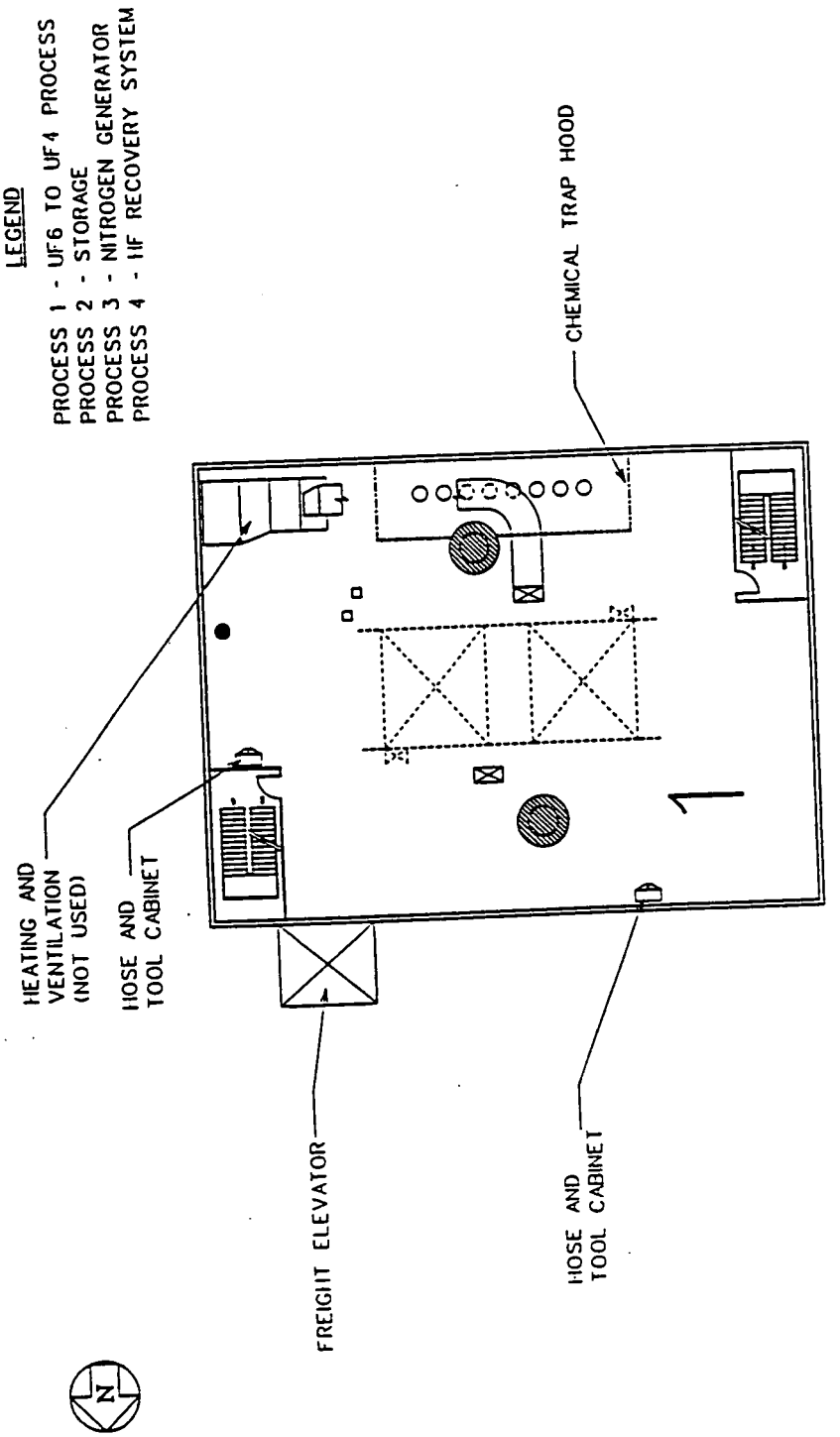


Figure 3-5 - Plant 7 Layout, Fourth Floor

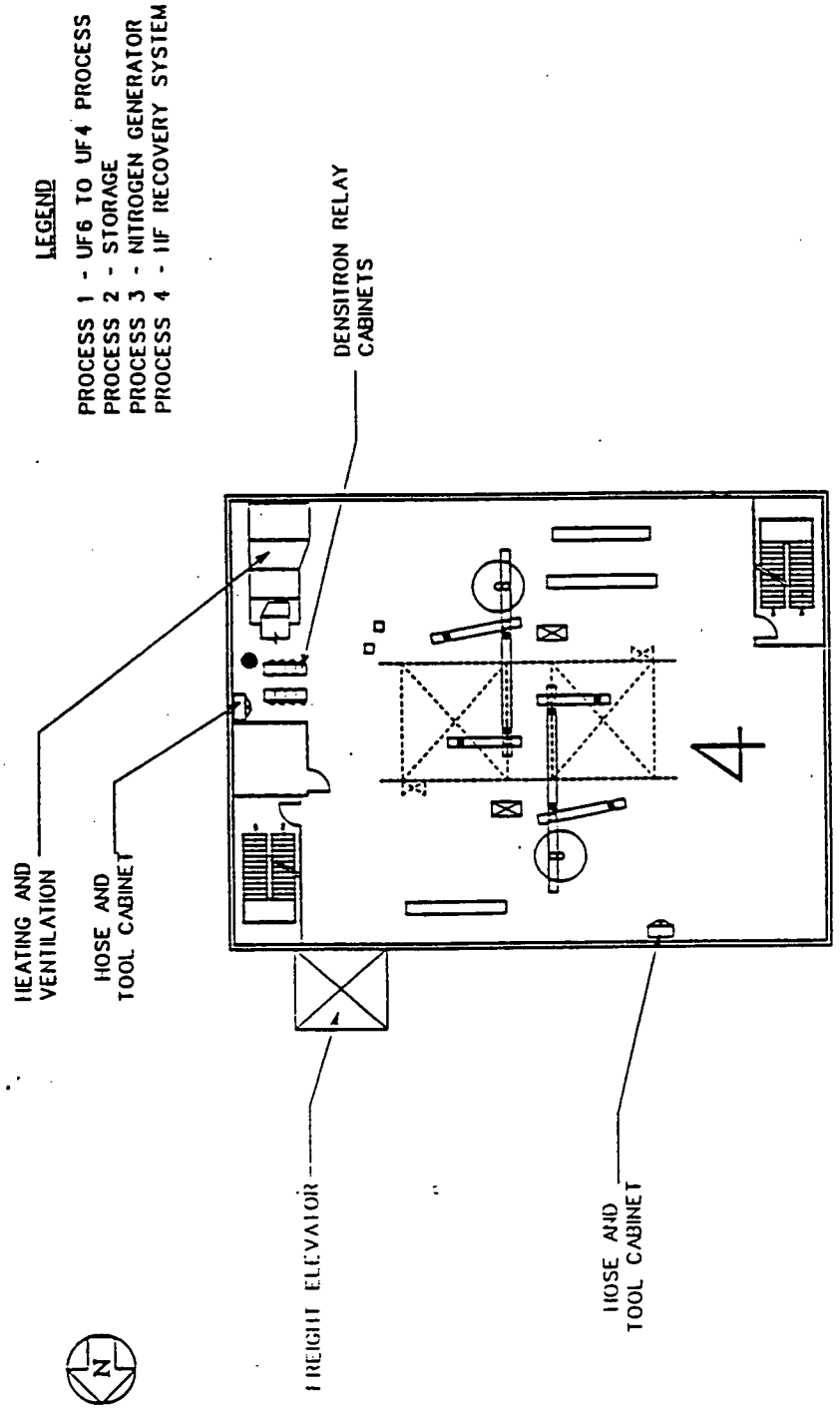


Figure 3-6 - Plant 7 Layout, Fifth Floor

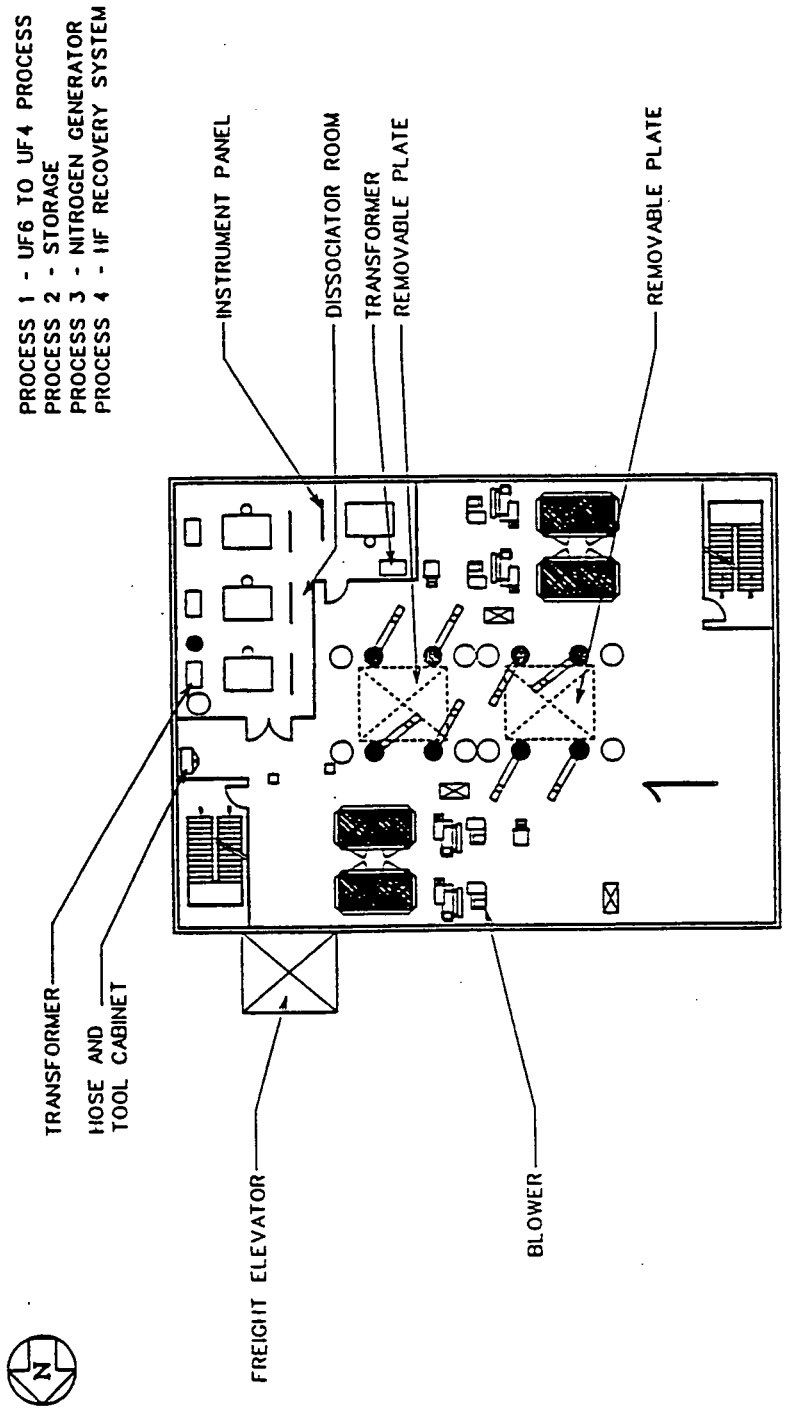


Figure 3-7 - Plant 7 Layout, Sixth Floor

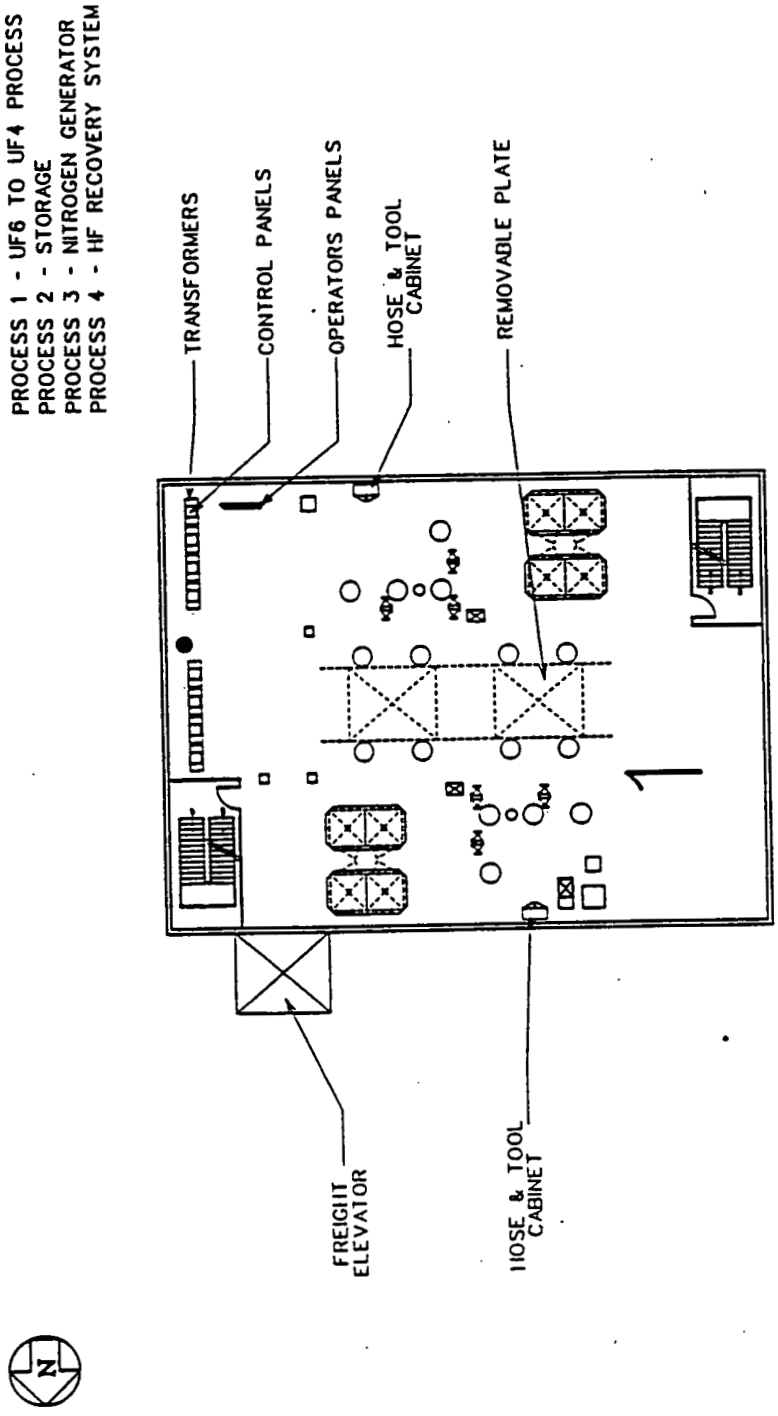


Figure 3-8 - Plant 7 Layout, Seventh Floor

Figure 3-9 - Plant 7 and Surrounding Facilities

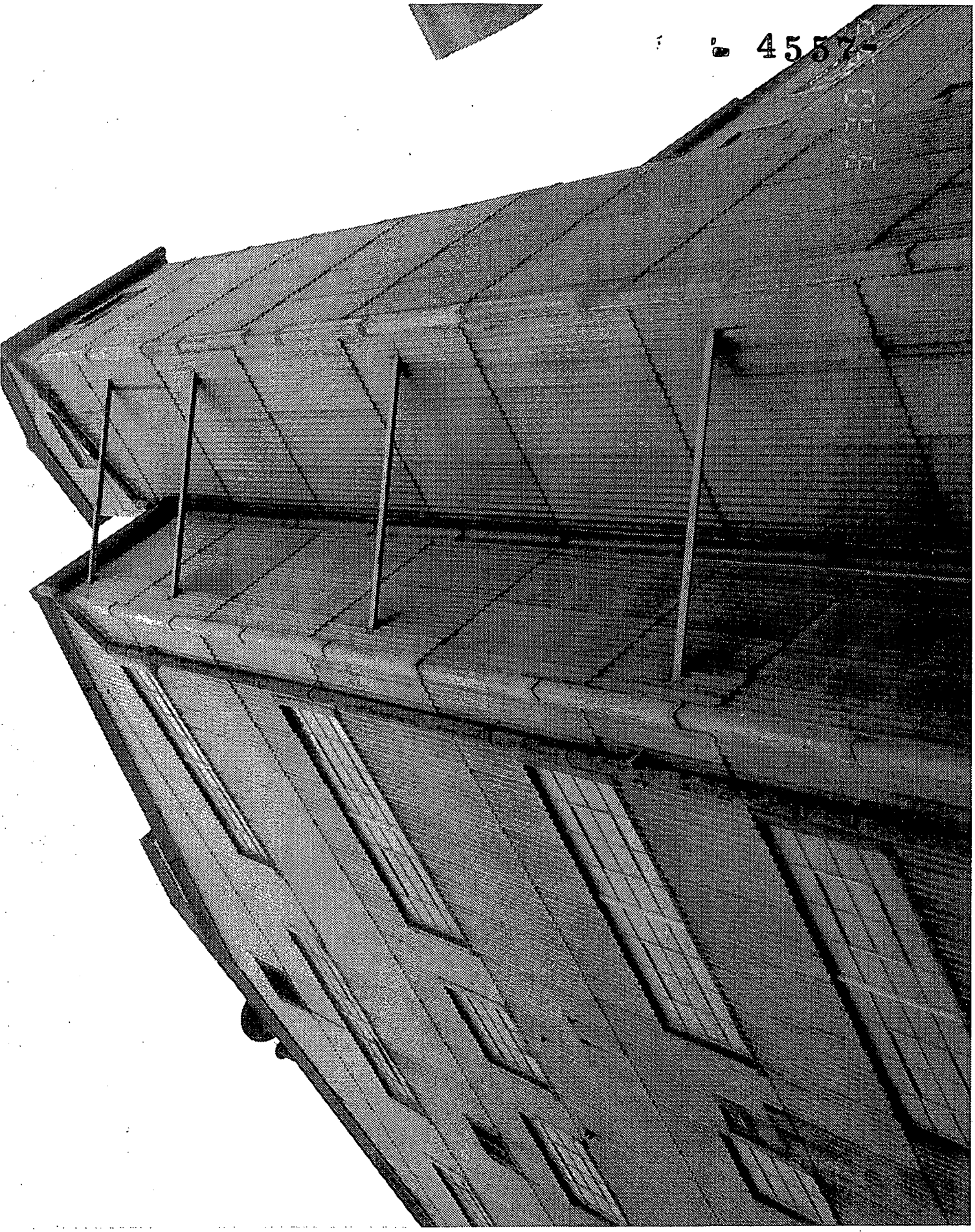


Figure 3-10 - Exterior of Plant 7

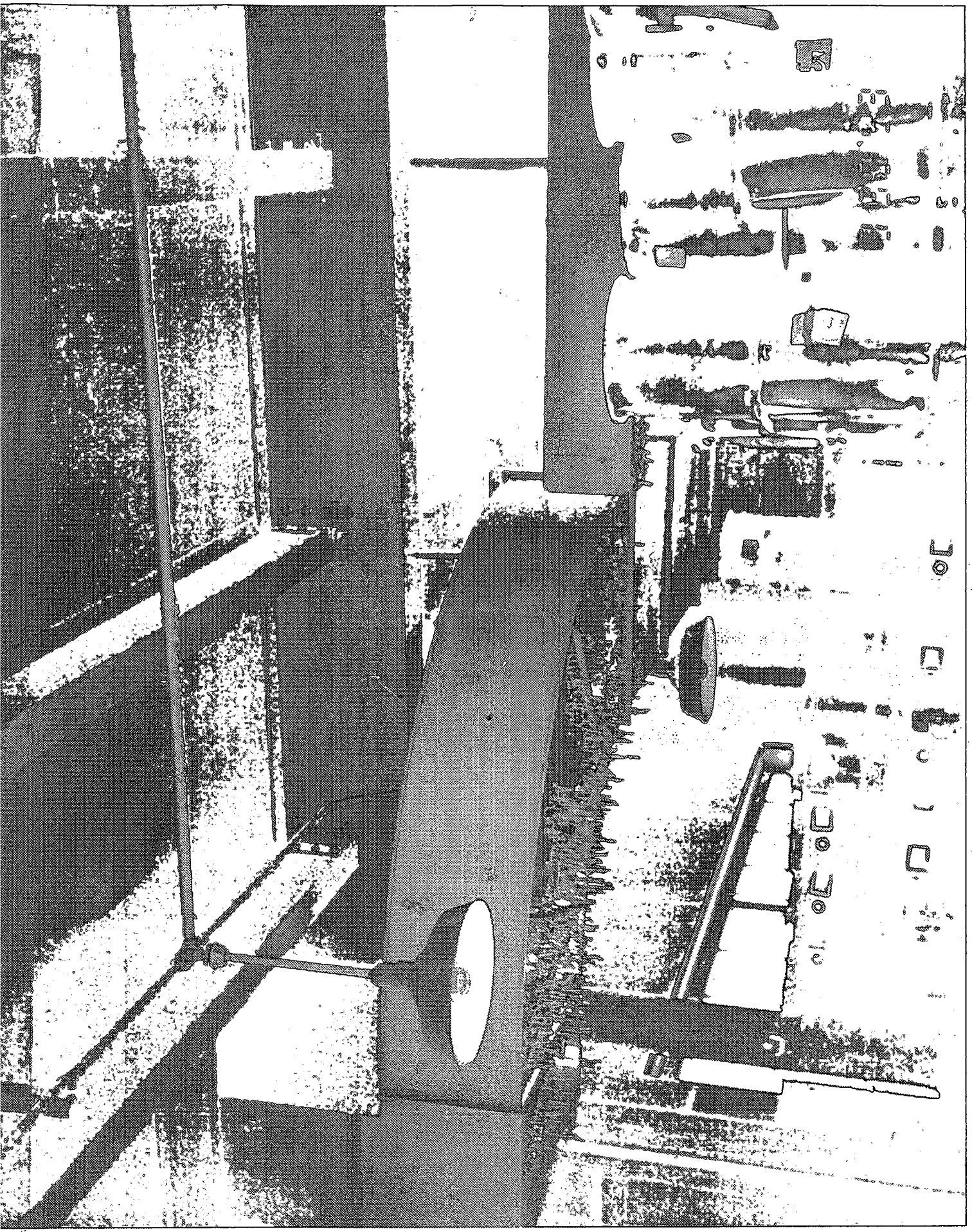


Figure 3-11 - Third Floor, Drums and Air Duct

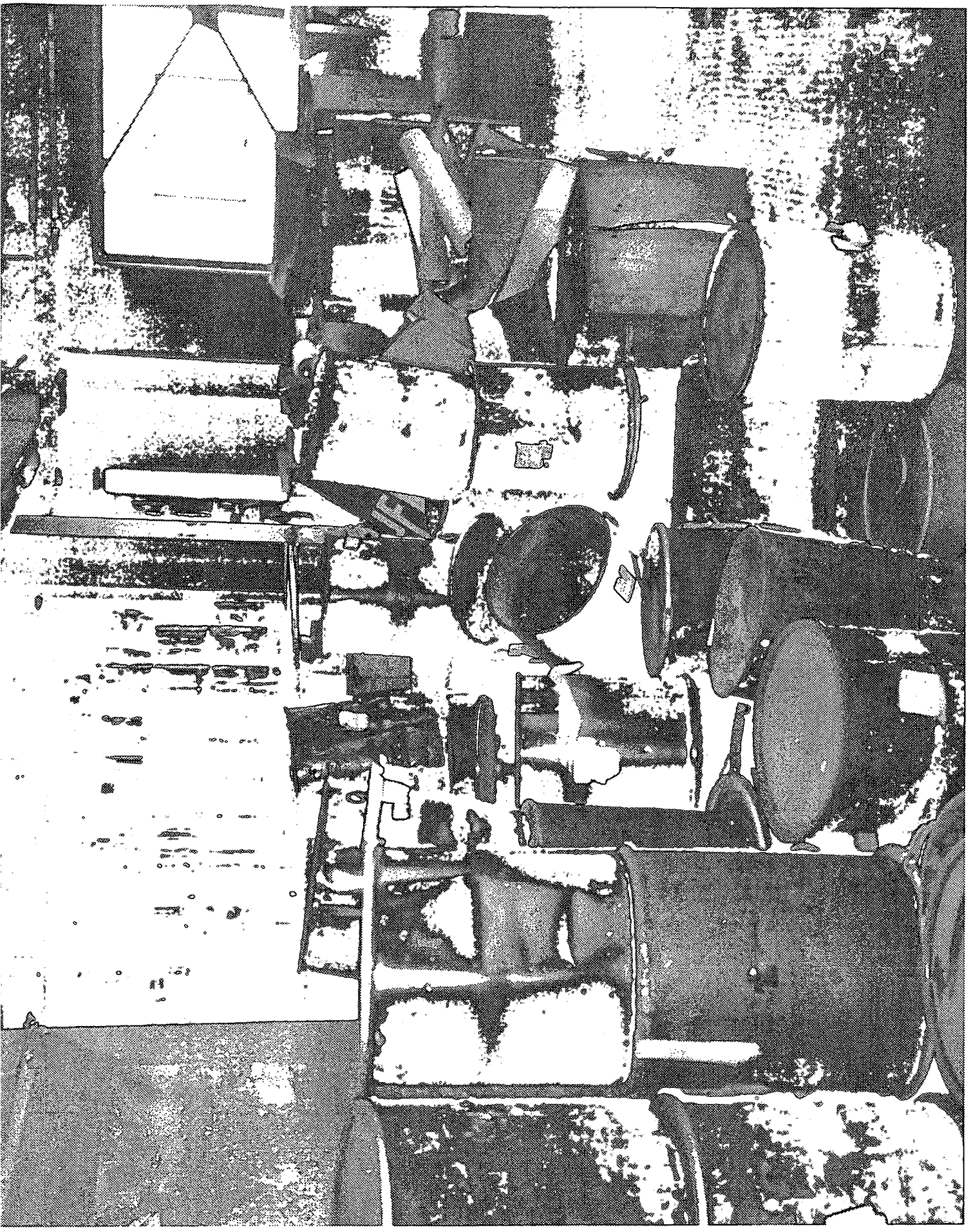


Figure 3-12 - Third Floor, Debris

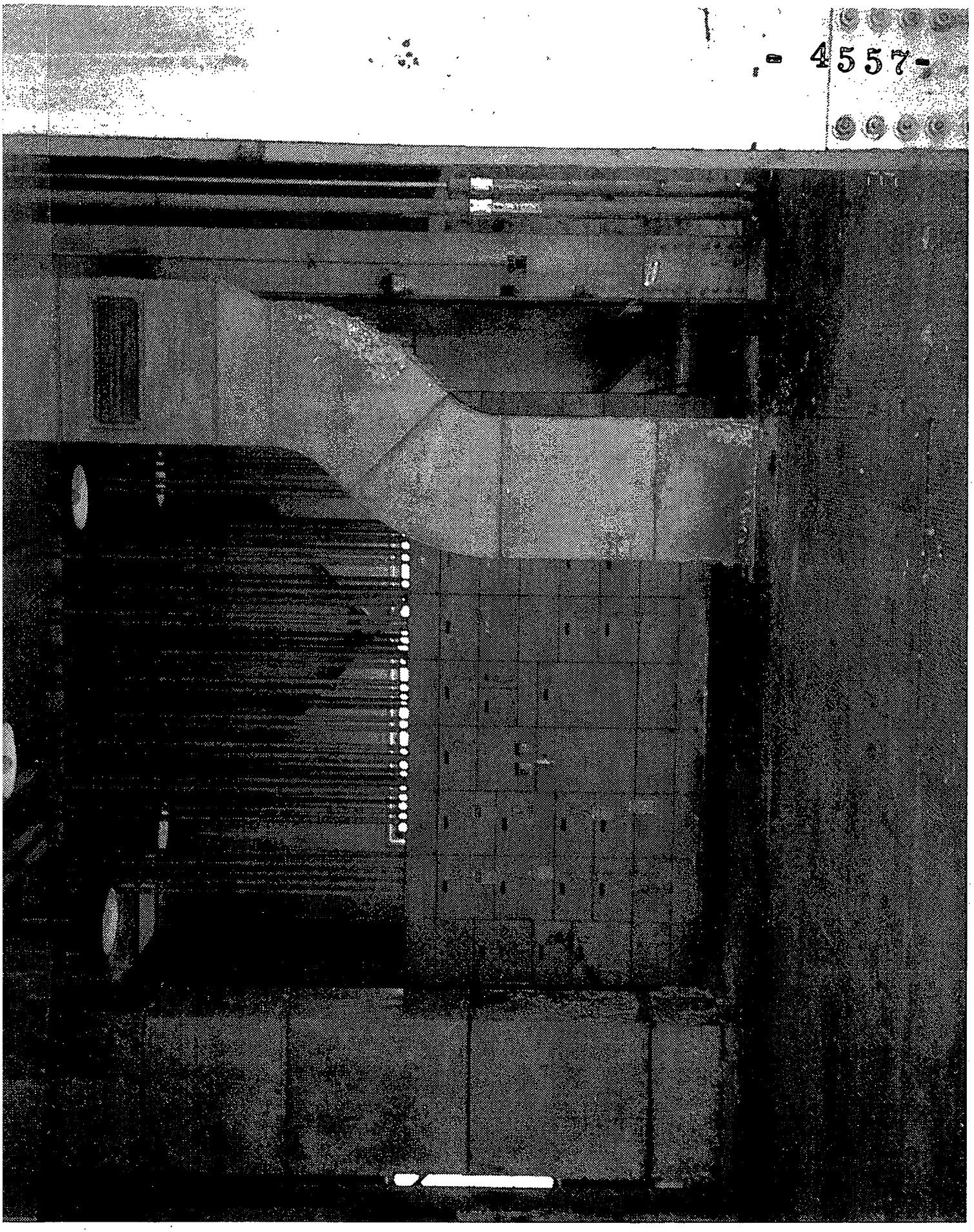


Figure 3-13 - Third Floor, Motor Control Center and Air Duct

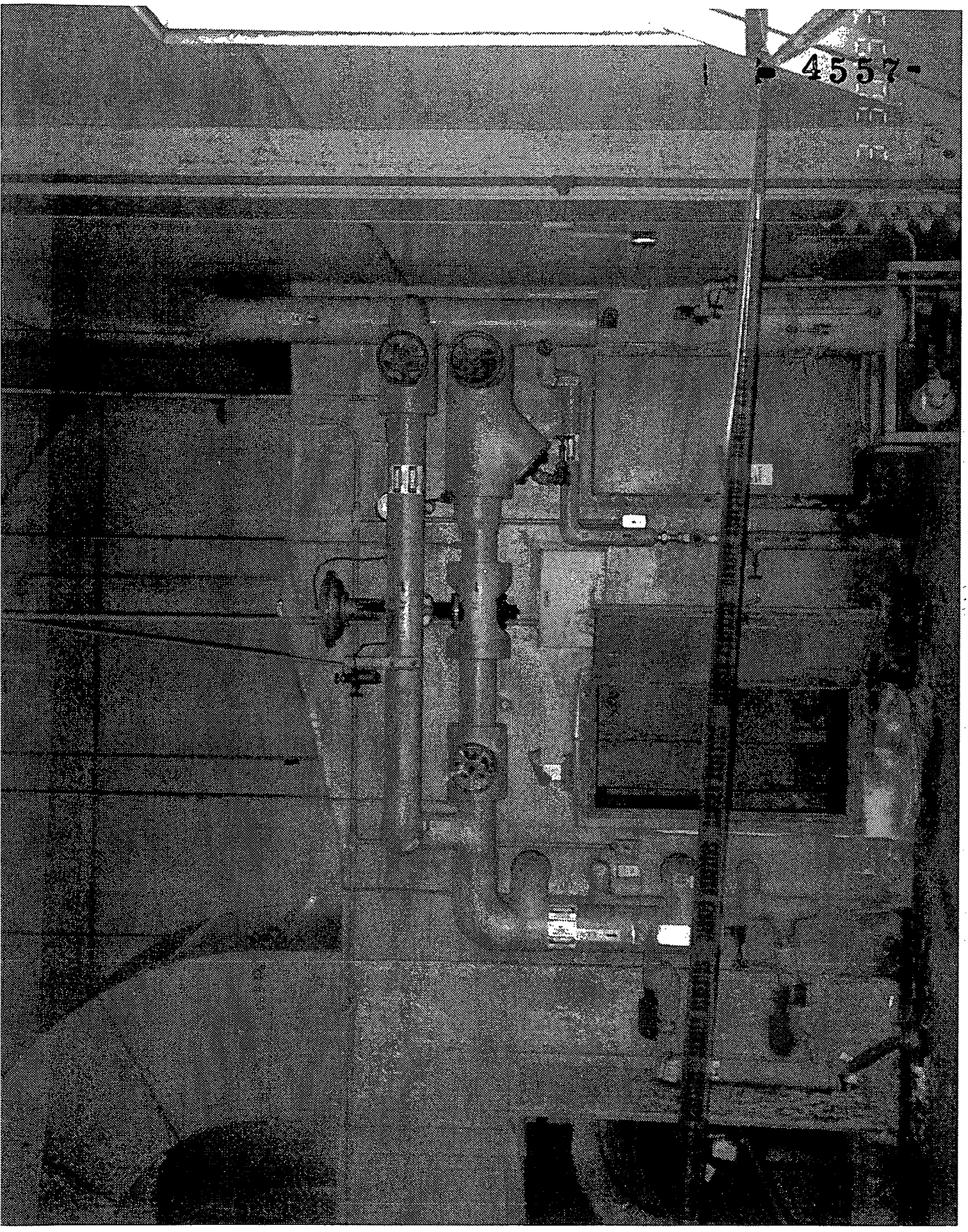


Figure 3-14 - Fourth Floor, Air Handling Unit

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Figure 3-15 - Sixth Floor, Disassociator

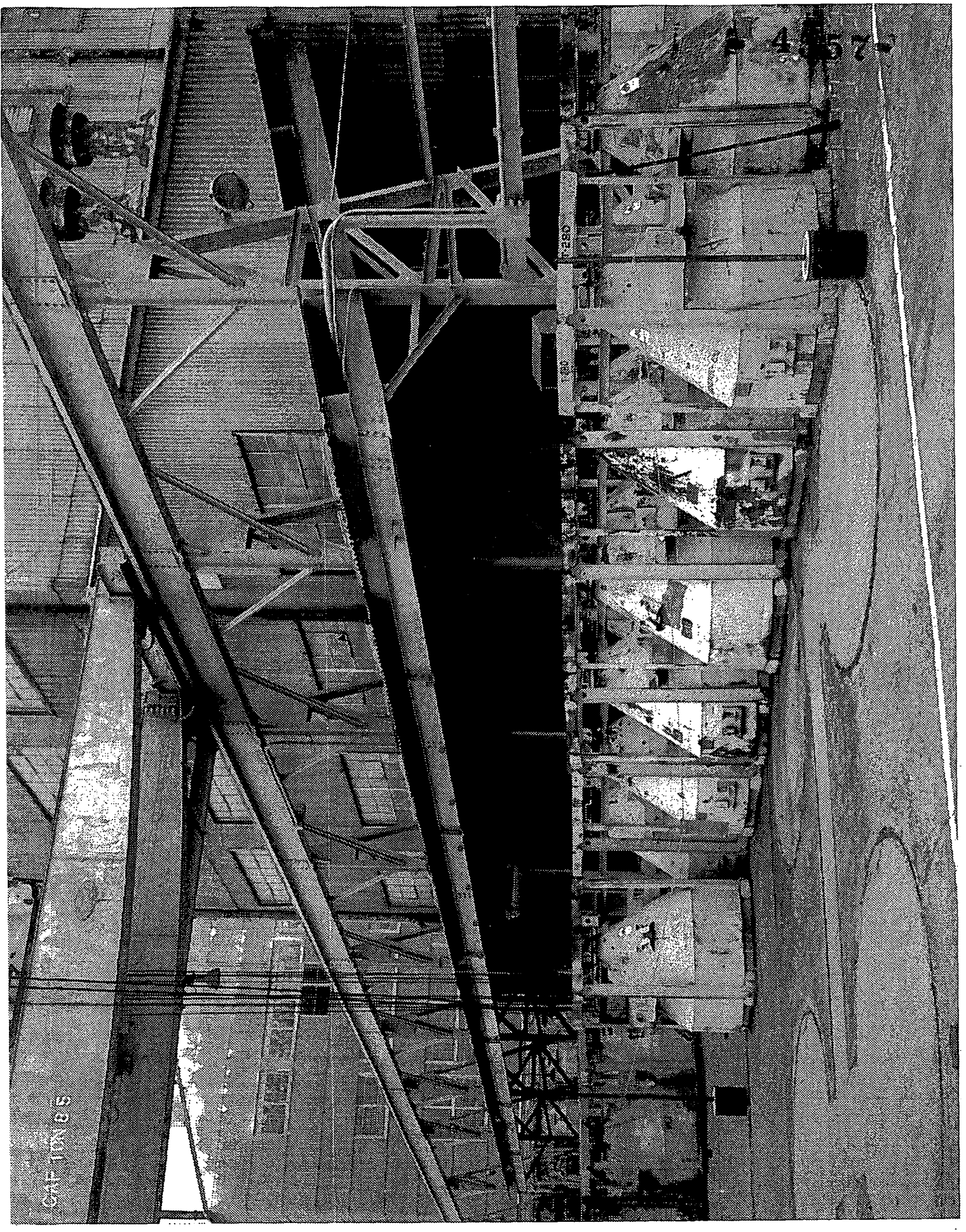

Figure 3-16 - Bridge Crane and T-Hoppers - Plant 7, West Side

SECTION 4

SUMMARY OF POTENTIAL CONTAMINANTS

4.1 Existing Survey Data

In March/April 1991, and again in May 1992, radiological surveys were conducted in Plant 7. Swipe samples were taken at random locations throughout all seven floors, providing an accurate summation of radiological conditions. Each sample collected identified removable alpha and beta-gamma contamination. The readings collected during both surveys are summarized in Table 4-1, Summary of Plant 7 Radiological Data, and included in the Removal Site Evaluation (Appendix A).

[illegible] of tran[illegible] panels, thermal system insulation (TSI), floor tile, mastic and other [illegible]taining materials is prevalent throughout the structure walls (both int[illegible] [illegible]ior) as well as roofing panels. Asbestos fibers are assumed to be present in the fire brick used in the ammonia dissociators, but are not present in the mortar used to stabilize the fire brick.

The seventh floor has been home to pigeons and various species of birds. The presence of bird droppings as well as bird carcasses are a health and safety concern for the Decontamination and Dismantling (D&D) team. Bird droppings harbor a fungus or mold known as Histoplasma Capsulatum. Histoplasma Capsulatum is capable of causing histoplasmosis, an airborne, potentially severe disease that can cause an illness similar to influenza or, with more serious symptoms, similar to tuberculosis. A clean-up action to eradicate any bird droppings will commence prior to the D&D mobilization effort.

4.2 Potential Chemical Hazards

Based on processes conducted within Plant 7 and as identified in the OU-3 Work Plan Addendum, the following chemicals could exist in Plant 7: UF_6, UF_4, UO_2, UO_2F_2, HF (aqueous and anhydrous), ammonia, and nickel.

Table 4-1 - Summary of Plant 7 Radiological Data

Floor	Alpha Counts (dpm/100cm²)			Beta-Gamma Counts (dpm/100 cm²)		
	Low	High	Mean	Low	High	Mean
One	15	1,209	139	29	3,355	472
Two	23	4,776	208	135	11,080	775
Three	133	3,589	589	198	41,611	2,699
Four	133	7,616	917	130	15,939	3,042
Five	133	33,253	2,300	335	55,620	6,449
Six	133	3,757	892	153	21,246	4,247
Seven	133	10,971	2,332	130	73,296	11,063

Note: Results for floors one and two are from the 1991 Radiological Survey Report, and the results for floors three through seven are from the 1992 Radiological Survey Report as floors one [illegible] were excluded from the 1992 survey. All results compiled in this table are for re[illegible] contamination.

SECTION 5

JUSTIFICATION FOR REMOVAL ACTION

Section IX, Removal Actions, of the Amended Consent Agreement required that on or before January 15, 1992, the U.S. DOE shall identify and submit a list of additional removal actions and a schedule for submitting work plans or other appropriate documentation for such actions.

Plant 7 is specifically identified in Section IX F.2 as Removal Action 19. This required the DOE to meet the January 15, 1992 deadline for submitting required documentation for scheduling this Removal Action.

Pursuant to Section 300.410 of the NCP, the DOE has confirmed that a removal action is required for Plant 7. An RSE (Appendix A) has been completed which determined that the situation met the following decisional criteria:

1) Regulation (CFR) 300.415(b)(2)(i) - Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants

2) 40 CFR 300.415(b)(2)(viii) - Other situations or factors that may pose threats to public health or welfare or the environment

The RSE provides greater insight to justify this removal action (Appendix A).

SECTION 6

PLANT 7 DISMANTLING REMOVAL ACTION

6.1 Removal Action Approach

The primary purpose of this project is to mitigate the actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants, or contaminants. This removal action consists of dismantling Plant 7 (a seven-story building) and the bridge crane to the west of Plant 7. The Bridge Crane will be dismantled to allow for adequate lay down space in the immediate vicinity of Plant 7. The physical work will include removal of ACM, dismantling, size reducing, segregating, decontaminating (surface cleaning), packaging, certifying, and placing materials into interim storage. A portion of the waste materials will be set aside for use in the OU-3 Treatability Studies. The materials designated for disposal will be packaged and shipped off-site in accordance with Removal Action 9 - Removal of Waste Inventories. All structural steel will be segregated for recycle or beneficial re-use.

Foundations and the grade level slab will not be removed under this action. These components will have the gross contamination removed. Cracks and fissures will be repaired, protrusions will be removed, and the base slab will be sealed. The waterproof sealant will be applied prior to the water wash, which will be conducted during Phase II. This action will prevent contaminant infiltration during the wash down process as well as providing a non-porous surface which will aid in collection of the wash water.

The dismantling activities can be grouped into three phases:

1) Phase One: Phase One will be accomplished under the Safe Shutdown program, and includes the removal of existing inventory/materials from inside Plant 7 and the general cleaning/clearing of the construction zone. Any loose contamination will be removed from the inventory prior to packaging and relocation to on-site storage pending final disposition. Potential locations for the interim storage of the existing inventory include Buildings 67, 68, and 30.

2) Phase Two activities include: removal of loose contamination, removal of the pigeon debris, relocation of stored materials, application of the waterproof sealant, and the high pressure/low-volume water wash and the application of the lock-down agent where required.

3) Phase Three encompasses the removal of the interior ductwork, piping, conduit, equipment, interior transite and batting insulation, application of the lock-down where required, and finally the dismantling of the exterior transite and structural steel down to the grade level concrete slab.

Stormwater will be directed to the existing stormwater retention basins which are monitored. Radiological monitoring stations will be established at Plant 7 construction access points, and in any other identified controlled work areas. These monitoring stations shall be utilized anytime personnel and equipment (such as fork trucks, cranes, etc.) are leaving the controlled work areas. This action will limit the migration of radiological contamination.

This removal action, to the extent practicable considering the exigencies of the situation, will attain ARARs under federal environmental or state environmental or facility siting laws (40 CFR 300.415[i]). This removal action will be conducted under the authority of CERCLA Section 106 (a). This removal action shall, to the extent practicable, contribute to the efficient performance of any anticipated long-term remedial action with respect to the release or threatened release concerned (40 CFR 300.415[c]).

6.2 Control Measures

Plant 7 will be subjected to a variety of control measures to prevent fugitive emissions/contaminant migration. During Phase I operations, major cracks and holes in Plant 7 will be sealed. HEPA filtered vacuums will be used to collect loose contamination from all accessible surfaces. Controls will be established to prevent the release of radiological or asbestos particulates which may be generated during the D&D process. The directed air flow ventilation system will utilize the infiltration of outside air as supply air to the exhaust system. Localized containment/isolation zones will be used for the large scale removal of asbestos. Background ambient air samples will be collected prior to the commencement of asbestos removal activities. These asbestos isolation zones will remain under negative air pressure throughout the removal duration. Industrial Hygiene will monitor ambient air within the isolation zone as well as the HEPA filtered exhaust air from the isolation zone. The air released from the isolation zones will then be filtered through Plant 7's HEPA system prior to being exhausted into the atmosphere. Corrective actions will be implemented if fiber levels exceed the OSHA Asbestos Construction Standard of 0.1 fibers/cc. The dismantling of isolation zones shall only occur after Industrial Hygiene has completed air sampling and released the area.

Egress routes from the building will be controlled through enclosed vestibules containing local radiation monitoring equipment. All equipment and personnel leaving the controlled area will be monitored prior to leaving. See Figure 3.2 for n[illegible]al egress routes. Step-off pads and monitoring stations will be provided at the enclosed vestib[illegible] .ontrol potential contaminant migration. These monitoring stations shall be utilized anytime p[illegible] . and equipment (such as fork trucks, cranes, etc.) are leaving the controlled work areas.

Transite panels and all o[illegible]r suspected ACM will be removed in accordance with Removal Action 26. Section 7, Asbestos Removal Plan, identifies additional information for the abatement.

The Sampling and Analysis Plan identifies air monitoring, soil monitoring, and wastewater programs.

The FEMP procedures for cutting, working in enclosed areas, and employment of HEPA filters will be observed to eliminate potential exposure to personnel and the environment. The Project-Specific Health and Safety Plan will provide details on procedures to be followed.

The interior of Plant 7 will be decontaminated utilizing a high pressure/low volume water wash. The base level slab in Plant 7 contains an elevator pit and a sump which will be sealed. This sump and/or elevator pit will serve as the collection point for all wash water associated with the high pressure water wash. Holes in the interior transite will be patched or sealed to the best extent practicable to prevent water loss. A curb will be constructed outside the building several feet from the perimeter wall. This curb will provide containment for any water which has leaked through the transite walls.

Collection of the decontamination water as well as water generated from the wet cutting of concrete will be accomplished with various water collection techniques (wet/dry vacuums, squeegees etc.) to the greatest extent possible so that gross particulates can be captured. Wash water that seeps to the lower floor will be collected in the elevator shaft pit and/or sump. A sump pump will be used to pump the water to a mobile containers placed outside the building. Water collected in vacuums will be transported to the mobile containers. Section 9.2 identifies sampling requirements for the wash water.

6.3 Disassembly and Removal

The activities required for the disassembly of Plant 7 can be grouped into three phases:

1) Phase One covers the removal of existing inventory and loose materials from inside Plant 7, removal of gross contaminants, and clearing the construction zone around Plant 7 of miscellaneous materials.

2) Phase Two activities include: removal of loose contamination, removal of the pigeon debris, relocation of stored materials, application of the waterproof sealant, and the high pressure/low-volume water wash and the application of the lock-down agent where required.

3) Phase Three encompasses the removal of the interior ductwork, piping, conduit, equipment, interior transite and batting insulation, application of the lock-down where required, and finally the dismantling of the exterior transite and structural steel down to the grade level concrete slab.

The following description provides more detail of the activities required for the dismantlement of Plant 7. Phase 3 activities shall not commence until Phase 1 and 2 activities have been completed; however, some overlap could occur between Phase 1 and Phase 2 activities.

Phase 1

Phase One will be accomplished under the FEMP Safe Shutdown program. Prior to the arrival of the dismantlement subcontractor, the Safe Shutdown program will remove the miscellaneous materials stored in Plant 7. This includes existing drummed inventory, empty UF_4 containers, pallets of electrical circuit breakers, various spare parts, and miscellaneous debris. Any loose contamination will be removed from inventory prior to packaging and relocation to on-site storage pending final disposition. Potential locations for the interim storage of the existing inventory include Buildings 67, 68, and 30.

The construction zone around Plant 7 will be cleared of miscellaneous equipment and materials prior to the arrival of the dismantlement subcontractor. This includes the removal of the T-hoppers (enclosed material transport hoppers), removal of existing personnel trailers on southeast side of Plant 7, and any other miscellaneous materials in the construction zone.

Controlled access into the construction zone will be established. Monitoring stations will be located at the personnel and equipment entrances into Plant 7. Perimeter signs and barriers will be installed.

[illegible]down program, via established site procedures, will remove the gross contamination from [illegible] [illegible]des removal of dead pigeons and pigeon droppings to eliminate the histoplasmosis concern. All accessible surfaces will be HEPA vacuumed to remove loose contamination.

All interior piping will be verified to be empty, disconnected, and capped. Ductwork will be inspected for accumulated materials, which will be removed and containerized for disposal.

Any major cracks and holes in the Plant 7 walls will be sealed to allow negative pressure to be maintained in the building.

Phase 2

The asbestos removal portion of Phase 2 will begin on the seventh floor after the Safe Shutdown Program has completed vacuuming of loose contamination on floors and removal of pigeon debris and stored materials. During Phase 2, FERMCO will perform high-level cleaning to remove loose contamination from the rafters, construct localized containment barriers. Friable Asbestos Containing Material (ACM), primarily Thermal System Insulation (TSI), will also be removed in this phase under Removal Action 26 - Asbestos Removals.

A waterproof sealant will be applied to the base floor slab so it can act as a catch basin for decontamination water and to cracks on the exterior. Decontamination of the interior of Plant 7 will be performed using a high-pressure/low-volume water wash. The water will be collected and containerized for sampling and disposition. Interior lock-down agents will be applied where required within Plant 7.

Phase 3

Phase 3 includes removal of the interior ductwork, piping, conduit, and equipment (for which localized ventilation will be used) within containment areas. Interior transite and batting insulation will also be removed along with the continued application of the lock-down where required to inaccessible areas. Finally, the exterior transite and structural steel will be removed down to the base slab.

6.4 Size Reduction/Decontamination

To minimize handling, the building structure, equipment, piping, etc. will be removed in pieces as large as possible. However, limitations on container size, material handling equipment capacity, and floor loading restrictions will require size reduction of some items to occur in place or at grade level. Size reduced materials will be packaged into appropriate containers for interim storage prior to disposition. Structural steel (primary, secondary, and decking > 1/4") members will be staged for recycling or beneficial re-use. A portion of each waste stream will be segregated for use in the evaluation of decontamination methods as part of the OU-3 Treatability Studies.

6.4.1 Size Reduction Methods

1) Size reduction may be accomplished by removing fasteners at joints, mechanical cutting, or flame cutting. Items destined for use in the Treatability Studies will undergo localized clean[illegible] of contaminants (radioactive and lead) from the area to be cut to minimize the impreg[illegible] contaminants into the cutting area. Local HEPA ventilation will be utilized as required [illegible]ng cutting operations to prevent the release of airborne contaminants.

2) Concrete cutting will be conducted both in place and at grade level as required. Control of particulate and water emissions beyond the work area will be provided.

3) Containers: Sea/Land containers, DOT Specification 7A Type A packages for Low Specific Activity (LSA) material, and 55-gallon drums will be used to contain size-reduced materials. These materials will be staged in an on-site interim storage area pending final disposition.

Section 6.2 identifies controls measures to mitigate particulate emissions.

6.4.2 Decontamination Methods

1) Preliminary decontamination will involve the use of HEPA vacuums and/or water washdown and wiping down of accessible surfaces.

2) The materials segregated for the OU-3 Treatability Studies will be used to evaluate various decontamination methods. The methods to be evaluated will be specified in the OU-3 Treatability

Study Work Plan. The anticipated types of technologies that will be evaluated include surface removal, contaminant stabilization, chemical surface decontamination, smelting processes, chemical leaching, and thermal treatment. These methods are viewed to represent the universe of decontamination technologies available for structural steel, miscellaneous metal, piping, concrete, transite and the other materials encountered in Plant 7 as well as numerous other facilities on site.

Section 6.2 identifies controls measures to mitigate particulate emissions.

6.5 Material Disposition

The purpose of the disposition plan section of this removal action work plan is to outline the various final disposition actions which will be employed during the demolition of Plant 7.

Integral to the successful completion of the Plant 7 removal action is the safe and efficient final disposition of all waste generated as a result of the dismantling. The Plant 7 dismantling will generate material requiring a variety of disposition options including:

1) Sorting and segregation
2) Size reduction
3) Characterization
4) Processing
5) Packaging
6) Recycling/beneficial re-use
7) Final disposition and/or disposal

Consistent with FEMP disposition policies, the plan will include recycling options as well as off-site waste disposal. The recycling actions will not impede the implementation of the dismantling activities. Since this is the first major D&D project at the FEMP, a portion of generated material streams will be diverted from direct disposal to analyze alternate treatment, recycling, and disposition options in support of the feasibility studies for OU-3. The experience, knowledge, and results will be quantified and used to make disposition decisions for the remaining D&D actions at the FEMP through the feasibility study process.

6.5.2 Summary

The D&D of Plant 7 will generate materials primarily composed of structural steel, miscellaneous steel, ductwork, pipe/conduit, equipment, concrete, miscellaneous asbestos containing material, transite, lead flashing, sheet lead, and lead caps.

Structural Steel

Recoverable structural steel will be segregated for the purpose of beneficial reuse.

Miscellaneous Steel

These materials will be packaged for shipment to NTS. However, some of this steel will be separated for use in the OU-3 treatability studies. These studies will be aimed at identifying recoverable metals for future reuse/recycling. A recoverable metal is defined as a metal greater than 1/4-inch thick and is characterized as having easily monitored surfaces.

Ductwork, Pipe, Conduit, Equipment, and Concrete

These materials will be packaged for shipment to NTS. However, small quantities of these materials be segregated for use in the OU-3 treatability studies.

Asbestos Containing Material/Transite

The asbestos containing material and transite will be packaged and placed in storage pending acceptance at a licensed disposal site.

Lead Flashing, Sheet Lead, and Lead Caps

These materials will be segregated during the dismantling process and will be investigated for reuse/recycling.

Table 6-1, Disposition Summary, identifies the anticipated waste streams and quantities. Table 6-3, identifies retained waste stream volumes for the treatability study.

The waste streams identified for disposal at NTS will be shipped within 90 days of exiting the Plant 7 control zone.

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6.5.3 Recycling

Only material defined as recoverable in Removal Action 17 Work Plan, Improved Storage of Soil and Debris, will be identified for recycling. Classification as recoverable, and therefore recycling, is based on several factors which include economic evaluations, available technologies, volume of secondary waste generated, monitoring capabilities, applicable contamination limits, availability of uses for the materials, and availability of final disposition options. It is important to note that the economic considerations are primarily driven by disposal costs as well the costs of processing, storage, regulatory requirements, and salvage value.

Recycling may include both beneficial reuse of contaminated material as well as decontamination below free release without radiological control and unrestricted release. Release is dependent on the type of contamination, depth, media porosity, and geometry for survey. Volume or mass contamination type material will be released without radiological controls only if it can be demonstrated to have no added radioactivity (reference DOE Orders 5400.1, "General Environmental Protection Program," and 5400.5, [illegible]n of the Public and the Environment"). Release of materials with surface [illegible] based on the most restrictive requirement between the guidance in DOE Order 5400.5, proposed 10 CFR 834 (the codification of DOE Order 5400.5), NRC Regulatory Guide 1.86, or state radioactive material license possessed by a subcontractor processing facility. The surface radioactivity guides are summarized in Table 6-2.

Table 6-1 ion Summary

Debris Type	Anticipated Contaminants of Concern	icipated sposition	Estimated Quantities/Notes
Structural Steel Miscellaneous Steel	Radioactive Surface Contamination	Rec le	Approximately 550 tons
Ductwork	Radioactive Surface Contamination	Ship to NTS	11,400 square feet of galvanized ductwork
Pipe/Conduit	Radioactive Surface Contamination Asbestos	Ship to NTS	Estimated 3,400 linear feet of asbestos-covered piping >3-inch diameter and 6,000 linear feet of uninsulated
Equipment	Radioactive Surface Contamination Asbestos	Ship to NTS	4 ammonia dissociators 2 large air handling units
Concrete	Radioactive Surface Contamination	Ship to NTS	2,500 square feet (6 inches thick)
Asbestos Containing Material	Radioactive Surface Contamination Asbestos	On-site Storage Pending NTS Acceptance	Includes asbestos batt insulation, fire brick, floor tile, etc.
Transite	Radioactive Surface Contamination Asbestos	On-site storage Pending NTS Acceptance	17,000 square feet of internal - (1/4 and 1/2 inch thick) 41,000 square feet of external - (7/16 inch thick)
Sheet Lead/Flashing/Caps	Radioactive Surface Contamination	Recycle	Thickness is 1/16 inch

Note: Estimated quantities do not reflect the materials to be segregated for the treatability study as identified in Table 6-3.

Table 6-2 - Surface Radioactivity Guides

Nuclide (See Note 1)	Removable (dpm/100 cm²) (See Notes 2 and 3)	Total Fixed and Removable (dpm/100 cm²)
U-natural, U-235, U-238, and associated decay products	1,000 alpha	5,000 alpha
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	20	500
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	200	1,000
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission), except Sr-90 and others [illegible] mixed fission products containing Sr-90	1,000 beta-gamma	5,000 beta-gamma
[illegible] surfaces contaminated by HT, HTO, and metal tritide aerosols	10,000	10,000

Notes:

1) The values in this table apply to radioactive contamination deposited on, but not incorporated into the interior of the contaminated item. Where contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for the alpha-and beta-gamma-emitting nuclides apply.

2) The amount of removable radioactive material per 100 square centimeters of surface area should be determined by swiping the area with dry filter or soft absorbent paper while applying moderate pressure, and then assessing the amount of radioactive material on the swipe with an appropriate instrument of known efficiency. For objects with a surface area less than 100 cm², the entire surface should be swiped, and the activity per unit area should be based on the actual surface area. Except for transuranics, Ra-228, Ac-227, Th-228, Th-230, Pa-231, and alpha emitters, it is not necessary to use swiping techniques to measure removable contamination levels if direct [illegible]veys indicate that the total residual contamination levels are below the values for [illegible]movable contamination.

3) The levels may be averaged over one square meter provided the maximum activity in any area of 100 cm² is less than three times the value in Table 2-2 of the DOE Radiological Control Manual.

6.5.4 Disposal

To expedite materials generated from the D&D of Plant 7, disposition for a majority of the waste generated is to package and dispose of the waste as Low-Level Waste at an approved disposal facility. As stated previously, this decision is based on available technologies; available uses; and the economics of waste handling, transportation, and disposal. Although it is believed that uses for contaminated concrete, asbestos, and transite may be identified and feasible to implement, none have been demonstrated to be available at this time. Committing the entire volume of these types of material to as yet unidentified alternative disposition would delay the implementation of the project and conflict with the objectives of the Plant 7 Removal Action. With respect to non-recoverable metal, the decision to dispose of the material is based on the cost of re-use or recycling. It should also be noted that the light weight of the material allows effective compaction and packaging for disposal.

6.5.5 Demonstration Tests

It is the DOE's goal to use the Plant 7 D&D Removal Action as a demonstration test of recycling and [illegible]s, which will provide useful information to support subsequent D&D [illegible]easibility studies. A small portion of the light gauge metal, concrete, and transite [illegible] will be diverted from immediate disposal, and projects will be initiated to evaluate alternative disposition or recycling options. The remainder of this section will outline the anticipated tests. The tests will become an integral part of the feasibility studies.

Where applicable, the tests will be integrated with the existing contracts for recycle, re-use, and disposal which have been awarded through DOE Morgantown. The DOE Morgantown contracts are part of the Program Research and Development Announcement (PRDA) for recycle, re-use, and disposal of waste from DOE decommissioning actions.

The anticipated non-recoverable materials and volumes to be retained for treatability testing, as well as an initial listing of potential technology types for testing, are summarized in the table below.

Table 6-3 - Materials for OU-3 Treatability Study

Media	Planned Retained Volume	Anticipated Technology Types
Slab Concrete	(12) 3-foot x 6-foot sections	Surface removal contaminant stabilization
Scrap Metal	Miscellaneous contaminated equipment and scrap metal amounting to approximately 2,000 pounds	Physical surface decontamination Chemical surface decontamination Smelting processes
Transite Panels	320 square feet (approximately ten 4-foot x 8-foot panels)	Chemical leaching Thermal treatment

Note: Structural steels and exotic metals have been assumed viable for recycle/beneficial re-use.

6.6 Regulatory Requirements

This removal action is being undertaken pursuant to Section IX of the Amended Consent Agreement issued under CERCLA Section 106. As such, this removal action is to attain compliance with ARARs to the extent practicable considering the exigencies of the situation (40 CFR 300.415(i)). In determining whether compliance with ARARs is practicable, the DOE may consider the urgency of the situation and the scope of the removal action to be conducted. The list of ARARs and associated [illegible] implementation strategies were developed based on the non-time critical designation of the removal ac[illegible] [illegible]SE Section 5 - Appendix A). In addition to the ARARs, other Federal and State advisories, criteria, or guidance (known as To Be Considered [TBC]) may, as appropriate, be considered in formulating the removal action.

The ARARs and TBCs for this removal action, including a strategy for compliance, are presented in Table 6-4. The dismantling operations involve asbestos removal, handling of low-level radioactive contaminated material, material characterization, size reduction, packaging of radioactive waste materials, and shipment to an approved off-site disposal site (under Removal Action 9) and/or an approved on-site interim storage area.

Table 6-4 - Applicable [illegible]ant and Ap[illegible] [illegible]equirements

CA[illegible] Y	REGULATORY REQUIRE[illegible]	IMPLEMENTATION STRATEGY
General - Cont. Management	Waste containers are to be inspected weekl[illegible] and maintained in good condition. The waste must be compatible with the container or liner. The container [illegible]nust always be closed during storage except when it is [illegible]cessary to add or remove waste. The containers are to [illegible] handled to prevent rupture. The storage area must be [illegible]vided with containment as specified in 40 CFR [illegible]4.175. Special handling is required for ignitable and incompatible waste. 40 CFR 264 Subpart I [Applicable]	Any c[illegible]ed waste materials determined to be a hazardous or mixed waste [illegible]aced into an existing RCRA interim storage facility. The haza[illegible] mixed waste will be containerized and labelled in accordance wit[illegible] 262, Subpart C, and handled as required by 40 CFR 264, Su[illegible]e storage area selected will comply with the requirements of 40 CF[illegible] 5. These containers will be incorporated into current weekly ins[illegible]rams. No ignitable or incompatible waste is to be handled du[illegible]moval action. Waste materials for which analytical ch[illegible]ation results are pending will also be placed into interim storage.
General - Emergency Planning	Unless demonstrated otherwise, the following equipment must be provided: (1) an internal communications or alarm system, (2) telephone or two-way radio to summon emergency assistance, (3) portable fire extinguishers, spill control equipment, and decontamination equipment, and (4) water at adequate volume and pressure. Arrangements must be made with the local authorities to ensure proper emergency planning procedures. Procedures need to be consistent with existing arrangements. 40 CFR 264 Subpart C {Ohio Administrative Code [OAC] 3745-54-30 to 37} [Relevant and Appropriate]	Access to the existing sitewide internal communication/alarm system will be provided at the work site. Portable fire extinguishers will be provided, as required by DOE Order 6430.1A.
General - Public Health and Environment	The total effective dose equivalent to members of the public is limited to 100 mrem in a year, exclusive of the disposal for radioactive material into sanitary sewage in accordance with 10 CFR 20.2003. The dose in unrestricted areas is limited to 2 mrem in 1 hour. 10 CFR 20.1301 [Relevant and Appropriate] The exposure of members of the public to radiation sources as a consequence of all routine DOE activities will not cause, in a year, an effective dose equivalent greater than 100 mrem from all exposure pathways. DOE Order 5400.5, Chap II, Sect 1.a [To-Be-Considered]	Precautions will be taken to minimize exposure through the use of local containment of contaminated areas. All residues and debris will be stored in covered containers. Compliance will be based on site-wide monitoring at the site boundary and existing NESHAP reporting requirements.

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Table 6-4 - Applicable or R and Appropriate Requirements (Continued)

CATEGORY	REGULATORY REQUIRI	IMPLEMENTATION STRATEGY
General - Waste Determination	A person who generates a solid waste r. ..ine if that waste is a hazardous waste using th. es identified in 40 CFR 262.11. An overvi. hazardous waste determination procedures ented in 40 CFR 260, Appendix I. 40 CFR 262.11 {OAC 3745-52-11} [Appl. ..ole] Low-level waste will be characterized with sufficient accuracy to permit proper segregation and management. Waste characterization and shipping/management information is to be recorded. This information includes the physical and chemical characteristics, waste volume, waste weight, concentrations of major radionuclides, and historical records of generation, treatment, storage, shipping and disposal. DOE Order 5820.2A, Chap III.3.d and m [To-Be-Considered]	Detailed radiological surveys have been performed for Plant 7. Prior to dismantling, a Material Evaluation Form (SSOP-0002) will have to be completed. After a review of the potential chemical hazards, it has been determined that none of the identified chemicals would cause the generated waste streams to be classified as or exhibit characteristics of a listed hazardous waste. Therefore, no sampling is anticipated for hazardous waste determinations.
General - Worker Protection	The occupational radiation doses specified in 10 CFR 20 Subpart C shall be followed. In addition, the radiation survey and monitoring requirements, the administrative controls for restricted areas, and other precautionary procedures identified in 10 CFR 20, Subparts D to J shall be followed. 10 CFR 20 Subparts C to J [Relevant and Appropriate] At DOE facilities, the radiation protection standards contained in DOE Order 5480.11 for occupational workers, unborn children, minors, and on-site members of the public shall not be exceeded. DOE Order 5480.11 [To-Be-Considered] 10 CFR 835 (Proposed) [To-Be-Considered]	Although the radiation protection standards promulgated under 10 CFR 20 are only applicable to US NRC licensed facilities, these protection standards are deemed to be relevant and appropriate for individuals entering a radiologically controlled area at the FEMP. These standards are mandatory for NRC licensees after January 1, 1994 with early compliance encouraged. Work crews will be required to dress appropriately as outlined in the Health and Safety Plan. Work areas will be surveyed for radiation level and dosimeters will be worn, as required, to monitor worker exposure.

Table 6-4 - Applicable or Rele propriate Requirements (Continued)

CATEGORY	REGULATORY REQUIREME	IMPLEMENTATION STRATEGY
General - Worker Protection	The safety and health standards for general con presented in 29 CFR 1926 will be followed. Tl standards appear in DOE Order 5483.1A. 29 CFR 1926 [Relevant and Appropriate] DOE Order 5483.1A [To-Be-Considered]	This removal action will be conducted in accordance with applicable general construction standards of the Occupational Safety and Health Administration (OSHA). The OSHA standards are incorporated in DOE Order 5483.1A. The specific requirements will be identified in the task-specific health and safety plan.
General - Worker Protection	Employers shall develop and implement a written safety and health program for their employees involved in hazardous waste operations. All occupational safety and health requirements of 29 CFR Parts 1910 and 1926 are to be followed. If there is a conflict or overlap, the most protective provision shall apply. 29 CFR 1910.120 [Relevant and Appropriate] DOE Order 5483.1A [To-Be-Considered]	This removal action will be conducted in accordance with the provisions of e FERMCO Comprehensive Environmental Occupational Safety and Health gram (FERMCO, February 1993). As specified by 29 CFR 1910.120(b)(4), a task-specific health and safety plan will be developed for this removal action.

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Table 6-4 - Applicable or Re ıt and Appropriat ements (Continued)

CATEGORY	REGULATORY REQUIREMENT	IMPLEMENTATION STRATEGY
Operational - Air Discharges (Radionuclides)	Emissions of radionuclides to the ambient air from DOE facilities will not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem per year above background. This limit is based on an effective dose equivalent as calculated per the International Commission on Radiological Protection's Publication No. 26. Modelling and sampling procedures are specified in 40 CFR 61.93. An annual report must be submitted to US EPA headquarters and regional offices by June 30. This report includes the monitoring results as recorded in DOE's Effluent Information System and the effective dose equivalent calculations, as required by 40 CFR 61.93, for the previous year. Records as specified under 40 CFR 61.95 must be maintained for at least 5 years. 40 CFR 61 Subpart H {OAC 3745-54-94 & 95} [Applicable] DOE Order 5400.5, Chapter II [To-Be-Considered] DOE Order 5820.2A.III.3.a.2 [To-Be-Considered] The annual average radionuclide concentrations in air effluents are to be controlled so that the levels specified in Appendix B, Table II of 10 CFR 20 (Sections 20.1001 to 20.2401) are not exceeded. 10 CFR 20.1302(b) [Relevant and Appropriate]	Pro ıtainment and a ventilation system with HEPA filtered exh ntially contaminated work areas. Visible emissions will be mit g dismantling using standard construction practices such as wr Compliance will be demonstrated by local Continuous Air M vided in addition to those already existing at the site boundary. Th ... of the existing site-wide air monitoring program are provided to the US EPA on an annual basis.

Table 6-4 - Applicable or R and Appropriate Requirements (Continued)

CATEGORY	REGULATORY REQUIR	IMPLEMENTATI TEGY
Operational - Air Discharges (Nuisances and Fugitive Dust)	The emission or escape into open air fro: rce whatsoever, of smoke, ashes, dust, dirt, ids, fumes, gases, vapors, odors, or any othe: ces in such a manner or in such amounts as to the health, safety, or welfare of the public o use unreasonable injury or damage to property will be declared a public nuisance and is prohibited. OAC 3745-15-07 [Applicable] The significant and avoidable deterioration of air quality shall be prohibited. OAC 3745-17-05 [Applicable] For those communities and areas identified in OAC 3745-17-08 Appendix A, the visible emissions of fugitive dust generated during grading, loading, or construction operations and other practices which emit fugitive dust are to be minimized or eliminated. OAC 3745-17-08 [Relevant and Appropriate]	The FEMP is not within a communi a identified in OAC 3745-17-18 Appendix A; however, the remov ruction activities may generate fugitive dust. As such, this re t is deemed to be relevant and appropriate due to potential ust generation during construction activities. The potential for emi il be controlled by providing local containment and a ventilation syste.. HEPA filtered exhaust for potentially contaminated work areas.
Operational - Air Discharges (NAAQS)	The National Ambient Air Quality Standards (NAAQS) for lead and particulate matter will be achieved in accordance with 40 CFR 50.6 & 50.12. 40 CFR 50.6 & 50.12 {OAC 3745-71-02} [Relevant and Appropriate]	The potential for emissions will be controlled by providing local containment and a ventilation system with HEPA filtered exhaust for potentially contaminated work areas. Based upon estimations of the maximum amounts of particulate matter and lead which could be generated by this removal action, no impact to the ambient air quality is expected. A program for monitoring particulate matter in the ambient air is already established for the FEMP. No additional ambient air monitoring is proposed for this removal action.

Table 6-4 - Applicable or Relevant and Approp[illegible]quirements (Continued)

CATEGORY	REGULATORY REQUIREMENT	IMPLEMENTATION STRATEGY
Operational - Asbestos Handling	Asbestos waste generated must be disposed of in accordance with OAC 3745-20-06. No visible emissions during the collection, processing, packaging, transporting, or disposition of any asbestos-containing waste material. Waste material will be sealed into durable leak-tight disposal containers or an approved alternative disposal system. Containers must be labeled in accordance with this section. 40 CFR 61 Subpart M [Relevant and Appropriate] {OAC 3745-20-02 & 06} [Applicable] Asbestos contained in the air in areas accessible to the public in buildings that are owned, operated or leased by a public entity (state or locality) cannot be more than 10,000 asbestos fibers longer than five microns per cubic meter of air calculated as an eight hour time weighted average, which is measured during periods of normal building occupancy. ORC 3710.02(A)(10)(a) [Relevant and Appropriate] The construction standard covers demolition, salvage, removal, encapsulation, construction, repair, maintenance, renovation, installation, spill/emergency cleanup, and transportation on a construction site of asbestos, tremolite, anthophyllite, or actinolite. 29 CFR 1926.58 [Relevant and Appropriate]	Curr[illegible] form of asbestos is nonfriable. Should the material become friable, one of the management/disposal methods below will be used: 1. Adequately wet asbestos-containing waste material and seal the material into durable leak-tight disposal containers or enclosure system in accordance with Paragraph (C) of OAC 3745-20-04. 2. For facilities demolished in accordance with Paragraph (A)(1)(a) of OAC 3745-20-04 or Paragraph (C) of OAC 3745-20-04, where asbestos was not removed prior to dismantling, keep asbestos-containing dismantling debris adequately wet or encapsulated until collected for disposal in accordance with Paragraph (C)(5) of this rule. 3. Process friable asbestos-containing waste material into nonfriable forms, such as nonfriable pellets or other shapes. The volume of asbestos particles (greater than five microns) in the ambient air will be below the level specified in ORC 3710.02. At any time during asbestos removal, the standards identified in 29 CFR 1926.58 will be adhered to.

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Table 6-4 - Ap[illegible] or Relevant and Appropria[illegible] [illegible]uirements (Continued)

CATEGORY	REGULATORY R[illegible]REMENT	IMPLEMENTATION STRATEGY
Closure - Decontamination and Decommissioning - Buildings	Remedial actions shall be condu[illegible] so as to provide reasonable assurance that the res[illegible]al radioactivity in any occupied or habitable building, th[illegible] annual average (or equivalent) radon decay product concentration (including background) shall not exceed 0.02 of the Working Level. In any case, the average shall not exceed 0.03 of the Working Level. The level of gamma radiation shall not exceed the background level by more than 20 microroentgens per hour. Guidance for implementation of this standard and criteria for establishing alternative limits are described in 40 CFR 192, Subpart C. 40 CFR 192, Subpart B & C [Relevant and Appropriate] The management and free release of wastes, residues, structures, equipment, and other property shall adhere to the radiological protection requirements and guidelines described in DOE Order 5400.5. The requirements of this section shall apply for surface contamination of existing structures and equipment (Figure IV-1). Proposed rule 10 CFR 834, the codification of DOE Order 5400.5, presents surface contamination guidelines in Table 2 (58 FR 16281) that are consistent with US NRC Regulatory Guide 1.86 and Table IV-1 of DOE Order 5400.5. DOE Order 5400.5, Chapter IV [To Be Considered] Proposed 10 CFR 834 (58 FR 16281) [To Be Considered] A reasonable effort shall be made to eliminate residual contamination and to achieve the acceptable surface contamination levels as stated in the US NRC Regulatory Guide 1.86. US NRC Regulatory Guide 1-86 [To Be Considered]	The most restrictive limit will be used to establish the free release criteria for this remedial action. Radiation surveys will be performed prior to releasing any potentially contaminated materials (including silo rubble and remediation facility components) off-site to demonstrate compliance with the specified standards. These surveys should show compliance averaged over limited areas rather than point-by-point compliance. Prior DOE-HQ approval is required to take any radioactively contaminated waste materials (i.e., detectable radiation levels) to a non-DOE facility even if the waste materials meet the "free-release" criteria.

SECTION 7

ASBESTOS REMOVAL METHOD PLAN

7.1 Introduction

This section of the RAWP substantiates the removal methodology associated with the abatement of ACM which currently exists in Plant 7. Various types of ACM were heavily used in the construction and as an insulating material on many of the Plant 7 components. Due to past process operations, portions of the ACM are significantly damaged (friable), radioactively and potentially chemically contaminated. The removal methods and techniques outlined in this section will be accomplished in accordance with the Large Project Asbestos Work Practices, Removal Action 26, which establishes control measures necessary for the abatement of ACM.

Asbestos containing material will be removed during the dismantlement of Plant 7. Significant quantities of radiologically and potentially non-radiologically contaminated, friable and non-friable ACM are located throughout Plant 7. The following types of ACM currently exist:

1) Transite panels (interior and exterior)

2) Thermal System Insulation (pipe run and fitting insulation, gaskets)

3) Miscellaneous ACM (resilient floor tile, floor tile mastic, fire brick, insulation located on tanks, electrical wire coverings, etc.)

Suspect materials, which were found to be inaccessible during bulk sampling by Diagnostic Engineering Inc. (DEI), will be assumed to be asbestos contaminated and handled accordingly. According to the DEI Asbestos Survey and Assessment, most TSI was significantly damaged and friable. The transite and miscellaneous ACM was observed to be predominantly non-friable.

7.2 Background

The February 1992 DEI Asbestos Survey & Assessment for the FEMP, characterized accessible ACM according to the Asbestos Hazard Emergency Response Act (AHERA). The characterization performed by DEI (per AHERA) identified the ACM to be in good to poor condition. The TSI was found to be friable and significantly damaged. The transite and miscellaneous ACM are currently considered non-friable. The December 1992 RSE (Revision 0, Plant 7 Dismantling [Appendix A]) presents additional information pertaining to the inspection and characterization results and is further referenced for additional information.

7.3 Control Measures

Interior asbestos removal shall be conducted within isolation zones, use glove bag techniques, or approved enclosure techniques. The ACM removal area may be isolated from the rest of the building using a negative pressure system that establishes lower atmospheric pressure within the enclosure. This will prevent asbestos fiber release to the environment and minimize worker exposure. This pressure differential or static pressure is accomplished by creating a vacuum in the work area by utilizing portable HEPA filters which will remove airborne asbestos fibers.

The ACM will be removed, packaged and dispositioned in accordance with FEMP Site Procedures and approved disposal facility certifications and transfer criteria in effect at the time of abatement. The ACM abatement shall be designed in sufficient detail to provide for the safe, efficient and controlled removal of all ACMs in full compliance with ARARs, DOE Orders, the FEMP Asbestos Management Plan and other related procedures identified for this project.

If during dismantling any transite panels become friable, an encapsulant will be applied to render in non-friable.

7.4 Worker Protection

The workers involved in the ACM abatement will be protected from asbestos fiber release in accordance with applicable Federal and State requirements and criteria. The task specific Health and Safety Plan will identify the appropriate PPE required for ACM abatement activities conducted in Plant 7.

7.5 Abatement

The abatement to be conducted within Plant 7 will consist of removing the interior and exterior transite wall panels, TSI, and miscellaneous ACM.

The TSI was found to be in poor condition, significantly damaged, and friable throughout Plant 7. The TSI will remain on the smaller piping, but will be removed from piping feasible for decontamination. Glove bag techniques may be used during the piping removal.

The TSI will be removed from the areas where the pipe cut is to be made prior to the size reduction of the pipe. This portion of the removal will be conducted in isolated areas utilizing local containment under negative pressure. Size reduction of piping with TSI intact shall occur in isolated areas to prevent fiber release to the environment. The TSI is assumed to be radiologically contaminated. Gaskets used predominantly in piping (flanges) valves, pumps, and other equipment to prevent leakage of fluids between solid surfaces. Gaskets will be addressed with the TSI.

Per 40 CFR 61.145(c)(1)(i), the floor tile is a Category 1 nonfriable Regulated Asbestos Containing Material (RACM). Per this statute, the floor tile can remain in the facility as the facility is being razed. However, this material must be treated as an ACM during building razing.

The following criteria shall apply to the Category 1 nonfriable RACM (floor tile):

1) The material must be adequately wetted during an cutting or disjointing.

2) The material must be adequately wet until final disposition.

The interior transite wall panels and batting insulation will be removed in isolated zones with critical barriers (local containment) utilizing negative pressure. Following abatement, the transite panels will be segregated as friable and non-friable radiologically contaminated. This material will be surveyed and placed in containers.

The anticipated dismantling technique for the exterior transite panels is unbolting while utilizing a point source vacuum for collection of any particulates. The transite panels are considered nonfriable; however, if a panel is cut a portable HEPA vacuum will be used for particulate collection. The transite panels will then be moved to grade level for monitoring and packaging.

SECTION 8

PROGRAM MANAGEMENT

8.1 Responsibilities

The DOE is the lead agency for this removal action and will coordinate and execute continuation of this removal action. As stated in Section XXII of the Amended Consent Agreement, if the DOE determines that any activities or work being implemented under this Amended Consent Agreement may create an imminent threat to human health or the environment from the release or threat of release of hazardous substance, pollutant, contaminant, or hazardous constituent, it may stop any work or activities for such a period of time as needed to respond and take whatever action necessary to abate the danger. Work may be stopped for 72 hours while the DOE seeks guidance from the US EPA regarding the existence of the danger and whether to proceed with the work. Reporting to the Ohio Environmental Protection Agency (Ohio EPA) and US EPA will be in accordance with Section XXIII of the Amended Consent Agreement.

Fernald Environmental Restoration Management Corporation (FERMCO) will coordinate, manage, implement, and monitor all activities and prepare all reports associated with the removal action in a manner consistent with DOE and regulatory guidance.

This removal action will be handled by the CRU-3 team to ensure compatibility with the final remedial action(s) selected for OU-3. Data and results from this removal action will be used to evaluate the final remedial options for OU-3. FEMP site personnel will manage the project using Feed Materials Production Center (FMPC)-2201 Topical Manual, Project Management Procedures.

All field personnel involved will be trained in accordance with 29 CFR 1910.120, the standard operating procedures for the work involved, and the requirements of the approved work plan. The effectiveness and integrity of the containment, monitoring, and other equipment installations will be assessed on a periodic basis. This will be accomplished by personnel normally assigned those duties. FERMCO will provide environmental monitoring and will inspect and repair the facility, as necessary.

<u>Resources</u>

1) Remove existing inventories as well as equipment and T-hoppers surrounding Plant 7.

2) Ground movement of containers in the work area will be routinely performed by FEMP forces.

3) All monitoring, surveying, and QA compliance activities of the project will be performed by FEMP personnel.

4) All monitoring, maintenance, and QA compliance activities of the ventilation systems will be performed by FEMP personnel.

5) Installation of barriers will be performed by designated FEMP contractor personnel.

6) All erection and dismantling of equipment and structures will be performed by designated contractors.

7) The designated FEMP contractor will maintain a clean working area at all times to minimize the potential for release of contaminants.

8) Designated FEMP contract personnel will provide oversight to the fixed price sub contractors activities.

8.2 Schedules

The proposed key milestones for this removal action are given in Table 8-1. The construction bid package is to be issued within 5 months following the approval of this work plan. The schedule provides 26 months for completion after start of field activities.

Table 8-1 - Key Milestones of Proposed Project Schedule

	Duration (Months)	Accumulated Duration (Months)
Work Plan Approval	0	0
Initiate Design	1	1
Complete Design/Issue Construction Bid Package	4	5
Mobilization Activities	3	8
Complete Removal Action	26	34
Issue Final Report	12	46

8.3 Approvals and Reporting

As required under Section IX of the 1991 Amended Consent Agreement, the US EPA is to approve the Work Plan prior to commencing the removal action. The basic components of the approval procedure for the Work Plan are as follows:

1) The DOE will submit the Work Plan to the US EPA providing a concise description of the activities to be performed. The Work Plan contains a sampling and analysis plan, a quality assurance plan, and a schedule.

2) The US EPA will review and approve the Work Plan and provide any comments to the DOE within 30 days. The Ohio EPA will review and provide comments to the DOE within 30 days.

3) The DOE will submit a revised Work Plan, addressing all US EPA and Ohio EPA comments, to the US EPA within 30 days following receipt of comments. The DOE may extend the 30-day period an additional 20 days by providing notice to the US EPA.

Upon receiving US EPA approval, the DOE will initiate the removal action within 5 calendar days. The removal action is to be implemented in accordance with the approved work plan and schedule.

The progress of the removal action will be reported to the US EPA in the Amended Consent Agreement/Amended Consent Decree progress report on a monthly basis. A final report will be issued using 40 CFR 300.165, "On-Scene Coordinator (OSC) Reports," as a guide for compiling information. This report will be issued within 1 year of project completion.

SECTION 9

SAMPLING AND ANALYSIS PLAN

9.1 Sampling Objectives

As identified in Section 4, radiological surveys have been conducted in Plant 7. The data available from these surveys is sufficient to assess radiological conditions in determining worker protection requirements. Table 4-1 and the RSE (Appendix A) list the results of these surveys. This sampling and analysis plan will identify the sampling requirements needed to support the removal of Plant 7, while achieving the following objectives:

1) Ensure continued protection of human health and the environment through a comprehensive sampling program that will determine packaging requirements of materials generated from the dismantling of Plant 7

2) Accurately survey materials for appropriate packaging and preparation for storage and\or off-site disposal

3) Accurately complete the Materials Evaluation Form for each material stream as identified in SSOP-0002, Completing The Material Evaluation Form (Appendix B)

9.2 Dismantling Sampling and Analysis

This sampling plan has identified the following anticipated material streams and the associated sampling requirements. Any additional material streams (e.g., wash water, PPE, containment materials) generated as a result of this removal action will be radiologically surveyed and, if appropriate, samples will be collected for laboratory analysis.

Per the 1988 Consent Decree, Section 3.5 requires that prior to producing a hazardous or mixed waste stream, on-site accurate analysis and/or characterization shall be completed. This shall be accomplished through the completion of the Materials Evaluation Form (Appendix B) for each material stream generated by the commencement of Removal Action 19. The dismantling of Plant 7 will generate four main material streams:

1) Steel/other metals
2) Miscellaneous debris
3) Concrete
4) ACM

Based on process knowledge, the anticipated contaminants in Plant 7 are as follows: UF_6 (Uranium Hexafluoride), UF_4 (Uranium Tetrafluoride), UO_2 (Uranyl Oxide), UO_2F_2 (Uranyl Fluoride), HF (Hydrogen Fluoride - aqueous and anhydrous), NH_3 (dissociated ammonia), and Ni (nickel).

Based on process knowledge, the materials in Plant 7 do not exhibit characteristic properties nor are they listed waste; there is a concern with lead-based paint exceeding regulatory guidance levels for lead. As a result of this concern, the document within Appendix C identifies the methodology which will be used to determine if the Plant 7 will exceed RCRA levels. During dismantling activities, lead flashing, caps, and sheet lead will be separated and evaluated for the possibility of recycling as identified in Table 6-1, Disposition Summary.

Wastewater will be generated from the high-pressure water wash for the decontamination of the plant, the dismantling of piping, or the wet cutting of concrete. Any water generated from the D&D activities is expected to be compatible with other Plant 7 wastewater and will be combined into one container. Two mobile containers will be utilized for this removal action. These tanks will have the capacity for containing discharged water for 1 week. This way, as one tank is being sent to the contaminated side of the Plant 8 Sump or the General Sump pending analytical results, another container is being moved into place. The wastewater in the holding tank will be sampled and analyzed in accordance with the SCQ procedures. The decontamination water will initially be sampled for pH, lead, copper, nickel, chromium, and uranium. Table 9-1 identifies wastewater sampling requirements.

Sampling results will determine whether the water goes to the Plant 8 sump for vacuum filtration prior to being discharged to the General Sump. Water sent to the General Sump can also be directed to Plant 8 as part of the normal operation of the facility. The ppm limits for discharges from the General Sump are based on and in compliance with flows of the NPDES effluent limits. Ref: PL-3007, NPDES Permit Compliance Plan.

Phase I activities will be accomplished under the Safe Shutdown program, which utilizes in-place Material Evaluation Forms (MEF) to make the RCRA determination. Any sampling required will be done in accordance with the EPA approved SCQ.

9.3 Environmental Monitoring

All activities within the scope of this removal action are above-grade, and controlled to prevent fugitive air emissions and fugitive surface water runoff. Even though there will be institutional controls in place throughout the duration of the removal action, ambient air within Plant 7 will be monitored. Table 9-2 identifies Environmental and Occupational Monitoring.

Table 9-1 - Wastewater Sampling Procedures

Constituent	Analyte or Class of Analytes	ASL	Prep Methods	Analytical Method(s)
Lead, Copper, Nickel, Chromium	Metals by AAS (Flame)	B	SW846-3010 or 7760[7]	SW846-7000 Series or 3500[4] Series
pH	pH (Electrometric)	B	W	SW846-9040 or 4500B[4]
Uranium[51]	Low (ppm) Level	B	W	EPM3002[5]

(4) *Standard Methods for the Analysis of Water and Wastewater, 17th Edition.* These methods are used for NPDES analyses.

(5) *FEMP Environmental Process Monitoring Lab Method.*

(7) 7760 contains the preparation for Ag.

Table 9-2 - Environmental and Occupational Monitoring

Environmental
Stormwater - Since all work will be done in controlled environments with no disruption to the existing drainage system, stormwater will continue to be managed and monitored in accordance with existing sitewide procedures under the NPDES permit and drainage controls.
Groundwater - The monitoring of adjacent wells will be in accordance with existing sitewide requirements for RI characterization and surveillance. It is anticipated that this removal action will have no impact on groundwater.
Air - To verify the presence of negligible fugitive air emissions, six High-Volume Grab Samplers will be erected around the perimeter of Plant 7. This action will obtain a representative sample from an unconfined volume of air in the vicinity of the emission source. Emphasis will be placed on positioning the samplers in line with the prevailing winds. Two units will collect samples from the south and west sides for measurements of radionuclide concentrations prior to the winds crossing Plant 7. The remaining four will provide surveillance on the north and east sides of Plant 7. These units shall collect samples prior to the commencement of Removal Action 19 and throughout the dismantling process. The preliminary readings shall establish the baseline against which all readings throughout the removal action shall be compared. The air monitoring stations' filters shall be pulled on a weekly basis and analyzed for uranium. A portion of the acid solution shall be retained each week for preparation of a composite which will be analyzed for trace concentrations of radionuclides such as isotopes of radium, and thorium. This composite shall demonstrate the overall effectiveness of the Plant 7 containment.
Soil - A baseline survey shall be established to determine current radiological soil contamination levels. On a monthly basis Radiological Safety Technicians shall survey staked locations at Plant 7 and log the radiological soil survey results. The monthly readings will be evaluated for any increase in the baseline survey.
Occupational/Monitoring **(The Task-Specific Health and Safety Plan will provide additional information for the following)**
Secondary Containment Exhaust Air - The air discharged through HEPA filters from the secondary containment will be monitored per requirements identified by the Site Industrial Hygiene Group.
Radiation Frisking - Friskers will be provided at point of egress.

SECTION 10

HEALTH AND SAFETY PLAN

The Plant 7 Removal Action will be conducted in accordance with the provisions of the approved FEMP Comprehensive Environmental Occupational Safety and Health Program. A task-specific Health and Safety Plan, which will be used by the personnel who conduct the removal action field task, will be prepared. The task-specific Health and Safety Plan will be maintained at the work site for the entire duration of the removal action.

The removal action task-specific Health and Safety Plan will identify field work tasks to be performed, describes the hazards (i.e., physical, chemical and radiological) associated with these tasks, and specify the frequency and type of air and personnel monitoring to be conducted during work activities. Personal protective equipment is to be used by workers for each task. Training and medical monitoring/ surveillance requirements, site control measures, decontamination procedures, and contingency plans for an emergency (e.g., medical, spill, fire, and explosion) will be identified.

SECTION 11

QUALITY ASSURANCE

The overall quality assurance program at the FEMP site is conducted under the requirements set forth in the SCQ. The SCQ was developed in accordance with the criteria specified in the American National Standards Institute /American Society of Mechanical Engineers NQA-1, US EPA Guideline QAMS-005/80 and DOE Orders 5700.6C, 4700.1 and 5400.1 and other DOE Orders specifying quality assurance (QA) related requirements. It uses DOE Order 5700.6C for basic requirements and incorporates the other requirements to enhance the QA Program and tailor it to meet the needs of the site.

The Amended Consent Agreement, Subsection IX.B, requires the inclusion of a quality assurance plan within the Removal Action Work Plan. This quality assurance plan addresses the specific actions required to implement the removal action. The quality assurance requirements identified for this removal action include procedures for collecting and analyzing waste and environmental samples, and for conducting field radiation surveys.

The specific quality assurance procedures are already provided in the SCQ, FEMP Procedures, and US EPA SW-846 1986, which are hereby incorporated as part of this Work Plan reference. The US EPA is in the process of reviewing the SCQ, which addresses all FEMP sampling and analysis activities.

The FEMP will prepare project-specific supplements to the SCQ for each project which require sampling and analysis plan.

SECTION 12

REFERENCES

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

(DEI 1992) DEI, February 28, 1992. *Asbestos Survey and Assessment for the Fernald Environmental Management Project.*

(DOE 1992a) United States Department of Energy, August 1992. *Improved Storage of Soil and Debris Removal Action 17 Work Plan.* Prepared for the DOE by PARSONS.

(DOE 1992b) ----------, 1992. *Radiological Control Manual.* Washington: DOE/EH-0256T.

(DOE 1992c) ----------, September 22, 1992. *Sitewide CERCLA Quality Assurance Project Plan.* Fernald: US DOE, FEMP (FD-1000).

(DOE 1992d) ----------, December 1992. *Engineering Evaluation/Cost Analysis for Removal Action 27 - Management of Contaminated Structures.*

(FERMCO 1993) Fernald Environmental Restoration Management Corporation, February 15, 1993. *Comprehensive Environmental Occupational Safety and Health Program (ESH-1-1000), Rev. 0. Fernald, Ohio; FEMP.*

(US EPA 1987) United States Environmental Protection Agency, November 13, 1987. *Revised Procedures for Planning and Implementing Off-Site Response Actions.* Washington: Office of Waste Programs Enforcement.

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

(PARSONS 1992) PARSONS, December 1992. *Removal Site Evaluation - Plant 7 Dismantling.*

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

(WEMCO 1991b) ----------, November 27, 1991. *Quality Assurance Program Description (QAPD).* Fernald: WEMCO (RM-0012).

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

APPENDIX A

PLANT 7 DISMANTLING REMOVAL SITE EVALUATION

- 4557 -

Removal Site Evaluation
Plant 7 Dismantling

Fernald Environmental Management Project
Fernald, Ohio

WEMCO Subcontract No. 2-21487
December 1992
Revision No. 0

Operable Unit 3, Project Order 32

PARSONS

Fairfield Executive Center
6120 South Gilmore Road
Fairfield, Ohio 45014

Removal Site Evaluation
Plant 7 Dismantling

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ATTACHMENTS

A **Asbestos Survey Report**

B **1991 Radiological Survey Report**

C **1992 Radiological Survey Report**

D **Results of Plant 7 Tank and Sump Sampling**

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2-1 Summary of Radiological Survey Reports

3-1 Surface Contamination Guidelines

LIST OF ACRONYMS AND ABBREVIATIONS

ACM	asbestos containing material
AHERA	Asbestos Hazard Emergency Response Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DEI	Diagnostic Engineering, Inc.
dpm	disintegrations per minute
DOE	(United States) Department of Energy
EE/CA	Engineering Evaluation/Cost Analysis
FEMP	Fernald Environmental Management Project
NCP	National (Oil and Hazardous Substances Pollution) Contingency Plan
PPE	personal protective equipment
RAWP	Removal Action Work Plan
RSE	Removal Site Evaluation
US EPA	United States Environmental Protection Agency
WEMCO	Westinghouse Environmental Management Company of Ohio

SECTION 1

INTRODUCTION

Plant 7 was constructed in 1954 and is located in the former Production Area at the Fernald Environmental Management Project (FEMP). This building housed the process to reduce uranium hexafluoride (UF_6) to uranium tetrafluoride (UF_4, also referred to as green salt). In addition to these compounds, NH_3, H_2, N_2, HF (anhydrous and aqueous), and freon were used in the facility. Plant 7 was operational from 1954 to 1956, after which the Pilot Plant assumed this operation. Machining of thorium metal was also performed at Plant 7 but was not a predominate process. Currently, the building is used for storage of equipment, empty containers, and containerized green salt generated at the FEMP.

The building dimensions are approximately 80' x 110' x 110' (seven stories). Asbestos containing material (ACM) was heavily used in the construction of Plant 7. The outside wall consists of a single layer of ACM siding secured with steel pins and lead caps. The roof is constructed with a double layer of ACM panels and the interior walls are composed of flat ACM. The floor on the first level is a concrete slab while the remaining floors are 5/16-inch thick steel plates. The second and fifth floors also contain small concrete slabs in addition to the steel plates.

This Removal Site Evaluation (RSE) has been completed by the Department of Energy (DOE) under Section 104 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and is consistent with Section 300.410 of the National Oil and Hazardous Substance Pollution Contingency Plan (NCP, 40 CFR 300). This RSE addresses the dismantling of Plant 7 and has been prepared to support the decision as to whether the present conditions warrant a removal action. This action was identified in the Amended Consent Agreement between the DOE and the United States Environmental Protection Agency (US EPA 1991).

SECTION 2

IDENTIFICATION OF SOURCE TERMS

There are three types of contamination present within Plant 7. Asbestos, radiological contaminants, and histoplasma capsulatum have been identified as primary contaminants within the building. The paragraphs below describe each contaminant as well as the extent of contamination present within Plant 7.

Asbestos

An asbestos survey performed by Diagnostic Engineering, Inc. (DEI 1991) identified the areas containing asbestos in Plant 7. The report, provided as Attachment A, showed that Plant 7 contains significant quantities of both friable and nonfriable asbestos.

Friable asbestos is present in pipe, tank and duct insulation as well as firebrick. Friable asbestos is an inhalation hazard, capable of causing asbestosis, mesothelioma, and bronchial or lung cancer.

Nonfriable asbestos is present in duct insulation, floor tile, gasketry, roofing, siding, and interior walls. The siding, roofing and interior walls consist of a mixture of portland cement, fine silica sand, asbestos fibers and water that was commonly used during the time period when Plant 7 was constructed. In a nonfriable form, the probability of exposure to asbestos fibers is greatly reduced.

The report results assessed the ACM per the Asbestos Hazard Emergency Response Act (AHERA) to be in poor to good condition. Also, the AHERA hazard ranking for ACM was the highest possible (poor, significant damage), representing the most hazardous condition. It was recommended that the ACM be either removed and replaced or repaired.

Radiological

Radiological Survey Reports were prepared in March 1991 and May 1992 for Plant 7. These surveys, presented as Attachments B and C respectively, examined alpha and beta-gamma activities (dpm/100cm^2) but did not identify the specific radionuclides involved. A review of the plant history indicates that thorium metal was machined at one time, although not a predominate process. Sampling was performed at the Plant 7 tank and sump (provided in Attachment D) and revealed that uranium is the primary radiological contaminant. This supports the review of plant history as well as the Engineering Evaluation/Cost Analysis (EE/CA) that is being prepared for Removal Action No. 27, Management of Contaminated Structures (WEMCO 1992), which includes the dismantling of Plant 7. A summary of the radiological survey reports is presented in Table 2-1.

Table 2-1 Summary of Radiological Survey Reports[a]

FLOOR	ALPHA COUNTS (dpm/100cm²)			BETA-GAMMA COUNTS (dpm/100cm²)		
	Low	High	Mean	Low	High	Mean
One	15	1,209	139	29	3,355	472
Two	23	4,776	208	135	11,080	775
Three	133	3,589	589	198	41,611	2,699
Four	133	7,616	917	130	15,939	3,042
Five	133	33,253	2,300	335	55,620	6,449
Six	133	3,757	892	153	21,246	4,247
Seven	133	10,971	2,332	130	73,296	11,063

[a] Results for floors one and two are from the 1991 Radiological Survey Report and the results for floors three through seven are from the 1992 Radiological Survey Report as floors one and two were not part of the 1992 survey.

Histoplasma Capsulatum

Histoplasma capsulatum is a fungus or mold that is capable of causing the airborne disease histoplasmosis. Histoplasmosis is a disease that can be severe, causing an illness similar to influenza or, with more serious symptoms, similar to tuberculosis. This fungus is usually found in areas where bird droppings have accumulated. Plant 7 currently has areas where bird droppings have accumulated and presents a risk to workers. The areas consist of primarily the sixth and seventh floors as well as the Plant 7 penthouse.

SECTION 3

EVALUATION OF THE MAGNITUDE OF THE POTENTIAL THREAT

Presented below are the magnitudes of potential threat for each contaminant identified in Section 2 of this RSE. The potential threat will be examined to assess the need for a removal action in Section 4.

Asbestos

The asbestos survey report completed for Plant 7 (DEI 1991) identifies a large amount of friable asbestos. This material poses a significant airborne inhalation threat to site personnel involved in activities within the building, such as inspecting the containerized material stored within Plant 7. The AHERA hazard ranking for ACM was the highest possible (poor, significant damage), representing the most hazardous condition.

Radiological

The Plant 7 primary radiological contaminant is uranium, which is widespread throughout the building. The majority of the contamination is below the allowable surface residual limits (per DOE Order 5400.5) for uranium materials. These limits are provided in Table 3-1. Contamination above these allowable limits shall be removed prior to releasing the material for disposal.

Uranium is an alpha emitter and uranium particles that are inhaled or ingested can pose a significant threat. The alpha radiation exposure to site personnel is not expected to be significant while wearing proper personal protective equipment (PPE). Areas identified in Plant 7 that pose a potential threat will be isolated utilizing applicable containment procedures.

Histoplasma Capsulatum

Several areas have been identified in Plant 7 that contain significant accumulations of bird droppings. It is also known that the droppings have been present for many years, hence the presence of histoplasma capsulatum is certain. The presence of this material poses a significant threat to site personnel without PPE involved in activities within Plant 7.

Table 3-1 Surface Contamination Guidelines

Radionuclide[b]	Allowable Total Surface Residual Contamination (dpm/100 cm²)[a]		
	Average[c,d]	Maximum[d,e]	Removable[d,f]
U-Natural, U^{235}, U^{238}, and associated decay products	5,000α	15,000α	1,000α

[a] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute measured by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[b] Where surface contamination by both alpha- and beta-gamma emitting radionuclides exists, the limits established for alpha- and beta-gamma-emitting radionuclides should apply independently.

[c] Measurements of average contamination should not be averaged over an area of more than 1 m^2. For objects of less surface area, the average should be derived for each object.

[d] The average and maximum dose rates associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/h and 1.0 mrad/h, respectively, at a depth of 1 cm.

[e] The maximum contamination level applies to an area of not more than 100 cm^2.

[f] The amount of removable material per 100 cm^2 of surface area should be determined by wiping an area of that size with dry filter of soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wiping with an appropriate instrument of known efficiency. When removable contamination on objects of surface area less than 100 cm^2 is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. It is not necessary to use wiping techniques to measure removable contamination levels if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.

SECTION 4

ASSESSMENT OF THE NEED FOR A REMOVAL ACTION

Pursuant to 40 CFR 300.410, the DOE has evaluated the appropriateness of a removal action. Of the several factors for determining the appropriateness of a removal action (presented in 40 CFR 300.415(b)(2)), the following applies to this action:

1) 40 CFR 300.415(b)(2)(i) - Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants.

2) 40 CFR 300.415(b)(2)(viii) - Other situations or factors that may pose threats to public health or welfare or the environment.

These factors are considered appropriate because there exists the potential for site personnel to be exposed to asbestos and/or histoplasma capsulatum. The presence of these contaminants already warrants the use of anti-contamination clothing and respirators for any activities conducted within Plant 7.

SECTION 5

APPROPRIATENESS OF A RESPONSE

It has been determined that a non-time critical removal action is required to address the dismantling of Plant 7. There is no imminent or substantial endangerment which would warrant a time critical removal action (a removal action requiring initiation within six months). This determination was based upon the fact that the contamination present poses an airborne threat to personnel within the building. Non-time critical removal actions have a time period greater than six months before response actions begin. As required by the NCP, an EE/CA is being prepared that includes this removal action (WEMCO 1992). An Action Memorandum will be issued and included in the Administrative Record to document the decision for a removal action. The dismantling of Plant 7 is also consistent with the remediation goals of the FEMP.

A Removal Action Work Plan (RAWP) will be prepared for the implementation of this action as required by Section IX.F.2 of the Amended Consent Agreement between the DOE and the US EPA (US EPA 1991). The schedule for developing the RAWP has been submitted to the US EPA as a Phase III removal action under the Amended Consent Agreement. The RAWP will be submitted to the US EPA for approval prior to initiating the removal action.

SECTION 6

REFERENCES

(DEI 1991) Diagnostic Engineering, Inc., 1991. *Facility Owner's - Asbestos Survey Report, WEMCO - FEMP Building # 7, Plant # 7.*

(US EPA 1991) United States Environmental Protection Agency - Region V, U. S. Department of Energy, 1991. *Consent Agreement as Amended Under CERCLA Sections 120 and 106(a).* Administrative Docket Number : V-W-90-C-057.

(WEMCO 1992) Westinghouse Environmental Management Company of Ohio, August 1992. *Engineering Evaluation/Cost Analysis for Removal Action No. 27, Management of Contaminated Structures.* Draft.

REPORT CONCLUSIONS

GENERAL:

At the request of the Westinghouse Environmental Management Company (WEMCO): Building #7, Plant # 7 a 41,572 S.F. facility, located at the Fernald Environmental Management Project (FEMP) in Fernald, Ohio was surveyed by Diagnostic Engineering Inc. (DEI) from April 24, thur April 30, 1991, for asbestos-containing materials (ACM). The survey included visual observation for ACM, sampling of suspect materials, and laboratory analysis through WEMCO facilities. Effort was made to survey all accessible suspect materials. Additional suspect but unsampled materials could be located between walls, in voids, in electrical wiring or in other inaccessible areas; caution should be exercised regarding these areas. Quantities were assessed for all suspect materials by means of mechanical measuring devices and visual observation. Boxes of replacement insulation are located throughtout the facility. These boxes are labeled asbestos free and were not sampled.

The ACM can be defined into the following categories:

FRIABLE - Means any asbestos-containing material that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

NONFRIABLE - Means any asbestos-containing material that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

BULK SAMPLE RESULTS:

Materials discovered to contain asbestos fibers in percentages of greater than one percent (>1%) fall into the following categories:

Friable Materials	Sample Location
Pipe run insulation	Throughout facility
Pipe fitting insulation	Throughout facility
Tank insulation	6th floor Dissociation Room
Duct insulation	4th floor Process area
Firebrick	Room 7-19 and 6th floor

Nonfriable Materials	Sample Location
Duct insulation	5th floor Process area
Transite sheet material	All Interior walls
Resilient floor tile (9"x9")	2nd floor Production office
Floor tile mastic	2nd floor Production office
Gasketry	Storage room 719
Transite sheet material	Exterior Walls

Suspect materials sampled which do not contain detectable levels of asbestos fibers include:

Suspect Materials	Material Location
HVAC Flexible connector	7th floor, column D-1

ASSUMPTIONS:

Materials sampled which are considered to be contaminated due to the proximity to asbestos-containing material include:

Suspect Materials	Material Location
None observed	

Identified below are other materials which may contain asbestos but which were not sampled as part of the scope of this project or because of inaccessibility, or which could not be representatively sampled. Such materials should be assumed to contain asbestos until they are confirmed to be asbestos-free.

Suspect Materials	Material Location	Reason Excluded
Fire-Rated/Insulated Door Core	Various Locations	Destructive Sampling
Roofing Materials	Roof	Per scope of work
Residual Material	Exterior Gutters	Per scope of work

CONDITION:

All material that has been tested positive for asbestos, or is assumed to be asbestos, is assessed to be in POOR to GOOD condition. A summary of the current condition, potential for disturbance, and quantities of ACM is shown graphically in the following pages.

RECOMMENDED RESPONSE ACTIONS:

The highest assessed hazard rank for ACM in Building # Z is Z (where a rank of Z represents the most hazardous condition). Remove and replace or repair all ACM in categories 4 through Z. After these measures are taken all remaining ACM can be managed in place per the operations and maintenance procedures described in IH&S-IH-03 "Control of Work Involving Asbestos".

WARNING

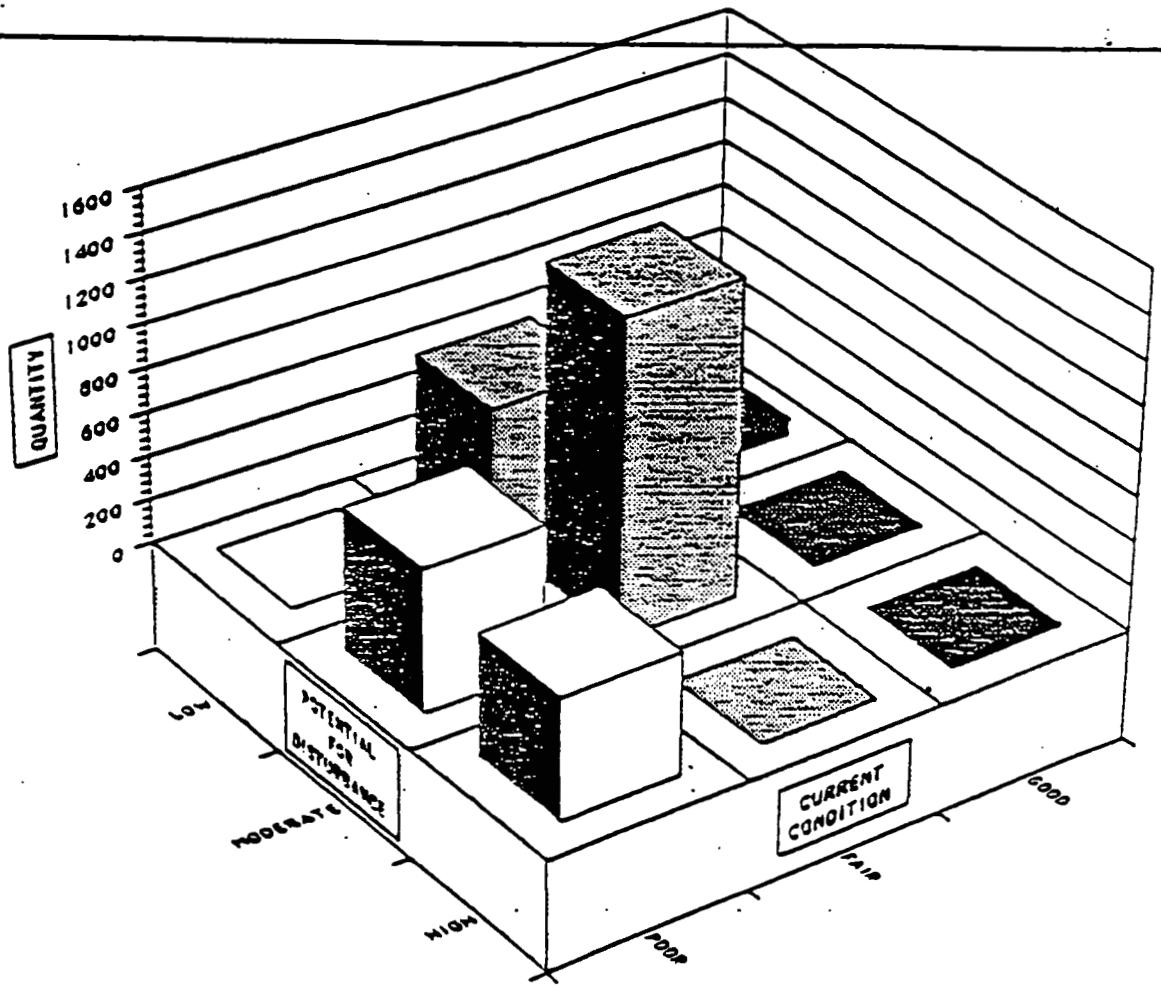
Under certain conditions, asbestos is a cancer causing material. Its condition, handling and disposal are regulated by federal, state and local agencies. All asbestos abatement work must be performed in accordance with governing agency regulations. If ACM is disturbed or appears to have become damaged, the condition should be reported immediately to the Facility Owner, the AEDO and to Industrial Hygiene.

P 4557-

SURVEY TABULATION GRAPHICS

0081

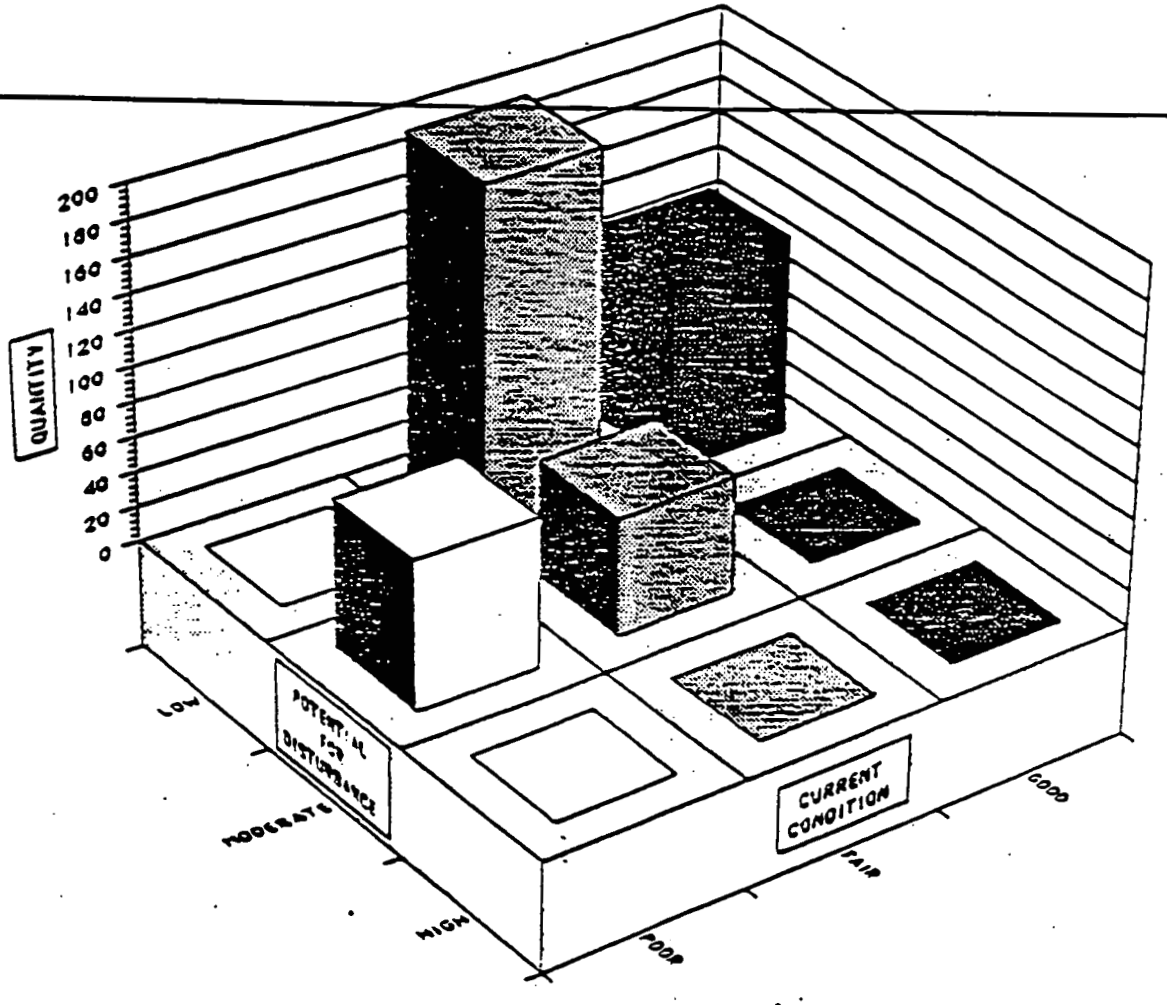
BUILDING 7 WEMCO FACILITY OWNERS REPORT



ACM THERMAL SYSTEM INSULATION
PIPING (BY LINEAR FOOTAGE)
NOTE: CONDITION PATTERNS CORRESPOND TO
THOSE SHOWN ON TOP OF 3D COLUMNS

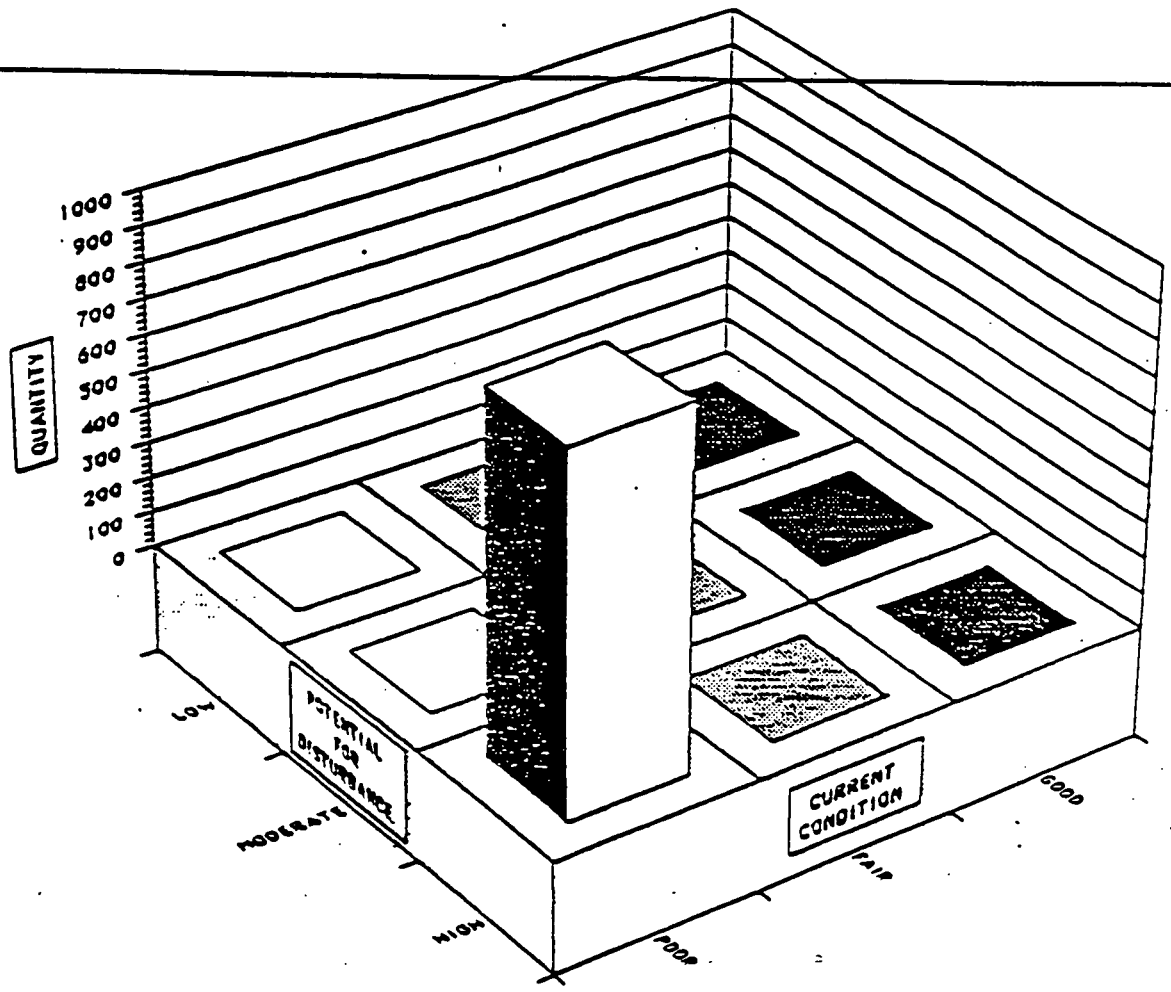
- GOOD
- FAIR
- POOR

BUILDING 7 WEMCO FACILITY OWNERS REPORT



ACM THERMAL SYSTEM INSULATION FITTINGS (EACH) NOTE: CONDITION PATTERNS CORRESPOND TO THOSE SHOWN ON TOP OF 3D COLUMN	■ GOOD ▩ FAIR □ POOR

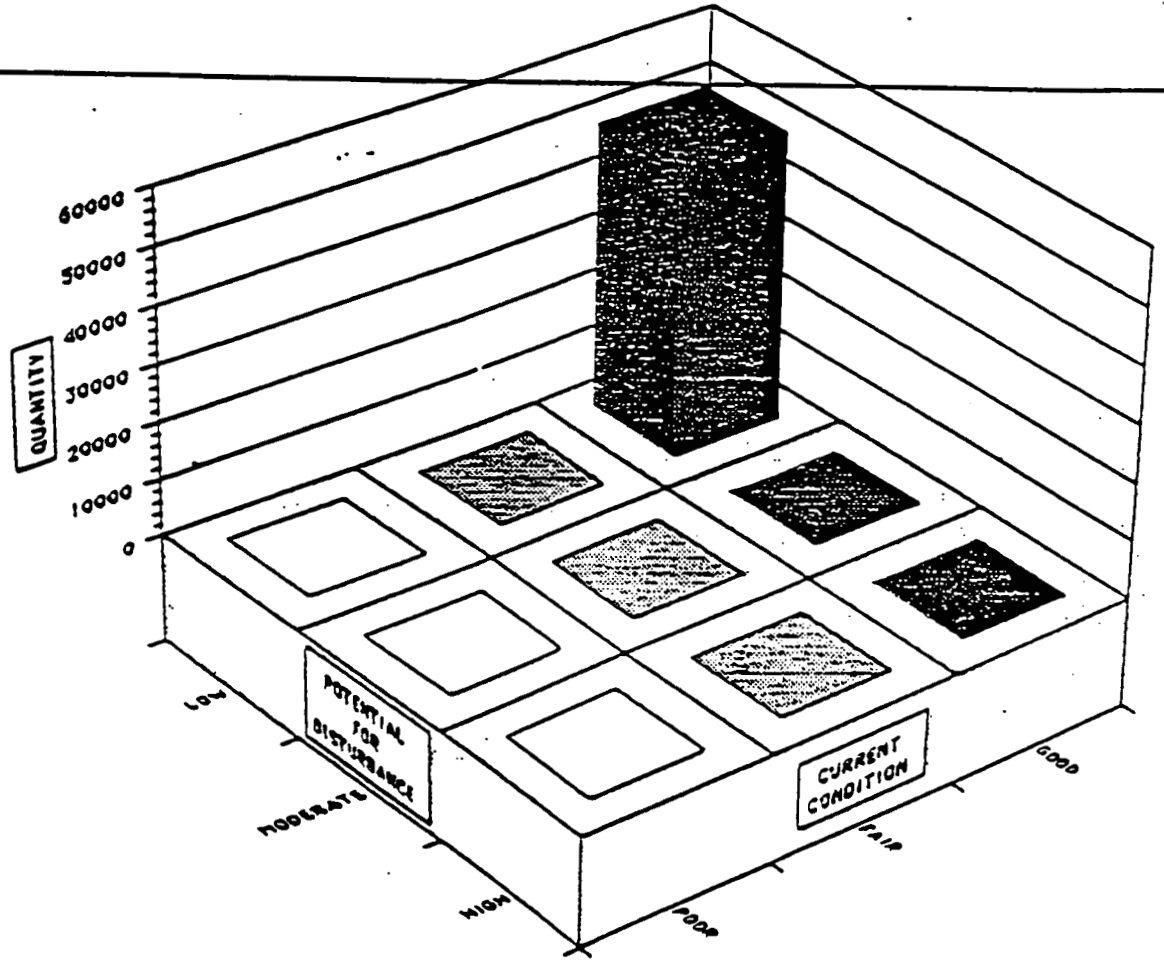
BUILDING 7 WEMCO FACILITY OWNERS REPORT



ACM FLOOR TILE
(BY SQUARE FOOTAGE)
NOTE: CONDITION PATTERNS CORRESPOND TO
THOSE SHOWN ON TOP OF 3D COLUMNS

GOOD
FAIR
POOR

BUILDING 7 WEMCO FACILITY OWNERS REPORT



TRANSITE SHEET MATERIAL
(BY SQUARE FOOTAGE)
NOTE: CONDITION PATTERNS CORRESPOND TO
THOSE SHOWN ON TOP OF 3D COLUMNS

■ GOOD
▨ FAIR
□ POOR

Client:
WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY

Facility:
FERNALD ENVIROMENTAL MANAGEMENT PROJECT

City, State:
FERNALD, OHIO

ASBESTOS-CONTAINING MATERIALS RESPONSE ACTION TABLE BY HOMOGENEOUS AREA

DIAGNOSTIC ENGINEERING INC.
5725 Dragon Way, Suite 321
Cincinnati, Ohio 45227
(513) 271-3737

Survey Date(s): 04/24/9

Revision Date:

BUILDING # and NAME:
Plant #7

Homogeneous Area Number	Material	Comments	WEMCO Hazard Rank	Recommended Response Action
07-001	Pipe Run Insulation	(4" O.D.) Steam line insulation	7	Remove and Replace
07-002	Pipe Fitting Insulation	(4" O.D.) Steam line tee valve insulation	1	O & M
07-003	HVAC Flexible Connector	Flexible connector on fan unit	NA	NA
07-004	Pipe Run Insulation	(4" O.D.) Steam line insulation	7	Remove and Replace
07-005	Pipe Fitting Insulation	(3" O.D.) Ammonia line fitting insulation	7	Remove and Replace
07-006	Pipe Run Insulation	(4" O.D.) Ammonia line insulation	7	Remove and Replace
07-007	Storage Tank / Exchanger Insulation	Light gas surge tank insulation	4	Repair and O & M
07-008	Pipe Run Insulation	(4" O.D.) Condensate line insulation	7	Remove and Replace
07-009	Pipe Run Insulation	(5" O.D.) Service water line insulation	5	Repair and O & M
07-010	Pipe Fitting Insulation	(6" O.D.) LS steam line fitting insulation	1	O & M
07-011	Pipe Run Insulation	(10" O.D.) Steam line insulation	5	Repair and O & M
07-012	Pipe Fitting Insulation	(4" O.D.) Condensate line fitting insulation	4	Repair and O & M
07-013	Pipe Run Insulation	(4" O.D.) Condensate line insulation	4	Repair and O & M
07-014	Pipe Run Insulation	(6" O.D.) Service water line insulation	5	Repair and O & M
07-015	Pipe Fitting Insulation	(3" O.D.) Potable water line fitting insulation	1	O & M
07-016	Pipe Run Insulation	(4" O.D.) Potable water line insulation	5	Repair and O & M
07-017	Pipe Run Insulation	(4" O.D.) Service water line insulation	4	Repair and O & M
07-018	Pipe Fitting Insulation	(6" O.D.) Service water line tee fitting insulation	5	Repair and O & M
07-019	Duct Insulation	Duct insulation	4	Repair and O & M
07-020	Pipe Run Insulation	(10" O.D.) Steam line insulation	7	Remove and Replace
07-021	Pipe Fitting Insulation	(6" O.D.) Steam line fitting insulation	1	O & M
07-022	Pipe Run Insulation	(4" O.D.) Condensate line insulation	5	Repair and O & M
07-023	Pipe Fitting Insulation	(4" O.D.) Condensate line fitting insulation	5	Repair and O & M
07-024	Pipe Run Insulation	(6" O.D.) Service water line insulation	7	Remove and Replace
07-025	Pipe Run Insulation	(4" O.D.) Potable water line insulation	1	O & M
07-026	Duct Insulation.	Duct insulation	4	Repair and O & M
07-027	Pipe Fitting Insulation	(6" O.D.) Service water line tee fitting insulation	1	O & M
07-028	Transite Sheet Material	Transite wall	1	O & M
07-029	Pipe Fitting Insulation	(3" O.D.) Steam line fitting insulation	1	O & M

Client:
WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY

Facility:
FERNALD ENVIROMENTAL MANAGEMENT PROJECT

City, State:
FERNALD, OHIO

ASBESTOS CONTAINING MATERIALS
RESPONSE ACTION TABLE
BY HOMOGENEOUS AREA

DIAGNOSTIC ENGINEERING INC.
5725 Dragon Way, Suite 321
Cincinnati, Ohio 45227
(513) 271-3737

4557

Survey Date(s): 04/29/91

Revision Date:

BUILDING # and NAME:
Plant #7

Homogeneous Area Number	Material	Comments	WEMCO Hazard Rank	Recommended Response Action
07-030	Pipe Run Insulation	(4" O.D.) Steam line insulation	7	Remove and Replace
07-031	Pipe Run Insulation	(4" O.D.) Condensate line insulation	7	Remove and Replace
07-032	Pipe Run Insulation	(4" O.D.) Service water line insulation	4	Repair and O & M
07-033	Pipe Run Insulation	Potable water line pipe could not be sampled due to drums in the way.	1	O & M
07-034	Pipe Fitting Insulation	(4" O.D.) Steam line fitting insulation	1	O & M
07-035	Pipe Run Insulation	(6" O.D.) Steam line insulation	5	Repair and O & M
07-036	Pipe Fitting Insulation	(4" O.D.) Condensate line fitting insulation	1	O & M
07-037	Pipe Run Insulation	(4" O.D.) Condensate line insulation	4	Repair and O & M
07-038	Pipe Fitting Insulation	(6" O.D.) Service water line tee valve insulation	1	O & M
07-039	Pipe Run Insulation	(4" O.D.) Service water line insulation	1	O & M
07-040	Pipe Fitting Insulation	(4" O.D.) Service water line tee fitting insulation	1	O & M
07-041	Pipe Run Insulation	(4" O.D.) Service water line insulation	1	O & M
07-042	Pipe Run Insulation	(3" O.D.) Potable water line insulation	4	Repair and O & M
07-043	Pipe Fitting Insulation	(4" O.D.) Potable water line fitting insulation	1	O & M
07-044	Resilient Floor Tile (9" X 9")	(9" X 9") Resilient floor tile, red	7	Remove and Replace
07-044	Floor Tile Mastic	Floor tile mastic, black	7	Remove and Replace
07-045	Gasketry - REMOVED, PER DEC LETTER DATED 1-28-92	Rope Gasket - RA	1	O & M
07-046	Pipe Fitting Insulation	(6" O.D.) Steam line fitting insulation	4	Repair and O & M
07-047	Pipe Run Insulation	(4" O.D.) Steam line insulation	5	Repair and O & M
07-048	Pipe Fitting Insulation	(4" O.D.) Condensate line fitting insulation.	4	Repair and O & M
07-049	Pipe Run Insulation	(4" O.D.) Condensate line insulation	7	Remove and Replace
07-050	Pipe Fitting Insulation	(4" O.D.) Service water line fitting insulation	5	Repair and O & M
07-051	Pipe Run Insulation	(4" O.D.) Service water line insulation	4	Repair and O & M
07-052	Transite Sheet Material	Transite siding	1	O & M
07-53	Firebrick	Stored Firebrick, white in color inside room 7-19	1	O & M
07-54	Firebrick	Pink in color on the process floor discarded	NA	NA
07-56	Pipe Run Insulation	(5" O.D.) Live steam line	1	O & M
07-57	Pipe Run Insulation	(4" O.D.) Clean condensate line	1	O & M
07-58	Transite Sheet Material	Interior transite smooth sampled from broken section	1	O & M

ATTACHMENT B

1991 RADIOLOGICAL SURVEY REPORT

-4557-

FMPC

INDUSTRIAL RADIOLOGICAL SAFETY & TRAINING - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT

Date: 3/3/91 | LOCATION: PLT 7 | AST. | Page 1 of 2

Time: 11:00 | LEVEL: 2ND FLOOR

REASON FOR SURVEY: ☒ ROUTINE ☒ SPECIAL REQUEST ☐ RWP ☐ INCIDENT

COMMENTS:

MDA 15/14 DPM α/β-γ

INSTRUMENTS

MODEL	SERIAL NUMBER	CALIBRATION DATE	EXPO.	EFF
LB 5120	84	11/93	α	.52
			β-γ	41

ANALYZE FOR: ☒ ALPHA ☒ BETA-GAMMA ☐ OTHER

TYPE OF SURVEY: ☒ CONTAMINATION ☐ RADIATION ☐ OTHER

FOLLOW-UP SURVEY ATTACHED ☐YES ☐NO

SURVEY MAP ATTACHED ☐YES ☐NO

ITEM NUMBER	GRID COORDINATES	DESCRIPTION	CORRECTED DOSE RATE (mRem/hr) γ CONTACT	β/γ CONTACT	γ 3 FT.	β/γ 3 FT.	DPM ALPHA 100 CM²	PROBE	DPM BETA-GAMMA 100 CM²	PROBE
1		FLOOR					110		135	
2							144		204	
3							283		983	
4							188		483	
5							110		726	
6							387		2080	
7							153		245	
8							170		226	
9							179		456	
10							92		295	
11							318		731	
12							505		3600	
13							231		658	
14							110		571	
15							185		690	
16							378		896	

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SUPERVISOR NOTIFIED	TIME	DATE	NOTIFIED BY	REVIEWED BY	DATE

FMPC

OPERATIONS SAFETY & HEALTH - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT (CONTINUATION SHEET)

	GRID COORDINATES	DESCRIPTION	CORRECTED DOSE RATE (mRem/hr) γ CONTACT	β/γ CONTACT	γ 3 FT.	β/γ 3 FT.	DPM ALPHA 100 CM²	DPM BETA-GA PROBE 100 CM²
		FLOOR					75	126
18		↓					115	506
19		↓					100	709
20		X-BEAM					785	3587
21		I BEAM					214	495
22		DRUM					300	769
23		OVER I BEAM					1279	5208
24		TOP OF CONTROLLER					3105	11680
25		[illegible]					318	690
26		I BEAM					1304	5674
27		KNEE					92	245
28		KNEE					118	350
29		KNEE					476	9121
30		I BEAM					1751	5763
31		CAN					274	520
32		CAN					1305	3350
33		I BEAM					1785	5764
34		DUCT					1530	5337
35		WINDOW SILL					285	713
36		DRUM					188	704
37		OVER					569	1327
38		DRUM					300	5017
39		DRUM					23	192
40		OVER I BEAM					1270	4110
41		WINDOW					170	185
42	00090	DRUM					248	823
43		OVERHEAD					567	2488

4557-

FMPC

INDUSTRIAL RADIOLOGICAL SAFETY & TRAINING - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT

Date: 3/13/07 | LOCATION: Pit 7 | AST.

Time: | LEVEL: 5ES | Page 1 of 2

REASON FOR SURVEY: ☒ ROUTINE ☒ SPECIAL REQUEST ☐ RWP ☐ INCIDENT

COMMENTS:

FLOOR 1

MDA 15/19 DPM/100 CM²

FOLLOW-UP SURVEY ATTACHED ☐ YES ☒ NO

SURVEY MAP ATTACHED ☒ YES ☐ NO

INSTRUMENTS

MODEL	SERIAL NUMBER	CALIBRATION DATE	BKGD.	EFF
2350-00	#4	11/06	4	.52	33
		8-8	3.00	.4

ANALYZE FOR: ☒ ALPHA ☒ BETA-GAMMA ☐ OTHER

TYPE OF SURVEY: ☒ CONTAMINATION ☐ RADIATION ☐ OTHER

ITEM NUMBER	GRID COORDINATES	DESCRIPTION	CORRECTED DOSE RATE (mRem/hr) γ CONTACT	β/γ CONTACT	γ 3 FT.	β/γ 3 FT.	DPM ALPHA 100 CM²	DPM ALPHA PROBE	DPM BETA-GAMMA 100 CM²	DPM BETA-GAMMA PROBE
1		FLOOR					23		295	
2							23		190	
3							15		128	
4							67		125	
5							110		259	
6							271		667	
7							315		939	
8							197		937	
9							115		145	
10							101		173	
11							176		762	
12							58		98	
13							75		529	
14							196		708	
15							127		650	
16		↓					84		616	

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SUPERVISOR NOTIFIED	TIME	DATE	NOTIFIED BY	REVIEWED BY	DATE

0091

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OPERATIONS SAFETY & HEALTH - RADIOLOGICAL SAFETY 6 45574
RADIOLOGICAL SURVEY REPORT (CONTINUATION SHEET)

ER	GRID COORDINATES	DESCRIPTION	CORRECTED DOSE RATE (mRem/hr)				DPM ALPHA		DPM BETA-GA
			CONTACT	CONTACT	3 FT.	3 FT.	100 CM	PROBE	100 CM
17		FLOOR					170		574
18							67		231
19							115		500
20							495		1222
21							127		425
22							118		506
23							231		424
24							170		396
25							49		222
26							136		378
27		↓					110		356
28		WINDOW SILL					144		470
29		TOP OF CONTROL BOX					733		2485
30		TOP OF ENRICHED CAN					421		456
31		TOP OF CAN					162		583
32		CONVEYER SCREW					4002		[illegible]
33		CONVEYER SCREW					15		49
34		CONVEYER SCREW					41		89
35		MOTOR					517		335
36		WINDOW SILL					425		1457
37		EQUIPMENT BLOCK					387		1715
38		DRUM					283		653
39		CONTAINER					136		425
40		WINDOW SILL					170		428
41		CONTAINER					1201		2850
42		TOP OF DRUM					222		1338
43		TOP OF DRUM					118		456

FMPC
INDUSTRIAL RADIOLOGICAL SAFETY & TRAINING - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT

4557-

Date: 3/2/91 | LOCATION: PLT 7 | AST: | Page 1 of 2

Time: 1730 | LEVEL: 3RD FLOOR

REASON FOR SURVEY: ☐ ROUTINE ☒ SPECIAL REQUEST ☐ RWP ☐ INCIDENT

COMMENTS:

HOE 15/19 α/100 DPM

INSTRUMENTS				
MODEL	SERIAL NUMBER	CALIBRATION DATE	BKGD.	EFF
1,3500	84	11/90	.52	2
		2-3	304	.4

ANALYZE FOR: ☒ ALPHA ☒ BETA-GAMMA ☐ OTHER

FOLLOW-UP SURVEY ATTACHED ☐ YES ☒ NO

SURVEY MAP ATTACHED ☒ YES ☐ NO

TYPE OF SURVEY: ☒ CONTAMINATION ☐ RADIATION ☐ OTHER

ITEM NUMBER	GRID COORDINATES	DESCRIPTION	CORRECTED DOSE RATE (mRem/hr) γ CONTACT	β/γ CONTACT	γ 3 FT.	β/γ 3 FT.	CPM ALPHA 100 CM²	CPM ALPHA PROBE	CPM BETA-GAMMA 100 CM²	CPM BETA-GAMMA PROBE
1		FLOOR					370		1000	
2							214		630	
3							75		84	
4							253		915	
5							179		437	
6							283		804	
7							257		420	
8							541		675	
9							110		360	
10							110		259	
11							252		804	
12							58		103	
13							127		255	
14							352		864	
15							335		937	
16		↓					456		457	

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NOTIFICATION OF SURVEY RESULTS

SUPERVISOR NOTIFIED	TIME	DATE	NOTIFIED BY	REVIEWED BY	DATE

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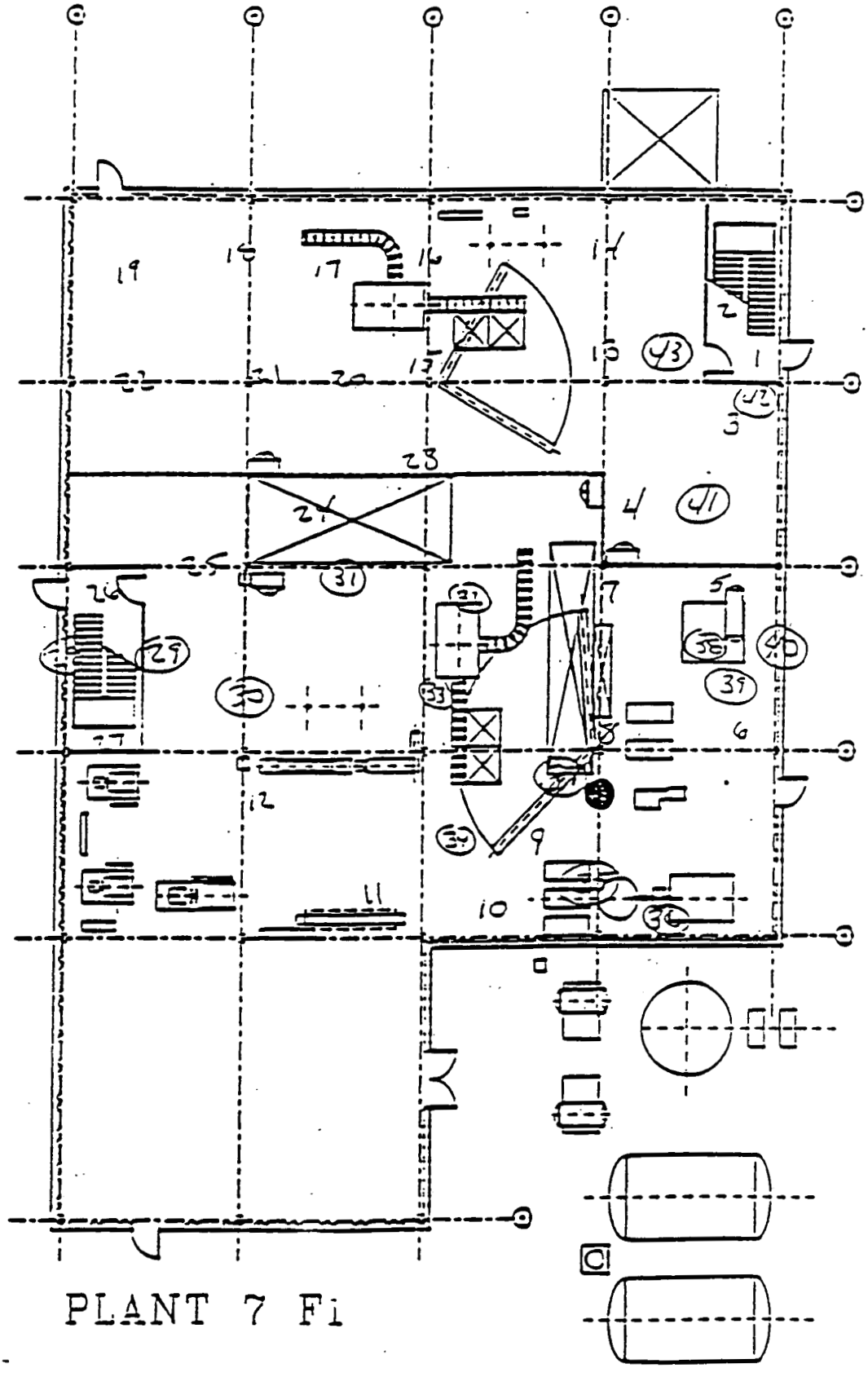
FMPC

OPERATIONS SAFETY & HEALTH - RADIOLOGICAL SAFETY

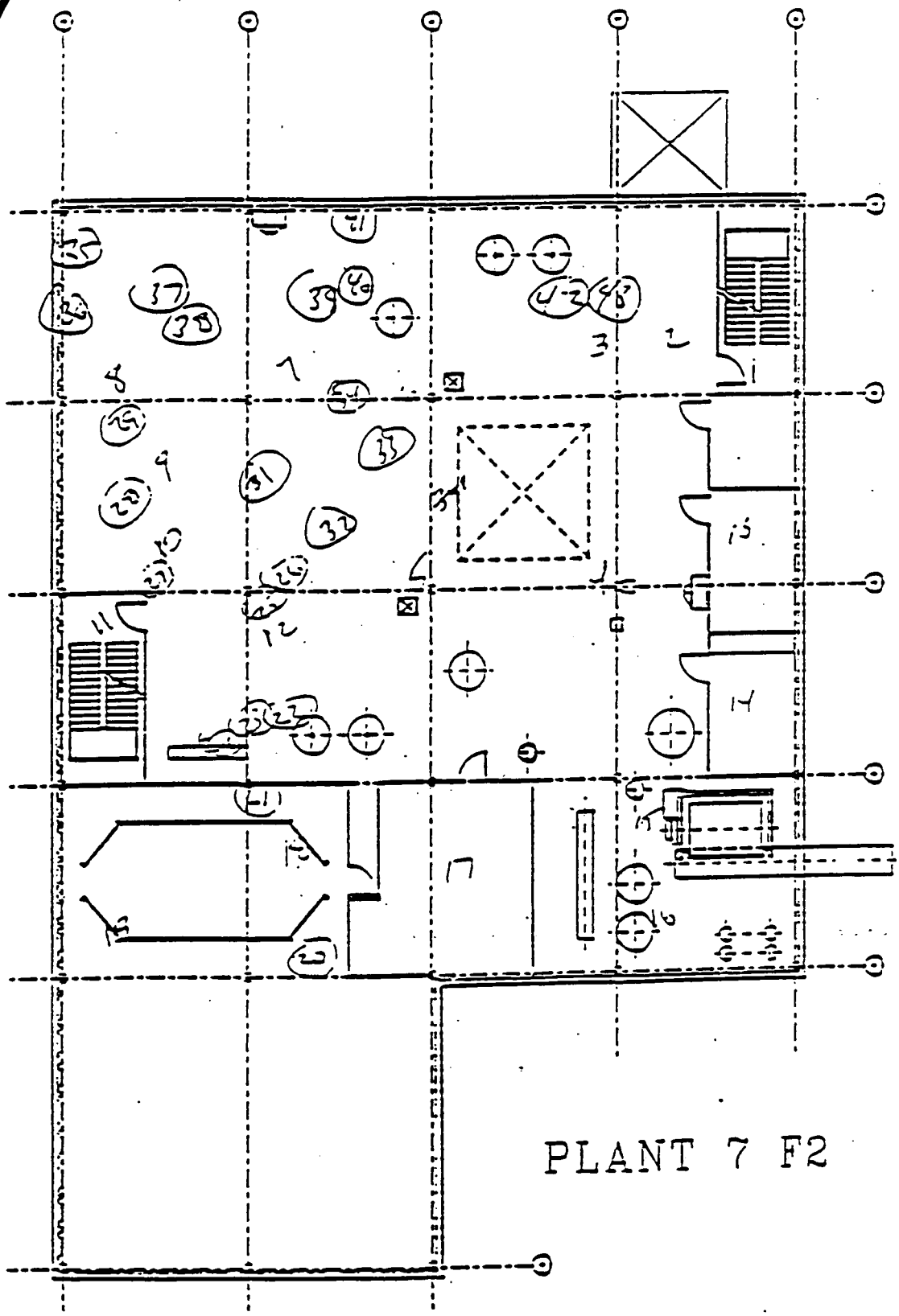
RADIOLOGICAL SURVEY REPORT (CONTINUATION SHEET)

ATES	DESCRIPTION	CORRECTED DOSE RATE (mRem/hr) γ CONTACT	β/γ CONTACT	γ 3 FT.	β/γ 3 FT.	DPM ALPHA 100 CM²	DPM ALPHA 99CSE	DPM BETA-GAMMA 100 CM²	DPM BETA-GAMMA 99C
	FLOOR					179		736	
	FLOOR					240		804	
	JUNCTION BOX					517		1731	
	INSIDE CANS					1201		4502	
	INSIDE CANS					3062		10557	
22	INSIDE CANS					1478		8456	
23	WINDOW SILL					201		8869	
24	WINDOW SILL					535		1070	
25	WINDOW SILL					482		1002	
26	TOP OF CANS					179		465	
27	TOP OF CANS					257		603	
28	TOP OF DUCT					2214		10566	
29	CONTROLLER					283		804	
30	BOX					318		626	
31	JCT. BOX					1270		5652	
32	TOP OF CAN					274		922	
33	TOP OF CAN					378		1323	
34	TOP OF CAN					257		722	
35	ELECTRICAL EQUIPMENT ON PALLET					499		1763	
36	BREAKER					499		1213	
37	DRUM LID					257		575	
38	TOP OF CAN					185		511	
39	TOP OF CAN					491		1024	
40	TOP OF CAN					283		574	
41	RAILING					231		587	
42	LIGHT					214		626	
43	TOP OF WIRE RUN					1270		4596	

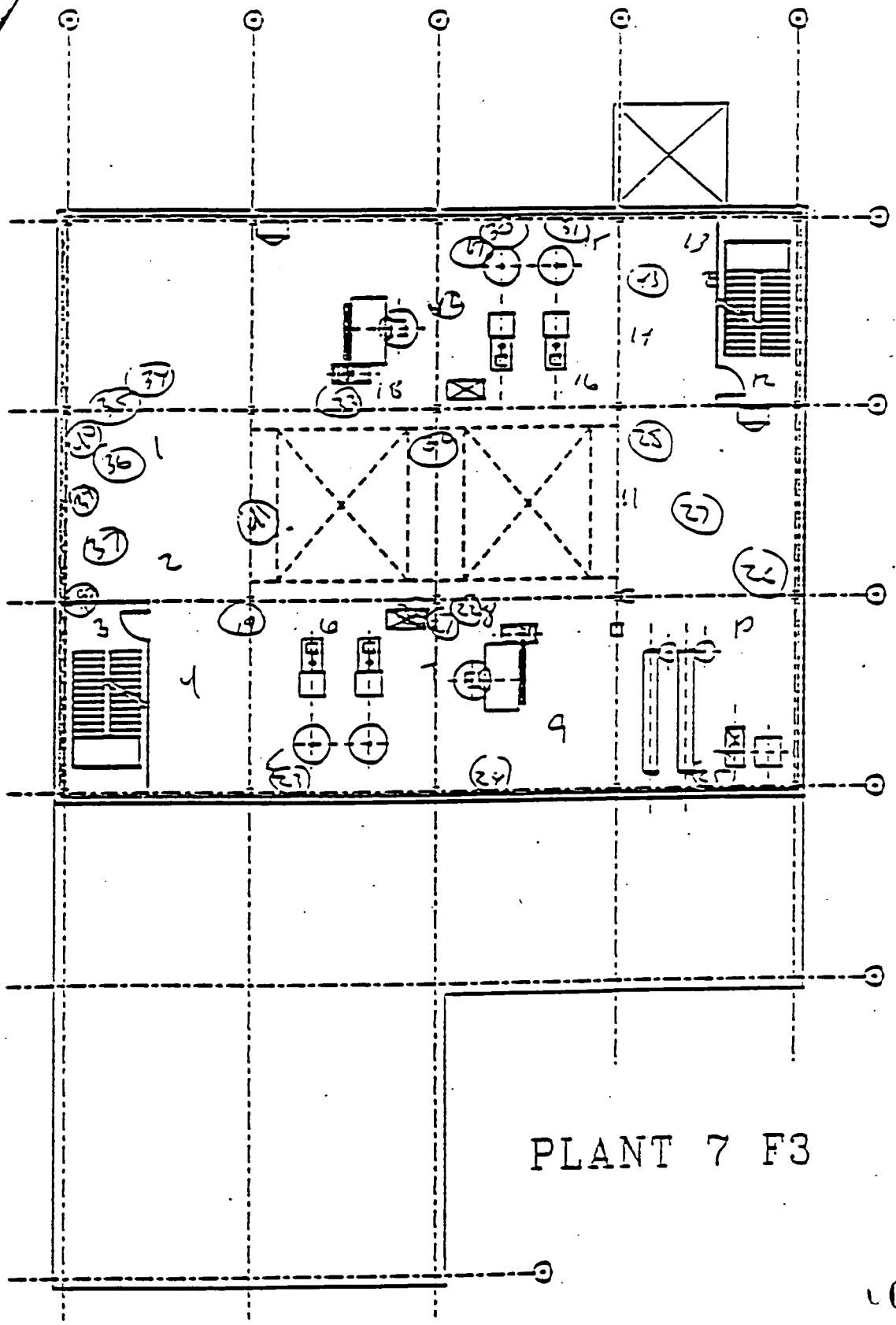
0094



PLANT 7 F1



PLANT 7 F2



PLANT 7 F3

/

FMPC

INDUSTRIAL RADIOLOGICAL SAFETY & TRAINING - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT

- 4557 -

Date: 4/19/91 | LOCATION: Room F | AST: | Page 1 of 5

Time: 1520 | LEVEL: 1st Floor | 4

REASON FOR SURVEY:

☒ ROUTINE ☐ SPECIAL REQUEST ☐ RWP ☐ INCIDENT

COMMENTS:

Contamination Survey
(Semi Annual)
Random Readings - Not Time Lapse
Used Corrected

INSTRUMENTS

MODEL	SERIAL NUMBER	CALIBRATION DATE	EXPIR.	EFF
LB5100	84	11/90	4	.34
			0-1	2.54

ANALYZE FOR: ☒ ALPHA ☒ BETA-GAMMA ☐ OTHER

TYPE OF SURVEY: ☒ CONTAMINATION ☐ RADIATION ☐ OTHER

FOLLOW-UP SURVEY ATTACHED ☐ YES ☒ NO

SURVEY MAP ATTACHED ☒ YES ☐ NO

ITEM NUMBER	GRID COORDINATES	DESCRIPTION	CORRECTED DOSE RATE (mRem/hr) γ CONTACT	β/γ CONTACT	γ 3 FT.	β/γ 3 FT.	CPM ALPHA 100 CM²	CPM ALPHA PROBE	CPM BETA-GAMMA 100 CM²	CPM BETA-GAMMA PROBE
1		Floor					32		80	
2							134		213	
3							92		190	
4							49		295	
5							41		102	
6							117		153	
7							100		313	
8							168		253	
9							168		332	
10							160		472	
11							117		327	
12							75		117	
13							75		112	
14							41		112	
15							58		125	
16							58		80	

NO.	DISTRIBUTION OF COPIES
1	Radiological Safety Technician Supervisor
2	Radiological Safety Engineer
3	Facility Supervisor

NOTIFICATION OF SURVEY RESULTS

SUPERVISOR NOTIFIED	TIME	DATE	NOTIFIED BY	REVIEWED BY	DATE
				[illegible]	4/22/91

FMPC

OPERATIONS SAFETY & HEALTH - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT (CONTINUATION SHEET)

	GRID COORDINATES	DESCRIPTION	CORRECTED DOSE RATE (mRem/hr) γ CONTACT	n/γ CONTACT	γ 1 FT.	n/γ 1 FT.	CPM ALPHA 100 CM²	PROBE	CPM BETA-GAM 100 CM²	PROBE
		Floor					41		105	
							66		195	
							219		300	
							120		194	
							72		112	
							492		970	
23							17		245	
24							350		895	
25							54		185	
26							75		213	
27							57		131	
28							353		1102	
29							75		220	
30							125		405	
31							194		272	
32							100		167	
33							75		249	
34							83		249	
35							262		509	
36							20		30	
37							151		657	
38							77		305	
39							83		150	
40							42		171	
41							117		240	
42							126		171	
43							57		157	

0099

FMPC

OPERATIONS SAFETY & HEALTH - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT (CONTINUATION SHEET)

- 45573

GRID ORDINATES	DESCRIPTION	CORRECTED DOSE RATE (mRem/hr) α CONTACT	β/γ CONTACT	γ 3 FT.	β/γ 3 FT.	CPM ALPHA 100 CM²	CPM ALPHA PROBE	CPM BETA-GAMMA 100 CM²	CPM BETA-GAMMA PROBE
	Floor					75		112	
						58		117	
						685		944	
47						75		152	
48						126		236	
49						58		171	
50						202		411	
51						1704		692	
52						24		84	
53						83		251	
54						270		506	
55						245		542	
56						390		958	
57						855		2019	
58						611		1252	
59						117		295	
60						168		364	
61						2626		2977	
62						159		254	
63						117		139	
64						151		309	
65						211		254	
66						245		332	
67						109		185	
68						100		117	
69						117		353	
70						279		487	

00100

F 4557-

FMPC

OPERATIONS SAFETY & HEALTH - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT (CONTINUATION SHEET)

	GRID COORDINATES	DESCRIPTION	CORRECTED DOSE RATE (mRem/hr) γ CONTACT	β/γ CONTACT	γ 3 FT.	β/γ 3 FT.	DPM ALPHA 100 CM²	DPM ALPHA PROBE	DPM BETA-GAMMA 100 CM²	DPM BETA-GAMMA PROBE
		[illegible]					390		970	
							92		2[illegible]	
73							185		3[illegible]	
74							49		17[illegible]	
75							679		15[illegible]	
76							177		50[illegible]	
77							100		36[illegible]	
78							58		21[illegible]	
79							24		21[illegible]	
80							58		15[illegible]	
81							83		171	
82							50		112	
83							568		175	
84							92		20[illegible]	
85							125		130	
86							75		17[illegible]	
87							92		157	
88							58		107	
89							92		213	
90							100		256	
91							100		125	
92							41		66	
93							83		204	
94							134		255	
95							49		130	
96		0101					15		85	
97							66		107	

FMPC

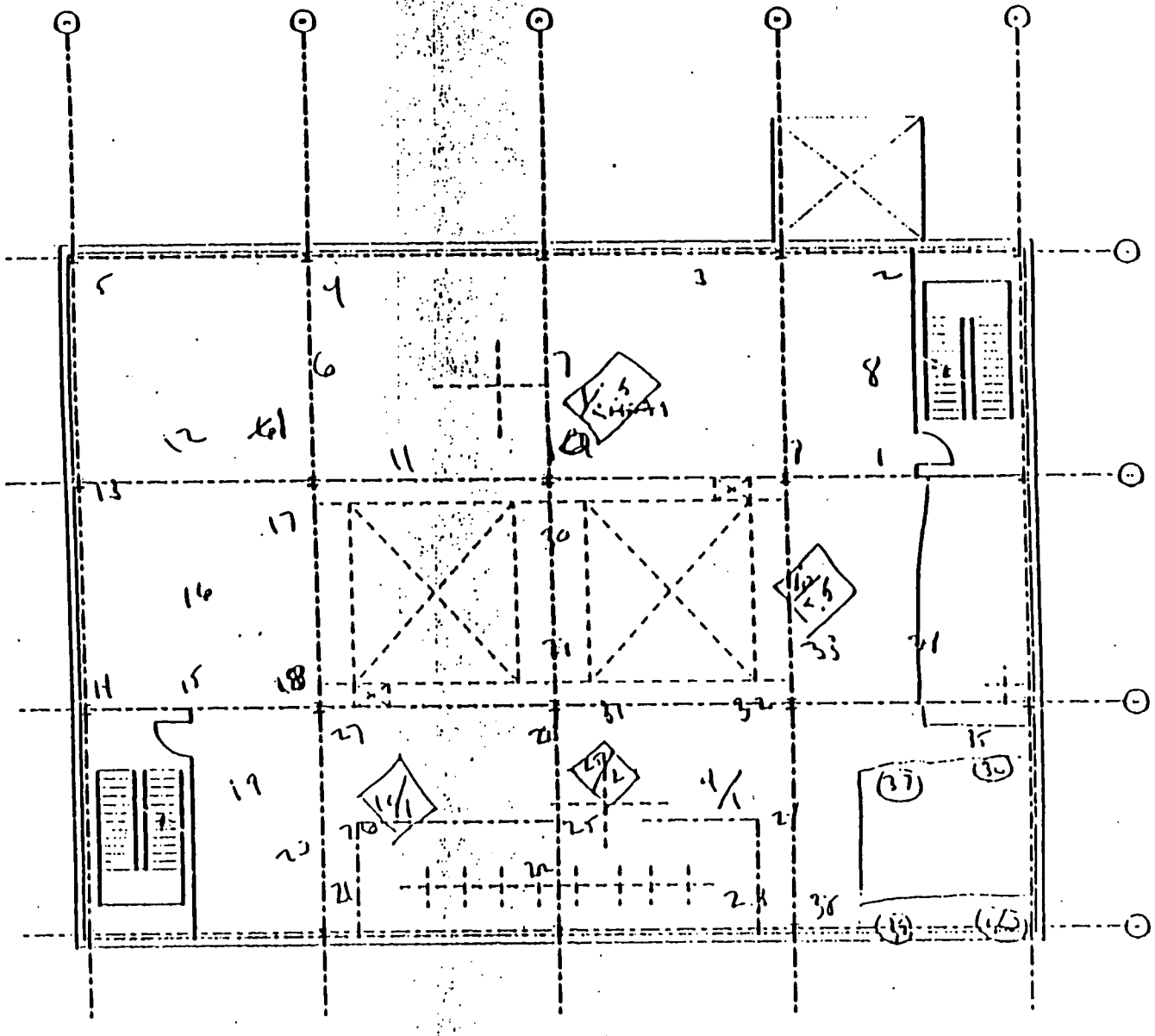
OPERATIONS SAFETY & HEALTH - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT (CONTINUATION SHEET)

4557-

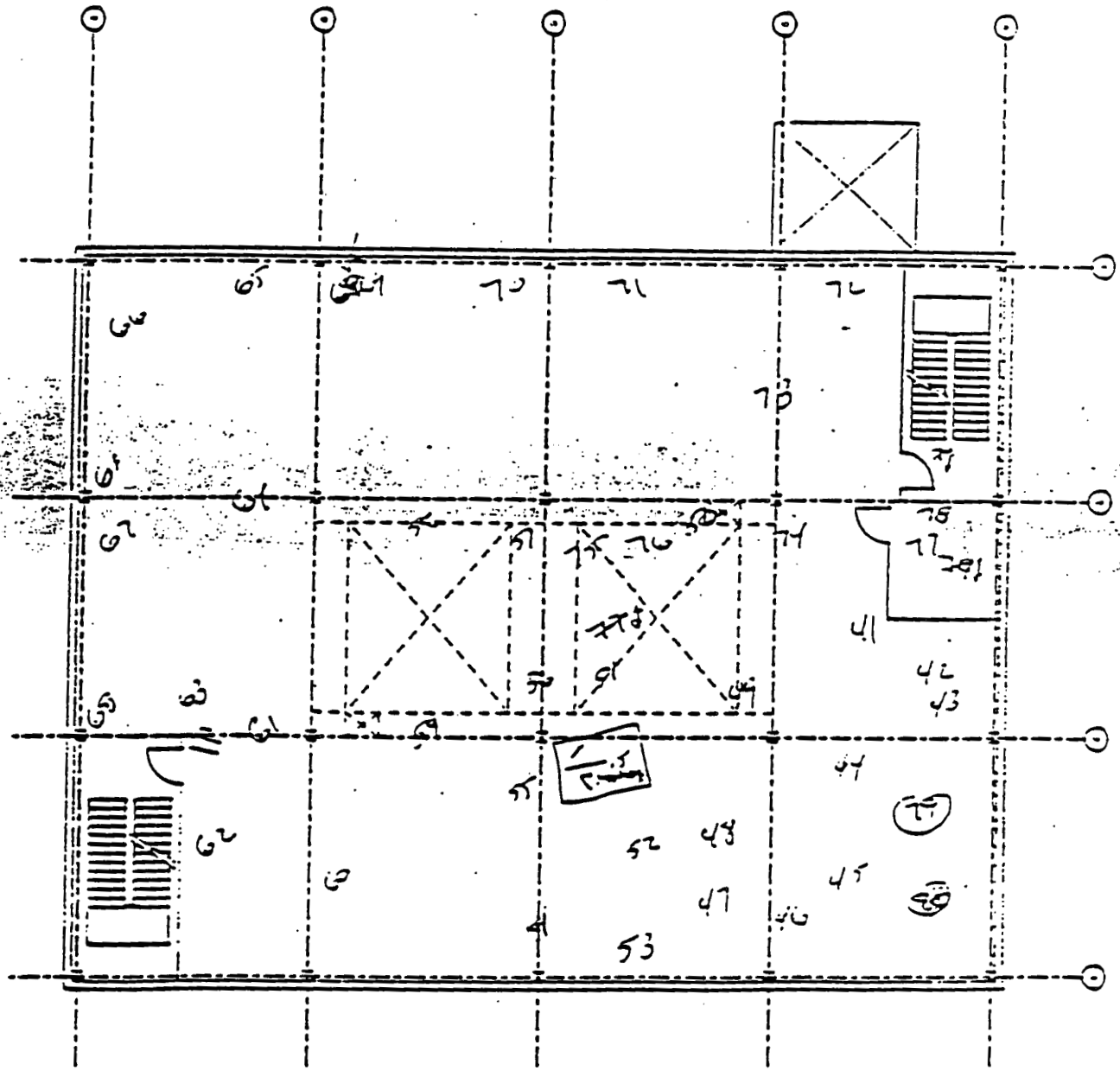
ITEM NUMBER	GRID COORDINATES	DESCRIPTION	CORRECTED DOSE RATE (mRem/hr) γ CONTACT	β/γ CONTACT	γ 3 FT.	β/γ 3 FT.	CPM ALPHA 100 CM²	CPM ALPHA PROBE	CPM BETA-GAMMA 100 CM²	CPM BETA-GAMMA PROBE
98		[illegible]					58		135	
99							92		100	
100							175		521	
101							100		126	
102							[illegible]		[illegible]	
103							100		217	
104							215		2722	
105							275		12412	
106							302		341	
107							75		171	
108							58		85	
109							58		117	
[illegible]							75		176	
111							83		100	
112							58		135	
113							58		139	
114							126		100	

0102



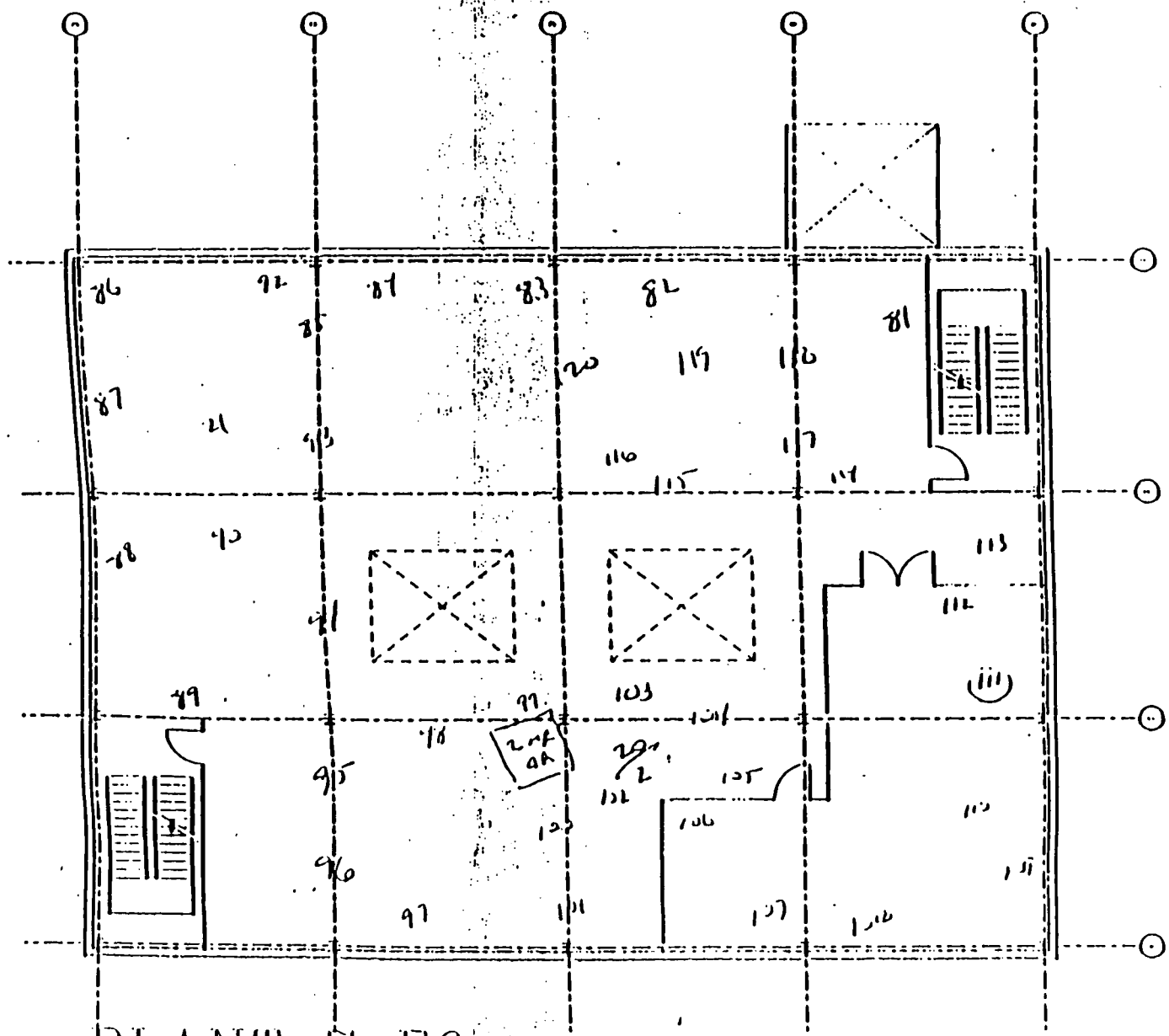
PLANT 7 F4

- 45574



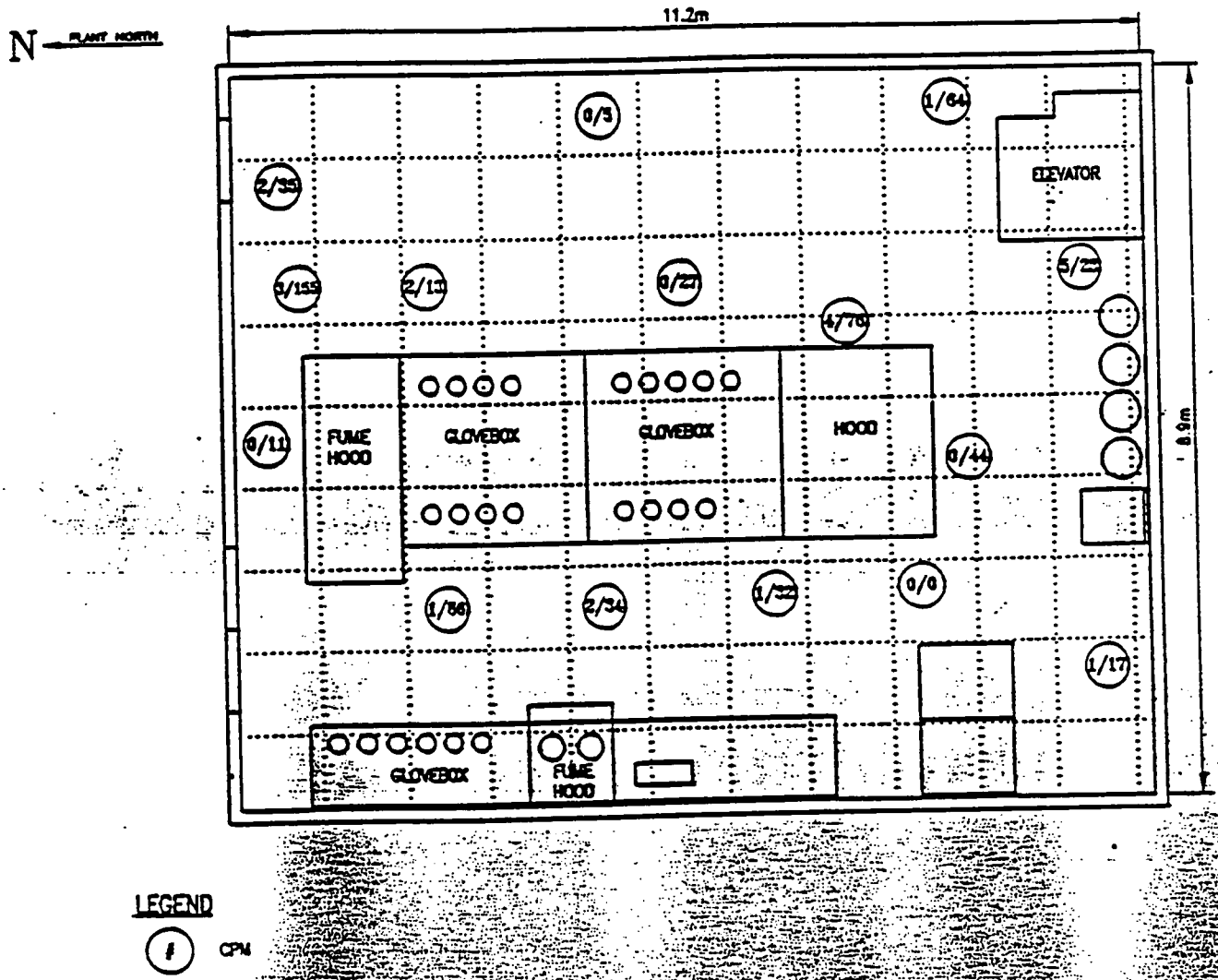
PLANT 7 F5

0104



PLANT 7 F6

PLANT 7 FT



LEGEND

(#) CPM

HEALTH PHYSICS SURVEY (SW-19)
TRANSFERABLE ALPHA/BETA (PERFORMED ON 03-08-91)

Figure 4

ATTACHMENT C

1992 RADIOLOGICAL SURVEY REPORT

Copy

- 45572

Fernald Site

INDUSTRIAL, RADIOLOGICAL SAFETY & TRAINING - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT

Date: 05/13/92 Time: 18: 0 RSTs: INC

Location: PLANT 7 Level: 3RD - 7TH FLOORS Reason: PRE-RUP SURVEY OF UPPER LEVELS OF PLANT 7

*** NOTIFICATION OF SURVEY RESULTS ***

Supervisor Notified	Time	Date	Notified by

*** REVIEW OF SURVEY RESULTS ***

Reviewed by	Date

*** COUNTING SYSTEM & SURVEY INSTRUMENTS ***

Model	SN	Type	Calib. Due	Bkgd. (cpm)	Eff./CF	MDA (dpm)	(OPTIONAL) Inspection/Response Sat. (Y/N)
LB5100	8	Alpha	JUN92	0.36	0.298	133.0	N/A
LB5100	8	B-G	JUN92	2.66	0.439	130.0	N/A

		Alpha DPM/100cm^2		B-G DPM/100cm^2		CORRECTED DOSE RATES (mrem/hr)			
ITEM NUM	LOCATION/ DESCRIPTION	REMOVABLE	FIXED PLUS REMOVABLE	REMOVABLE	FIXED PLUS REMOVABLE	CONTACT g	CONTACT B-g	3-FT g	3-FT B-g
1	OVERHEAD	2884		9173					
2	OVERHEAD	5468		26713					
3	OVERHEAD	5804		31474					
4	OVERHEAD	6911		28900					
5	OVERHEAD	6777		21041					
6	OVERHEAD	8153		49014					
7	OVERHEAD	6307		31383					
8	OVERHEAD	9562		46918					
9	OVERHEAD	9797		53615					
10	OVERHEAD	10971		73296					
11	FLOOR	1173		4572					
12	FLOOR	133		198					
13	FLOOR	1542		4663					
14	FLOOR	< MDA		540					
15	FLOOR	200		267					
16	FLOOR	< MDA		130					

FS-F-1993-1 (REV. 10/2/91) equivalent

Fernald Site

INDUSTRIAL, RADIOLOGICAL SAFETY & TRAINING - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT (CONTINUATION)

		Alpha DPM/100cm^2		B-G DPM/100cm^2		CORRECTED DOSE RATES (mrem/h			
ITEM NUM	LOCATION/ DESCRIPTION	REMOVABLE	FIXED PLUS REMOVABLE	REMOVABLE	FIXED PLUS REMOVABLE	CONTACT g	CONTACT B-g	3-FT g	3- B-
17	FLOOR	401		1064					
18	FLOOR	1005		3319					
19	FLOOR	< MDA		950					
20	FLOOR	267		426					
21	FLOOR	166		312					
22	FLOOR	< MDA		130					
23	FLOOR	233		198					
24	FLOOR	669		2249					
25	FLOOR	703		1747					
26	FLOOR	367		1315					
27	FLOOR	334		1224					
28	FLOOR	636		3706					
29	FLOOR	1273		6007					
30	FLOOR	569		6850					
31	FLOOR	5535		18126					
32	FLOOR	3354		10495					
33	FLOOR	3086		18148					
34	FLOOR	334		4253					
35	FLOOR	2280		11725					
36	FLOOR	9394		29857					
37	FLOOR	166		449					
38	FLOOR	< MDA		< MDA					
39	FLOOR	166		335					
40	FLOOR	904		2886					
41	FLOOR	< MDA		449					
42	FLOOR	< MDA		< MDA					

FS-F-1993-1 (REV. 10/2/91) equivalent

RADIOLOGICAL SURVEY REPORT (CONTINUATION)

		Alpha DPM/100cm^2		B-G DPM/100cm^2		CORRECTED DOSE RATES (mrem/hr)			
ITEM NUM	LOCATION/ DESCRIPTION	REMOVABLE	FIXED PLUS REMOVABLE	REMOVABLE	FIXED PLUS REMOVABLE	CONTACT g	CONTACT B-g	3-FT g	3-FT B-g
43	FLOOR	< MDA		290					
44	FLOOR	669		1998					
45	FLOOR	267		677					
46	FLOOR	703		3911					
47	FLOOR	< MDA		< MDA					
48	FLOOR	4663		28057					
49	FLOOR	703		4321					
50	FLOOR	1676		5779					
51	FLOOR	300		495					
52	FLOOR	401		1474					
53	FLOOR	502		1474					
54	FLOOR	435		1634					
55	FLOOR	< MDA		517					
56	FLOOR	737		2180					
57	FLOOR	669		1269					
58	FLOOR	1945		9128					
59	FLOOR	< MDA		153					
60	FLOOR	2180		9287					
61	FLOOR	3354		20813					
62	FLOOR	267		973					
63	FLOOR	904		4526					
64	FLOOR	267		1406					
65	FLOOR	669		4208					
66	FLOOR	< MDA		312					
67	FLOOR	< MDA		608					
68	FLOOR	< MDA		399					

FS-F-1993-1 (REV. 10/2/91) equivalent

Fernald Site
INDUSTRIAL, RADIOLOGICAL SAFETY & TRAINING - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT (CONTINUATION)

		Alpha DPM/100cm^2		B-G DPM/100cm^2		CORRECTED DOSE RATES (mrem/hr.			
ITEM NUM	LOCATION/ DESCRIPTION	REMOVABLE	FIXED PLUS REMOVABLE	REMOVABLE	FIXED PLUS REMOVABLE	CONTACT g	CONTACT B-g	3-FT g	3-FT B-g
69	FLOOR	334		882					
70	FLOOR	< MDA		381					
71	FLOOR	< MDA		381					
72	FLOOR	435		973					
73	FLOOR	401		1246					
74	FLOOR	< MDA		244					
75	FLOOR	133		381					
76	FLOOR	133		540					
77	FLOOR	971		3638					
78	FLOOR	1643		6964					
79	FLOOR	569		3638					
80	FLOOR	300		1747					
81	FLOOR	367		1087					
82	FLOOR	1240		6417					
83	FLOOR	1710		9743					
84	FLOOR	804		1998					
85	FLOOR	1106		4777					
86	FLOOR	133		631					
87	FLOOR	3119		13251					
88	FLOOR	3757		21246					
89	FLOOR	3555		20130					
90	FLOOR	1441		4891					
91	FLOOR	133		472					
92	FLOOR	535		2727					
93	FLOOR	1341		7306					
94	FLOOR	503		3044					

0112

Fernald Site
INDUSTRIAL, RADIOLOGICAL SAFETY & TRAINING - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT (CONTINUATION)

		Alpha DPM/100cm^2		B-G DPM/100cm^2		CORRECTED DOSE RATES (mrem/hr)			
ITEM NUM	LOCATION/ DESCRIPTION	REMOVABLE	FIXED PLUS REMOVABLE	REMOVABLE	FIXED PLUS REMOVABLE	CONTACT g	CONTACT B-g	3-FT g	3-FT B-g
95	FLOOR	267		2066					
96	FLOOR	636		4709					
97	FLOOR	502		2408					
98	FLOOR	8320		33866					
99	FLOOR	602		1839					
100	FLOOR	1643		6713					
101	FLOOR	< MDA		950					
102	FLOOR	< MDA		< MDA					
103	FLOOR	267		813					
104	FLOOR	401		1224					
105	FLOOR	602		5119					
106	FLOOR	233		1406					
107	FLOOR	1508		6121					
108	FLOOR	871		3501					
109	FLOOR	166		1224					
110	FLOOR	267		700					
111	FLOOR	569		1884					
112	FLOOR	468		1337					
113	FLOOR	2045		8331					
114	FLOOR	971		4116					
115	FLOOR	502		1588					
116	FLOOR	1676		4982					
117	FLOOR	602		1907					
118	FLOOR	1676		7055					
119	FLOOR	1273		4618					
120	FLOOR	18058		41119					

FS-F-1993-1 (REV. 10/2/91) equivalent

Fernald Site
INDUSTRIAL, RADIOLOGICAL SAFETY & TRAINING - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT (CONTINUATION)

		Alpha DPM/100cm^2		B-G DPM/100cm^2		CORRECTED DOSE RATES (mrem/h			
ITEM NUM	LOCATION/ DESCRIPTION	REMOVABLE	FIXED PLUS REMOVABLE	REMOVABLE	FIXED PLUS REMOVABLE	CONTACT g	CONTACT B-g	3-FT g	3- B-
121	FLOOR	< MDA		381					
122	FLOOR	166		335					
123	FLOOR	1139		5255					
124	FLOOR	971		3775					
125	FLOOR	1307		5506					
126	FLOOR	1441		4731					
127	FLOOR	1374		4435					
128	FLOOR	1441		5825					
129	FLOOR	1072		3524					
130	FLOOR	33253		55620					
131	FLOOR	133		290					
132	FLOOR	< MDA		176					
133	FLOOR	200		1110					
134	FLOOR	200		905					
135	FLOOR	133		608					
136	FLOOR	300		608					
137	FLOOR	435		1178					
138	FLOOR	< MDA		130					
139	FLOOR	< MDA		244					
140	FLOOR	< MDA		153					
141	FLOOR	133		176					
142	FLOOR	2045		15939					
143	FLOOR	2884		11793					
144	FLOOR	1441		6007					
145	FLOOR	300		700					
146	FLOOR	727		2750					

Fernald Site
INDUSTRIAL, RADIOLOGICAL SAFETY & TRAINING - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT (CONTINUATION)

		Alpha DPM/100cm^2		B-G DPM/100cm^2		CORRECTED DOSE RATES (mrem/hr)			
ITEM NUM	LOCATION/ DESCRIPTION	REMOVABLE	FIXED PLUS REMOVABLE	REMOVABLE	FIXED PLUS REMOVABLE	CONTACT g	CONTACT B-g	3-FT g	3-FT B-g
147	FLOOR	< MDA		540					
148	FLOOR	1710		8604					
149	FLOOR	669		1497					
150	FLOOR	435		1588					
151	FLOOR	< MDA		130					
152	FLOOR	435		1474					
153	FLOOR	< MDA		< MDA					
154	FLOOR	401		1064					
155	FLOOR	971		3547					
156	FLOOR	1374		4390					
157	FLOOR	904		2362					
158	FLOOR	636		1474					
159	FLOOR	1374		6053					
160	FLOOR	1039		3524					
161	FLOOR	2414		7192					
162	FLOOR	1844		6759					
163	FLOOR	569		1474					
164	FLOOR	267		859					
165	FLOOR	7616		9196					
166	FLOOR	< MDA		290					
167	FLOOR	636		1451					
168	FLOOR	1877		5870					
169	FLOOR	837		2841					
170	FLOOR	837		3684					
171	FLOOR	267		631					
~~172~~	~~FLOOR~~	~~[illegible]~~		~~7410~~					

FS-F-1993-1 (REV. 10/2/91) equivalent

Fernald Site
INDUSTRIAL, RADIOLOGICAL SAFETY & TRAINING - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT (CONTINUATION)

		Alpha DPM/100cm^2		B-G DPM/100cm^2		CORRECTED DOSE RATES (mrem/			
ITEM NUM	LOCATION/ DESCRIPTION	REMOVABLE	FIXED PLUS REMOVABLE	REMOVABLE	FIXED PLUS REMOVABLE	CONTACT g	CONTACT B-g	3-FT g	3 B
173	FLOOR	837		3091					
174	FLOOR	< MDA		198					
175	FLOOR	3589		41611					
176	FLOOR	636		1360					
177	FLOOR	133		586					
178	FLOOR	267		791					
179	FLOOR	< MDA		< MDA					
180	FLOOR	133		472					
181	FLOOR	< MDA		244					
182	FLOOR	502		2613					
183	FLOOR	535		1884					
184	FLOOR	1106		2772					
185	FLOOR	2683		8718					
186	FLOOR	166		290					
187	FLOOR	< MDA		335					
188	FLOOR	300		426					
189	FLOOR	904		2271					
190	FLOOR	1039		3456					
191	FLOOR	233		973					
192	FLOOR	435		1565					
193	FLOOR	435		1816					
194	FLOOR	1341		3661					
195	FLOOR	300		586					
196	FLOOR	267		631					
197	FLOOR	< MDA		813					
198	FLOOR	166		1334					

Fernald Site
INDUSTRIAL, RADIOLOGICAL SAFETY & TRAINING - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT (CONTINUATION)

		Alpha DPM/100cm^2		B-G DPM/100cm^2		CORRECTED DOSE RATES (mrem/hr)			
ITEM NUM	LOCATION/ DESCRIPTION	REMOVABLE	FIXED PLUS REMOVABLE	REMOVABLE	FIXED PLUS REMOVABLE	CONTACT g	CONTACT B-g	3-FT g	3-FT B-g
199	FLOOR	< MDA		1041					
200	FLOOR	233		1224					
201	FLOOR	200		495					
202	FLOOR	502		1679					
203	FLOOR	770		2226					
204	FLOOR	166		495					
205	FLOOR	1341		3570					
206	FLOOR	1072		2750					
207	FLOOR	166		517					
208	FLOOR	837		3319					
209	FLOOR	367		677					
210	FLOOR	300		836					

ATTACHMENT D

RESULTS OF PLANT 7 TANK AND SUMP SAMPLING

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30t

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

AnaLIS ID: 910815-093 Project: 0020 0001 Customer Sample ID: 91-092-2900
Customer: SITE MEDIA SAMPLING Requisition Number:
Date Sampled: 15-AUG-1991 Date Sample Received: 15-AUG-1991
Sampled By: O.D.LAURSEN Date Sample Completed:
Material Description: PLANT 7 TANK&SUMP Charge Number: SJA00

Activ. Number	Procedure No.	Analysis	Result	Units	Data Entered By	QA File Number	Date Completed
		1,1-Dichlorethylene	--------	mg/L			
		1,2-Dichloroethane	--------	mg/L			
		1,4-Dichlorobenzene	--------	mg/L			
		2,4,5-Trichlorophenol	--------	mg/L			
		2,4,6-Trichlorophenol	--------	mg/L			
		2,4-Dinitrotoluene	--------	mg/L			
		2-Butanone (MEK)	--------	mg/L			
		2-Methylphenol (o-Cresol)	--------	mg/L			
		4-Methylphenol (p-Cresol)	--------	mg/L			
		Ag (TCLP)	--------	mg/L			
		As (TCLP)	--------	mg/L			
		Ba (TCLP)	--------	mg/L			
		Benzene	--------	mg/L			
		Carbon Tetrachloride	--------	mg/L			
		Cd (TCLP)	--------	mg/L			
		Chlorobenzene	--------	mg/L			

		Chloroform	--------	mg/L			
		Cr (TCLP)	--------	mg/L			
		Hexachlorobenzene	--------	mg/L			
		Hexachlorobutadiene	--------	mg/L			
		Hexachloroethane	--------	mg/L			
		Hg (TCLP)	--------	mg/L			
		Nitrobenzene	--------	mg/L			
		Pb (TCLP)	--------	mg/L			
		Pentachlorophenol	--------	mg/L			
		Pyridine	--------	mg/L			
		Se (TCLP)	--------	mg/L			
		Tetrachloroethene	--------	mg/L			
		Trichloroethene	--------	mg/L			
		Vinyl Chloride	--------	mg/L			
		m-Cresol	--------	mg/L			
103905	1039	U - Volumetric AnL INORG	10.7	%	JE REILMAN	1	5-SEP-19
305905	3059	Total Th - Color. AnL	<45	ppm	FL MILLER	1	29-NOV-19
401305	4013	Alpha Activity - ISO RAD	37,000	pCi/g	PA PAPET	4013-91-162	19-AUG-19
	4013	Beta Activity - ISO RAD	46,000	pCi/g	PA PAPET	4013-91-162	19-AUG-19

6w
30t

Westinghouse Materials Co of Ohio
Analytical Chemistry Department
Results of Analyses

AnaLIS ID: 910819-070 Project: 0020 0001 Customer Sample ID: 91-092-2901
Customer: SITE MEDIA SAMPLING Requisition Number:
Date Sampled: 19-AUG-1991 Date Sample Received: 19-AUG-1991
Sampled By: W BUDACH Date Sample Completed:
Material Description: PLT 7 TANK & SUMP SP-2 SUMP Charge Number: SJA00

Activ. Number	Procedure No.	Analysis	Result	Units	Data Entered By	QA File Number	Date Completed
		1,1-Dichlorethylene	--------	mg/L			
		1,2-Dichloroethane	--------	mg/L			
		1,4-Dichlorobenzene	--------	mg/L			
		2,4,5-Trichlorophenol	--------	mg/L			
		2,4,6-Trichlorophenol	--------	mg/L			
		2,4-Dinitrotoluene	--------	mg/L			
		2-Butanone (MEK)	--------	mg/L			
		2-Methylphenol (o-Cresol)	--------	mg/L			
		4-Methylphenol (p-Cresol)	--------	mg/L			
		Ag (TCLP)	--------	mg/L			
		As (TCLP)	--------	mg/L			
		Ba (TCLP)	--------	mg/L			
		Benzene	--------	mg/L			
		Carbon Tetrachloride	--------	mg/L			
		Cd (TCLP)	--------	mg/L			
		Chlorobenzene	--------	mg/L			

		Chloroform	--------	mg/L			
		Cr (TCLP)	--------	mg/L			
		Hexachlorobenzene	--------	mg/L			
		Hexachlorobutadiene	--------	mg/L			
		Hexachloroethane	--------	mg/L			
		Hg (TCLP)	--------	mg/L			
		Nitrobenzene	--------	mg/L			
		Pb (TCLP)	--------	mg/L			
		Pentachlorophenol	--------	mg/L			
		Pyridine	--------	mg/L			
		Se (TCLP)	--------	mg/L			
		Tetrachloroethene	--------	mg/L			
		Trichloroethene	--------	mg/L			
		Vinyl Chloride	--------	mg/L			
		m-Cresol	--------	mg/L			
300204	3002	U - BrPADAP AnL	22522	ppm	FL MILLER	OLH	5-SEP-199
303304	3033	pH - Electrode AnL	VOID	pH	FL MILLER	1	12-DEC-199
305904	3059	Total Th - Color. AnL	<45	ppm	FL MILLER	1	12-DEC-199
401304	4013	Alpha Activity - ISO RAD	1700	pCi/g	TB GRANAT	4013-91-163	20-AUG-199
	4013	Beta Activity - ISO RAD	2400	pCi/g	TB GRANAT	4013-91-163	20-AUG-199

***** Comments from the ENVIRONMENTAL & PROCESS MATERIALS LABORATORY for sample 910819-070 *****

Unable to do pH on solid sample

APPENDIX B

PROCEDURES

SP-P-35-023 - Radiological Contamination Surveys (January 22, 1992)
SSOP-0002 - Completing the Material Evaluation Form (October 22, 1991)
SSOP-0003 - Receiving, On-Site Movement and Off-Site Shipment of Nonradioactive Hazardous Material (April 30, 1992)
PP-0314 - Packaging, On-Site Movement and Off-Site Shipment of Material (December 20, 1991)
SSOP-0044 - Management of Soil, Debris, and Waste from a Project

Westinghouse Materials Company of Ohio

	INDUSTRIAL HYGIENE AND SAFETY MANUAL			
	CONTROL OF WORK INVOLVING ASBESTOS			Industrial Hygiene
IH&S-IH-03	Date: 03-20-89	Rev: 0		

1.0 PURPOSE

To describe the requirements and methods to be used to ensure that exposures of employees to asbestos are within applicable limits and are controlled to levels which are As Low As Reasonably Achievable (ALARA).

2.0 SCOPE

This procedure establishes responsibilities regarding work involving asbestos, and provides information on asbestos hazard awareness, and requirements covering how asbestos work is to be controlled. This procedure applies to all WMCO personnel, subcontractors and/or others at the FMPC.

3.0 DEFINITIONS

3.1 Asbestos - a fibrous material suitable for use as an incombustible, non-conducting, or chemically resistant material; includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.

3.2 Asbestos Fiber - a particulate form of asbestos, 5 micrometers or more in length, with a length-to-diameter ratio of at least 3 to 1.

3.3 Asbestos Work Area - any area in which asbestos work is being done.

3.4 Asbestos Worker - personnel who may be exposed to airborne asbestos fibers as a part of their defined or assigned job.

3.5 Assistant Emergency Duty Officer (AEDO) - the AEDO is the onsite management authority for all shifts and for all abnormal events. This position is filled by a Utilities Engineer.

3.6 Demolition - the wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations.

3.0 DEFINITIONS (continued)

3.7 Demolition/Renovation Project Asbestos Removal Form - a form provided by Environmental Compliance which is completed by a Planner of Asbestos Work, Supervisor-In-Charge of Asbestos Workers, or a Project Engineer providing information to Environmental Compliance in advance of any asbestos removal or demolition job.

3.8 Emergency Renovation - a renovation operation that was not planned but results from a sudden, unexpected event. This term includes operations necessitated by non-routine failures of equipment which must be addressed to minimize downtime on essential process equipment and those operations necessary to mitigate potential human health risk.

3.9 Friable Asbestos Material - any material containing more than one percent asbestos by weight, that hand pressure can crumble, pulverize, or reduce to powder when dry.

3.10 Glove Bag - a polyethylene plastic bag fitted with arms through which work can be performed, and which allows workers to remain completely isolated from the asbestos material being removed.

3.11 HEPA Vacuum - a portable vacuum cleaner equipped with a high efficiency particulate air (HEPA) filter designed to be 99.97% efficient at collecting 0.3 micron size particles.

3.12 Incidental (Demolition and/or Renovation) - extremely small, minor removals which are necessary to facilitate normal conduct of business. These projects could not have reasonably been foreseen or planned, and do not constitute classification as emergency removals.

3.13 Planned Major (Demolition and/or Renovation) - non-emergency removals involving the removal of friable asbestos materials from at least 260 linear feet of pipes or at least 160 square feet of other facility components such as transite.

3.14 Planned Minor (Demolition and/or Renovation) - non-emergency removals involving the removal of friable asbestos materials from less than 260 linear feet of pipes or 160 square feet of other facility components such as transite.

3.15 Planner of Asbestos Work - person responsible for planning jobs involving work with asbestos (e.g., job planner - estimator, project engineer, maintenance supervisor).

3.16 Renovation - altering in any way one or more facility components. Operations in which load-supporting structural members are wrecked or taken out are specifically excluded.

3.17 Small-scale, short duration operations - work activities which have a reduced potential for elevated levels of asbestos fibers being generated due to the small scale or short duration of the operation (See Section 5.2.4.5 for criteria).

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3.0 DEFINITIONS (continued)

3.18 Supervisor-In-Charge - the person(s) supervising the employee(s) performing the work required.

4.0 RESPONSIBILITIES

4.1 Facility Owner

4.1.1 Ensures prompt maintenance/repair of deteriorated or damaged insulation or other asbestos containing material.

4.1.2 Contacts Industrial Hygiene for regulation of areas containing deteriorated or damaged insulation until repairs can be made.

4.1.3 Contacts Industrial Hygiene for sampling of insulation or other material to determine asbestos content.

NOTE: Asbestos cannot be identified by the human eye. All existing insulation shall be considered as containing asbestos unless identified by labeling or analysis as non-asbestos.

4.2 Planner of Asbestos Work

4.2.1 Minimizes use of asbestos-containing materials by ordering asbestos-free substitutes whenever possible.

4.2.2 Notifies Environmental Compliance of each asbestos-related or suspected asbestos-related operation to be performed, by completing and forwarding the Demolition/Renovation Project Asbestos Removal Form (Attachment B) as required by Environmental Compliance.

4.2.3 The initiator of emergency or unplanned jobs involving asbestos work shall notify Environmental Compliance and the Industrial Hygiene Technician prior to the start of the job.

NOTE: If the work does not involve a job planner-estimator, it is the responsibility of the supervisor-in-charge of the work force to complete and forward the Demolition/Renovation Project Asbestos Removal Form to Environmental Compliance.

4.3 Supervisor-In-Charge of Asbestos Workers

4.3.1 Submits names of asbestos workers to the Medical Service Section and the Industrial Hygiene Subsection of the OS&H Department.

4.3.2 Assures a minimum use of asbestos-containing material, by using asbestos-free substitutes.

4.0 RESPONSIBILITIES (continued)

4.3.3 Verifies that all personnel working with asbestos have completed the appropriate asbestos worker training programs.

4.3.4 Verifies that all personnel identified as asbestos workers are respirator fit-tested once every six months.

4.3.5 Instructs personnel in proper methods of working and handling asbestos-containing materials and ensures compliance.

4.3.6 Initiates a FMPC Work Permit Form (OS&H form 2939) per Site Procedure FMPC-516 for any work resulting in the handling of any asbestos-containing material. Contacts Industrial Hygiene Technician to issue FMPC Asbestos Work Permit (OS&H form 2940, Attachment C). Verifies that the completed Work Permit and Asbestos Work Permit is posted at the asbestos work site.

4.3.7 Shall attend the appropriate asbestos training courses before supervising any asbestos work permit job.

4.3.8 Verifies the asbestos work site is posted with asbestos warning signs, and that the area is segregated from other work areas by rope, barrier tape or plastic sheeting. Verifies compliance with the Asbestos Work Permit requirements.

4.3.9 Assures use of proper personal protective equipment and the proper disposal of bagged clothing, bagged scrap, and labeling of such materials.

4.3.10 Ensures that no free standing liquid is contained in the bagged asbestos waste.

4.4 Asbestos Worker

4.4.1 Performs jobs in accordance with requirements set forth on the Asbestos Work Permit.

4.4.2 Shall not perform any work with asbestos until successfully completing the asbestos worker training program.

4.4.3 Shall report any situation to their immediate supervisor regarding potential exposure to friable asbestos material.

4.4.4 Shall immediately report any signs of heat stress from co-workers or themselves to the supervisor-in-charge.

4.4.5 Wears personal air sampling equipment when directed by supervision or Industrial Hygiene.

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4.0 RESPONSIBILITIES (continued)

4.5 Industrial Hygiene

4.5.1 Reviews and concurs with specifications for subcontract/vendor work involving asbestos and with selected bid package.

4.5.2 Verifies, through contact with Environmental Compliance for each asbestos job, that regulatory notification has been completed and that approval to begin work has been granted before issuing Asbestos Work Permit.

4.5.3 Authorizes and provides special precautions and work practices for each asbestos job by completing and returning the Asbestos Work Permit to the supervisor-in-charge of asbestos workers (job supervisor).

4.5.4 Specifies the use of proper personal protective equipment required for each asbestos job.

4.5.5 Ensures adequate monitoring by sampling selected job operations based on duration and degree of potential exposure and provides notification of air sampling results as required.

4.5.6 Evaluates effectiveness of control measures and/or engineering controls in maintaining the required asbestos TLV.

4.5.7 Notifies supervision when personnel identified as asbestos workers are due for six month fit-testing and conducts the fit-testing.

4.5.8 Provides training and instruction to personnel in the proper methods of working with, and handling asbestos-containing materials.

4.5.9 Performs periodic inspections of asbestos work-sites to ensure compliance with acceptable asbestos work practices.

4.5.10 Reviews the use of asbestos-containing materials and recommends asbestos-free replacements whenever possible.

4.5.11 Regulates areas when asbestos containing materials are found in extremely poor condition to reduce the potential for exposure to individuals working in the immediate area of the damaged materials.

4.5.12 Performs inspections of buildings and surrounding areas to identify areas where asbestos containing materials are present.

4.5.13 Conducts routine air monitoring to ensure that airborne levels are within acceptable levels.

4.0 RESPONSIBILITIES (continued)

4.5.14 Collects samples of suspect asbestos materials for positive identification by laboratory analysis and tags sampled areas for future reference.

4.6 Medical Services

4.6.1 Performs annual physical examination on all personnel identified as asbestos workers, provides medical guidance concerning these employees, and makes recommendations based on medical condition and medical history.

4.6.2 Retains asbestos workers' medical files for the duration of their employment, plus thirty years.

4.7 Procurement

4.7.1 Verifies Industrial Hygiene concurrence prior to award of subcontracts for construction/engineering projects involving work with asbestos and prior to issuance of Purchase Orders to vendors involving work with asbestos.

4.7.2 Procures or modifies procurement specifications as directed by the requisitioner and/or OS&H to ensure use of asbestos-free materials whenever possible.

4.8 Project Engineer

4.8.1 Reviews all construction/engineering projects to identify as early as possible if any asbestos will be involved in the project.

4.8.2 Includes requirements for compliance with all asbestos regulatory requirements in project specifications for jobs involving work with asbestos and provides specifications to Industrial Hygiene for review.

4.8.3 Includes requirement for submittal of an acceptable Asbestos Work Plan in project specifications involving work with asbestos.

4.8.4 Specifies asbestos-free substitutes whenever possible.

4.8.5 Notes on drawings when asbestos is required or removed.

4.8.6 Completes a Demolition/Renovation Project Asbestos Removal Form (Attachment B) and submits to Environmental Compliance whenever construction projects involve the demolition and/or removal of asbestos containing materials.

4.8.7 Ensures proper FMPC Asbestos Work Permits are obtained during the course of the work.

4.0 RESPONSIBILITIES (continued)

4.9 Waste Operations

4.9.1 Provides interim storage, transport and disposal of asbestos waste material.

4.9.2 Recommends and provides approved containers for disposal of asbestos waste material.

4.10 Waste Technology

Establishes guidelines for interim storage, transport and disposal of asbestos waste material.

4.11 Environmental Compliance

4.11.1 Reviews, recommends and approves, in cooperation with responsible organizations, control and disposal methods for compliance with EPA regulations.

4.11.2 Provides notification to Industrial Hygiene when regulatory approval has been granted for an asbestos demolition or renovation project to commence.

4.11.3 Provides direction and any required training to all personnel required to complete the Demolition/Renovation Project Asbestos Removal Form.

4.12 Assistant Emergency Duty Officer (AEDO)

4.12.1 Classifies an event and determines if it is reportable to DOE as an emergency or non-routine event.

4.12.2 May direct OS&H personnel to perform analysis and monitoring efforts.

4.12.3 Logs all events and ensures that all original reports, forms, and logs are placed in Emergency Preparedness files.

4.12.4 Ensures that areas of damaged asbestos are regulated, repaired and cleaned up in an expeditious manner after an asbestos related event.

5.0 GENERAL

5.1 Asbestos Awareness and Hazard Control

5.1.1 Asbestos refers to a group of fibrous silicate minerals which are valued for their ability to withstand heat, insulate, and to reinforce other materials. When the FMPC was built, and in later years, asbestos was widely used in steam pipe insulation, asbestos-cement pipes, corrugated asbestos-cement board (transite) and furnace insulation

5.0 GENERAL (continued)

Asbestos dust may be generated when such equipment is damaged, repaired or replaced. Asbestos may also be present in floor tile/sheeting, valve packing, gaskets, brake linings, and other materials.

5.1.2 Asbestos cannot be identified by the human eye. All existing insulation and other items listed in Section 5.1.1 shall be considered as containing asbestos unless identified by labeling or analysis as non-asbestos.

5.1.3 To identify the presence or absence of asbestos, contact the Industrial Hygiene Technician for sample collection or for results of prior analysis. Previously sampled locations are marked with an identification tag and analytical results are available from Industrial Hygiene for these samples. An example of the sample location identification tag is shown in Attachment A.

NOTE: Use of this asbestos sample tag was initiated in October 1988. Before this tag was used, asbestos bulk sample locations were identified using plastic tape with a six digit number indicating the sample number.

5.1.4 Airborne asbestos dust, consisting of microscopic fibers, constitutes a known respiratory hazard, because asbestosis, mesothelioma, and cancer of the lungs or other body organs may result from inhalation of asbestos fibers after a latency period. Therefore asbestos dust exposures and releases to the environment must be minimized even though extra time and effort are required.

5.1.5 Since airborne asbestos fibers are a known respiratory hazard, it is important to maintain asbestos containing materials (specifically pipe insulation) in good condition in order to reduce the potential for employee exposure to airborne asbestos fibers.

5.1.6 All personnel must be alert for the presence of damaged asbestos containing materials and notify the Facility Owner who shall ensure proper repairs are made and shall contact Industrial Hygiene for posting of hazard warnings if appropriate.

NOTE: If insulation or other asbestos containing material has been seriously damaged creating a potential for exposure to dust contact the AEDO and Industrial Hygiene immediately for proper regulating of the area, clean-up, and repair. (See Section 5.7).

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5.1.7 Industrial Hygiene performs periodic inspections of buildings to identify areas where pipe insulation or other suspect asbestos containing structures are damaged and in a

5.0 GENERAL (continued)

friable condition. The Facility Owner is informed of the findings for corrective action and the area may be identified with hazard warnings if necessary.

5.1.8 An FMPC Asbestos Work Permit must be obtained and its requirements followed, for any work with asbestos-containing materials at the FMPC.

5.2 Planning for Work/Projects Which May Involve Asbestos

5.2.1 General

Asbestos is present in many building materials found at the FMPC. Many construction and maintenance activities involve the disturbance of asbestos containing materials. For this reason, all construction/maintenance activities should be evaluated as early as possible to determine if any suspect asbestos containing materials are present and may be disturbed during the course of the work activity.

5.2.1.1 If materials suspected of containing asbestos are present, Industrial Hygiene shall be contacted to collect samples to determine if the suspect materials contain asbestos or are asbestos-free.

NOTE: If suspect asbestos containing materials are to be disturbed as part of construction/maintenance activities, and time does not allow for sampling of the suspect materials, the materials shall be handled as asbestos.

5.2.1.2 For work to be performed by a subcontractor or vendor, requirements for compliance with FMPC controls for work with asbestos shall be included in procurement documents and an Asbestos Work Plan shall be submitted by the subcontractor/vendor for any work which involves asbestos and shall be provided to Industrial Hygiene for review and concurrence. (See Section 5.2.2)

NOTE: For minor asbestos work such as drilling holes in floor tile or transite, an Asbestos Work Plan is not required. (See Section 5.2.2.3 Note)

5.2.1.3 For all asbestos work the need for a Demolition/Renovation Project Asbestos Removal Form (Attachment B) shall be evaluated and the form filed if required. (See Section 5.2.3)

5.0 GENERAL (continued)

5.2.1.4 An OSHA "competent person" shall be assigned to supervise the asbestos work project, except small-scale, short-duration work. (See Section 5.2.4)

5.2.1.5 For all asbestos work an FMPC Asbestos Work Permit shall be obtained. (See Section 5.2.5)

5.2.2 Subcontract/Vendor Specifications and Work Plan:

For any project/construction activity which involves work with asbestos the procurement documents shall include the following:

5.2.2.1 Requirements for compliance with all applicable regulatory requirements involving work with asbestos including those of OSHA, EPA and the State of Ohio.

5.2.2.2 The requirement that subcontractor/vendor shall submit documentation of proper respirator fit-testing, medical certification and training in the use of respirators for all involved workers to Industrial Hygiene prior to the start of work.

5.2.2.3 The requirement for submittal of an Asbestos Work Plan as part of the bid.

NOTE: For minor asbestos work such as drilling holes in transite or floor tile, an Asbestos Work Plan is not required. However, before the start of these minor asbestos work activities, Industrial Hygiene shall be presented documentation as specified in Section 5.2.2.2 and documentation that all workers have attended knowledge level asbestos worker training as specified by OSHA.

5.2.2.3.1 This Work Plan shall be submitted to and approved by WMCO Industrial Hygiene prior to the start of work and shall include the scope of the proposed asbestos work, the proposed asbestos abatement methods to be used during the asbestos work, engineering controls that will be used to control the release of asbestos fibers, personnel and clearance air monitoring procedures, protective equipment to be used including respiratory protection and protective clothing, and the employee training program.

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5.0 GENERAL (continued)

5.2.2.3.2 All subcontractor/vendor employees required to supervise or perform asbestos removal work shall be licensed for asbestos removal in accordance with the laws of the State of Ohio. Records of this licensing shall be submitted with the Asbestos Work Plan.

5.2.2.3.3 The subcontractor/vendor must submit with the Work Plan evidence that the company is certified by the State of Ohio as an Asbestos Hazard Abatement Contractor.

5.2.3 Required Notifications:

Before any asbestos demolition or renovation may commence, certain regulatory requirements must be met. (Contact Environmental Compliance for additional information.) Written notification shall be provided to Environmental Compliance well in advance of commencing work (30 to 40 days prior to the start of planned demolition or renovation). The written notification shall be in the form of a Demolition/Renovation Project Asbestos Removal Form (see Attachment B).

5.2.3.1 For a Planned Major Demolition or Renovation project involving friable asbestos, a minimum of 30 days written notification must be given to Environmental Compliance prior to commencing work.

5.2.3.2 For a Planned Minor Demolition project, a minimum of 40 days written notification must be given to Environmental Compliance prior to commencing work.

5.2.3.3 For a Planned Minor Renovation project, the Asbestos Removal Form is to be completed and forwarded to Environmental Compliance prior to commencing work.

5.2.3.4 Emergency and Incidental Demolitions are not recognized by the regulators. All demolition activities are to be reported in accordance with sections 5.2.3.1 and 5.2.3.2.

NOTE: If a situation arises where such a removal is necessary to mitigate potential human health risks, the project manager or supervisor shall immediately contact Environmental Compliance.

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5.0 GENERAL (continued)

5.2.3.5 Emergency Renovation removals must be orally reported directly to Environmental Compliance prior to the removal, if practical, or immediately thereafter.

NOTE: When an Emergency Renovation must be accomplished on an off-shift or weekend, notification to Environmental Compliance must occur as soon as practical afterwards.

5.2.3.6 Incidental Renovation removals must be orally reported directly to Environmental Compliance prior to the removal.

5.2.3.7 When completing the Asbestos Removal Form, it is necessary to be as accurate as possible with the starting date of an asbestos removal project since it is the most likely date of an inspection by an off site regulatory agency. When the proposed starting date must be changed, immediate oral notification shall be made to Environmental Compliance.

NOTE: Any questions or concerns regarding EPA regulations and reporting requirements shall be addressed to the Environmental Compliance Subsection of the OS&H Department.

5.2.4 Supervision of Asbestos Work:

The supervisor of an asbestos work project (except small-scale, short duration work) shall be qualified as a "competent person" as defined in the OSHA Asbestos Standard. The term "competent person" as defined by OSHA means one who has passed an OSHA approved training course, is capable of identifying existing asbestos hazards in the workplace and who has the authority to take prompt corrective measures to eliminate them. See Section 5.6.1.5 for the training requirements for the assigned "competent person".

5.2.4.1 The assigned "competent person" for an asbestos work activity must be a supervisory level individual and must be physically present at the work site as long as workers are inside the asbestos work area.

5.2.4.2 The duties of the "competent person" include at least the following: establishing the asbestos work area, ensuring its integrity (when an enclosure is constructed), and controlling entry and exit from the asbestos work area.

5.0 GENERAL (continued)

5.2.4.3 The "competent person" is responsible for supervising any employee air sampling, ensuring that all employees working inside the asbestos work area wear the appropriate personal protective equipment, ensuring that these employees are trained in the use of appropriate methods of exposure control, and ensuring that these workers use the proper decontamination procedures when exiting the asbestos work area.

5.2.4.4 The "competent person" is also responsible for ensuring that engineering controls in use during the asbestos work are in proper operating condition and are functioning properly.

5.2.4.5 For small-scale, short-duration operations, a trained "competent person" is not required to supervise the asbestos work because there is a reduced potential for elevated levels of asbestos fibers being generated. See Section 5.6.1.4 for the training requirements for the supervisor of a small-scale, short-duration asbestos work activity.

5.2.4.5.1 Small-scale, short-duration operations are maintenance or renovation tasks, where the removal of asbestos containing materials is not the primary goal of the job (e.g., pipe insulation repair, valve replacement, drilling holes in transite to mount conduit, installing electrical conduits or piping through transite, etc.).

5.2.4.5.2 A small-scale, short-duration operation is any activity where employees' exposures to asbestos can be kept below the OSHA action level via worker isolation techniques, such as glove bags, mini-enclosures, or the removal of an entire asbestos-covered pipe or structure. Activities such as the removal of up to 160 square feet of transite or the removal of up to 30 feet of pipe insulation by glove bag are known to result in employee exposures less than the OSHA action level. Removals which exceed these size limits shall not be classified as small-scale, short-duration.

5.0 GENERAL (continued)

5.2.4.5.3 Asbestos work not fitting the small-scale, short-duration criteria of 5.2.4.5.2 cannot be reduced in size by creating two or more small scale operations.

5.2.4.5.4 All of the requirements of 5.2.4.5.1 through 5.2.4.5.3 must be met for a maintenance or renovation task requiring the removal of asbestos to be classified as a small-scale, short-duration operation.

5.2.5 Authorization to Perform Work - Asbestos Work Permit:

After all regulatory requirements have been met, Industrial Hygiene shall be contacted to issue an FMPC Asbestos Work Permit (Attachment C). An Asbestos Work Permit is required for all activities involving work with asbestos, and shall be posted at the perimeter of the asbestos work area prior to the start of work.

NOTE: The permit shall be posted outside the actual work area so it can be viewed without entering the asbestos work area.

5.3 Proper Asbestos Work Practices

5.3.1 When working with asbestos, certain precautions are required to ensure the health and safety of the asbestos workers and building occupants.

NOTE: A stock of safety supplies required to perform asbestos abatement activities are available through Inventory Control & Warehousing. See Attachment D.

5.3.2 Before start of asbestos work activity, the supervisor-in-charge shall identify the proper disposal methods for asbestos waste, and the final on-site destination of the containerized waste (contact Waste Operations).

5.3.2.1 Waste containers from Waste Operations shall be available at the asbestos work site before the start of work.

5.3.2.2 All material removed during asbestos work, shall be wetted, double bagged in plastic (at least 12 mil total plastic), sealed, placed in white 55 gallon drums or wooden boxes supplied by Waste Operations, suitably labeled, and disposed of in accordance with disposal requirements of Waste Technology.

5.0 GENERAL (continued)

NOTE: All waste shall have sufficient absorbent material added to it in order to be able to absorb two (2) times the volume of liquid in the container.

5.3.2.3 The final on-site destination of the containerized waste shall be determined by Waste Operations.

5.3.3 The asbestos work area shall be segregated such that other personnel will not be subjected to asbestos. This shall be accomplished by roping-off the area, using banner-guard tape, or by using plastic sheeting to totally enclose the work area. The manner of segregating the work area shall be approved by Industrial Hygiene and will depend on the size of the job and exposure potential. When total enclosure of the work area is required the need for use of a HEPA filtered negative pressure ventilation system and for special clearance air sampling shall be evaluated and approved by Industrial Hygiene.

NOTE: When a HEPA filtered negative pressure ventilation system is used as part of a total enclosure job, the system shall be operated continuously in order to constantly clean the air inside the enclosure of asbestos fibers. The HEPA ventilation shall continue to operate until clearance air sampling shows acceptable results.

NOTE: Nearby building occupants shall be notified before asbestos work begins to prevent unauthorized access to the work area.

5.3.4 All asbestos work areas shall be posted with asbestos warning signs. See Attachment E for required wording.

NOTE: After completion of the job the work area shall remain segregated and warning signs posted until approval is obtained from Industrial Hygiene indicating that final inspection of work area is completed.

5.3.5 Requirements of the Asbestos Work Permit for clearing the work area of extraneous items, and use of plastic sheeting to prevent contamination of equipment and surfaces shall be complied with.

5.0 GENERAL (continued)

5.3.6 Any local ventilation systems which have the potential to spread asbestos fibers in the immediate work area or throughout the building shall be tagged and locked out of service, or otherwise protected, until the asbestos removal and clean-up is completed. After the ventilation system has been shut down, ventilation duct openings shall be sealed with plastic when there is the potential for asbestos contamination to get into the building ventilation system.

5.3.7 Smoking, chewing tobacco/gum, eating or drinking shall not be permitted in the asbestos work area.

5.3.8 Personnel working in asbestos work areas shall use approved respiratory protection.

5.3.8.1 Only the same brand and size of respirator with which the person was fitted shall be worn.

5.3.8.2 The respirator requirements specified for each asbestos job by Industrial Hygiene on the Asbestos Work Permit shall be complied with.

5.3.9 All personnel inside the asbestos work area shall comply with protective clothing requirements and respirator requirements as posted and as stated on the Asbestos Work Permit and the FMPC Work Permit.

5.3.9.1 At the completion of the asbestos work or whenever exiting the asbestos work area, any visible asbestos shall be vacuumed from disposable clothing using a HEPA-filtered vacuum cleaner (approved for asbestos use) before removal of disposable clothing.

NOTE: HEPA vacuums used for asbestos work must be labeled for use with asbestos only. When a HEPA vacuum previously used for asbestos work is to be used for clean-up of non-asbestos materials, the paper disposal bag and cloth main filter must be removed and disposed of as asbestos waste and refitted with clean replacements.

5.3.9.2 Disposable protective clothing shall be removed upon leaving the asbestos work area, placed in 12-mil plastic bags, labeled as asbestos waste, sealed, and placed with other asbestos waste in white 55 gallon drums marked with proper asbestos identification labels.

5.0 GENERAL (continued)

5.3.9.3 When removing disposable protective clothing, continue using respiratory protection until all disposable protective clothing has been sealed in plastic bags.

5.3.9.4 Personnel working inside the asbestos work area shall decontaminate as per steps 5.3.9.1 through 5.3.9.3 at each departure from the work area and shall shower before lunch and at the end of their shift.

5.3.10 Friable asbestos scrap material is not allowed to be handled in a dry condition. All asbestos containing materials shall be adequately wetted before removal (i.e., thoroughly soaked before removal is attempted). Use of surfactants to improve the wetting properties of water is recommended. The water or wetting agent shall be applied by a gentle spray or mist so as not to disturb the asbestos and generate airborne fibers. It may be necessary to continue the wetting process until the asbestos material is bagged and sealed.

5.3.11 During demolition of items insulated with or otherwise containing friable asbestos, items shall be removed so as to minimize stripping of insulation, i.e., insulated piping can be removed in sections by removing small areas of insulation at set intervals, sealing exposed insulation, wrapping piping in plastic, cutting through piping where asbestos has been removed, and placing cut sections of insulated piping into waste containers. Items (pipes, ducts, structural members, etc.) that are covered with materials containing asbestos, shall not be dropped or thrown to the ground, but shall be carefully lowered to the ground.

5.3.12 When removing asbestos pipe insulation, plastic glove bags shall be used whenever feasible during the removal to minimize the escape of asbestos fibers. The glove bag allows for total enclosure of the asbestos removal while isolating the worker from any significant exposure to the asbestos being removed.

NOTE: Glove bags cannot be used on pipes at temperatures above 130 degrees Fahrenheit because the plastic will melt. Every effort should be made to cool the piping before removing the insulation. When this is not practical, wet methods shall be used to remove the insulation.

5.3.13 After completion of all stripping/removal work, surfaces from which asbestos containing materials have been removed shall be cleaned to remove all visible residue. After cleaning, a sealant shall be used on the cleaned surface to lock down any remaining fibers.

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5.0 GENERAL (continued)

5.3.14 Any asbestos debris on the floor or other surfaces in the work area shall be immediately removed by a HEPA vacuum (approved for asbestos use) or wetted and removed by wet wiping to avoid suspension.

NOTE: Sweeping, be it wet or dry, with or without sweeping compound, is not allowed.

5.3.15 When the asbestos work is completed, the work area shall be thoroughly cleaned to remove any visible asbestos debris. Clean-up should be accomplished using either a HEPA vacuum (approved for asbestos use) or wet methods for clean-up.

5.3.16 After clean-up of the work area is completed, the Industrial Hygiene Technician shall be contacted to conduct a visual inspection of the work area to verify that no visible asbestos debris is present. The Technician shall inform the supervisor or workers of any deficiencies found and then reinspect the area after recleaning. This process shall be repeated until acceptable clean-up conditions are obtained. The work area shall remain segregated and warning signs posted until the results of visual inspection are acceptable.

5.3.17 For total enclosure jobs only, general area air samples are required after final clean-up of the work site to determine that airborne asbestos levels inside the enclosure are at acceptable levels. (See paragraph 5.5.3). Clearance air samples will be collected only after a visual inspection of the enclosure is acceptable.

5.3.18 The Industrial Hygiene Technician shall notify the Supervisor-In-Charge or his designee when the final clean-up is acceptable (visual inspection and clearance sampling, if required), and that all remaining barriers and signs can be removed.

5.3.19 Deviations in the requirements of this section may be approved by the Industrial Hygiene Technician issuing the specific permit for the job with prior authorization from the Manager, Industrial Hygiene.

5.4 Work Practices for Work Involving Transite

5.4.1 Specific procedures are required when working with transite due to its unique characteristics. Transite is not as difficult to work with because the asbestos fibers are bonded in concrete until damaged, cut, etc.

5.4.2 The work area shall be isolated and defined by posting warning signs and securing warning tape. Additional isolation may be specified on the Asbestos Work Permit.

5.0 GENERAL (continued)

5.4.3 All personnel inside the asbestos work area shall comply with protective clothing requirements and respirator requirements as posted and as stated on the Asbestos Work Permit and the FMPC Work Permit.

5.4.4 Transite panels shall be removed whole whenever feasible and handled with care to avoid breakage.

5.4.5 As bolts are removed from each panel, they should be wet down to minimize any dust which may be generated.

5.4.6 Once removed, panels shall be wrapped with two layers of plastic and then placed in labeled wood or metal boxes (supplied by Waste Operations) for storage and shipment. When panels are larger than the container they are placed in, they shall be loosely double-wrapped in plastic, sealed, then broken in half and folded over. The broken panels shall then be wrapped with one more layer of plastic and sealed before they are placed into containers. Contact Waste Operations for additional information regarding waste handling.

NOTE: All waste containers shall have sufficient absorbent material added to absorb two times the volume of liquid present.

5.4.7 When cutting or drilling through transite the use of a HEPA filtered vacuum at the location of the penetration is required. This may be achieved by the use of a HEPA-filtered vacuum cleaner or power tools fitted with "point-of-cut" HEPA exhaust ventilation. The use of amended water shall also be employed at the penetration to minimize dusting. Deviations from these requirements must be approved by the Industrial Hygiene Technician.

NOTE: When cutting or drilling through transite the opposite side of the transite wall shall be sealed with plastic if there is a potential for generation of dust on the other side of the wall.

5.4.8 After removal of transite all surfaces adjacent to or in contact with the transite shall be thoroughly cleaned by wiping down with a wet rag or by vacuuming with a HEPA filtered vacuum approved for use with asbestos.

NOTE: If the surfaces appear to be contaminated with asbestos, they should be thoroughly cleaned before working with the transite.

5.4.9 After all asbestos jobs, the Industrial Hygiene Technician shall be contacted to perform a visual inspection of the work site to determine if the area has been cleaned up properly. (See paragraph 5.3.17)

5.0 GENERAL (continued)

5.4.10 For total enclosure jobs only, general area air samples are required after final clean-up of the work site to determine that airborne asbestos levels inside the enclosure are at acceptable levels. (See paragraph 5.5.3)

5.4.11 Approval shall be obtained from the Industrial Hygiene Technician before barriers and warning signs can be removed at the work site. (See paragraph 5.3.19)

5.4.12 Deviations in the requirements of this section may be approved by the Industrial Hygiene Technician issuing the specific permit for the job with prior authorization from the Manager, Industrial Hygiene.

5.5 Air Monitoring Requirements for Asbestos Work Activities

5.5.1 Determination of employee exposure to asbestos shall be made from breathing zone air samples collected during asbestos work activities as required by OSHA regulations. This air sampling shall be used to evaluate the effectiveness of control measures and/or engineering controls in maintaining the required asbestos exposure levels inside the segregated work area. The determination of whether such air sampling is required for a particular job shall be made by Industrial Hygiene.

5.5.1.1 Employees shall be notified of results of personal air samples collected on them during asbestos work activities.

5.5.2 General area air samples shall be collected as necessary outside the segregated work area during asbestos work activities to evaluate the effectiveness of the control measures in maintaining asbestos exposure levels outside the segregated work area to below the OSHA action level of 0.1 fibers per cubic centimeter. The determination of whether such air sampling is required for a particular job shall be made by Industrial Hygiene.

5.5.3 When total enclosure of the work area is required general area clearance air samples shall be collected. Results of asbestos clearance sampling shall be less than the EPA recommended 0.01 fibers per cubic centimeter (considering background).

5.6 Training and Qualification of Workers

NOTE: The training requirements covered in this section apply only to WMCO personnel. Subcontractor/vendor personnel shall meet the training requirements for asbestos workers and supervisory personnel as specified by the laws of the State of Ohio and shall provide documentation of such to WMCO.

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5.0 GENERAL (continued)

NOTE: For minor asbestos work, such as drilling holes in transite or floor tile, subcontractor/vendor personnel shall have attended knowledge level asbestos worker training as specified by OSHA and shall provide documentation of such training to WMCO.

5.6.1 When working with asbestos, the asbestos workers and their supervisors are required to have completed specific training classes designed to meet regulatory requirements.

5.6.1.1 All individuals working with asbestos shall have completed a knowledge level asbestos worker training program prior to performing the work. This classroom training informs the worker of the requirements for handling asbestos and of the hazards associated with asbestos exposure.

5.6.1.2 All employees assigned to remove asbestos materials by glove bags must have attended hands-on glove bag training.

5.6.1.3 All employees assigned to work with asbestos materials that are required to wear negative pressure air-purifying respirators must have been respirator fit-tested in the last six (6) months and must have proper respirator training.

5.6.1.4 Supervisors assigned to supervise small-scale, short-duration asbestos work must have training equivalent to the training requirements for the workers doing the job. If the job is a glove bag removal of pipe insulation, the supervisor must have attended hands-on glove bag training.

5.6.1.5 Any supervisor assigned to supervise an asbestos work project (except small-scale, short duration work) must have completed the required training to qualify as an OSHA "competent person". This training consists of 32 hours of classroom and hands-on training and must be approved by the State of Ohio.

5.7 Handling Spills or Incidents Involving Asbestos

5.7.1 Any spill or incident which results in the potential for release of asbestos fibers shall be reported immediately to the Facility Owner, the AEDO, and to Industrial Hygiene. The affected area shall be evacuated immediately if airborne asbestos fibers are likely to be present.

5.7.2 The requirements of FMPC-503, "FMPC Spill Incident Reporting and Cleanup", shall be complied with as appropriate.

5.0 GENERAL (continued)

5.7.3 The AEDO and Industrial Hygiene shall evaluate the damaged asbestos and determine the appropriate corrective action which must be taken. When damaged asbestos is friable and could result in exposures to personnel (e.g., is in an occupied area, in a traffic area, or in the vicinity of a building ventilation system) immediate corrective actions are required, and the following steps must be followed.

5.7.3.1 The area shall be regulated using asbestos warning tape or other barriers to control access into the area in order to prevent exposure to, and the spread of asbestos contamination. Any person requiring entry into the regulated area must comply with respirator and protective clothing requirements specified by the Industrial Hygiene Technician.

5.7.3.2 All building ventilation systems in the immediate area shall be turned off or sealed off to prevent the spread of asbestos contamination.

5.7.3.3 The Facility Owner or the AEDO shall ensure that the area of damaged asbestos is repaired and clean-up is completed in an expeditious manner.

5.7.3.4 After repairs and clean-up of the area have been completed, Industrial Hygiene shall perform a visual inspection of the area to ensure that clean-up has been completed.

NOTE: As part of this inspection, general area air samples may be collected to measure levels of airborne fibers.

5.7.3.5 After the Industrial Hygiene inspection has determined the area to be properly cleaned, the warning barriers may be removed and the area reoccupied.

6.0 PROCEDURE

None

7.0 APPLICABLE DOCUMENTS

7.1 29 CFR 1910.1001, "Asbestos Guidelines for General Industry".

7.2 29 CFR 1926.58, "Asbestos Guidelines for the Construction Industry".

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7.0 APPLICABLE DOCUMENTS (continued)

7.3 40 CFR 61, subpart M, "USEPA National Emission Standards for Hazardous Air Pollutants (NESHAPS) Asbestos Regulations".

7.4 Regulatory Compliance Guide SW:2, "Asbestos Removal Notification".

7.5 Ohio Department of Health "Asbestos Hazard Abatement Rules", Chapter 3701-34, Ohio Administrative Code, (effective July 20, 1987).

7.6 FMPC-503, "FMPC Spill Incident Reporting and Cleanup".

7.7 FMPC-516, "Control of Permits for Hazardous Work".

7.8 OS&H SOP OSH-P-41-006, "Issuing Permits for Asbestos Work".

8.0 FORMS USED

8.1 Demolition/Renovation Project Asbestos Removal Form, Form #(To be determined).

8.2 FMPC Work Permit, Form #FMPC-OS&H-2939

8.3 FMPC Asbestos Work Permit, Form # FMPC-OS&H-2940.

9.0 ATTACHMENTS

9.1 Attachment A, Asbestos Bulk Sampling Identification Tag

9.2 Attachment B, Demolition/Renovation Project Asbestos Removal Form.

9.3 Attachment C, FMPC Asbestos Work Permit.

9.4 Attachment D, Asbestos Safety Supplies Available Through Stores.

9.5 Attachment E, Asbestos Warning Sign

ATTACHMENT A

ASBESTOS BULK SAMPLING IDENTIFICATION TAG

CAUTION

DO NOT REMOVE THIS TAG

This material has been sampled to determine whether or not it contains

ASBESTOS

Before working with this material, contact Industrial Hygiene (ext. 6207) and request the results for

ASBESTOS SAMPLE NUMBER

A 1009

FMPC-OS&H-3030 (9/13/88) A

IH&S-IH-03	Date: 03-20-89	Rev: 0

ATTACHMENT B

DEMOLITION/RENOVATION PROJECT ASBESTOS REMOVAL FORM

DEMOLITION/RENOVATION PROJECT
ASBESTOS REMOVAL FORM
FEED MATERIALS PRODUCTION CENTER

Owner: U.S. Department of Energy

Operator: Westinghouse Materials Company of Ohio
7400 Willey Road
Fernald, Ohio 45030

Description of Facility (Item) Being Demolished/Renovated: Size: _____ Age: _____ Prior Use: _____

Estimated Quantity of Asbestos to Remove[1]: Linear feet[2]: _____ Square feet[3]: _____

* NOTE: Quantities > 260 L.F. of pipe or > 160 S.F. of surface area require notification of regulatory authorities prior to commencing work. Do not begin work unless written notification from Environmental Compliance is received.

Location of Facility (Item): (Include Room # or physical location with BLD/PLANT #) _____

Demolition/Renovation (circle one) Start Date: _____

Schedule: Completion Date: _____

Does this include the wrecking or taking out of any load supporting structural member of a facility with any related handling operations? (circle one) yes / no If yes, explain.

_____

Nature of Planned Demolition/ Renovation Methods to be Used: _____

Removal Procedures (Wetting, Ventilation, etc.): _____

Name and Location of Storage/ Disposal Sites: _____

Authority Requiring Removal: _____

WMCO Project Number: _____

Project Contact: _____ Ext. _____

* NOTE: Quantities > 260 L.F. and > 160 S.F. of surface area require notification of regulatory authorities prior to commencing work. Do Not Begin work unless written notification from Regulatory Compliance is received.

Completed by: _____ Name (Typed) _____ Title

Date of form Completion: _____ Ext. _____

Signature: _____ Date _____

Additional Information (if applicable):

Footnotes:

1 If quantity to be removed is less than 260 linear feet on pipes or 160 square feet on surface area, please indicate techniques of estimation.

2 Estimate for linear feet based on length of pipe insulation being removed.

3 Estimate for square feet based on surface area of asbestos being removed.

cc: Waste Management
Industrial Hygiene

Any questions, please contact S. G. Schneider at extension 8672.

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ATTACHMENT C

FMPC ASBESTOS WORK PERMIT

This permit is only valid when it is attached to the FMPC Work Permit Form which has Section A through D completed.

FMPC WORK PERMIT NO.:

Sections A & B contain descriptive information about the job and the qualifications of personnel. This information should be obtained from the supervisor-in-charge.

SECTION A - BACKGROUND AND REGULATORY INFORMATION *(To be supplied by supervisor-in-charge)*

1. Exact location:
2. Exact description of work to be conducted:
3. Amount of asbestos to be removed (in linear or/square feet):
4. Regulatory approval received to begin work: ☐ YES ☐ DNA
   (For information, supervisor should contact Environmental Compliance)
5. Supervisor(s):

SECTION B - EMPLOYEE INFORMATION

1. Employee(s) assigned to job:

NAME	BADGE NO.

	YES	NO
2. Employee(s) assigned to job have attended asbestos worker training in past twelve (12) months.		
3. Employee(s) assigned to job have attended glovebag training (applicable to glovebag removal only).		
4. Employee(s) assigned to job have been respirator fit-tested in last six(6) months.		
5. Employee(s) have been instructed by supervision of proper disposal methods.		

Section C contains items which shall be complied with on this job as indicated.

SECTION C - PRE-JOB REQUIREMENTS (SPECIFIED BY: _____ IH TECHNICIAN INITIALS _____ DATE _____ TIME)

PREPARATION OF WORK SITE *(All Asbestos Jobs)*

	REQ'D	DNA
1. Work area barricaded and/or roped off		
2. Asbestos warning signs posted at work site		
3. All small items removed from designated work area		
4. Large equipment secured and covered with plastic		
5. Floor and ledges covered with plastic		
6. Area ventilation systems locked and tagged out		
7. Nearby occupants shall be notified of asbestos work to prevent unauthorized access to work area		
8. Contact IH Technician to inspect work area preparation before asbestos removal begins		

PREPARATION OF WORK SITE *(For Total Enclosure Jobs Only)*

	REQ'D	DNA
1. Floor and wall penetrations covered and sealed		
2. Negative air enclosure set-up around work area		
3. Negative air machine operating continuously		
4. General area air samples taken before work begins		

RESPIRATORY PROTECTION REQUIRED

☐ HALF-MASK ☐ FULL-FACE ☐ AIRLINE
☐ OTHER: _____

FILTER TYPE REQUIRED:

☐ HIGH EFFICIENCY DUST (PURPLE)
☐ OTHER: _____

WORK PRACTICES

	REQ'D	DNA
1. Personal air samples required *(samples collected for entire shift when possible)*		
2. No smoking, eating or drinking permitted in work area		
3. HEPA-Filtered vacuum required for clean-up		
4. HEPA vacuum required at point of cut/drilling		
5. Glove bag removal of pipe insulation required		
6. Transite panels shall be removed whole		
7. Asbestos material shall not be allowed to drop		
8. Disposable clothing shall be periodically inspected for rips and tears		
9. Amended water shall be used to wet down material		
10. Asbestos material thoroughly wet down before removal		
11. Removed material promptly bagged *(not allowed to dry out)*		
12. Surfaces shall be coated with a sealant to encapsulate any remaining fibers		
13. Work area cleaned after completion of work each day		
14. Tools and equipment shall be cleaned of all residual dust before removal from work area.		
15. Personnel to decontaminate at each departure from work area		
16. Bag contaminated clothing and waste promptly		
17. Bagged waste material shall be placed in white drums or wooden boxes and labeled as asbestos waste *(exterior of containers shall be clean and asbestos-free)*		
18. Shower before lunch and at end of shift		

APPROVAL TO BEGIN WORK

IH TECHNICIAN SIGNATURE:	DATE:	SUPERVISOR-IN-CHARGE SIGNATURE:	BADGE NUMBER:
	TIME:		DATE:

SECTION D - FINAL INSPECTION REQUIREMENTS (SPECIFIED BY: _____ IH TECHNICIAN INITIALS _____ DATE _____ TIME)

	REQ'D	DNA
1. Visual inspection of work area for residual dust required after completion of job *(contact IH Technician)*		
2. General area air samples required after completion of job *(contact IH Technician)*		
3. Obtain IH Technician approval before removal of barriers & warning signs		

NO.	DISTRIBUTION OF COPIES
1	POST AT JOB SITE
2	IH&S *(RECORD COPY)*
3	IH&S *(FIELD COPY)*

APPROVAL TO REMOVE BARRIERS AND WARNING SIGNS

IH TECHNICIAN SIGNATURE:	DATE:
	TIME:

FMPC-OS&H-2940 (REV 3/15/88)

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ATTACHMENT D

ASBESTOS SAFETY SUPPLIES AVAILABLE THROUGH INVENTORY CONTROL & WAREHOUSING

Stores #	Item Description
S-00222	Label, "Danger-Asbestos", for placement on disposal packages containing asbestos materials.
S-00225	Sign, "Danger-Asbestos", for posting at asbestos work areas.
S-00258	Barrier tape, with "Danger-Asbestos" wording, red 3"x 1000' roll.
S-00051	Polyethylene sheeting, 6 mil thickness, 12'x100' long, for placement on the ground and to cover items in an asbestos work area. Can be used for construction of a mini-enclosure.
S-00219	Polyethylene, 30 gallon drum liners (6 mil), can be used for disposal of asbestos waste.*
S-00234	Polyethylene, 55 gallon drum liners (6 mil), can be used for disposal of asbestos waste.*
	* Asbestos waste must be disposed of in 12 mil thickness of plastic, then placed in plastic lined white drums or wood boxes for shipment to NTS. White drums and wood boxes are supplied by Waste Operations.
M-00639	Medium size, Disposable coveralls, white, KleenGuard
M-00640	Large size, Disposable coveralls, white, KleenGuard
M-00641	X-Large size, Disposable coveralls, white, KleenGuard
M-00642	XX-Large size, Disposable coveralls, white, KleenGuard
M-00653	Shoe covers, white paper booties, KleenGuard
M-00485	Size 12, T-cut white plastic shoe covers, can be worn over white paper booties.
M-00486	Size 13, T-cut white plastic shoe covers, can be worn over white paper booties.
M-00487	Size 14, T-cut white plastic shoe covers, can be worn over white paper booties.
M-00488	Size 15, T-cut white plastic shoe covers, can be worn over white paper booties.
M-00643	Disposable hood, white, KleenGuard

ATTACHMENT D (continued)

ASBESTOS SAFETY SUPPLIED AVAILABLE THROUGH INVENTORY CONTROL & WAREHOUSING (continued)

Stores #	Item Description
G-01366	Plastic tape, 2"x100' long roll
G-04459	Duct tape, 2"x60 yard long roll
M-00781	Glove bag (vertical), for removal of pipe insulation from vertical piping up to 10" diameter.
M-00785	Glove bag (horizontal), for removal of pipe insulation from horizontal piping up to 8" diameter.
G-04486	Asbestos encapsulant, BWE-3000 penetrating blue solution, 24 ounce spray bottle, for sealing damaged areas of pipe insulation until permanent repairs can be made.
G-04487	Asbestos surfactant, BWE-5000 penetrating pink solution, 24 ounce spray bottle, for use in wetting down asbestos containing materials prior to removal.
G-04488	Asbestos surfactant, Asbesto-Wet wetting solution, to be mixed 1/2 ounce per gallon of water. Place mixture in garden sprayer, use for wetting down insulation prior to removal.
GZ-16733	Paper disposal bags for Nilfisk GS-80 vacuum cleaner
GZ-19090	Paper disposal bags for Nilfisk GS-81 vacuum cleaner
GZ-16735	Paper disposal bags for Nilfisk GS-82 vacuum cleaner
GZ-16738	Cloth microfilter to cover motor unit on all models of Nilfisk vacuum cleaners.

Garden sprayers (3) for use during glove bag removal and other removal projects are available through the Pipe Shop.

Nilfisk HEPA vacuums for asbestos work are available through the Pipe Shop (extension 6436 or radio 219), Waste Operations (extension 6708 or radio 708) or through Industrial Hygiene (extension 6207 or radio 357).

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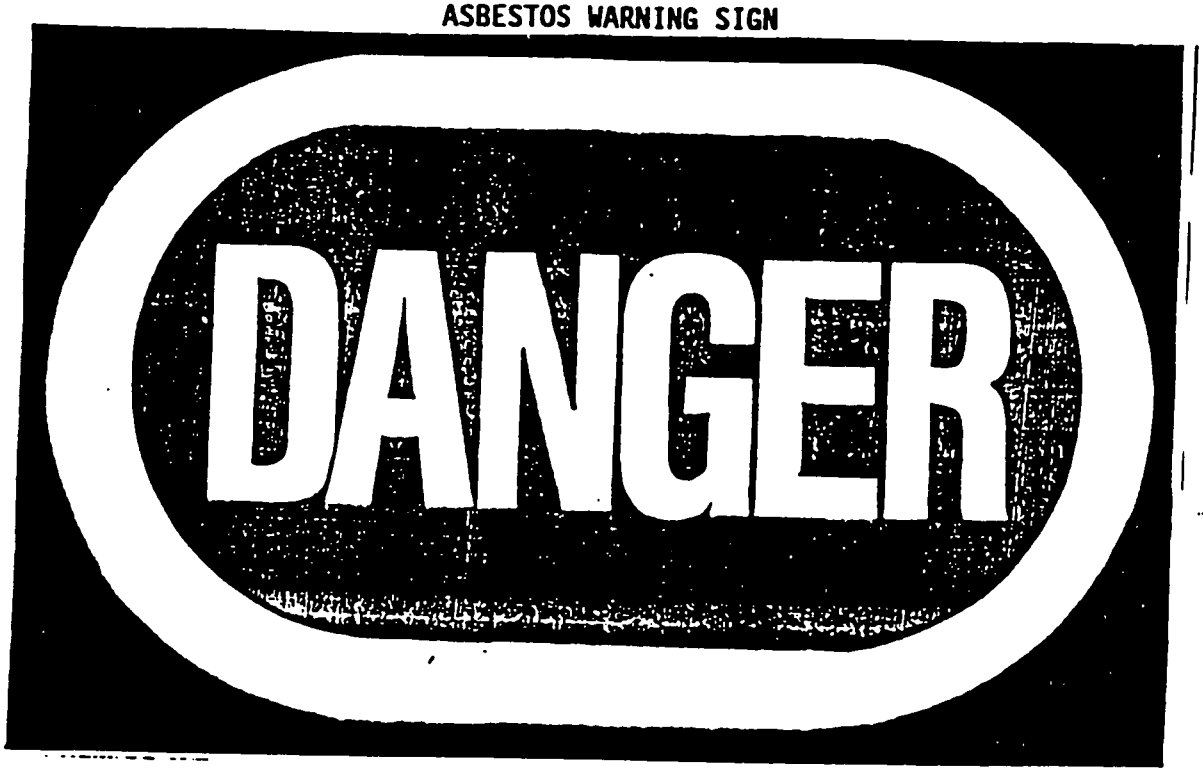
ATTACHMENT E

ASBESTOS WARNING SIGN



ASBESTOS

CANCER & LUNG DISEASE

HAZARD

AUTHORIZED PERSONNEL ONLY

RESPIRATORS & PROTECTIVE

CLOTHING

ARE REQUIRED IN THIS AREA

WARNING DO NOT BREATH ASBESTOS FIBERS

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ISSUE AND REVISION RECORD

DATE OF ISSUE	REVISION NUMBER	EFFECTED PAGES	REASON FOR CHANGE
	0		Original issue of the procedure

0153

CONTROL COPY

Control Number 2030

Revision: 3

Safety Procedures	Title: Unrestricted Release of Materials from the FEMP	SP-P-35-010
		Department: IRS&T Section: RS

Authorization: S.J. Hunsfield

Supersedes: None

Revision Date: 8/07/92

1.0 PURPOSE

To assign responsibility and establish the procedure for the unrestricted release of materials from the FEMP.

2.0 SCOPE

This procedure establishes the requirements necessary for the unrestricted release of materials from the FEMP. This procedure does not apply to the release of liquids or bulk material such as soil and concrete.

3.0 DEFINITIONS

3.1 Material - An all inclusive term used to refer to building materials, tools, office equipment, etc.

4.0 RESPONSIBILITIES

4.1 The Manager(s) of personnel required to perform work per this procedure shall ensure that affected personnel are informed or trained to the extent necessary, prior to the initiation of that work.

4.2 Radiological Safety Technicians are responsible for performing all surveys required by this procedure.

5.0 GENERAL

5.1 The predominant radionuclides of concern at the FEMP are natural and low-enriched Uranium and their short-lived decay products. Contamination with thorium and radium is also possible in some areas such as the waste storage area and the Thorium storage warehouses.

5.0 GENERAL (continued)

5.2 Acceptable surface contamination levels for known radionuclides are set forth in Attachment A, "Surface Contamination Limits".

5.3 Surveys for removable contamination need not be performed when direct survey indicates contamination levels are below the removable contamination limits.

5.4 When U-238 is the isotope of concern direct beta surveys alone are acceptable for determining unrestricted release limits.

5.5 Contamination surveys may be performed with hand held instruments or automated equipment provided that the contamination limits given in Attachment A can be detected.

5.6 Liquids and bulk materials such as concrete and rubble can not be released as unrestricted per this procedure.

5.7 The Manager of Radiological Safety shall be contacted for "special case" items such as radium dial watches, thoriated camera lenses, etc..

6.0 PROCEDURE

6.1 Verify that survey equipment is in calibration and has been successfully source checked for the day.

6.2 Perform surveys per SP-P-35-023, "Radiological Contamination Surveys" or use automated contamination monitoring instruments such as tool monitors.

6.3 Materials with inaccessible surfaces which are likely to be contaminated but are of such size, construction, or location as to make them inaccessible for survey shall be assumed to exceed the limits for unrestricted release.

6.4 When material is surveyed for unrestricted release at locations other than Controlled area exits and meets applicable criteria, material identification and control shall be maintained as follows:

6.4.1 An Article Surveyed Tag, Attachment B, containing the following information shall be attached to the article or lot of articles surveyed.

6.4.1.1 Description of article(s).

6.4.1.2 Contamination levels.

6.4.1.3 Area from which the article was moved.

6.0 PROCEDURE (continued)

6.4.1.4 Name, printed and signature, of the RST performing the survey.

6.4.1.5 Date and time of survey.

6.5 If material is found to have removable contamination the following steps shall be taken:

6.5.1 Materials shall be bagged to minimize the potential of spreading contamination.

6.5.2 A tag with the words "Caution - Radioactive Material" (Attachment C) shall be secured to the bag indicating the type and level of contamination detected.

6.5.3 Material shall be transported to an appropriate area for decontamination or storage.

6.6 Materials shall be released from the FEMP only after survey results adequately demonstrate compliance with the release limits.

6.6.1 Material not released within eight hours or one work shift of the time of the previous survey shall be resurveyed unless the following conditions are met:

6.6.1.1 The material or articles must be placed in radiologically clean containers after the survey.

6.6.1.2 The containers must be sealed using a tamper proof seal with a unique identification number. Containers may be anything that prevents contamination such as drums, sealands etc..

6.6.1.3 The seal identification number shall be recorded on the survey form.

6.6.1.4 If the container is to be released with the materials inside, its external surface must be surveyed prior to release.

6.6.2 The RST stationed at the control point through which material is released may choose to resurvey material even though it has been previously surveyed within the prescribed time.

6.6.3 The control point RST shall remove any Article Surveyed Tags prior to release

7.0 APPLICABLE DOCUMENTS

7.1 SP-P-35-023, "Radiological Contamination Surveys".

7.2 DOE Order 5400.5, "Radiation Protection of the Public and Environment".

8.0 FORMS USED

8.1 Article Surveyed Tag, FMPC-IRS&T-1545.

8.2 "Caution - Radioactive Material" Tag.

9.0 ATTACHMENTS

9.1 Attachment A, "Surface Contamination Limits".

9.2 Attachment B, "Article Surveyed Tag".

9.3 Attachment C, "Caution - Radioactive Material" Tag.

Attachment A

SURFACE CONTAMINATION LIMITS[a]

NUCLIDE	FIXED PLUS REMOVABLE		REMOVABLE[b,e]
	AVERAGE[b,c]	MAXIMUM[b,d]	
U-nat, U-235, U-238, and associated decay products, alpha emitters.	5,000 dpm /100 cm^2	15,000 dpm /100 cm^2	1,000 dpm/100 cm^2
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm^2	300 dpm/100 cm^2	20 dpm/100 cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000 dpm/100 cm^2	3,000 dpm/100 cm^2	200 dpm/100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5,000 dpm /100 cm^2	15,000 dpm /100 cm^2	1,000 dpm /100 cm^2

[a] Where surface contamination by both alpha and beta-gamma emitting nuclides exists, the limits established for alpha and beta-gamma emitting nuclides should apply independently.

[b] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[c] Measurements of average contaminant should not be averaged over more than one square meter. For objects of less surface area, the average should be derived for each object.

[d] The maximum contamination level applies to an area of not more than 100 cm^2.

[e] The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

Attachment B

ARTICLE SURVEYED TAG

Fernald Site
IRS&T

Article Surveyed

DESCRIPTION:

ALPHA	BETA-GAMMA
Fixed & Removable: dpm/frisk	Fixed & Removable: dpm/frisk
Removable: dpm/100 cm²	Removable: dpm/100 cm²

COMMENTS:

DATE:	TIME:

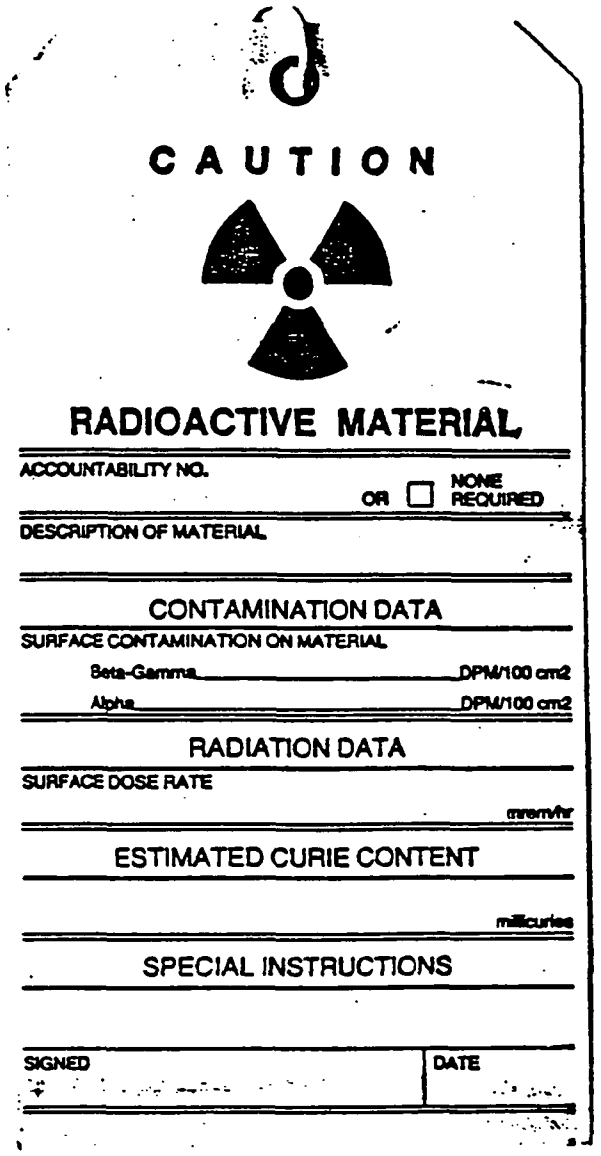
RST (PRINTED):

RST (SIGNATURE):

FS-F-1545 (REV. 3/17/92)

Attachment C

"CAUTION - RADIOACTIVE MATERIAL" TAG



EXAMPLE , "CAUTION RADIOACTIVE MATERIAL" TAG

ISSUE AND REVISION RECORD

DATE OF CHANGE	REVISION NUMBER	AFFECTED PAGES	REASON FOR REVISION
10/25/88	0	ALL	Original issue of procedure
11/17/88	1	1,2	To correct limits for unrestricted release.
03/13/90	2	All	To assign limits for unrestricted release based on radioisotopic data.
08/07/92	3	All	To allow for direct beta survey techniques to determine unrestricted release criteria when U-238 is the isotope of concern and to provide for the use of automated monitoring equipment.

CONTROL COPY

Control Number 354

Westinghouse Environmental Management Company of Ohio	Page 1 of 12	Revision: 2
Safety Procedures	Title: Radiological Contamination Surveys.	SP-P-35-023
		Department: IRS&T Section: RS
Authorization:		Supersedes: None Revision Date: 1/22/92

1.0 PURPOSE

Assign responsibilities and establish the procedure for performing radiological contamination surveys.

2.0 SCOPE

This procedure defines the method to schedule, perform, and document contamination surveys.

3.0 DEFINITIONS

3.1 Contamination - Radioactive material that is not contained or is present where it is unwanted. Classified as:

3.1.1 Removable - Loose contamination that readily transfers to a smear with moderate pressure.

3.1.2 Fixed - Contamination that does not readily transfer to a smear.

3.2 Frequency - The time frame in which a scheduled survey shall be completed.

3.2.1 Daily - Shall be completed each calendar day, with the exception of weekends and holidays.

3.2.2 Weekly - Shall be completed between 0000 hours Monday and 2400 hours the following Sunday.

3.2.3 Monthly - Shall be completed during the calendar month.

3.0 DEFINITIONS (continued)

3.2.4 Quarterly - Shall be completed four times per year, once in each calendar quarter. The calendar quarters are:

1st - January 1 to March 31.
2nd - April 1 to June 30
3rd - July 1 to September 30
4th - October 1 to December 31

3.2.5 Semi-Annual - Shall be completed two times per year; once between January 1 and June 30, and the other between July 1 and December 31 each calendar year.

3.2.6 Annual - Shall be completed during the calendar year.

3.3 Minimum Detectable Activity (MDA) - The amount of activity which must be surpassed for a sample to be considered above background.

3.3.1 The MDA for Geiger-Mueller (G-M) pancake probes is considered to be:

3.3.1.1 1000 dpm/100 cm^2 (100 cpm above background) for direct survey techniques.

3.3.1.2 400 dpm/probe area (100 cpm above background) for smear techniques.

3.3.2 The MDA for alpha-scintillator type probes is considered to be:

3.3.2.1 200 dpm/100 cm^2 (20 cpm above background) for direct survey techniques.

3.3.2.2 200 dpm/probe area (20 cpm above background) for smear techniques.

3.4 Gross Area Smears - Large area smears taken as an indication of the presence or absence of contamination.

4.0 RESPONSIBILITIES

4.1 The Manager(s) of personnel required to perform work per this procedure shall ensure that affected personnel are informed and/or trained to the extent necessary prior to initiation of that work.

4.0 RESPONSIBILITIES (continued)

4.2 RS Supervisor(s) shall be responsible for scheduling and reviewing all surveys as prescribed by this procedure.

4.3 The RSTs shall be responsible for performing and documenting surveys in accordance with the requirements of this procedure.

5.0 GENERAL

5.1 The purposes of contamination surveys are:

5.1.1 Characterize the levels of contamination in an area.

5.1.2 Provide documentation of radiological conditions.

5.1.3 Detect trends and build-up of contamination in areas.

5.1.4 Provide a base for contamination control.

5.2 Frequencies of surveys in areas not stated in this procedure shall be determined by the responsible RST Supervisor. Frequency is based on:

5.2.1 Changes in work routine.

5.2.2 Changes in the occupancy of the area.

5.2.3 Changes in personnel access to the area

5.2.4 Construction, demolition or decommissioning work that requires a Radiation Work Permit.

5.2.5 History of area contamination.

6.0 PROCEDURE

6.1 For fixed contamination surveys for depleted or natural uranium beta-gamma instruments alone may be used for activity determination.

6.2 Direct frisk with a G-M pancake probe

6.2.1 If the background exceeds 300 cpm, the item being surveyed should be moved to an area where the background is <300 cpm if possible. If this is not possible the background should be noted on the survey form.

6.0 PROCEDURE (continued)

6.2.2 The probe shall not be moved faster than 3 inches per second to detect 100 cpm above background.

6.2.3 Beta-gamma probes shall be within 1/2" of the surface that is being monitored.

6.2.4 Frisk desired area, determine average reading in cpm, subtract background cpm, and multiply result by four to determine dpm per probe area.

6.2.5 To determine dpm per 100 cm^2 using a G-M pancake probe, multiply cpm above background times ten.

6.2.6 Record the contamination level in the "Fixed Plus Removable" column of the Radiological Survey Report (Attachment A).

6.2.7 Dry smears shall be taken whenever direct frisk indicates activity exceeding applicable limits for removable activity.

6.3 Direct frisk with an alpha instrument

6.3.1 If the background exceeds 20 cpm, the item being surveyed should be moved to an area where the background is < 20 cpm if possible. If this is not possible the background should be noted on the survey form.

6.3.2 The probe shall be held stationary for 5 seconds. If an audible signal or meter movement is detected, hold the probe stationary for an additional 15 seconds.

6.3.3 Alpha probes must be within 1/8" of the surface being frisked.

6.3.4 Frisk the desired area and determine the average reading in cpm.

6.3.5 Subtract the background cpm, and multiply the result by ten to determine dpm per probe area. For alpha scintillator probes dpm per 100 cm^2 shall be considered equal to dpm per probe area.

6.3.6 Record the contamination level on the Radiological Survey Report (Attachment A).

6.3.7 Dry smears shall be taken whenever direct frisk indicates activity exceeding applicable limits for removable activity.

6.4 Smears

0165 Protective gloves should be worn when taking smears.

6.0 PROCEDURE (continued)

6.4.2 Dry Smooth Surface Smears

6.4.2.1 Using dry paper or cloth smears, trace approximately a 40 cm (16") long "s" figure or approximately a 100 cm^2 area unless otherwise required by a specific procedure.

6.4.2.2 Apply moderate pressure with at least two fingers.

6.4.2.3 Analyze smears as outlined in step 6.4.5.

6.4.2.4 Record analysis data for the area smeared in the "Removable" column of the Radiological Survey Report (Attachment A). For areas where it is not feasible to smear 100 cm^2 a comment shall be included indicating the approximate area smeared.

6.4.3 Gross-area Smears

6.4.3.1 Wipe a large area, several hundred square centimeters or greater, with a standard smear or a large absorbent cloth, such as masslin.

6.4.3.2 Frisk the smear directly with a portable alpha or beta/gamma survey instrument for indication of the presence of contamination. Removable contamination detected should be averaged over the area smeared.

6.4.3.3 Gross-area smears that indicate no detectable contamination can be used to confirm that removable contamination is less than the MDA of the instrument used to count the smear divided by the area smeared.

6.4.3.4 Gross-area smear results shall be reported in the "Removable" column of the Radiological Survey Report (Attachment A). A comment shall be included indicating that a large area smear was used and the approximate area smeared.

6.4.4 Smears on other surfaces

6.4.4.1 Conduct surveys as described in step 6.4.2, except cloth smears shall be used when the material to be smeared is too coarse to adhere to smear paper, the surface is rough and porous, or the contamination loosely adheres to the surface.

6.4.4.2 It is permitted to smear wet areas, inside spill-area boundaries, or areas where loose surface contamination is expected but is not detectable using dry smears. Wet smears shall be allowed to dry before counting.

6.0 PROCEDURE (continued)

6.4.5 Smear Sample Analysis

6.4.5.1 Smears taken to detect activities above the portable instrument MDA should be counted with field survey instruments as outlined in procedure SP-P-35-046 "Counting Smears with Field Survey Instruments".

6.4.5.2 Smears taken to detect activities less than the MDA of the portable survey instrument shall be counted on a low background counting system per SP-P-35-37,"Operation of the Tennelec Automatic Low Background Counting Systems (LB5100 Series II/III and LB5100/5500.)".

6.5 Documentation

6.5.1 Radiological contamination surveys shall be documented using the Radiological Survey Report (Attachments A and B) or equivalent.

6.5.2 Any unusual events or conditions that may influence the survey results shall be noted on the survey form (i.e., porous surface, wet smears).

6.5.3 All reported readings shall be clearly specified as dpm/probe area, dpm/100 cm^2 or dpm/area smeared for gross-area smears.

6.5.4 All instruments used in performing the survey shall be recorded on the Radiological Survey Report. Documentation of the inspection and performance test of the instruments may be recorded on the survey report in accordance with procedure SP-P-35-028 "Inspection and Performance Testing of Portable Radiation Survey Instruments."

6.5.5 Maps should be used wherever possible so that survey locations can be accurately documented. Each map page shall be included in the total pages of the survey report.

6.5.6 Readings less than MDA shall be recorded as "< MDA". The value(s) for MDA for each instrument used shall be recorded on the survey report.

6.5.7 When information is to be entered into the Flow Gemini Database, grid coordinates shall be used to identify the survey location.

6.5.8 All analysis data printouts shall be attached to the survey report.

6.5.9 All survey forms shall be signed and dated by the RST(s) performing the survey.

6.0 PROCEDURE (continued)

6.5.10 Completed Radiological Survey Reports shall be reviewed, dated and initialed in the provided box by the responsible RST supervisor.

6.5.10.1 The RST Supervisor shall inform the RST of follow-up requirements and/or surveys when required.

6.5.10.2 The RST shall notify the facility supervisor, radiological safety technician supervisor, and Radiological Assessment promptly of any areas requiring decontamination.

6.5.11 A copy of all survey reports shall be on file for one quarter in the custody of the RST Supervisor. All reports exceeding one quarter of date of the survey shall be removed from the files and prepared for long term storage in the vault.

6.5.12 Copies of the completed Radiological Survey Report shall be distributed as required per the distribution list at the bottom of the form.

6.6 Schedule

6.6.1 Unless otherwise specified by this procedure, all scheduled surveys shall be for loose contamination only. More frequent surveys or performing fixed plus removable surveys may be specified by the responsible RST supervisor or Radiological Engineer through the RST supervisor.

6.6.2 Controlled Areas

6.6.2.1 At least quarterly.

6.6.2.2 Break rooms, offices, and drinking areas within controlled areas shall be surveyed at least weekly. Fixed plus removable surveys shall be performed at least annually.

6.6.2.3 Approved eating areas within controlled areas shall be surveyed at least daily. Fixed plus removable surveys shall be performed at least annually.

6.6.3 Regulated Areas

6.6.3.1 At least monthly. Fixed plus removable surveys shall be performed at least annually.

6.6.3.2 Drinking fountains and water coolers within Radiological Areas shall be surveyed daily.

6.0 PROCEDURE (continued)

6.6.4 Contamination Areas

6.6.4.1 At least annually.

6.6.5 Radiation Areas

6.6.5.1 At least semi-annually. Fixed plus removable surveys shall be performed at least annually.

6.6.6 High Radiation Areas

6.6.6.1 At least annually. Surveys shall be performed prior to work being performed in the area.

6.6.7 Control Points (from contamination areas)

6.6.7.1 Based on usage. Control points used on a daily basis shall be surveyed daily.

6.6.8 Control Points (from regulated areas)

6.6.8.1 At least weekly.

6.6.9 Control Points (from controlled areas)

6.6.9.1 At least daily

NOTE: In cases that two classifications apply, such as an areas that is a contamination area and a radiation area, the more frequent survey requirements of the two classifications apply.

7.0 APPLICABLE DOCUMENTS

7.1 SP-P-35-046, "Counting Smears with Field Survey Instruments".

7.2 SP-P-35-028, "Inspection and Performance Testing of Portable Radiation Survey Instruments".

7.3 SP-P-35-37, "Operation of the Tennelec Automatic Low Background Counting Systems (LB5100 Series II/III and LB5100/5500.)".

8.0 FORMS USED

8.1 FS-F-1993-1, Radiological Survey Report

8.2 FS-F-1993-2, Radiological Survey Report (Continuation Sheet)

9.0 ATTACHMENTS

9.1 Attachment A, Radiological Survey Report

9.2 Attachment B, Radiological Survey Report (Continuation Sheet)

ATTACHMENT A

RADIOLOGICAL SURVEY REPORT

Fernald Site
IRS&T - RADIOLOGICAL SAFETY
RADIOLOGICAL SURVEY REPORT

DATE	LOCATION	PRINT NAME	PAGE
TIME	LEVEL	SIGNATURE	1 of ___

REASON FOR SURVEY

INSTRUMENTS

MODEL	SERIAL NUMBER	TYPE (α, β, γ)	CALIBRATION-DUE DATE	BKGD. (cpm)	EFF./CF	MDA (dpm)	IBSP PERFORMANCE TEST SAT? YES	NO

ITEM NUMBER	LOCATION AND/OR DESCRIPTION	DPM/100cm² ALPHA		DPM/100cm² BETA-GAMMA		CORRECTED DOSE RATE (MREM/HR)			
		REMOVABLE	FIXED PLUS REMOVABLE	REMOVABLE	FIXED PLUS REMOVABLE	γ CONTACT	β/γ CONTACT	γ AT ___ FT.	β/γ AT ___ FT

NO.	DISTRIBUTION OF COPIES
1	Radiological Safety Supervisor
2	Facility Supervisor
3	Operable Unit Manager

NOTIFICATION OF SURVEY RESULTS

SUPERVISOR NOTIFIED	TIME	DATE	NOTIFIED BY	REVIEWED BY	DATE

FS-F-1992-1 (REV. 11/7/91)

ATTACHMENT B

RADIOLOGICAL SURVEY REPORT (CONTINUATION SHEET)

Fernald Site
IRS&T - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT - CONTINUATION SHEET Page ____ of ____

ITEM NUMBER	LOCATION AND/OR DESCRIPTION	DPM/100cm² ALPHA		DPM/100cm² BETA-GAMMA		CORRECTED DOSE RATE (MREM/HR)			
						γ	β/γ	γ	β/γ
		REMOVABLE	FIXED PLUS REMOVABLE	REMOVABLE	FIXED PLUS REMOVABLE	CONTACT	CONTACT	AT ____ FT.	AT ____ FT.

FS-F-1993-2 (REV. 11-7-91)

ISSUE AND REVISION RECORD

DATE OF CHANGE	REVISION NUMBER	AFFECTED PAGES	REASON FOR REVISION
01/02/91	0	ALL	Original issue of procedure
06/21/91	1	ALL	To include procedure for performing Gross-area smears and to recommend field counting smears wherever applicable.
01/22/92	2	ALL	To denote that the MDA for direct frisk is different than the MDA of smear counting when using portable instrumentation, to allow direct frisks in higher background provided it is documented, to reformat schedule to be based on area classification, and to update Radiological Survey Report Form.

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

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.

R - MATERIAL REVISED, ADDED, OR DELETED.

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.

R - MATERIAL REVISED, ADDED, OR DELETED.

3.0 RESPONSIBILITIES (cont.)

3.7.5 Providing EPA waste No.

3.7.6 Providing applicable reactivity group codes.

3.7.7 Filling out Section IV of the MEF.

4.0 DEFINITIONS

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

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

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

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

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

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

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

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

4.0 **DEFINITIONS** (cont.)

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

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

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

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

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

5.0 **GENERAL**

5.1 General Instructions for Completing the Material Evaluation

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

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

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

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

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

5.1.2.3 Enter the required data on the attachment sheet.

5.1.2.4 Sign the attachment sheet.

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

5.1.2.6 Fasten the attachment sheet to the MEF.

5.1.3 Refer questions regarding the form to F&ME.

6.0 PROCEDURE

6.1 Identification of Material

MATERIAL GENERATOR

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

6.1.2 Obtain a Material Evaluation Number from F&W.

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

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

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

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

6.2 Establish Safety Requirements

IRS&T

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

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

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

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

6.3 Identification of Material

MATERIAL GENERATOR

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

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 1). F&ME may use entire lot codes to designate a waste stream.

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

6.4.3 When Section II is complete, proceed as follows:

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

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

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

6.5 Material Analysis/Disposition Determination

F&ME

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

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

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

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

6.0 PROCEDURE (cont.)

6.6 Establish Safety Requirements

IRS&T

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

6.6.2 Sign and forward the MEF to F&ME.

6.7 Additional Requirements

F&ME

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

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

6.7.2 When additional information is received, proceed as follows:

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

6.7.2.2 Ensure that Section II is complete.

6.7.2.3 Initial and date each revision of Section II.

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

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

6.8 Classified Material

ENVIRONMENTAL ENGINEERING

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

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

6.0 PROCEDURE (cont.)

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

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

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

6.8.2.1 Complete Section III per Table 3.

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

6.9 Material Identification

TSWP

NOTE: DELETED

6.9.1 Complete Section IV per Table 4.

6.9.2 Review section IV and confirm container information is correct.

6.9.3 Forward the MEF to FM&E.

6.10 Revising the Material Evaluation

MATERIAL GENERATOR, F&ME, OR ENVIRONMENTAL ENGINEERING

6.10.1 Determine a revision to the MEF is required.

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

MATERIAL GENERATOR

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

6.10.4 Obtain a revision number from Waste Management.

6.0 PROCEDURE (cont.)

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

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

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

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

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

7.0 APPLICABLE DOCUMENTS

7.1 Drivers

None

7.2 Reference Documents

None

8.0 APPLICABLE FORMS

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

R - MATERIAL REVISED, ADDED, OR DELETED.

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

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

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

R - MATERIAL REVISED, ADDED, OR DELETED.

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

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

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

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

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

R - MATERIAL REVISED, ADDED, OR DELETED.

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

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

R - MATERIAL REVISED, ADDED, OR DELETED.

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

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

R - MATERIAL REVISED, ADDED, OR DELETED.

TABLE 5
FINGERPRINT ANALYSIS PARAMETERS

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

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

Fernald Site
MATERIAL EVALUATION FORM

MEF NO.: _____

MEF REV. NO.: _____

SECTION I - MATERIAL GENERATOR

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

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

16. a. REASON FOR SUSPECTING ALL SUBSTANCES AND QUANTITY
16. b. SOURCE FOR REASON AND QUANTITY (Attach MSDS if Available)
☐ MSDS ☐ Prior Evaluation of Similar Material
☐ Personnel Interviews ☐ AEDO Log ☐ Container Label
☐ Historical Records ☐ Physical Evidence ☐ Sump Report
☐ FEMP Lot Code ☐ Process Information ☐ Spill Database
What Material: _____
SRC: _____ MTC: _____
16. c. HEALTH AND SAFETY CONCERNS/REQUIREMENTS
16. d. SIGNATURE AND DATE:
17. HAS THE "FINGERPRINT" VISUAL INSPECTION BEEN COMPLETED? ☐ YES ☐ NO
18. NUMBER OF PHASES
19. pH (IF KNOWN) (Attach Lab Results)
20. FLASH POINT (IF KNOWN) (Attach Lab Results)
21. HAS A PAINT FILTER TEST BEEN COMPLETED? ☐ YES ☐ NO
22. IS IT REACTIVE? ☐ YES ☐ NO | EXPLAIN
23. IS IT IGNITABLE? ☐ YES ☐ NO | EXPLAIN
24. OTHER INFORMATION (Example: Is the Material a Product or Waste?)
25. ADDITIONAL SOURCES OF INFORMATION
26. PRIMARY CONTACT INDIVIDUAL. | EXTENSION | DATE COMPLETED

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

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

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

R - MATERIAL REVISED, ADDED, OR DELETED.

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 17 of 18
Title: COMPLETING THE MATERIAL EVALUATION FORM		DOCUMENT NO: SSOP-0002 REVISION NO. 3
Authorization: W. H. Britton, President	Supersedes: None	Issue Date: 10-22-91

Fernald Site
MATERIAL EVALUATION FORM
(Continued)

MEF NO ____
MEF REV NO. ____

SECTION II - FACILITY AND MATERIALS EVALUATION

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

SECTION III - ENVIRONMENTAL ENGINEERING

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

SECTION IV - TOXIC AND SOLID WASTE PROGRAMS

1. PROPER D.O.T. SHIPPING NAME
2. D.O.T. HAZARD CLASS
3. REQUIRED LABELS
4. D.O.T. IDENTIFICATION NO ☐ UN ☐ NA — SUFFIX
5. EPA WASTE NO
6. APPLICABLE REACTIVITY GROUP CODES (COPY FROM SECTION III, ITEM 2)
7. FEMP SRC AND MTC (COPY FROM SECTION I ITEM 1) — SRC — MTC
8. IS A REVISION TO MEF REQUIRED? ☐ YES ☐ NO
9. DISTRIBUTION
   - MATERIAL GENERATOR — DATE
   - ENVIRONMENTAL ENGINEERING — DATE
   - ENVIRONMENTAL MONITORING — DATE
   - MC&A — DATE
   - IPS&T — DATE
   - FACILITIES AND WAREHOUSING — DATE
   - F&ME — DATE
   - CONTROLLED HOLDING AREA — DATE
10. PRIMARY CONTACT INDIVIDUAL — EXTENSION — DATE COMPLETED

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

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

R - MATERIAL REVISED, ADDED, OR DELETED.

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

RECORD OF ISSUE/REVISIONS

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

R - MATERIAL REVISED, ADDED, OR DELETED.

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 1 of 15
Title: **RECEIVING, ON-SITE MOVEMENT AND OFF-SITE SHIPMENT OF NONRADIOACTIVE HAZARDOUS MATERIAL**		DOCUMENT NO: SSOP-0003 REVISION NO. 1
Authorization: H. F. Daugherty, President	Supersedes: None	Effective Date: 04-30-92

1.0 PURPOSE

This document defines the procedure for receiving, on-site movement, and off-site shipment of nonradioactive hazardous material.

2.0 SCOPE

This procedure applies to organizations involved in the receiving, on-site movement, and off-site shipment of nonradioactive hazardous material.

3.0 DEFINITIONS

3.1 Control Person - A facility owner or designee accountable for nonradioactive hazardous material or receiving nonradioactive hazardous material at their facility.

3.2 Hazardous Material - A material or substance, including a hazardous substance, which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, or property during transport.

3.3 Material Safety Data Sheet (MSDS) - A written document provided by the manufacturer of a chemical that identifies the constituents, health hazards, exposure limits, necessary precautions and controls, and emergency first aid procedures associated with the chemical.

3.4 Nonradioactive Hazardous Material - A material or substance, including a hazardous substance, that has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, or property during transport that has a specific activity of 0.002 microcuries per gram or less per DOT Regulations (Title 49 CFR).

3.5 Off-Site - All areas of the FEMP outside the boundaries of the main perimeter security fence that are not controlled at all times by guards and security fences allowing limited access.

3.6 On-Site - All areas of the FEMP inside the main perimeter security fence that are controlled at all times by guards and security gates allowing limited access.

3.7 Packaging - The assembly of containers and any other components attached thereto, including inner receptacles, absorbent material, supporting structure, thermal insulation, and supplementary attached equipment.

3.8 Package - The package, together with its contents, as presented for transportation.

3.0 **DEFINITIONS** (cont.)

3.9 Shipment Originator - The person or WEMCO section who initiates an on-site movement or off-site shipment of nonradioactive hazardous material.

3.10 Working Quantity - An amount of material that can be carried to the jobsite (for example, the quantity needed for one work day).

4.0 **RESPONSIBILITIES**

4.1 Facilities & Warehousing - Responsible for assigning personnel and equipment for receiving, on-site movement, and off-site shipment of nonradioactive hazardous materials.

4.2 Inventory Control and Warehousing - Responsible for Warehouse Attendants who inspect and verify the accuracy of shipments of nonradioactive hazardous material, affixes applicable placards to carrier trailer if required, and verifies marking and labeling of packages as required. Also responsible for receiving, inspecting and expediting incoming shipments of nonradioactive hazardous materials against applicable receiving document.

4.3 Logistics Administration (Traffic) - Responsible for ensuring compliance with all Federal, State and local regulations, DOE Orders and Directives, and for reviewing support documentation, preparing bill of lading and other shipping documentation as required, providing guidance on the requirements for packaging, marking, labeling, and shipping of nonradioactive hazardous materials including coordinating the scheduling of off-site shipment(s) with carriers.

4.4 Materials Control and Accountability - Responsible for reviewing all documentation associated with off-site shipments including quality assurance documentation.

4.5 Radiological Safety - Responsible for conducting radiological surveys of materials, packages, and carrier vehicles that will be used for off-site shipments, documenting results of surveys, and providing copies of the results as required.

4.6 Shipment Originator - Responsible for accumulating and coordinating the packaging of nonradioactive hazardous materials and preparing documentation for materials for off-site shipment.

4.0 RESPONSIBILITIES (cont.)

4.7 Site-Wide Quality Assurance - Responsible for verifying the packaging processes for nonradioactive hazardous materials and other related materials and for conducting periodic inspections of packaging operations. Coordinate all required Quality Assurance review activities including conducting annual audits of the packaging and transportation of hazardous material shipments.

5.0 GENERAL

5.1 Nonradioactive hazardous materials received on-site in DOT specification packaging shall be transported on-site in the same packaging.

5.2 Empty DOT specification packaging(s) shall be retained at the on-site delivery point for use in future on-site movements of the same nonradioactive hazardous material.

5.3 WEMCO shall have a Material Safety Data Sheet (MSDS) for each nonradioactive hazardous material which is used. Copies of the required MSDS for each material shall be maintained in the workplace and be readily accessible during each work shift to employees when they are in their work areas.

5.4 All non-routine shipments and/or receipts not covered by specific procedure shall have formal plans developed that describe the process, requirements and organizational interface before work proceeds.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

None

7.0 PROCEDURE

7.1 Receiving Material

SITE SERVICES, INVENTORY CONTROL & WAREHOUSING

7.1.1 Receive nonradioactive hazardous material per applicable department procedures.

7.2 On-Site Movement of Nonradioactive Hazardous Material

SHIPMENT ORIGINATOR

7.2.1 Identify and quantify material by completing Form FMPC-OPR-3292 (See Figure 1).

7.0 PROCEDURE (cont.)

SHIPMENT ORIGINATOR

7.2.2 Contact Site Services or Inventory Control & Warehousing to package material.

7.2.3 Notify Radiological Safety when package is complete and ready for a radiological survey.

NOTE: A radiological survey does not have to be conducted if the material is being moved from a lower radiological control area to a higher radiological control area.

7.2.4 Complete a Nonradioactive Hazardous Material Shipment Approval Tag (FMPC-OPR-2947) (See Figure 2) and attach to the package.

7.2.5 Attach to the package the vendor supplied MSDS for the Nonradioactive Hazardous Material.

7.2.6 Attach a copy of the Radiological Survey Report (FS-F-1993-1) (See Figure 3) to Logistics Administration's copy of the WMCO Hazardous Material Transfer On-Site Shipment (FMPC-OPR-3292) (See Figure 1).

7.2.7 Notify Facilities & Warehousing for movement of the material.

7.2.8 Provide Facilities & Warehousing with Form FMPC-OPR-3292 (See Figure 1).

7.2.9 If the material is not immediately moved, temporarily store material per the requirements of Table 1.

FACILITIES & WAREHOUSING

7.2.10 Move packaged material per applicable department procedure.

7.3 Receipt of Requested Nonradioactive Hazardous Material from On-site Location

7.3.1 Check that the material received corresponds to the material identified by form FMPC-OPR-3292 (See Figure 1).

7.3.2 If discrepancies are found notify supervisor.

7.3.3 Ensure that the attached MSDS matches material as identified on form FMPC-OPR-3292 (See Figure 1).

7.0 **PROCEDURE** (cont.)

7.3.4 Sign the WMCO Hazardous Material Transfer On-Site Shipment (FMPC-OPR-3292) (See Figure 1) and distribute copies to the sections indicated on the lower left portion of the form.

7.4 Off-Site Shipment

SHIPMENT ORIGINATOR

7.4.1 Provide Logistics Administration with minimum 24 hour advance notice of off-site shipment of material.

7.4.1.1 Identify and quantify material by completing form FMPC-CONT-3388 (See Figure 4).

7.4.1.2 Provide Logistics Administration with the information required to determine applicable shipping requirements.

7.4.1.3 Contact Facilities & Warehousing or Inventory Control & Warehousing to package material for shipment.

7.4.1.4 Notify Radiological Safety when the packaging is complete and ready for a radiological survey.

7.4.1.5 Obtain appropriate signatures from Radiological Safety on form FMPC-CONT-3388, indicating that packaged material is not radioactive.

7.4.1.6 Complete Nonradioactive Hazardous Materials Shipment Approval tag (FMPC-OPR-2947) (See Figure 2) and attach to the package.

7.4.1.7 Attach a vendor supplied MSDS to the package for nonradioactive hazardous material.

7.4.1.8 Submit the completed Shipping Order for Hazardous Materials/ Hazardous Waste-Non-Nuclear (FMPC-CONT-3388) (See Figure 4) to Materials Control and Accountability for approval.

7.4.1.9 Attach a copy of the Radiological Survey Report (FS-F-1993-1) (See Figure 3) to the approved Shipping Order for Hazardous Materials/Hazardous Waste-Non-Nuclear (FMPC-CONT-3388) (See Figure 4) and forward the documentation to Site Services Logistics Administration so that a bill of lading may be prepared for off-site shipment.

7.0 **PROCEDURE** (cont.)

SHIPMENT ORIGINATOR

7.4.1.10 Notify Facilities & Warehousing when the material is ready to be moved to the predetermined loading dock.

7.4.1.11 Provide Facilities & Warehousing with Form FMPC-CONT-3388 (See Figure 4).

7.4.1.12 If the material is not immediately moved, temporarily store per requirements of Table 1.

INVENTORY CONTROL & WAREHOUSING

7.4.2 Conduct inventory control activities of nonradioactive hazardous materials packages per applicable department procedure.

LOGISTICS ADMINISTRATION

7.4.3 Notify carrier to dispatch driver to FEMP for shipment pick-up when the load is ready for shipment.

7.4.4 Verify that the vehicle inspections are conducted and documented on the OFFSITE LOADING - TIE DOWN INSPECTION - VEHICLE INSPECTION (FMPC-SAML-2495) (See Figure 5).

7.4.5 Request Radiological Safety to conduct a radiological survey of the carrier vehicle trailer.

7.4.6 Verify that the Radiological survey results comply with applicable regulations and are documented on the Vehicle Radiation Monitoring Report (FS-IRS&T-1596-1).

7.4.7 Upon receipt of the Shipping Order for Hazardous Materials/Hazardous Waste-Non-Nuclear, prepare a bill of lading as applicable.

NOTE: A bill of lading is required for common carrier transportation.

7.4.8 Request Radiological Safety to conduct a radiological survey of carrier vehicle tractor prior to site departure as required per applicable departmental procedure(s).

7.4.9 Sign bill of lading and Shipping Order.

7.0 PROCEDURE (cont.)

MATERIALS CONTROL AND ACCOUNTABILITY

7.4.10 After receipt of all associated shipment documentation, review and document.

7.4.11 Sign shipping order to authorize release of off-site shipment of non-radioactive hazardous materials.

RADIOLOGICAL SAFETY

7.4.12 Perform a radiological survey of transport vehicle tractor as required by applicable department procedure(s).

7.4.13 Complete Vehicle Radiation Monitoring Report (FS-IRS&T-1596-1) and forward to Logistics Administration.

SHIPMENT ORIGINATOR

7.4.14 Sign the Shipping Order For Hazardous Materials/Hazardous Waste-Non-Nuclear (FMPC-CONT-3388) (See Figure 3) authorizing information provided on the form is correct.

LOGISTICS ADMINISTRATION

7.4.15 Provide the Carrier/Driver with the written driver instruction packet, containing specific instructions regarding controls for hazardous material shipments if required.

7.4.16 Verify that applicable placards have been placed on the front and back, and opposite sides of carrier vehicle if applicable.

7.4.17 Complete and return Shipping Order for Hazardous Materials/ Hazardous Waste-Non-Nuclear (FMPC-CONT-3388) (See Figure 1) to Materials Control and Accountability the day of shipment departure.

8.0 APPLICABLE DOCUMENTS

8.1 Drivers

8.1.1 DOE 1540.1, "Materials Transportation and Traffic Management"

8.1.2 OR 1540.1B, "Materials Transportation and Traffic Management"

8.1.3 DOE 1540.2, "Hazardous Material Packaging for Transport - Administrative Procedures"

8.0 **APPLICABLE DOCUMENTS** (cont.)

8.1.4 DOE 5480.3, "Safety Requirements for the Packaging and Transportation of Hazardous Materials"

8.1.5 DOE 5700.6B, "Quality Assurance"

8.1.6 40 CFR Parts 116 -117, "Designation of Hazardous Substances and Their Reportable Quantities"

8.1.7 49 CFR Parts 100-199, "Hazardous Material Regulations"

8.1.8 49 CFR Parts 383-397, "Federal Motor Carrier Safety Regulations"

8.2 Reference Documents

None

9.0 **APPLICABLE FORMS**

9.1 Hazardous Material Transfer On-site Shipment, FMPC-OPR-3292 (Figure 1)

9.2 Nonradioactive Hazardous Materials Shipment Approval Tag, FMPC-OPR-2947 (Figure 2)

9.3 Radiological Survey Report, FS-F-1993-1 (Figure 3)

9.4 Shipping Order for Hazardous Material/Hazardous Waste-Non-Nuclear (Figure 4)

9.5 Off-Site Loading Tie-Down Inspection, Vehicle, Form FMPC-SAML-2495 (Figure 5)

10.0 **FIGURES**

10.1 Figure 1, "WMCO Hazardous Material Transfer On-Site Shipment"

10.2 Figure 2, "Nonradioactive Hazardous Materials Shipment Approval"

10.3 Figure 3, "Radiological Survey Report"

10.4 Figure 4, "Shipping Order for Hazardous/Materials Waste-Non-Nuclear"

10.5 Figure 5, "Off-Site Loading Tie-Down Inspection, Vehicle"

TABLE 1
HAZARDOUS MATERIALS SEGREGATION/SEPARATION CHART

HAZARDOUS MATERIALS STORAGE REQUIREMENTS

(The Letter "X" Indicates that these Materials MUST NOT be Loaded or Stored Together"

NUMBER	HAZARDOUS MATERIAL	1	2	3	4	5	COMMENTS
1	Flammable Liquids or Flammable Gases; Flammable Liquid or Flammable Gas Label					X	
2	Flammable Solids; Flammable Solid Label; Oxidizer; Oxidizer Label; Organic Peroxide; Organic Peroxide Label			X		X	
*3	Corrosive Liquids; Corrosive Label		X			X	*3-Corrosive liquids must not be loaded above or adjacent to flammable solids, or oxidizing materials, except that shippers loading truckload shipments of corrosive liquids and flammable solids or oxidizing materials packages and who have obtained prior approval from the Department may load such materials together when it is known that the mixture of contents would not cause a dangerous evolution of heat or gas.
4	Nonflammable Gases; N.F.G. Label						
5	Poisonous Gases or Liquids in Tank Car Tanks, Cylinders; Poison Gas Labels	X	X	X			

WMCO
HAZARDOUS MATERIAL TRANSFER
ON-SITE SHIPMENT

In the event more information is needed to complete this form, call Traffic on extension 6462

DATE	ORIGINAL P.O. NUMBER *From Receiver attached to Shipment*	VEHICLE NUMBER *To be completed by FSS driver*
MOVE FROM	CONSIGNED TO	

TO BE COMPLETED BY SHIPPER

LINE NO. *(In P.O.)*	QUANTITY	MATERIAL DESCRIPTION *From Present list attached to Shipment*

This is to certify that the above named materials are classified, described, packaged, marked and labeled, and are in proper condition for transportation according to applicable regulations of the Department of Transportation.

PER	DATE	TIME	PER
SHIPPER			
PER	DATE	TIME	
RECEIVER			FACILITIES SERVICES DRIVER

Upon Completion of the move, one copy must be sent to Traffic, MS 49.

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FMPC-EC-3292 (1/3/91)

WMCO HAZARDOUS MATERIAL TRANSFER ON-SITE SHIPMENT
FORM FMPC-OPR-3292
Figure 1

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 11 of 15
Title: RECEIVING, ON-SITE MOVEMENT AND OFF-SITE SHIPMENT OF NONRADIOACTIVE HAZARDOUS MATERIAL		DOCUMENT NO: SSOP-0003 REVISION NO. 1
Authorization: H. F. Daugherty, President	Supersedes: None	Effective Date: 04-30-92

Nonradioactive Hazardous Materials Shipment Approval

This shipment has been inspected and approved for shipment.

Name: _____

Date: _____

FMPC-OPR-2947 (REV. 5/16/90)

NONRADIOACTIVE HAZARDOUS MATERIALS SHIPMENT APPROVAL
FORM FMPC-OPR-2947
Figure 2

FMPC

ENVIRONMENT, SAFETY & HEALTH - ENVIRONMENTAL & RADIOLOGICAL MONITORING

RADIOLOGICAL SURVEY REPORT - PLANT 5

Date:
Time:

LOCATION: Plant 5 Production Offices

ERMT:

ROUTE TO: D. E. Ames, A. B. Colquhoun

REASON FOR SURVEY: ☑ ROUTINE ☑ SPECIAL REQUEST _____ SOP# _____

COMMENTS: Weekly Contamination Survey of Plant 5 Production Offices

INSTRUMENTS

MODEL	SERIAL NUMBER	BKRD.	EFF.

ANALYZE FOR: ☑ ALPHA ☑ BETA-GAMMA ☐ TOTAL U ☐ PARTICULATE

TYPE OF SURVEY: ☐ CONTAMINATION ☐ STACK FILTER ☐ RADIATION ☐ OTHER _____

SAMPLE NUMBER	ITEM NUMBER	DESCRIPTION	DOSE RATE		DPM ALPHA		DPM BETA-GAMMA	
			CONTACT	3 FT	100 CM²	PROBE	100 CM²	PROBE
	1	Step Off Pad						
	2	Cabinet Top						
	3	Floor						
	4	Desk Top						
	5	Top of Light Fixture						
	6	Cabinet Top						
	7	Floor						
	8	Floor						
	9	Desk Top						
	10	Floor						
	11	Floor						
	12	Window Sill						
	13	Ledge						
	14	Step Off Pad						
	15	Floor						
	16	Desk Top						

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2	Health Physics
3	Supervisor

RADIOLOGICAL SURVEY REPORT
FORM FS-F-1993-1
Figure 3

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 13 of 15
Title: RECEIVING, ON-SITE MOVEMENT AND OFF-SITE SHIPMENT OF NONRADIOACTIVE HAZARDOUS MATERIAL		DOCUMENT NO: SSOP-0003 REVISION NO. 1
Authorization: H. F. Daugherty, President	Supersedes: None	Effective Date: 04-30-92

Westinghouse Environmental Management Company of Ohio

SHIPPING ORDER FOR HAZARDOUS MATERIALS/HAZARDOUS WASTE—Non-Nuclear

Date Prepared _____

SHIP TO	ROUTING				SHIPPING ORDER NO
STREET	PREPAID	CAR OR TRAILER NO	SEAL NO.	SHIPPED FROM PLANT, WAREHOUSE	ORIGINATOR NO
CITY / STATE	COLLECT	BILL OF LADING NO WASTE MANIFEST NO	HAZARDOUS MATERIAL SHIPPING DOCUMENT NO.		DATE SHIPPED
MATERIAL DESCRIPTION			ORIGINATOR'S SIGNATURE		TIME SHIPPED

APPROVALS: SHIPMENT AUTHORIZATION. | ECIQA. | IRSET. | MC&A.

ORIGINATOR'S DATA								ANALYSES ATTACHED	ADDITIONAL INFORMATION
FROM MBA	COST CODE	UN/NA NUMBER	P.O. NO	LOT NUMBER	QUANTITY	WEIGHT (LBS) GROSS	TARE	NET		

DISTRIBUTION OF COPIES	
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2 Traffic	7 Environmental Compliance
3 Quality Engineering	8 Radiological Safety
4 Environmental Engineering	9 Facilities and Warehousing
5 Originator of Shipping Order	

FS-CONT 3388 (REV 8 3 91)

I, _____ certify that this shipment was made on the above date after complying with all regulatory requirements

SHIPPING ORDER FOR HAZARDOUS/MATERIALS WASTE-NON-NUCLEAR
FORM FMPC-CONT-3388
Figure 4

FMPC
OPERATIONS DEPARTMENT - TRANSPORTATION SECTION

OFFSITE LOADING — TIE DOWN INSPECTION — VEHICLE INSPECTION

Date: _____

COMMODITY:	CARRIER:	TRAILER NO:	SEAL NO FA-WMCO

BALE/BOX/DRUM/SEA LAND CONTAINER NUMBERS:

	DISCREPANCIES DETECTED	CORRECTED		SHIPMENT REJECTED	
		YES	NO	YES	NO
LSA					
LSA-RQ					
LC					
LC-RQ					
TOTAL					

Cor[illegible] SIGNATURE - CHECKER

TIE-DOWN INSPECTION AND CHECK-OFF SHEET

INSPECTION ITEM	YES	NO
Wood shoring installed to prevent longitudinal or lateral movement		
Steel strapping around the cargo securing as a stable shipment		
When weight dictates, containers divided into two units, one front and one rear of trailer not exceed ng approximately 20,000 pounds each		
[illegible] steel strapping utilized (5450 lbs. minimum tensile strength)		
[illegible] each anchor plates or [illegible] bolts fastened to underframe ([illegible] each side of unit) placed and secured for [illegible] transverse bands over unit)		
Four each brakeman plates or [illegible] bolts fastened to underframe (two for each hand) placed under each unit and secured for two longitudinal bands securing the boxes sides into one tight unit, anchored to the floor of the trailer		
Two Signode seals No. 107 crimped whenever two bands are used on an end over end lap joint		
Anchor and brakeman plates secured with eight each 2" nails		
Sea Land Containers . . . . . 4 each nylon straps ([illegible])		
. . . . . Chains ([illegible])		
. . . . . 2 X 4s ([illegible])		

VEHICLE INSPECTION REPORT

CONDITION	PASS	FAIL	CONDITION	PASS	FAIL	CONDITION	YES	NO
Condition of Floor			Condition of Sides			Detected Sabotage Devices		
Condition of Interior			Condition of Exterior			Detected Evidence of Sabotage		
Condition of Roof			Condition of Rear Doors					
Overall appearance			General Comments					

Accepted. _____ Rejected _____

Checked By: _____ SIGNATURE - TRANSPORTATION SUPERVISOR

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1	Transportation Section RECORD COPY

FMPC-OPR-2495 (REV 7/19/90)

OFF-SITE LOADING TIE-DOWN INSPECTION, VEHICLE
FORM FMPC-SAML-2495
Figure 5

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 15 of 15
Title: **RECEIVING, ON-SITE MOVEMENT AND OFF-SITE SHIPMENT OF NONRADIOACTIVE HAZARDOUS MATERIAL**		DOCUMENT NO: SSOP-0003 REVISION NO. 1
Authorization: H. F. Daugherty, President	Supersedes: None	Effective Date: 04-30-92

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
01-30-91	0	SSOP required for receiving and transporting nonradioactive hazardous material per Request No. P91-025, initiated by C. S. Stapleton.
04-30-92	1	Revision required to implement DOE Order 1540.1, Rev. 4 per Request No. S92-097, initiated by C. S. Stapleton.

RADIOLOGICALLY NON-CONTAMINATED ASBESTOS CONTAINING MATERIAL WASTE (ACM) DISPOSITION

SSOP-0081

Effective Date: 09-03-92

AUTHORIZED BY: _____ 8/25/92
H. F. Daugherty, President Date

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

Westinghouse Environmental Management Company of Ohio
P. O. Box 398704
Cincinnati, Ohio 45239-8704

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT SYSTEM		SITE STANDARD OPERATING PROCEDURE Page 1 of 15
Title: **RADIOLOGICALLY NON-CONTAMINATED ASBESTOS CONTAINING MATERIAL WASTE (ACM) DISPOSITION**		DOCUMENT NO: SSOP-0081 REVISION NO. 0
Authorization: H. F. Daugherty, President	Supersedes: None	Effective Date: 09-03-92

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Authorization: H. F. Daugherty, President	Supersedes: None	Effective Date: 09-03-92

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
09-03-92	0	Procedure required to establish new ACM Waste Disposition procedure. Per Request No. S92-178, initiated by L.W. Johns.

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT SYSTEM		SITE STANDARD OPERATING PROCEDURE Page 3 of 15
Title: **RADIOLOGICALLY NON-CONTAMINATED ASBESTOS CONTAINING MATERIAL WASTE (ACM) DISPOSITION**		DOCUMENT NO: SSOP-0081 REVISION NO. 0
Authorization: H. F. Daugherty, President	Supersedes: None	Effective Date: 09-03-92

1.0 PURPOSE

To provide a protocol to permit disposition of Asbestos Containing Material (ACM) waste produced in a radiologically non-controlled area as non-radioactive.

2.0 SCOPE

This procedure is created to address the radiological concerns for transfer of radiologically non-contaminated ACM waste created in radiologically non-controlled areas at the Fernald Environmental Management Project (FEMP) to an approved final burial site. This would help minimize the burden of assumed radiologically contaminated ACM waste on site storage and reduce final disposition costs. This procedure does not supersede the material evaluation form procedure for characterizing waste.

3.0 DEFINITIONS

ACM - Asbestos Containing Material

Competent Person - Supervisor of an Asbestos Project, as defined by (7.0 OSHA) 29CFR1926.58.

Inaccessible Areas - Areas accessible to radiological contamination but where the material geometry does not permit a radiological contamination determination to be made.

Julian Calendar Date - A date format using four numbers the first number is the last digit of the year ie. for the year 1992 all the julian calendar dates for that year will begin with the number "2". The number for the year is followed by the number for that day during the year. For January 15, 1992 the julian calendar date is 2015.

Lagging - The cloth wrapping around insulating material used for protection, usually painted to make it nonporous.

Radiologically Controlled Area (RCA) - Any area to which access is controlled in order to protect individuals from exposure to radiation and radioactive materials.

Reusable Container - Locking waste receptacles that will be accessed more than once before container is full, i.e., ISO (sea/land), railroad car and dumpsters.

Serialized Seal - A uniquely numbered connecting device which once installed cannot be opened without breaking the device.

3.0 **DEFINITIONS** (cont.)

Single Use Containers - Locking waste receptacles that typically are filled on initial entry and are not expected to be opened again except perhaps on a final inspection prior to disposal, i.e., drums or metal boxes.

Unrestricted Release - A release of property (e.g., waste) based on a formal, documented decision reflecting DOE standards and associated implementing procedures that the property may be utilized, treated or disposed of by any party without concern for radioactive content.

4.0 **RESPONSIBILITIES**

Asbestos Program Coordinator

- Ensures that the requirements of this procedure are followed.
- Assigns responsibilities for maintaining the required lists/logs, such as:
  - Radiologically Non-Contaminated ACM Waste Log.
  - ACM Reusable Container Log.
  - ACM Reusable Container Location List.

Radiological Safety

- Evaluates lagging integrity with an asbestos hazard evaluation specialist, certified in the state of Ohio.
- Responsible for radiological surveys of ACMs.
- Ensures that the Competent Person understands the areas which are below the limits specified in Section 7.1 and any specific controls which will be required to insure survey integrity.
- Ensures that the ACM waste removed in accordance with this procedure meets the requirements of Section 7.1 prior to being loaded into its respective container.
- Provides the seals/locks to control access to containers.
- Has sole responsibility for keys to reusable containers.

Quality Assurance

- Provides audits and surveillance as necessary to ensure that the guidelines listed in this procedure are followed.

4.0 **RESPONSIBILITIES** (cont.)

Competent Person

- Ensures that ACM that is removed and placed in containers in accordance with this procedure has been verified by a radiological safety technician to meet the requirements of Section 7.1.
- Signs the appropriate log.
- Forwards all surveys for ACM waste generated in accordance with this procedure to the Asbestos Program Coordinator or his designee.

5.0 **GENERAL**

ACM waste created in radiologically non-contaminated areas on site has been considered radiologically contaminated waste. This policy was initiated because radiologically contaminated material has been found during past renovations in radiologically non-controlled areas.

The primary sources of ACMs in radiologically non-contaminated areas are found in air duct and pipe insulation, floor tile and floor tile mastic. Because the non-permeable lagging of pipe and duct insulation form a barrier preventing contamination of the internal ACM, external contamination surveys are sufficient to determine if this material is radiologically contaminated. This material shall be radiologically released in accordance with section 7.1 of this procedure. Floor tile and mastic material may be surveyed after removal in accordance with procedures for the radiological release of general construction waste.

This procedure is established to clarify site policy for the radiological unrestricted release of ACM and does not supersede the site "Radiological Controls Requirements Manual", RM-0009 or the "Unrestricted Release of Materials from FMPC", SP-P-35-010.

This procedure requires that the lagging around the ACM is impermeable and that there is no radioactive contamination beneath the lagging. This procedure is not to be used when ACM is suspected to have internal radiological contamination which cannot be verified by external radiological surveys. Some indications of internal ACM contamination exposure that should be evaluated by the radiological technician are:

- Areas where repairs were made and loose/fixed contamination was found in surrounding areas.
- Areas where lagging is porous or has signs of internal water damage.

5.0 **GENERAL** (cont.)

- Insulation around radiologically contaminated system piping.
- Damaged lagging ends.
- Where process knowledge does not make it prudent to permit the ACM to meet the requirements in the "Unrestricted Release of Materials from FMPC", SP-P-35-010.

Floor tile and mastic ACM waste is characteristically non-porous material with no inaccessible areas after removal. These materials shall be radiologically characterized just prior to placing them in a container. If survey results on the floor tile exceed limits specified in "Unrestricted Release of Material from FMPC", SP-P-35-010 the floor tile shall be considered radiologically contaminated material.

6.0 **PREREQUISITES**

6.1 TOOLS AND SPECIFIC EQUIPMENT

Drums, containers, dumpsters, ISO (sea/land) containers as required.

Keys/seals for drums

Appropriate lists and documentation.

7.0 **PROCEDURE**

7.1 GENERAL

RADIOLOGICAL TECHNICIAN

1. Survey ACM to be removed and record in accordance with the "Unrestricted Release of Materials from FEMP", SP-P-35-010.

2. Verify that ACM meets the standards of Section 7.1.

   NOTE: If the time between radiological survey and ACM removal is greater than 3 days, and it has been determined that not all the ACM in the area meets the requirements of section 7.1 step 3 (NOTE) the radiologically non-contaminated ACM will be marked in place using the Article Surveyed Tags (this tag may be found in SP-P-35-010).

7.1 GENERAL (cont.)

RADIOLOGICAL TECHNICIAN

3. Verify the integrity of the outer lagging.

   NOTE: If there is no indication that the internal insulation has been exposed to radioactive contamination (Section 5.0) and outer lagging radioactive contamination levels are less than those limits found in SP-P-35-010, the lagging and internal ACM will be considered radiologically non-contaminated.

COMPETENT PERSON

4. Locate ACM containers in a radiologically non-controlled area.

5. Sign the appropriate ACM Log (Figure 1 and 2) to verify that all material in the container was permitted to be radiologically released and that all line items are correct. This log shall be maintained by the Asbestos Program Coordinator or designated person.

6. Store filled radiologically non-contaminated ACM containers in a radiologically non-controlled area.

7. Provide a copy of the radiological contamination survey to the Asbestos Program Coordinator or designee after receiving survey from Radiological Technician.

RADIOLOGICAL TECHNICIAN

8. Install a serialized seal to prevent unauthorized opening of the container.

9. Provide the Competent Person with a written copy of the ACM radiological contamination survey.

10. Control access to reusable/single use containers.

ASBESTOS PROGRAM COORDINATOR

11. List and file a copy of the ACM radiological contamination survey received from the Competent Person.

12. Number the radiological contamination surveys, used to characterize ACM being stored in single use containers in sequential order.

7.1 GENERAL (cont.)

ASBESTOS PROGRAM COORDINATOR

13. Number the radiological contamination surveys used to characterize ACM being stored in reusable containers with the load number (#) followed by the sequential number (#) of the survey for that load.

    NOTE: Refer to 7.3 step 7 for instructions on how to determine the LOAD NUMBER (#).

7.2 SINGLE USE CONTAINERS

COMPETENT PERSON

1. Number single use containers in sequential order, starting with ASB-1.

2. Separate ACM which meets the standards of Section 7.1 from radiologically controlled waste and place in a lockable container.

3. Have a radiological technician present when container is being filled, and if the container is to be reopened for any reason.

4. When the container is full, have a radiological technician install a serialized seal to prevent unauthorized opening of the container.

5. Log seal serial numbers in the Radiologically Non-contaminated ACM Waste Log. (See figure 1).

   NOTE: Each line entry will also include: the DATE/TIME the container is filled, The identification number (#) of the survey used to determine if the ACM waste was is not radiologically contaminated, and the Radiological Technician responsible for installing the seal. It will be signed by the Competent Person, whose signature verifies that all material in the container was permitted to be radiologically released and that all line items are correct. This log shall be maintained by the Asbestos Program Coordinator or designated person.

   NOTE: If the container is opened in a radiologically non-controlled area the radiological technician is not required to perform a survey but is required to ensure that no radiologically contaminated materials have been introduced into the container.

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT SYSTEM		SITE STANDARD OPERATING PROCEDURE Page 9 of 15
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Authorization: H. F. Daugherty, President	Supersedes: None	Effective Date: 09-03-92

RADIOLOGICALLY NON-CONTAMINATED ACM WASTE LOG

Date	Time	seal #	container #	Survey #	Name of Radiological Technician	Competent Person Signiture	Transferred to	Transferred from

Figure 1 - Radiologically Non-Contaminated ACM Waste Log

7.2 SINGLE USE CONTAINERS (cont.)

RADIOLOGICAL TECHNICIAN

6. Supervise the initial filling to ensure that no radiologically contaminated materials have been introduced into the container. Install a serialized seal to prevent unauthorized opening of the container.

7. Supervise any operations where containers are reopened by breaking old seal, verifying radiological controls while the drum is open, and installing a new serialized seal to prevent unauthorized opening of the container.

COMPETENT PERSON

8. Have a radiological technician present if container has to be reopened for any reason and make a new line entry in the radiologically non-contaminated ACM Waste Log. Enter the new seal number in the system administrator log "Transferred to" block, and enter a new line entry.

   NOTE: The new line entry shall contain the new seal number, the old seal number in the "Transferred from" block, the name of the radiological technician present when container was opened, and the signature of the person opening the container.

7.3 REUSABLE CONTAINERS

ASBESTOS PROGRAM COORDINATOR

1. Maintain a list of all reusable ACM containers on site in the ACM Reusable Container Location List (See figure 3). Sequentially number reusable ACM containers by general geographic location.

   NOTE: When an empty container is moved to a new general location, the next open consecutive number will be used to identify the container at this location.

2. Keep a separate "ACM Reusable Container Log" (See Figure 2) for each container load.

7.3 REUSABLE CONTAINERS (cont.)

RADIOLOGICAL TECHNICIAN

3. Ensure that reusable containers are locked at all times, except when entries are supervised by Radiological Safety.

   NOTE: Keys for all reusable containers will be kept by Radiological Safety.

COMPETENT PERSON

4. Label container, as specified by the Asbestos Program Coordinator, with "For Radiologically Non-contaminated Asbestos Containing Material Only - for entry contact Name/Phone" (list name/phone of designated person in charge of container). This identifies Radiologically Non-contaminated ACM only and the person responsible for information on the container.

ASBESTOS PROGRAM COORDINATOR (or designee)

5. Log the person responsible for each container in the ACM Reusable Container Location List.

6. Use a separate ACM Reusable Container Log for each container.

COMPETENT PERSON

7. List the Container number (1), and the Julian calendar date (2) that indicates when the container was last empty, at the top of the ACM Reusable Container Log (See figure 2) to individually identify each load. This new number (3) becomes the load number. (Load #_ _ - _ _ _ _)

8. Make a line entry, on the ACM Reusable Container Log, (See figure 2) each time material is placed in a container. The line entry shall include the date, time, number of bags to load in dumpster, survey number used to radiologically release the ACM, and the name of the radiological technician controlling access to the reusable container.

9. Sign the line entry when the bagged ACM is placed in the container. This signature is to verify that all material in the container was verified by a radiological technician to meet the requirements of Section 7.1, and all line entries are correct to the best of his/her knowledge.

ACM REUSABLE CONTAINER LOCATION LIST

Date	Container #	Person incharge of container	Name of Radiological Technician Controlling Keys	Location

Figure 2 - ACM Reusable Container Log

0219

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT SYSTEM		SITE STANDARD OPERATING PROCEDURE Page 13 of 15
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Authorization: H. F. Daugherty, President	Supersedes: None	Effective Date: 09-03-92

ACM REUSABLE CONTAINER LOCATION LIST

Date	Container #	Person Incharge of container	Name of Radiological Technician Controlling Keys	Location

Figure 3 - ACM Reusable Container Location List

7.3 REUSABLE CONTAINERS (cont.)

COMPETENT PERSON

10. Ensure that the ACM Reusable Container Log includes a copy of the surveys for the ACM inside the container. The survey shall be numbered by load number - sequential survey number for this load.

    NOTE: For example, the survey number for the 3rd radiological survey for container number 1 with the last empty date of Feb 15, 1992 would be 01-2046-03.

11. Label each bag of ACM waste with the survey number used for ACM removal, and the date/time it was placed in the container.

12. Send the container log to the Asbestos Program Coordinator for review and storage, when the container is emptied.

COMPETENT PERSON

13. Complete a line entry, and sign the entry; if no waste is added when a reusable container is opened, the line entry will include time/date, reason for entry, and the name of the radiological technician present.

    NOTE: If a partially filled reusable container is moved to a new location, a line entry will be made in the Reusable ACM Container Log consisting of Time/Date and "Container moved to (location description)". The next time the container is emptied the log number for the new location will be used.

8.0 APPLICABLE DOCUMENTS

8.1 DRIVERS

- DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities"
- RM-0012, "Quality Assurance Program Description"

8.2 REFERENCES

- RM-0012, "Quality Assurance Program Description"
- RM-00009, "Radiological Controls Requirements Manual"
- SP-P-35-010, "Unrestricted Release of Materials from FMPC"

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE POLICY AND PROCEDURE Page 1 of 29
Title: **PACKAGING, ON-SITE MOVEMENT AND OFF-SITE SHIPMENT OF MATERIAL**		DOCUMENT NO: PP-0314 REVISION NO. 0
Authorization: W. H. Britton, President	Supersedes: FMPC-314, Dated 12-31-90, Rev. 2	Issue Date: 12-20-91

1.0 POLICY

It is the policy of the Westinghouse Environmental Management Company of Ohio (WEMCO) to ensure that the packaging, on-site movement and off-site shipment of hazardous and non-hazardous materials, including radioactive materials, is conducted in a safe manner that provides for the protection of the public and the environment, and is in compliance with the applicable federal, state, and local regulations, Department of Energy (DOE) Orders and Directives, and WEMCO policies and procedures.

2.0 SCOPE

This procedure identifies, defines, and establishes the policies and responsibilities that govern the packaging, on-site movement, and off-site shipment of materials. Provisions of this document are applicable to all WEMCO Sections involved in the packaging, on-site movement, and off-site shipment of non-hazardous materials and hazardous materials, including hazardous substances, hazardous wastes, nuclear, and radioactive materials.

3.0 DEFINITIONS

3.1 Carrier - Any person engaged in the transportation of passengers or property as common, contract, or private charter, or freight forwarder, as defined in the Interstate Commerce Act, as amended, or by the United States Postal Service.

3.2 Consignee - The person or organization designated in the shipping papers to receive a shipment.

3.3 Hazardous Material - A material or substance, including a hazardous substance, which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, or property during transport.

3.4 Hazardous Substance - A material, including its mixtures and solutions, as defined in 49 CFR 171.8, section 101 (14) and 102 of CERCLA, section 311 (b) (2) (a) of the CWA.

3.5 Hazardous Waste - Any waste material that is designated as hazardous by the Administrator of the Environmental Protection Agency (EPA) in 40 CFR Part 261 and that is subject to the Hazardous Waste Manifest requirements of 40 CFR Part 262.

3.6 Material - For purposes of this procedure, any material classified as non-hazardous items or hazardous materials, including hazardous substances, hazardous wastes, nuclear, and radioactive materials.

3.0 DEFINITIONS (cont.)

3.7 Off-Site - All areas outside the main perimeter security fence that are not controlled at all times by guards and security gates.

3.8 On-Site - All areas inside the main perimeter security fence that are controlled at all times by guards and security gates to gain entrance to the Fernald Environmental Management Project (FEMP) Site.

3.9 Package - A packaging plus its contents as presented for transportation.

3.10 Packaging - The assembly of one or more containers and any other components necessary to ensure compliance with the minimum packaging requirements of 49 CFR.

3.11 Radioactive Material - Any material having a specific activity greater than 0.002 microcuries per gram per 49 CFR.

3.12 Radioactive Source - For the purpose of this procedure any source used as a standard for the radiation it emits sealed in a capsule or having a bonded cover in which the capsule or cover is strong enough to prevent contact with, or dispersion of, the radioactive material under normal conditions of use, including a one-meter drop onto an unyielding surface.

3.13 Radioactive Waste - Solid, liquid, or gaseous material that contains radionuclides regulated under the Atomic Energy Act of 1954, as amended, and of negligible economic value when the costs of recovery are considered.

3.14 Shipment Originator - The person, or WEMCO Section, who initiates an on-site movement or off-site shipment of material.

3.15 Waste Originator - Any person, or WEMCO Section, whose operation or process generates hazardous waste, radioactive waste, or a mixed waste.

3.16 Nuclear Material - Collective term that includes all such materials designated by the DOE. A listing of designated nuclear materials may be found in DOE Order 5633.3; however, at the FEMP site, nuclear materials shall mean depleted, normal, or enriched (less than 20% U-235 by weight) uranium or thorium.

4.0 RESPONSIBILITIES

4.1 Centralized Training - Responsible for the proper development of training activities to comply with mandatory training requirements and to enable employees to qualify, requalify, or enhance their ability to perform job duties and tasks. Responsible for appropriate documentation and maintenance of training activities, development of in-house audio/video training aids, providing assistance in the development/section training, maintaining and administering the TRMS', maintaining the TMR, including the maintenance of subcontractor training records supplied to centralized training by technical instructors or by the manager of the contracting department.

4.2 Maintenance/Garage - Responsible for the inspection of inbound carrier vehicles that will be used for outbound shipments, providing for the inspection used for on-site shipments, and the preventative maintenance of all such government vehicles at FEMP, and documenting all maintenance and inspections.

4.3 Radiological Safety - Responsible for conducting radiological surveys of materials, packages, and carrier vehicles that will be used for outbound shipments, documenting results of surveys, and providing copies of the results as required. Radiological Safety is also to be notified so surveys can be performed on all on-site movements of materials.

4.4 Facilities and Warehousing - Responsible for packaging materials for on-site movement, packaging uranium metals, oxides, and related products for off-site shipment, providing support documentation, and assigning the personnel and equipment required for on-site movements, loading off-site shipments, and spotting/loading carrier trailers and freight containers.

4.5 Material Control and Accountability - Responsible for the nuclear materials control and accountability program at FEMP.

4.6 Procurement/Materials Management - Responsible for the review and approval of off-site miscellaneous shipping documentation.

4.7 Analytical Section (of Site Services) - Responsible for providing analytical documentation of material samples and the packaging of samples for off-site analysis.

4.8 Logistics Administration - Responsible for developing and updating transportation related procedures ensuring compliance with all Federal, State and Local regulations, Doe Orders and Directives.

4.0 RESPONSIBILITIES (cont.)

4.9 Site-Wide Quality Assurance - Responsible for verifying the packaging processes for uranium metals, oxides, and other related materials and for conducting periodic inspections of packaging operations. Coordinate all required Quality Assurance review activities including conducting annual audits of the packaging and transportation of hazard material shipments.

4.10 Radioactive Source Controller - Responsible for controlling and the coordination of radioactive source for shipment off-site.

4.11 Safeguards and Security - Responsible for the coordination of security and safeguard measures for off-site shipments.

4.12 Shipment Originator - Responsible for preparing documentation of materials for on-site movement or off-site shipment.

4.13 Transportation Safety Committee - Responsible for the evaluation of WEMCO policies and procedures for packaging and transport of all materials, exchange knowledge and experience in resolution of transportation safety problems, uniform interpretation and implementation of Federal, State, and Local regulations, including OSHA safety requirements, DOE Orders, and WEMCO guidelines as applicable to transportation safety.

4.14 Traffic Control - Responsible for providing guidance on the requirements for the on-site movement of hazardous materials. Responsible for preparing bills of lading, coordinating the loading of off-site shipments, and coordinating the scheduling of off-site shipments.

4.15 Waste Originator - Responsible for accumulating and packaging waste for storage or disposal and for making the proper notifications when accumulated wastes must be transported to on-site storage facilities.

4.16 Facilities and Material Evaluation - Responsible for providing assistance to waste generators, arranging for waste sampling, and categorizing waste.

4.17 Waste Operations - Responsible for packaging hazardous and radioactive wastes for off-site shipment.

4.18 Waste Shipping Coordinator - Responsible for preparing and reviewing waste shipment documentation for off-site shipments.

4.19 Waste Shipping - Responsible for preparing waste packages and packaging waste for off-site shipment.

4.0 **RESPONSIBILITIES** (cont.)

4.20 Safe Shutdown - Responsible for controlling order requirements for nuclear materials disposition activities at the FEMP for off-site shipment.

5.0 **GENERAL**

5.1 Sections responsible for the activities assigned herein shall develop implementing procedures, and perform operational and oversight functions that are consistent with internal WEMCO operating policies and procedures.

5.2 Shipment generators for off-site shipments must prepare a nuclear, radioactive, hazardous material/hazardous waste - non-nuclear, or miscellaneous shipping order and have the order processed and approved by the appropriate sections before material will be set up for off-site shipment. In addition, all packages must have been monitored by the Radiological Safety section for removable contamination, radiation levels, per the applicable departmental procedures and provide appropriate documentation to Traffic Control.

5.3 PACKAGING PROVISIONS

Package Description Per Pkg.	Material Description	Authorized Gross Weight
DOT Spec 17C metal 5-gal. drum (DOT 7A Type A)	samples, bulk type radioactive material	100 lbs.
DOT Spec 17H metal 30-gal. drum (DOT 7A Type A)	samples, bulk type radioactive material	500 lbs.
DOT Spec 17H metal 55-gal. drum (DOT 7A Type A)	samples, bulk type radioactive material	900 lbs.
FEMP Family of wooden Boxes DOT 7A Type A:		
Model No. G-4214	uranium metal products	1,260 lbs.
Model No. G-4245	uranium metal products	225 lbs.
Model No. G-4255	uranium metal products	1,470 lbs.
Model No. G-4273-5	uranium metal products	3,045 lbs.
Model No. G-4273-6	uranium metal products	3,540 lbs.
Model No. G-4292	uranium metal products	1,330 lbs.
Strong Tight Containers	LSA Material consigned as exclusive use Limited Quantity Material	Dependent on container per applicable department procedure

5.0 **GENERAL** (cont.)

5.3.1 No special packaging provisions are required for the on-site movement and off-site shipment of nonhazardous miscellaneous materials.

5.3.2 PCB substances which are regulated by the Toxic Substances Control Act (TSCA) and the Clean Air Act (CAA) and shall be controlled the same as RCRA waste material.

5.3.3 WEMCO shall respond to incoming emergency calls concerning an accident involving hazardous materials shipped from the FEMP or in transit in the area, supporting the agency with authority, as requested per FMPC-125, "Emergency Management."

6.0 **PROCEDURE**

6.1 Packaging Operations

CENTRALIZED TRAINING

6.1.1 Approve departmental lesson plans for the personnel in each organization that are involved with the packaging of hazardous materials, hazardous wastes, and radioactive materials.

6.1.2 Verify that the results of lesson plans are documented and that training qualifications records are included in the employee's personnel record and entered into Centralized Training computer files.

ANALYTICAL SECTION (of Site Services)

6.1.3 Analyze the samples to determine the hazardous constituents of the waste.

6.1.4 Document the waste analysis results on the Report of Analysis form.

6.1.5 Provide analytical data to Environmental Management, and the Project Engineer (if requested) for use in characterizing the waste.

6.1.6 Package samples in accordance with applicable Sampling Plan and Departmental procedures. Ensure compatibility of materials in one package meets all criteria of Title 49 CFR, Subpart C, 177.848.

6.0 PROCEDURE (cont.)

ANALYTICAL SECTION (of Site Services)

6.1.7 Request that Radiological Safety monitor the samples and packages according to departmental procedures and provide the appropriate documentation.

SITE-WIDE QUALITY ASSURANCE

6.1.8 For all hazardous and radioactive packaging, verifies compliance with regulations, specifications, plans and procedures through review of documentation, witnessing of activities, and examination. Verifies identification of packaged uranium metals, oxide and related products against the Shipping Order for Nuclear Material. Conduct internal and independent audits of the packaging of hazardous materials including hazardous substances, hazardous wastes, and nuclear and radioactive materials according to the appropriate DOE requirements.

6.1.9 Conduct periodic inspections of packaging operations per applicable departmental procedures, to verify compliance with applicable DOT/DOE/EPA regulations, WEMCO policies and procedures, and document inspections.

6.1.10 Verify that radiological surveys have been conducted for materials.

6.1.11 Review radiological survey results and verify that the radiation readings for packages are within the limits established by 49 CFR; document the review on Form FEMP-IRS&T-1993.

TRAFFIC CONTROL

6.1.12 Verify that hazardous material is packaged for off-site shipment according to the applicable Safety Analysis Report for Packaging and Certificate of Compliance supplied by the Traffic Control.

SHIPMENT ORIGINATOR

6.1.13 Verify that personnel have been properly trained to package hazardous materials, hazardous substances, hazardous wastes, and nuclear and radioactive materials.

6.0 **PROCEDURE** (cont.)

SHIPMENT ORIGINATOR

6.1.14 Obtain approval from Nuclear Safety before packaging off-site shipments of enriched radioactive materials to ensure criticality concerns are addressed according to applicable regulations. Verify that each package used for on-site movement or off-site shipment of hazardous materials, hazardous substances, hazardous wastes, nuclear and radioactive materials is correctly assembled and that all components of the packaging are sufficiently secured.

6.1.15 Ensure packaging is free of rust, dents or other conditions making it unsuitable for loading material.

6.1.16 Package non-hazardous materials, hazardous materials, hazardous substances, hazardous wastes, and nuclear and radioactive materials for on-site movement or off-site shipment per applicable WEMCO procedures.

6.1.17 Inspect all hazardous materials packages to verify that it has been packaged properly. Notify supervisor if any defects or deficiencies are detected.

6.1.18 Verify that packaging has the capability that will enable the use of mechanical loading equipment, items may be placed on pallets to meet this requirement.

6.1.19 Verify that a radiological survey has been conducted on all packagings that will be used for the off-site shipment of nuclear or radioactive material before the packaging is used.

NOTE: Packagings that are contaminated above the levels specified in Title 49 CFR 173.443 may not be used for off-site shipments unless they are cleaned or refurbished.

6.1.20 Verify that inner packaging is suitably cushioned in the outer packaging with an adequate quantity of material to prevent breaking and shifting during transport, as directed by Traffic Control.

6.0 **PROCEDURE** (cont.)

SHIPMENT ORIGINATOR

6.1.21 Apply and Verify that all packages for on-site movement or off-site shipping, including samples, are marked and/or labeled according to the requirements of 49 CFR and the written instructions provided by the Traffic Control.

NOTE: Selection of the proper DOT shipping name is based on process knowledge of the waste stream, laboratory analysis, or the Material Evaluation Form provided by EA & QA.

6.1.22 Verify that all packages of material are monitored for external removal contamination and radiation levels.

RADIOACTIVE SOURCE CONTROLLER

6.1.23 Request Radiological Safety to conduct radiological surveys of the radioactive source material and packaging.

6.1.24 Review radiological survey results to verify compliance with applicable regulations.

6.1.25 Maintain constant surveillance of radioactive source material.

WASTE ORIGINATOR

6.1.26 Accumulate and package waste for storage and/or disposal according to all applicable EPA/DOT/DOE regulations and WEMCO procedures.

6.1.27 Notify Facilities and Materials Evaluation when accumulated waste is packaged for on-site storage facilities.

6.1.28 Request radiological surveys of wastes and packages as necessary.

6.1.29 Provide waste tally sheet to Environmental Compliance for use in preparing Material Evaluation forms.

FACILITIES AND MATERIALS EVALUATION

6.1.30 Provide assistance to waste generators with characterization and packaging of wastes for storage and/or disposal.

6.0 PROCEDURE (cont.)

ENVIRONMENTAL COMPLIANCE

6.1.31 Characterize waste according to Resource Conservation and Recovery Act (RCRA) guidelines and DOE requirements based on the results of the waste analysis conducted by Analytical Laboratories.

RADIOLOGICAL SAFETY

6.1.32 Conduct radiological surveys of materials and packages.

6.1.33 Document survey results on the appropriate forms according to departmental procedures.

6.1.34 Forward copies of the surveys to the Shipment Originator, Waste Originator, and Site-Wide Quality Assurance as required.

TRANSPORTATION SAFETY COMMITTEE

6.1.35 Evaluate policies for packaging safety at the FEMP for compliance with applicable federal, state and local regulations.

6.1.36 Ensure packaging policies and practices are conducted in accordance with all FEMP and OSHA safety requirements.

WASTE OPERATIONS

6.1.37 Package hazardous waste and radioactive waste.

6.1.38 Ensure that hazardous waste has been packaged according to EPA/DOT/DOE regulations and WEMCO Guidelines.

6.1.39 Verify that hazardous waste, radioactive, or mixed waste is packaged according to 49 CFR.

6.1.40 Request radiological surveys of packaged waste as required.

WASTE SHIPPING

6.1.41 Prepare waste packaging for use by the Waste Originator according to departmental procedures.

6.1.42 Prepare packages of waste according to departmental procedures and specific consignee requirements.

6.1.43 Request radiological surveys of waste containers as required.

6.0 **PROCEDURE** (cont.)

6.2 On-Site Movements

CENTRALIZED TRAINING

6.2.1 Approve departmental lesson plans for the personnel in each organization involved with the loading, and transporting of hazardous materials on site, hazardous wastes, and radioactive materials.

6.2.2 Verify that the results of lesson plans are documented and that training qualifications records are included in the employee's personnel record and entered into Centralized Training computer files.

ANALYTICAL SECTION (of Site Services)

6.2.3 Ensure that samples are properly identified and quantified in order to determine on-site transport requirements.

6.2.4 Ensure that temporary storage of samples incidental to transport complies with existing requirements in applicable operating procedures and Nuclear Safety guidelines.

6.2.5 Contact Traffic Control if further guidance is needed when offering samples for on-site movement.

SITE-WIDE QUALITY ASSURANCE

6.2.6 Conduct periodic inspections of on-site shipping operations per applicable departmental procedures to verify compliance with applicable DOT/DOE/EPA regulations, WEMCO policies and procedures, and document inspections. Also conduct internal and independent audits of the on-site transportation of hazardous materials including hazardous substances, hazardous wastes, and nuclear and radioactive materials according to the appropriate DOE requirements.

6.2.7 Sign checksheet/release verifying that all Site-Wide Quality Assurance/Quality Certification functions have been performed and documented for on-site movement as required.

TRANSPORTATION SAFETY COMMITTEE

6.2.8 Evaluate policies for on-site transportation safety at the FEMP for compliance with applicable Federal, State and Local regulations.

6.0 PROCEDURE (cont.)

TRANSPORTATION SAFETY COMMITTEE

6.2.9 Ensure on-site transportation policies and practices are conducted in accordance with all FEMP and OSHA safety requirements.

SHIPMENT ORIGINATOR

6.2.10 Verify that the material is properly identified and quantified to determine on-site movement requirements.

6.2.11 Notify Facilities and Warehousing when the material is ready to be moved.

6.2.12 Attach appropriate transfer documents from Material Control and Accountability when required. Initiate appropriate transfer documents for on-site movement of material from one area to another.

6.2.13 Verify that the storage of materials incidental to transport complies with current requirements contained in the appropriate operating procedures and Nuclear Safety guidelines.

6.2.14 Contact the Traffic Control if further guidance is required when material is moved on-site.

6.2.15 When shipping nonradioactive hazardous materials, initiate form FMPC-OPR-3292, "Hazardous Material Transfer On-site Shipment."

6.2.16 Attach the completed form FMPC-OS&H-1993-1 to the Traffic Control copy of Form FMPC-OPR-3292.

6.2.17 Ensure a signed "Nonradioactive Hazardous Materials Shipment Approval Tag," form FMPC-OPR-2947 is attached to each package when shipping on radioactive hazardous materials on-site.

WASTE ORIGINATOR

6.2.18 Notify Facilities Services, Site-Wide Quality Assurance and MC&A when accumulated packaged waste must be transported to on-site storage facilities.

6.2.19 Request radiological surveys of wastes and packages as required.

6.2.20 Notify Facilities and Warehousing when packaged waste is ready to be transported to on-site storage facility.

6.0 **PROCEDURE** (cont.)

MAINTENANCE/GARAGE

6.2.21 Inspect, perform preventative maintenance, and repair all government vehicles used for on-site movement of material at FEMP.

6.2.22 Maintain records of services.

6.2.23 Notify government vehicle custodians of scheduled preventative maintenance and safety inspection services.

FACILITIES AND WAREHOUSING

6.2.24 Verify that on-site motor vehicle operators possess a valid state driver's license with the appropriate endorsements.

6.2.25 Verify that on-site motor vehicle operators have been properly trained and qualified according to the responsibilities to be performed.

6.2.26 Motor vehicle operator shall document the inspection results on the appropriate vehicle inspection form (Form OPR 2414), sign the inspection form and submit it to their supervision, and notify supervision of any defective or unsafe vehicle conditions.

NOTE: All defective or unsafe vehicle conditions must be corrected before the vehicle can be used.

6.2.27 Ensure that all packages are marked per applicable departmental procedures.

NOTE: If package markings are illegible or missing, notify supervision per applicable departmental procedure.

6.2.28 Ensure that all hazardous waste packages are labeled with the applicable DOT/EPA/OSHA labels and/or markings.

NOTE: If package labels are illegible or missing, notify supervision per applicable departmental procedure.

6.0 **PROCEDURE** (cont.)

FACILITIES AND WAREHOUSING

6.2.29 Load the material properly on the transport vehicle and ensure that the material is adequately distributed for weight distribution, stable and secured against shifting during transport.

NOTE: Hazardous materials shall be loaded onto a transport vehicle according to the guidelines provided in the DOT Hazardous Materials Segregation/Separation Chart and in compliance with all applicable Nuclear Safety guidelines.

6.2.30 Deliver the material to the designated delivery point by using the most direct and least congested route.

6.2.31 Prepare depleted, normal, or enriched uranium and other nuclear or radioactive material for on-site movement.

NOTE: Material Control and Accountability (MC&A) documentation must accompany the shipment from one area to the next area when necessary.

6.2.32 Request radiological surveys of materials and packages if not already available.

6.2.33 Review and verify radiological survey results for compliance with the appropriate regulatory requirements.

6.2.34 Assign personnel and equipment for on-site movement as requested.

6.2.35 Provide personnel and equipment for special emergency on-site movement as requested.

TRAFFIC CONTROL

6.2.36 Provide guidance for the required documents, packaging, marking, labeling, and the requirements for the placarding of hazardous materials for on-site movement.

6.2.37 Verify that the appropriate Federal and State Regulations and WEMCO Guidelines are followed for personnel and environmental safety.

6.0 PROCEDURE (cont.)

RADIOLOGICAL SAFETY

6.2.38 Conduct radiological surveys of materials, packages and vehicles on site.

6.2.39 Document the survey results on the appropriate forms according to departmental procedures.

6.2.40 Forward copies of the surveys to the Shipment Originator, Waste Originator, Traffic Control, and Site-Wide Quality Assurance as required.

MATERIAL CONTROL AND ACCOUNTABILITY (MC&A)

6.2.41 Prepare MC&A documentation for on-site movement of material as required.

NOTE: MC&A documents shall be used for verification of the materials and will serve as the shipping papers for on-site movement.

6.3 Off-Site Shipments

CENTRALIZED TRAINING

6.3.1 Approve departmental lesson plans for the personnel in each organization involved with the off-site loading, and transporting of hazardous materials, hazardous wastes, and radioactive materials.

6.3.2 Verify that the results of lesson plans are documented and that training qualification records are included in the employee's personnel record and entered into Centralized Training computer files.

ANALYTICAL SECTION (of Site Services)

6.3.3 Notify Material Control and Accountability and the Traffic Control when a sample containing nuclear radioactive material is to be shipped off-site.

6.3.4 Initiate Shipping Order for Nuclear Material Form, FEMP CONT-558, for samples that are to be shipped to off-site laboratories for analysis

6.0 **PROCEDURE** (cont.)

ANALYTICAL SECTION (of Site Services)

6.3.5 Forward the shipping order to Material Control and Accountability.

6.3.6 Initiate Shipping Order for Hazardous Material/ Hazardous Waste Non-Nuclear Form, FEMP CONT-3388, for samples that are to be shipped to off-site laboratories for analysis.

6.3.7 Forward the shipping order to Material Control and Accountability.

6.3.8 Verify that the waste samples are in proper packaging for off-site shipment according to departmental procedures.

6.3.9 Generate Form No. FMPC-OPR-2595, Off-Site Loading and Tie Down Inspection.

6.3.10 Maintain and verify the chain of custody transfer for off-site shipment according to applicable procedures.

6.3.11 Request that Radiological Safety monitor the samples and packages according to departmental procedures and provide the appropriate documentation to Traffic Control.

SITE-WIDE QUALITY ASSURANCE

6.3.12 Verify the identification of packaged uranium metals, oxides, and related products with the Shipping Order for Nuclear Material.

6.3.13 Conduct periodic inspections of the shipping operations per applicable departmental procedures to verify compliance with applicable DOT/DOE/EPA regulations and WEMCO policies and procedures and document inspections.

6.3.14 Review the Garage Section incoming vehicle inspection form for vehicle defects or deficiencies.

6.3.15 Attach the Quality Assurance Inspection Sheet, Form QAC-891010-1, Rev 1, to the support documentation for each vehicle loaded.

6.3.16 Verify that radiological surveys have been conducted for each carrier trailer and the materials for off-site shipment.

6.0 **PROCEDURE** (cont.)

RADIOLOGICAL SAFETY

6.2.38 Conduct radiological surveys of materials, packages and vehicles on site.

6.2.39 Document the survey results on the appropriate forms according to departmental procedures.

6.2.40 Forward copies of the surveys to the Shipment Originator, Waste Originator, Traffic Control, and Site-Wide Quality Assurance as required.

MATERIAL CONTROL AND ACCOUNTABILITY (MC&A)

6.2.41 Prepare MC&A documentation for on-site movement of material as required.

NOTE: MC&A documents shall be used for verification of the materials and will serve as the shipping papers for on-site movement.

6.3 Off-Site Shipments

CENTRALIZED TRAINING

6.3.1 Approve departmental lesson plans for the personnel in each organization involved with the off-site loading, and transporting of hazardous materials, hazardous wastes, and radioactive materials.

6.3.2 Verify that the results of lesson plans are documented and that training qualification records are included in the employee's personnel record and entered into Centralized Training computer files.

ANALYTICAL SECTION (of Site Services)

6.3.3 Notify Material Control and Accountability and the Traffic Control when a sample containing nuclear radioactive material is to be shipped off-site.

6.3.4 Initiate Shipping Order for Nuclear Material Form, FEMP CONT-558, for samples that are to be shipped to off-site laboratories for analysis

6.0 **PROCEDURE** (cont.)

RADIOLOGICAL SAFETY

6.3.26 Document the survey results on the appropriate forms according to departmental procedures.

6.3.27 Forward copies of the surveys to the Shipment Originator, Waste Originator, Traffic Control, and Site-Wide Quality Assurance as required.

SHIPMENT ORIGINATOR

6.3.28 Provide the Traffic Control with the required advance notification of off-site shipment.

6.3.29 Verify that material is properly identified and quantified.

6.3.30 Provide the Traffic Control with the information required to determine the appropriate DOT requirements for the shipment.

6.3.31 Notify Facilities and Warehousing when the material is prepared for loading or movement to the designated area for off-site shipment.

6.3.32 Provide Facilities and Warehousing with the documentation that designates the location on-site where the material for off-site shipment is to be picked up, location on-site where the material for off-site shipment is to be delivered, and the name and quantity of the material to be moved.

6.3.33 Provide any additional information required to the transporter to facilitate the safe loading and movement of material.

6.3.34 Verify that the temporary storage of materials incidental to off-site transport is in compliance with the existing requirements of the appropriate operating procedures and Nuclear Safety guidelines.

6.3.35 Prepares Product Order per FMPC-714 for proposed shipments of nuclear product material.

6.3.36 Initiate Shipping Order for Nuclear Material (Form FMPC Cont-558) for nuclear materials that are to be shipped off-site and forward shipping order to Material Control and Accountability.

6.0 **PROCEDURE** (cont.)

SHIPMENT ORIGINATOR

6.3.37 Initiate Shipping Order for hazardous Material/Hazardous Waste - non-nuclear (Form FMPC Cont-3388) for all hazardous non-nuclear material that is to be shipped off site and forward shipping order to Material Control and Accountability.

6.3.38 Initiates Miscellaneous Shipping Order (FMPC-ADMS-871) and obtains applicable approvals for all non-nuclear nonhazardous material shipments. Forwards approved Miscellaneous Shipping Order (MSO) to the Traffic Control.

6.3.39 Request radiological survey results of materials and packages to ensure compliance with applicable regulations and site procedures.

6.3.40 Notify and obtain approval of site-wide Quality Assurance/ Quality Certification for shipments of nuclear material.

6.3.41 Obtain Radiological Safety sign-off for nonradioactive material on a Miscellaneous Shipping Order.

6.3.42 Obtain Environmental Compliance sign-off for nonhazardous material on a Miscellaneous Shipping Order.

6.3.43 Provide Traffic Control with the information necessary to the applicable DOT requirements and prepare the bill of lading.

6.3.44 Contact the Traffic Control for further guidance when preparing material for off-site shipment.

FACILITIES AND WAREHOUSING

6.3.45 Verify that the transport vehicle is appropriate for the weight and center of gravity of the material to be loaded.

6.3.46 Inspect the transport vehicle and record the findings of the inspection.

6.3.47 Accept or reject equipment based on the vehicle inspection.

6.3.48 Position packages on the vehicle so that the weight is equally distributed over the width and length of the vehicle and as equally as possible among the vehicle's axles.

6.0 PROCEDURE (cont.)

FACILITIES AND WAREHOUSING

6.3.49 Ensure the load is placed on the vehicle in such a manner that it does not obscure the driver's view ahead or to the right or left sides, interfere with the free movement of his arms or legs, prevent his free and ready access to accessories required for emergencies, or prevent the free and ready exit of any person from the vehicle's cab or driver's compartment.

6.3.50 Ensure that all loading of hazardous materials, hazardous substances, hazardous wastes, and radioactive materials is conducted according to the guidelines provided in the DOT Hazardous Materials Segregated/Separation Chart in compliance with all applicable Nuclear Safety guidelines.

6.3.51 Block and brace all packages on or in the vehicle to prevent shifting or changing of position during normal transportation conditions, and in such a manner that the packages will remain stable after the restraints are removed prior to unloading the packages.

NOTE: Do not rely upon the ends, sides, or doors of the vehicle to prevent shifting of heavy loads unless they are specifically designed for this purpose.

6.3.52 Ensure that all sides, sideboards, rear endgates and endboards capable of preventing packages shifting are in their proper place and are strong enough and high enough to ensure that packages will not shift upon, or fall from the vehicle.

6.3.53 Use as many tiedown assemblies to secure all packages being transported on vehicles which are not equipped with sides or sideboards, and rear endgate or endboard as directed by applicable FEMP procedures.

6.3.54 Use only tiedown assemblies that conform to the rules of 49 CFR 393.102; plastic or fiber rope, any material with unknown strength or any damaged materials shall not be used as components of a tiedown system.

6.3.55 Tiedown assemblies will be installed to ensure the load will not move or shift during normal transport.

6.0 PROCEDURE (cont.)

FACILITIES AND WAREHOUSING

6.3.56 Ensure the principal tiedown forces are transmitted to the vehicle's frame rather than the wood or metal decking, and that the strength of the tiedown attachment points on the vehicle are equal to or greater than the strength of the tiedowns.

6.3.57 Ensure that flexible tiedowns (e.g., rope, strap, chain, etc.) are free from contact with any other stationary objects when they are taut to prevent chafing and damage during transport.

6.3.58 Visually check all packages before loading to ensure no defects are present.

6.3.59 Complete and submit the Off-Site Loading and Tie-Down Inspection Form to the Traffic Control when necessary.

6.3.60 Review and verify the radiological survey results for compliance with the appropriate regulatory requirements.

6.3.61 Submit appropriate paperwork to Traffic Control after loading.

6.3.62 Assign personnel and equipment for loading off-site shipments as required.

6.3.63 Assign personnel and equipment for spotting/loading of carrier trailers and freight containers used for off-site shipments.

PROCUREMENT/MATERIALS MANAGEMENT

6.3.64 Review and approve Miscellaneous Shipping Orders (MSO) and other documentation for off-site shipment of non-hazardous materials.

6.3.65 Forward approved copies of the Miscellaneous Shipping Order (MSO) to the Traffic Control.

6.3.66 Verify, using the appropriate shipping order, that the packages of material are identified as on the shipping order.

6.3.67 Attach the required markings, labels, and tally sheet to the packages of hazardous materials adhering to departmental procedures and direction by Traffic Control.

6.0 **PROCEDURE** (cont.)

MAINTENANCE/GARAGE

6.3.68 Inspect the inbound carrier vehicles that will be used for off-site shipments according to Federal Motor Carrier Safety Regulations and WEMCO procedures.

6.3.69 Document the inspection results on the FEMP Preliminary Visual Trailer Inspection Form with appropriate comments.

6.3.70 Forward copies of the maintenance and inspection documents to Site-Wide Quality Assurance and Facility Service and Support Sections.

6.3.71 Inspect, lubricate, perform the preventative maintenance for, and repair all government vehicles used for loading off-site shipments at FEMP.

6.3.72 Maintain records of services.

6.3.73 Notify the government vehicle custodians of scheduled preventative maintenance and safety inspection services.

TRAFFIC CONTROL

6.3.74 Provide guidance for the required documents and the requirements for the placarding of off-site shipments.

6.3.75 Verify compliance with appropriate Federal and State Regulations and WEMCO Guidelines.

6.3.76 Coordinate the scheduling of off-site shipment with the Shipment Originator, Site Services, and the carrier.

6.3.77 Coordinate the loading of off-site shipment with Site Services, Facilities and Warehousing, and the carrier.

6.3.78 Review shipping documents for completeness, proper authorization(s), and compliance with WEMCO policy, procedures, and accounting requirements.

6.3.79 Ensure that all off-site shipments are in compliance with legal restrictions on weight and dimension prior to release.

6.0 **PROCEDURE** (cont.)

TRAFFIC CONTROL

6.3.80 Prepare the Uniform Hazardous Waste Manifest according to the requirements of 40 CFR and the appropriate departmental procedures using documentation provided by the Shipping Originator and WEMCO support sections.

6.3.81 Prepare and sign the bill of lading according to the requirements of 49 CFR using documents provided by the Shipping Originator and WEMCO support sections.

6.3.82 Obtain the signature of the carrier's agent (driver) on all bills of lading and hazardous waste manifests to acknowledge receipt of the shipment by the carrier.

6.3.83 Use only ICC and PUCO approved commercial or contract carriers according to the appropriate DOE requirements.

NOTE: Commercial or contract carriers must have received an identification number from the Administrator of the USEPA. Additionally, State EPA identification numbers must be obtained from the Administrator of the State EPA Office when required.

6.3.84 Issue the appropriate shipment notifications to consignees.

6.3.85 Return the shipping order and notify Material Control and Accountability when a shipment of hazardous material, hazardous waste (non-nuclear), or nuclear material is shipped from FEMP.

TRANSPORTATION SAFETY COMMITTEE

6.3.86 Evaluate policies for off-site transportation safety at the FEMP for compliance with applicable Federal, State and Local regulations.

6.3.87 Ensure off-site transportation policies and practices are conducted in accordance with all FEMP and OSHA safety requirements. Conduct periodic inspections and evaluations of all activities associated with the handling and transporting of hazardous materials for off-site shipments.

6.0 **PROCEDURE** (cont.)

SAFEGUARDS AND SECURITY

6.3.88 Provide interpretation and advice concerning the security and safeguard measures required for off-site shipment of classified or strategic nuclear materials.

6.3.89 Coordinate with Traffic Control to spot incoming carrier vehicles for inspection by the Maintenance Garage and to have the radiological survey conducted.

6.3.90 Verify that vehicle doors are properly secured.

6.3.91 Verify that the seal number, when recognizable, matches the serial number on the bill of lading before the shipment leaves the FEMP site.

6.3.92 Verify that the bill of lading has been signed by the Traffic Control authorizing the shipment to be released.

6.3.93 Coordinate emergency response activities for off-site shipments with the Emergency Operations Center as required.

MATERIAL CONTROL AND ACCOUNTABILITY (MC&A)

6.3.94 Verify that the consignee is authorized to receive the specific nuclear materials before the materials are shipped.

6.3.95 Process, verify the type of material and lot numbers, and approve the Shipping Order for Nuclear Material Form, FEMP CONT-558, for off-site shipment of nuclear material.

6.3.96 Forward the shipping order to the Traffic Control.

6.3.97 Process, verify the type of material and lot numbers, and approve the Shipping Order for Hazardous Material/ Hazardous Waste Non-Nuclear Form, FEMP CONT-3388, for off-site shipment of material.

6.3.98 Forward the shipping order to the Traffic Control.

6.3.99 Receive shipping order from Traffic Control.

6.3.100 Notify the consignee that the preparation for off-site shipment has been completed.

6.0 PROCEDURE (cont.)

MATERIAL CONTROL AND ACCOUNTABILITY (MC&A)

6.3.101 Prepare and forward to the consignee, DOE/NRC Nuclear Materials Transaction Report, Form 741, for off-site shipments.

NOTE: These documents are used for verification of materials and shipping paper by Facility Site Services for material transport.

RADIOACTIVE SOURCE CONTROLLER

6.3.102 Notify the Traffic Control of the intent to ship radioactive source material off-site.

6.3.103 Provide copy of the purchase order to the Traffic Control.

6.3.104 Request Radiological Safety to conduct radiological 48-hour surveys of the radioactive source material and packaging.

6.3.105 Review the radiological survey results to verify compliance with applicable departmental procedures.

6.3.106 Initiate Shipping Order for Hazardous Material/Hazardous Waste Non-Nuclear Form, FEMP CONT-3388, after approval from EC&QA.

6.3.107 Notify the Traffic Control when the packaged material is ready to be shipped off-site.

6.3.108 Maintain constant surveillance of radioactive source material until it is loaded onto the transport vehicle for off-site shipment.

6.3.109 Remove the radioactive source material shipped from the inventory list.

WASTE OPERATIONS

6.3.110 Package hazardous waste and radioactive waste for off-site shipments.

6.3.111 Verify that hazardous waste for off-site shipment has been packaged according to EPA/DOT/DOE regulations and WEMCO Guidelines.

6.3.112 Request radiological surveys of packaged waste as required per applicable departmental procedures.

6.0 **PROCEDURE** (cont.)

WASTE SHIPPING COORDINATOR

6.3.113 Prepare and forward the Storage and Disposal Data Sheet, the Tally Sheet, and other documents as required to Site-Wide Quality Certification for review and approval.

6.3.114 Prepare additional shipping documentation according to consignee requirements.

NOTE: Consignee requirements must exceed the requirements of 49 CFR.

6.3.115 Receive the documentation associated with off-site shipment from the appropriate departments.

6.3.116 Forward the documentation to Site-Wide Quality Assurance for review.

WASTE SHIPPING

6.3.117 Prepare waste packaging for use by the Waste Originator according to departmental procedures.

6.3.118 Prepare packages of waste for off-site shipping according to departmental procedures and specific consignee requirements.

6.3.119 Request the radiological survey of waste containers as required.

SAFE SHUTDOWN

6.3.120 Prepares Nuclear Materials Disposition Order (NMDO) per PP-5031 for proposed shipments of nuclear materials.

6.3.121 Acts as liaison internally to facilitate shipment and externally to ensure customer satisfaction.

6.3.122 Tracks NMDO through completion, issues completion notice and maintains documentation on activity.

7.0 **APPLICABLE DOCUMENTS**

7.1 Drivers

7.1.1 DOE 1540.1, "Materials Transportation and Traffic Control Management"

7.0 **APPLICABLE DOCUMENTS** (cont.)

7.1.2 OR 1540.1B, "Materials Transportation and Traffic Control Management"

7.1.3 DOE 1540.2, "Hazardous Material Packaging for Transport - Administrative Procedures"

7.1.4 DOE 1540.3, "Base Technology for Radioactive Material Transportation Packaging Systems"

7.1.5 DOE 5000.3A, "Occurrence Reporting and Processing of Operations Information"

7.1.6 DOE 5480.3, "Safety Requirements for the Packaging and Transportation of Hazardous Materials"

7.1.7 DOE 5632.1, "Physical Protection of Classified Matter and Information"

7.1.8 DOE 5632.2A, "Physical Protection of Special Nuclear Material and Vital Equipment"

7.1.9 DOE 5700.6B, "Quality Assurance"

7.1.10 DOE/EV 06194-3, "Explosives Safety Manual"

7.1.11 DOE 5480.19 "Conduct of Operations"

7.1.12 10 CFR Part 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions"

7.1.13 40 CFR Parts 116 -117, "Designation of Hazardous Substances and Their Reportable Quantities"

7.1.13 40 CFR Parts 260-265, "Standards Applicable to Hazardous Wastes"

7.1.14 49 CFR Parts 100-199, "Hazardous Material Regulations"

7.1.15 49 CFR Parts 383-397, "Federal Motor Carrier Safety Regulations"

7.1.16 International Atomic Energy Agency (IAEA) "Safety Series No. 6," 1985 Edition, as amended

7.0 **APPLICABLE DOCUMENTS** (cont.)

7.1.17 International Air Transport Association (IATA) "Dangerous Goods Regulations," 1991 Edition

7.1.18 International Civil Aviation Organization (ICAO) "Technical Instructions," 1985 Edition

7.1.19 American National Standards Institute (ANSI) N14 Series

7.1.20 Directory of DOE Certificates of Compliance for Radioactive Materials Packaging

7.2 Reference Documents

THIS SECTION WILL CONTAIN A LIST OF APPLICABLE WEMCO PROCEDURES.

8.0 **APPLICABLE FORMS**

THIS SECTION WILL CONTAIN A LIST OF APPLICABLE WEMCO FORMS AND FORM NUMBERS.

9.0 **ATTACHMENTS**

None

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE POLICY AND PROCEDURE Page 29 of 29
Title: PACKAGING, ON-SITE MOVEMENT AND OFF-SITE SHIPMENT OF MATERIAL		DOCUMENT NO: PP-0314 REVISION NO. 0
Authorization: W. H. Britton, President	Supersedes: FMPC-314, Dated 12-31-90, Rev. 2	Issue Date: 12-20-91

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
12-20-91	0	Document describing how on-site and off-site materials are packaged and moved per Request No. P91-387, initiated by J. McGrogan.

CONTROL 4557-

FMPC - 2185
Internal Special

SAMPLING PLAN FOR DRUMMED WASTE AT THE FMPC

by
Sampling Team
Janet Angert, Chairperson

October 1989

FEED MATERIALS PRODUCTION CENTER
Westinghouse Materials Company of Ohio
P. O. BOX 398704
CINCINNATI, OHIO 45239

PREPARED FOR THE
U.S. Department of Energy
OAK RIDGE OPERATIONS OFFICE
UNDER CONTRACT DE-AC05-860R21600

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F 4557-

FMPC-2185
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SAMPLING PLAN FOR DRUMMED WASTE AT THE FMPC

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J. L. Angert, Chairperson

October 1989

FEED MATERIALS PRODUCTION CENTER
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P.O. Box 398704
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Prepared for the
U.S. Department of Energy
OAK RIDGE OPERATIONS OFFICE
Contract DE-AC05-86OR21600

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Appendix

Sampling Plan For Drummed Waste At The FMPC

1.0 Introduction

A large quantity of process material is stored in drums at the Feed Materials Production Center (FMPC). A considerable portion of this material is waste. Some of the waste is RCRA (Resource Conservation and Recovery Act) hazardous. Most of it is radioactively contaminated. Waste that is both RCRA hazardous and radioactively contaminated is designated as mixed waste. RCRA waste must be stored properly, according to Code of Federal Regulations (CFR) Title 40, "Protection of Environment". Some of the waste must be properly treated before disposal. All of the waste must eventually be properly disposed.

Responsible decisions on proper storage, treatment, and disposal of waste are based on adequate knowledge of the material. This information can originate from process knowledge or analytical results. Process knowledge is only as reliable as the information available. Analytical results are reliable only if the samples are representative. The major purpose of this document is to present a statistically sound method for obtaining representative samples from waste material stored in drums at the FMPC.

If there is no limit on resources, all samples can be analyzed for numerous constituents. However, since there are limits on budget, time, personnel, and other resources, the requested analyses must also be limited. This document provides some of the pertinent information and a logical method for deciding which analyses to request.

After samples have been taken and analyzed, the results must be evaluated to determine if additional samples are required. This document provides a procedure to perform this evaluation based on proven statistical methods.

2.0 Objective

The objective of this Sampling Plan is to develop a sound sampling strategy to obtain representative samples. The resulting samples will yield statistically significant data for characterizing materials with respect to RCRA constituents. The whole process will ensure competent decision-making for the final disposition of the materials.

3.0 Scope

The Sampling Flow Chart on the following page shows the overall procedure to be followed once the decision has been made to sample a specific waste stream. The Section of this Sampling Plan that discusses each step is indicated. The group responsible for performing each step is also identified.

Section 4.0 discusses decision criteria for those analyses which must be made for samples representing a particular waste stream. This decision is based on information currently available on the material, information required to make a RCRA determination, and information required to treat or dispose of the waste material.

Section 5.0 outlines various techniques that can be used to sample drums and how the appropriate technique is chosen. Sample preservation, chain-of-custody, and field notebook records are also discussed.

Section 6.0 discusses how representative samples are obtained from backlog waste and the various types of waste streams. It discusses how to choose the optimum number of samples to be taken and how to select the specific drums to sample.

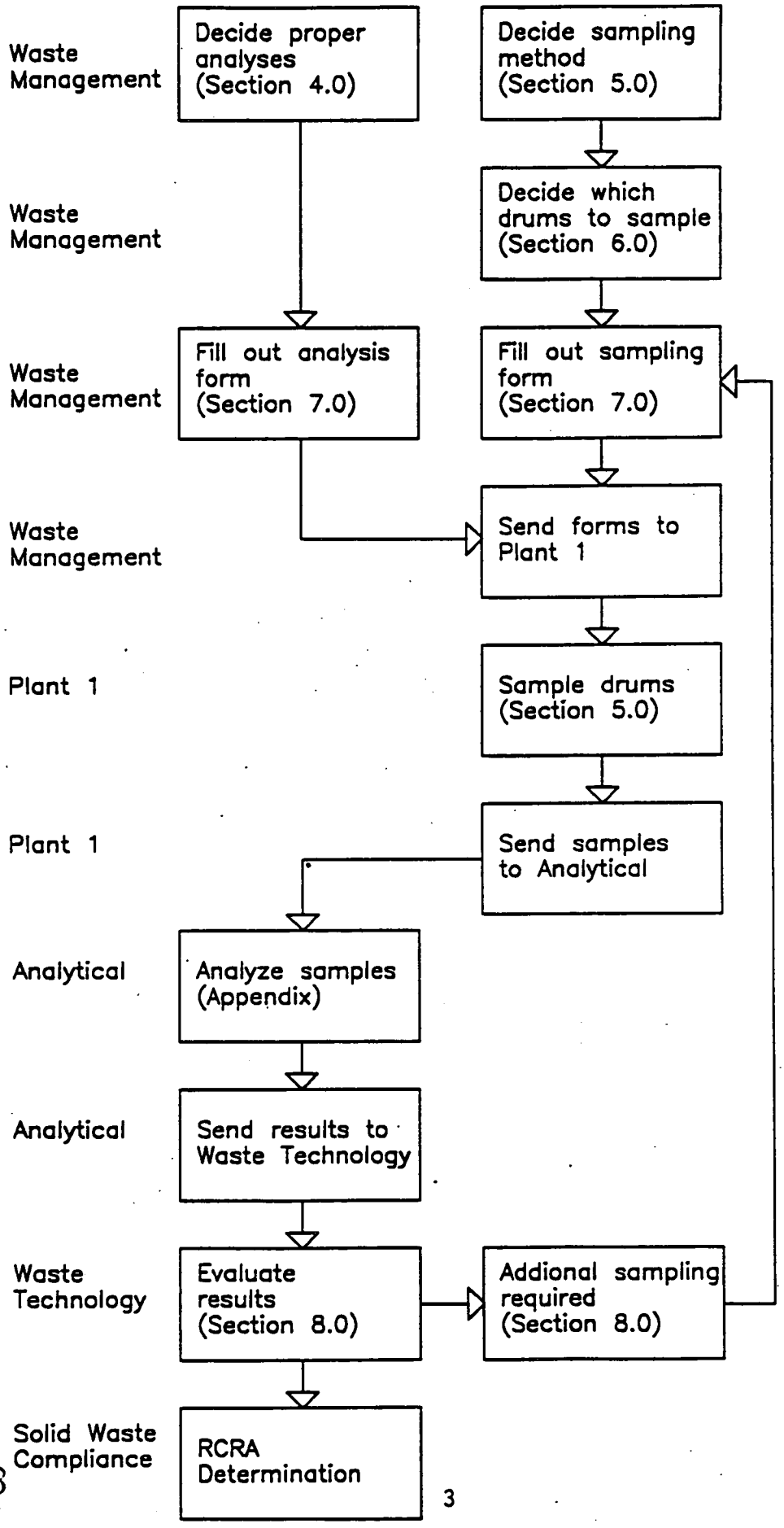
Section 7.0 describes the RCRA Analysis Request Form and the RCRA Sampling Plan Form and the procedure for completing these forms.

Section 8.0 discusses the statistical evaluation of the data obtained from analysis of the samples. This evaluation can be used to determine if enough samples have been taken to make a RCRA determination.

Section 9.0 summarizes the steps required to assure that the sampling quality is acceptable. It also outlines the additional sampling needed for analytical quality assurance.

Section 10.0 lists the documents that were used to develop this Plan. It also lists the pertinent reference documents.

SAMPLING FLOW CHART



4.0 Required Analyses

4.1 Available Information

Assemble all information available for the waste stream that will be sampled. This information may be obtained from process knowledge or from previous analytical data. Whatever the source, the information must be reliable and documented.

4.2 Required Information

Decide in advance what information will be necessary to characterize the material after sampling and analysis are complete. This information must be complete enough to determine if the material is RCRA hazardous, Land Ban, and/or radioactively contaminated. The information must also be used to determine proper storage, treatment, and disposal of the waste.

Title 40 CFR Part 261,"Identification and Listing of Hazardous Waste", defines RCRA hazardous waste. The information that is applicable to waste at the FMPC is summarized in Attachment A on Page 6.

Title 40 CFR Part 268, "Land Disposal Restrictions", lists wastes that are restricted from burial and their limiting concentrations. The analyses required to determine if a material is Land Ban are listed in Attachment B on Page 7. These analyses are performed only if a waste has been determined to be RCRA material.

To store a waste properly, compatibility with the storage container and with other wastes must be determined. The analytical requirements to make this determination include flash point, pH, corrosivity, reactivity, and a listing of all compounds constituting more than 1 percent of the waste. This information is included in the RCRA analyses listed in Attachment A and the Oak Ridge incinerator requirements listed in Attachment C, Pages 9 and 10.

Currently, there is no Department of Energy (DOE) or commercial treatment or disposal facility that will accept mixed waste from this site. The three DOE facilities considered in this Plan are the ones which are most likely to accept it in the future. If other facilities become available, their requirements will have to be considered as described below.

Information required by each treatment and disposal facility is described in the facility's Waste Acceptance Criteria (WAC). The Appendix contains a description of the analytical information required in the WAC's of:

A. Nevada Test Site (NTS)

B. Oak Ridge Gaseous Diffusion Plant (ORGDP) K-1435 Incinerator

C. Idaho National Engineering Laboratory (INEL) Incinerator

It also contains the appropriate forms for shipment of waste to these facilities. Attachment C lists the analyses required by the above sites.

4.3 Information To Be Obtained

The information described in Sections 4.1 and 4.2 is used to determine which analyses are missing for samples representing a particular waste. Waste that can be incinerated requires the analytical information described in the WAC's of ORGDP or INEL. Waste that can be buried at NTS requires the analytical information described in NTS's WAC.

The only radionuclides that waste streams at the FMPC will be analyzed for initially are U-235, gross alpha, beta, and gamma. If it is determined that the material is to be shipped to ORGDP for incineration, then the entire list of radionuclide analyses shown in Attachment C (Page 9) will be required.

Any analytical information that is required and is already available (from process knowledge or previous analyses) does not have to be redetermined. Furthermore, samples of waste that could not possibly contain organic material do not have to be analyzed for organic compounds.

4.4 RCRA Analysis Request Form

The RCRA Analysis Request Form shall be completed by approved FMPC personnel only. At the time of this writing, approved personnel includes members of the Sampling Team. The manager of Waste Management will designate which personnel are approved to complete this form. The completed form shall be submitted to the Area Supervisor at Plant 1 along with the RCRA Sampling Plan Form.

The RCRA Analysis Request Form is subject to revision based on the future needs of the Analytical Department and experience gained from using the Form. Directions on completing the RCRA Analysis Request Form are given in Section 7.0.

10-4-89 Attachment A

RCRA Analyses

Flash point (degrees F)
Corrosivity (mmpy) - pH
Reactivity
EP Toxicity (mg/L)
- Arsenic
- Barium
- Cadmium
- Chromium
- Lead
- Mercury
- Selenium
- Silver

Listed organics (ppm or wt%)
- Acetone
- Benzene
- n-Butyl alcohol
- Carbon disulfide
- Carbon tetrachloride
- Chlorinated fluorocarbons
- Chlorobenzene
- Cresols
- Cresylic acid
- Cyclohexanone
- o-Dichlorobenzene
- 2-Ethoxyethanol
- Ethyl acetate
- Ethyl benzene
- Ethyl ether
- Isobutanol
- Methanol
- Methyl ethyl ketone
- Methyl isobutyl ketone
- Methylene chloride
- Nitrobenzene
- 2-Nitropropane
- Pyridine
- Tetrachloroethylene
- Toluene
- 1,1,1-Trichloroethane
- 1,1,2-Trichloroethane
- Trichloroethylene
- 1,1,2,-Trichloro-1,2,2-trifluoroethane
- Trichlorofluoromethane
- Xylene

Attachment B

Land Ban Analyses

Analyze for Land Ban only if material is RCRA hazardous

pH
PCB (ppm)
Paint Filter Liquids Test
Metals (mg/L) - analyze liquid from Paint Filter Liquids Test
- analyze only if total is above level listed

Arsenic	500
Cadmium	100
Chromium	500
Lead	500
Mercury	20
Nickel	134
Selenium	100
Thallium	130

Cyanide (ppm) - analyze liquid from Paint Filter Liquids Test
Organics by TCLP (mg/L) - analyze only if total is above level listed

Acetone	0.59
n-Butyl alcohol	5
Carbon disulfide	4.81
Carbon tetrachloride	0.96
Chlorobenzene	0.05
Cresols and cresylic acid	0.75
Cyclohexanone	0.75
o-Dichlorobenzene	0.125
Ethyl acetate	0.75
Ethyl benzene	0.053
Ethyl ether	0.75
Isobutanol	5
Methanol	0.75
Methyl ethyl ketone	0.75
Methyl isobutyl ketone	0.33
Methylene chloride	0.96
Nitrobenzene	0.125
Pyridine	0.33
Tetrachloroethylene	0.05
Toluene	0.33
1,1,1-Trichloroethane	0.41
Trichloroethylene	0.091
1,1,2,-Trichloro-1,2,2-trifluoroethane	0.96
Trichlorofluoromethane	0.96
Xylene	0.15

Attachment C

Other Needed Information

All compounds >1% of the composition
Description of material (Color, appearance, solid, liquid, etc.)
Number of phases
Relative volume of each phase
Description of each phase

NTS Requirements

Cyanide (wt %)
Density (g/cc)
Moisture content (wt %)
Organic material content
Paint Filter Liquids Test
PCB (ppm)
Radioactive constituents
Sulfur (wt %)

Idaho, WERF Incinerator Requirements

If multiphase, perform analyses on each phase
Gross alpha (microcuries)
Gross beta (microcuries)
Gamma (microcuries)
Identify 99% of all gamma activity above 30 KeV
All compounds >1% of the composition
Chlorine (wt % or ppm) - total or volatilized during cumbustion
Fluorine (wt % or ppm) - total or volatilized during combustion
Lead (ppm)
Mercury (ppm)
PCB (ppm)
Phosphorus (wt % or ppm)
Sulfur (wt % or ppm)
Ash (wt %)
Heat of combustion (BTU/lb)
Paint Filter Liquids Test
Specific gravity
Viscosity (cp)

Oak Ridge, K-1435 Incinerator Requirements

If multiphase, perform analyses on each phase
All compounds >1% of the composition
Ash (wt %)
Corrosivity (mmpy)
Density (g/cc)
Heat of combustion (BTU/lb)
Size (wt % >20 mesh)
Specific Gravity
Total solids (wt %)
Vapor pressure (mm Hg)
Viscosity (cp)
Chlorine (wt %) - volatilized during combustion
Cyanide (wt %)
Fluorine (wt % or ppm) - volatilized during combustion
PCB (wt % or ppm)
Phosphorus (wt % or ppm)
Sulfur (wt % or ppm) - volatilized during combustion
Uranium (ug/g) - in duplicate
U-235 (wt %) - only if U > 5 ppm
Water content (wt %)
Gross alpha (microcuries)
Gross beta (microcuries)
Gamma (microcuries)
Identify 99% of all gamma activity above 30 KeV
Radionuclides (microcuries) - only if alpha, beta, or gamma is positive

- Calcium-45
- Carbon-14
- Cesium-137
- Chlorine-36
- Chromium-51
- Cobalt-58
- Neptunium-237
- Phosphorus-32
- Plutonium-238
- Plutonium-239
- Potassium-40
- Sulfur-35
- Technetium-99
- Thorium-228
- Thorium-230
- Thorium-232
- Thorium-234
- Tritium
- Uranium (total)
- Uranium-234
- Uranium-235
- Uranium-238
- Zinc-65

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Attachment C (con't)

Oak Ridge Requirements (con't)

Total metals (ppm)
- Aluminum
- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Copper
- Iron
- Lead
- Lithium
- Magnesium
- Manganese
- Mercury
- Nickel
- Selenium
- Silver
- Sodium
- Thallium
- Titanium
- Zinc

5.0 Sampling Techniques

5.1 Equipment

Samples are removed from drums by chemical operators at Plant 1 under the direction of Waste Management or Materials Control and Accountability (MC&A) as directed in SOP 1-C-101, "Sampling Residue and Waste Materials." The following guidelines can serve as a basis for deciding which sampler to use. (The automatic closed auger sampler shall not be used unless a procedure is devised to clean it thoroughly after each lot is sampled.)

A manual auger sampler is used for dense particulate solids that are hard to penetrate. This sampler is inserted vertically through the drum contents so all locations (1-9) on Figure 1 are used.

The grain sampler is used for free-flowing particulate solids that are fairly easy to penetrate. This sampler is inserted diagonally through the drum contents so only locations 1-8 on Figure 1 are used.

The pipe sampler is used for moist or otherwise cohesive particulate solids that can be pulled out as a "core" without flowing out of the sampler. This sampler is inserted diagonally through the drum contents so only locations 1-8 on Figure 1 are used.

Composite liquid waste samplers (COLIWASAs) are used to collect full depth samples from drums of liquid waste. The plastic COLIWASA should be suitable for all liquid wastes at the FMPC. Only if the plastic is noticeably attacked (softened) by a solvent waste should a glass COLIWASA be used.

Each of the foregoing samplers requires thorough cleaning after each lot (solid or liquid) is sampled.

5.2 Sample Handling and Tracking

Special handling requirements such as the use of a preservative or the need to cool the samples will be specified in the RCRA Analysis Request Form and the RCRA Sampling Plan Form (Section 7.0). All samples must be traced by the chain-of-custody procedure detailed in SOP 1-C-101. This SOP also requires that a field notebook be kept and it details what should be recorded therein.

6.0 Representative Sampling

A lot is a group of drums that are identified by the same 15-digit Lot Marking System Number.

A waste stream is a group of drums that contain similar material based on process knowledge.

6.1 Backlog Waste

It is imperative that samples taken for RCRA determinations be demonstrably representative of the waste stream being considered. This is accomplished by random sampling.

6.1.1 Random Sampling

The term "random sampling" means that all the different segments of a waste stream have an equal probability of being sampled. Since we are dealing with drums of waste, this implies that each drum has an equal chance of being sampled and all segments of each sampled drum have an equal chance of being sampled. There are two considerations: the number of samples and the location of the samples.

At least two samples must be analyzed to allow a confidence interval to be calculated. As discussed in Section 8.0, two samples tend to give a large confidence interval. For this reason, two samples are used if only one or two drums comprise the waste stream. A practical minimum is three samples from a waste stream containing three or more drums. It would be unusual to analyze more than five samples from a waste stream unless a large number of drums (over 50) is involved; in which case, a minimum of one drum in 10 must be sampled.

Extra samples are taken when the uniformity of the waste is not known and when taking the particular samples is difficult. For example, for a waste stream consisting of 10 drums, five drums would be randomly sampled: three for analysis plus two extras. Note that these extra samples are not duplicate samples; they are simply additional samples taken the same way as the samples for analysis in case the first three samples yield too wide a confidence interval (as discussed in Section 8.0). Any time limit on holding samples before analysis and special storage requirements must be considered when taking extra samples. Oversampling should not be done for its own sake since inventorying and keeping track of extra samples represent a significant effort.

The following summary is a guide for the number of samples needed based on the number of drums in a waste stream:

Number of Drums	Number of Samples for Analysis	Number of Samples for Extras*
1	2	1
2	2	2
3 to 15	3	2
16 to 40	4	3
41 to 50	5	3
over 50	10%	3

* Extra samples are taken when significant drum movement is required for access to drums or extraordinary preparation such as anti-C clothing is required. Any time limit on the holding of samples before analysis and special storage requirements must be considered when taking extra samples.

After the number of samples is set, it is necessary to determine exactly where the samples are to be taken. Basically, a lot or lot group of drums containing the same waste must be sampled randomly.

In order to choose random samples, random numbers must be obtained. Tables 1 and 2 are lists of random numbers from 1 to 20 and from 1 to 100, respectively. (Random numbers can also be calculated using simple calculator or computer based programs.) To use the random number lists, go down a column and take each number less than or equal to the total number of units being randomized. For 1 to 10 units, the "one's place" digit from either list can be used (zero being interpreted as 10). Since repeat samples are not desired, repeat random numbers must be skipped. "Used" random numbers should be discarded after use and new numbers generated, although "recycling" lists like Tables 1 and 2 are acceptable if new numbers are not immediately available.

Drums are randomized by first assigning each one a consecutive number: 1, 2, 3, etc. (Many waste streams already have consecutive drum numbers which can be used.) If, for example, four drums are to be sampled, then four random numbers less than or equal to the number of drums in the waste stream are obtained. The drums chosen to be sampled are entered on the RCRA Sampling Plan Form (see Section 7.0).

TABLE 1

Random Numbers, 1-20

11	18	11	4	9	10	1	18
1	4	6	15	14	13	16	1
20	7	2	16	9	13	20	17
8	13	6	3	15	8	10	8
17	7	17	15	5	19	20	8
15	18	18	18	13	5	15	4
15	17	19	4	14	10	4	14
12	6	17	13	1	1	20	13
13	12	14	9	4	2	2	12
7	8	20	14	2	15	15	10
13	3	20	6	4	17	15	16
3	4	17	5	9	6	14	7
8	18	13	7	8	17	10	10
20	9	9	5	1	2	17	6
5	19	4	16	9	3	15	20
11	1	4	5	13	15	8	3
14	13	6	20	20	9	16	8
16	9	18	15	17	11	17	18
16	10	19	15	13	17	4	1
17	8	15	11	12	12	8	9
18	17	18	19	8	8	6	15
14	10	14	11	14	9	20	8
3	5	20	9	13	11	12	5
8	2	10	10	7	16	11	5
11	2	2	3	18	11	4	4
19	20	7	10	15	15	19	14
10	3	8	20	17	14	14	2
15	15	4	6	5	1	9	8
3	13	9	9	9	8	9	12
13	7	10	16	14	17	13	6
2	16	20	20	3	5	14	7
9	18	14	10	18	16	7	18
20	4	18	12	7	14	3	4
7	8	4	15	7	18	14	19
10	12	7	2	16	15	4	7
13	12	2	15	2	2	17	8
19	3	19	6	4	3	20	7
4	1	10	15	8	14	9	7
9	17	1	7	5	4	17	17
10	2	20	3	3	6	5	7
1	15	2	17	18	19	13	6
5	5	12	2	4	3	15	19
15	11	5	16	19	9	15	8
15	5	7	18	14	16	5	13
19	5	15	11	11	1	6	16
11	13	7	9	12	5	10	10
16	10	17	19	7	6	2	3
19	3	11	5	6	9	10	14
12	19	10	3	1	2	9	16
4	7	2	6	7	7	16	2

45 6

TABLE 2

Random Numbers, 1-100

88	31	46	21	47	98	73	56
95	91	80	35	46	93	92	74
12	85	38	13	23	95	56	80
87	98	35	83	72	78	48	38
35	1	84	33	86	31	53	13
28	42	16	45	81	10	87	67
29	80	25	79	25	26	79	33
60	53	64	30	53	81	16	28
20	94	74	65	85	40	26	81
30	83	59	91	7	38	34	8
31	36	95	69	74	38	56	35
12	38	87	65	70	22	14	26
86	17	53	45	95	18	65	12
97	55	63	2	98	78	12	79
76	37	10	31	52	88	59	10
31	48	18	41	61	17	43	90
80	2	99	8	15	15	14	68
23	14	39	63	84	39	79	84
53	96	37	28	46	28	5	53
8	12	74	88	58	16	87	4
64	5	20	98	76	82	70	92
68	11	96	41	97	41	30	53
7	1	58	19	57	80	23	36
22	96	31	80	63	25		82
60	64	84	96	62	59	85	70
65	83	36	73	55	68	99	21
11	43	15	1	49	35	16	61
73	68	45	47	48	76	42	46
41	71	80	91	85	5	80	46
69	39	76	2	98	51	34	87
44	71	1	21	33	9	74	58
56	45	9	84	7	32	62	73
43	34	35	98	91	61	29	97
68	58	19	9	48	10	27	26
11	72	85	20	100	26	29	35
1	3	49	37	45	42	93	82
91	18	55	63	6	67	86	68
65	39	63	34	22	72	71	66
93	90	83	84	85	48	46	1
26	98	45	62	4	21	52	95
19	16	16	83	26	100	35	74
12	99	46	20	81	75	71	27
40	17	64	35	77	48	49	35
80	4	6	50	45	83	16	51
48	52	93	63	11	69	82	46
31	44	37	96	66	19	80	13
56	22	98	90	89	90	94	29
4	4	72	35	23	8	42	83
62	33	24	43	58	39	18	57
13	68	62	57	34	6	100	68
						9	

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The four drums indicated by the random numbers are then marked for sampling. (Note that "Extra Samples" may repeat drums for streams with few drums, but the sampling position in the drum must not repeat.)

Large waste streams may be more easily randomized in the field. For example, a waste stream containing 2000 drums might be stored on 500 pallets stacked two-high in a configuration that is 10 pallets wide and 25 pallets deep. If 10% random sampling is specified, a list with at least 2000 random numbers from 1 to 10 (0 to 9, 1 to 100, or 0 to 999, etc.) is obtained. Then a digit (for instance, "1") is picked and the random number list is checked to ensure that 200 "1's" are included on it. With this list in hand, the drums are worked through in a predetermined pattern. For instance, in this example, from left to right starting with the top row. As each drum is passed, a random number is checked off the list. Whenever a "1" is encountered, that drum is removed or marked for sampling. In this manner, only 10% of the drums need to be pulled for sampling.

If sampling is being done because the statistical evaluation (Section 8.0) indicates that more samples are needed, the samples must be taken randomly from unsampled drums.

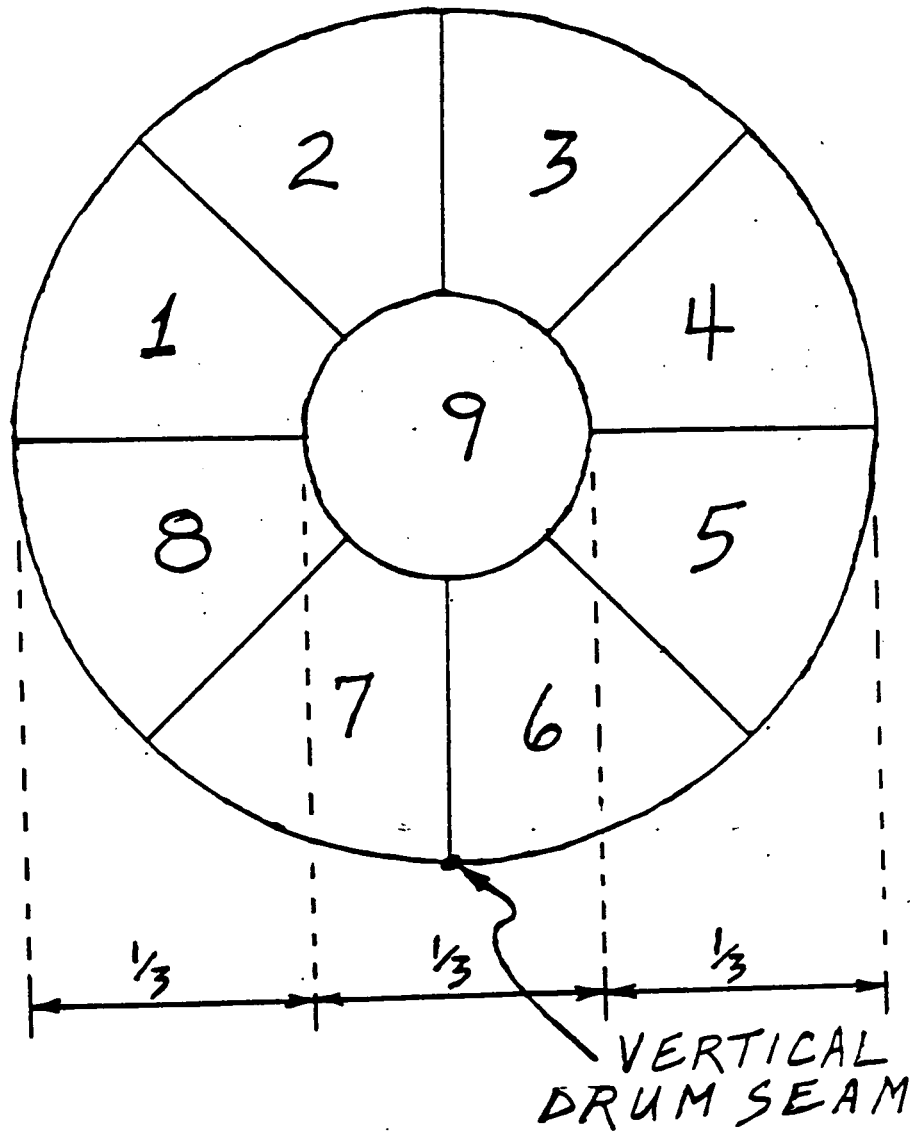
The sampling position within each solid waste drum is determined in the field just prior to taking each sample. The sampling position must be randomized (liquid waste drums are assumed to be radially uniform; i.e., only horizontal layers can be present). Since all drum samples will be taken from top to bottom, only the boring location on the top surface needs to be randomized. For our purpose, the top surface of each drum to be sampled is divided into an imaginary grid with nine sections of equal area as shown in Figure 1. To be consistent, the drum should always be faced at its vertical seam. The section to be sampled is determined by obtaining a random number from 1 to 9.

The following example should help clarify the preceding paragraphs:

> A specific waste stream consists of only 12 drums of presumably the same type of solid waste. The drums are in a difficult to reach location so it is decided to take three samples for analysis plus two extra samples. The drums are consecutively numbered 1, 2, 3, ..., 12. The first column in Table 1 is used to get five random numbers from 1 to 12 which are: 11, 1, 8, 12, 7. (Mark "7" as the last number used from the list.) Drums 11, 1, and 8 are sampled for analysis and drums 12 and 7 are sampled as extras. (Drums are sampled per SOP 1-C-101.) The drums can be sampled in any order. Say drum 11 is

FIGURE 1

SOLID WASTE DRUM SAMPLING GRID



chosen for sampling. Face drum 11 at its vertical seam. Get the next random number from 1 to 9 from Table 1. The next number after "7" is "13"; use "3" from this number. Figure 1 indicates that the sample must be taken from an outer section between 12:00 and 1:30. Take a full depth sample at this location. Repeat this procedure for all five samples.

While the foregoing randomizing technique may seem unwieldy, it is absolutely necessary in order to minimize possible bias when taking samples.

6.1.2 Composite Sampling

MC&A specifies which waste streams require Nuclear Material Accountability (NMA) sampling. For these streams, two different sampling schemes are performed concurrently: lot composite sampling to satisfy the requirements of NMA and random sampling to satisfy the requirements of this Plan. A lot composite is prepared by taking one sample from every drum in a lot and combining these samples in one container. A sample from this composite is then analyzed for uranium and U-235.

Compositing of random samples may be done to reduce the analytical costs of large waste streams. Compositing of random samples is the preparation of several samples obtained by combining equal numbers of random samples from the same waste stream. For example, a stream contains 1200 drums of waste. 120 random samples are taken. Groups of 12 random samples are combined to produce 10 composite samples for analysis.

Compositing of random samples can be used for large waste streams to reduce analytical costs. It may be done if the waste stream contains a large number of drums and knowledge of compositional ranges is not a concern. In no case shall less than five composite samples be analyzed. Compositing of random samples is unique in a given situation; therefore, a specific plan will be prepared for each waste stream where compositing of random samples is deemed appropriate.

6.2 Currently Accumulating RCRA Waste

RCRA waste streams that are currently being produced must be sampled at a frequency which assures that accurate, current data are available for timely dispositioning of the waste. Sampling strategy depends on the rate of waste production and the inherent stream variability. Drums should be sampled before being transported to a warehouse to minimize drum handling.

At a minimum, every RCRA waste stream must be sampled at a frequency of every 10th drum or one drum every three months, whichever occurs first. (Composite sampling of large waste streams may be specified to reduce analytical effort.) The only exception is for waste streams accumulating less than one drum in three months, in which case every drum is sampled and analyzed when full. Each new analysis must not vary outside a set range for each variable. This range is determined by the planned ultimate disposition of the waste. For example, a waste oil stream may be allowed a given range of 1,1,1-TCE, which would not affect the final disposition (presumably incineration).

When a waste stream is found to vary outside its allowed range, sampling and analysis of the offending variable for all subsequent drums shall commence in order to determine if the deviation is a perturbation or a real shift in waste stream properties. A "t test", as described in Section 8.0, shall be used on at least three consecutive drums to determine the significance of any perceived shift in variable mean.

6.3 Currently Accumulating non-RCRA Waste Streams

The sampling requirements for non-RCRA waste streams that through process knowledge and analysis have little or no potential of becoming RCRA shall be determined by internal record keeping and/or the off-site receiver of such waste. These sampling requirements vary widely and will not be detailed here.

Non-RCRA waste streams judged to have a reasonable potential of becoming RCRA must be sampled and analyzed frequently enough to maintain up-to-date 80% confidence intervals that are below RCRA limits. (Confidence interval calculations are covered in Section 8.0.) These are streams with one or more constituents pushing the RCRA limit. The minimum sampling frequency shall be every 10th drum or one drum every three months, whichever occurs first. Composite sampling of large waste streams may be specified to reduce analytical effort. An 80% confidence interval will be calculated after each sample is analyzed, using the current and previous two analytical results.

If the upper end of the 80% confidence interval exceeds the RCRA limit, the group of drums collected since the last "clean" result shall be considered "suspect" and treated as described in Section 6.1, Backlog Waste. Subsequently filled drums shall be individually sampled and a confidence interval calculated on the first five drums filled. Also, an investigation will begin as to the cause of the deviation. If sampling every drum and averaging over five drums narrow the confidence interval enough for a finding of non-RCRA, the waste stream shall continue to be considered as non-RCRA. Sampling all drums and averaging every five drums shall continue until it is

reasonably certain that the waste stream will remain non-RCRA. The sampling frequency can then be reduced. These judgements shall be made by Waste Management in consultation with Solid Waste Compliance.

6.4 Duplicate Sampling

For certain situations, duplicate samples are required. These may be requested for QA purposes or for use by an off-site analytical, treatment, or storage facility. The need for duplicate samples shall be stated on the RCRA Sampling Plan Form for each waste stream as discussed in the next section.

7.0 Sampling Forms

The forms discussed in this Section are subject to future revision based on the needs of the various groups involved and experience gained from using the forms.

7.1 RCRA Analysis Request Form

Attachment D is the RCRA Analysis Request Form. After it has been determined which analyses are needed, the RCRA Analysis Request Form is completed by appropriate FMPC personnel. At the time of this writing, appropriate personnel includes members of the Sampling Team. The manager of Waste Management will designate which personnel are approved to complete this form. The RCRA Analysis Request Form is contained in a Lotus file for ease of completion. (The lists of Attachments A, B, and C are also in a Lotus file.)

In the upper right corner of the form, there is space for information to track this form.

Number: Enter the number of the form. The Analysis Request Forms shall be numbered consecutively for tracking and filing purposes.

Priority: Enter the sampling priority level of the material.

Page of : Enter Page 1 of 1 if only one form is needed for the material. Otherwise, indicate the number of pages that will be required.

The first section of the form is for material identification. Fill in the section as follows:

Material Description: Enter the waste stream name or any appropriate description.

Number of drums in waste stream: Enter the total number of drums contained in the lot(s) of material sampled.

FMPC Lot Marking System Number: Identify the material using the FMPC Lot Marking System - Document Number FMPC 2178.

Drum Numbers: Identify all of the drums in the lot(s) of material using the drum numbers.

MC&A Inventory Numbers: Identify all of the drums in the lot(s) of material using the MC&A Inventory Numbers.

Charge Number: Enter the cost center that the Analytical Laboratories will charge for the work.

The second section of the form is for sampling information. Fill in the section as follows:

Will samples be preserved? Yes or No

If so, how? Describe the technique to be used. (add acid to lower the pH, lower the temperature, etc.)

Holding time for samples: Enter the maximum allowable time between sampling and analysis.

Drum Numbers for analysis: Indicate which drums (by drum number) will be sampled and analyzed.

Drum Numbers sampled as extras: Indicate which drums (by drum number) will be sampled, but analyzed only if the results of the first analyses are inconclusive.

Drum Numbers to be sampled in duplicate (Liquids only): Indicate which drums (by drum number) are to be sampled in duplicate.

Drum Numbers to be split for duplicate analysis (Solids only): Indicate which samples (by drum number) must be split by the Sample Receiving Laboratory for duplicate analysis.

Selected samples will be analyzed in duplicate. For liquid waste, the samples must be taken in duplicate. For solid waste, twice the volume of sample needed must be taken and placed in one container. The sample must be blended and split in the laboratory.

The third section of the form is blank. Use this section to describe which analyses to perform on each sample. This description can be written out or listed in the form of tables. Using the Lotus software, move the analyses that must be performed on each sample from the appropriate file into this space. Include space for Analytical to enter the Laboratory Number for each sample.

If more than one page is required to complete this table, list the Identifying Information at the top of each page. Include the information in the upper right corner to track the forms. The form number shall be the same on all pages necessary to complete the form for a waste stream. Continue the description or table on each page, including the headings. Sign and date each page.

After the form is completed, it must be dated and signed by a member of the Sampling Team or other authorized person in the space for "Authorized Signature". Analytical shall maintain a current list of personnel authorized to sign this form.

The signed form shall be sent to the Area Supervisor at Plant 1 along with the RCRA Sampling Plan Form. After the samples are taken, this form shall accompany the samples to Analytical's Sample Receiving Laboratory.

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RCRA Analysis Request Form

Number:
Priority:
Page of

Identifying Information
- Material Description:
- Number of drums in waste stream:
- FMPC Lot Marking System Number:
- Drum Numbers:
- MC&A Inventory Numbers:
- Charge Number:

Sampling Information
- Were samples preserved?
  - If so, how?
- Holding time for samples:
- Drum Numbers sampled for analysis:
- Drum Numbers sampled as extras:
- Drum Numbers sampled in duplicate (Liquids only):
- Drum Numbers to be split for duplicate analysis (Solids only):

Analyses Required

This form and the Sampling Plan Form must be dated and signed by an authorized individual.

I certify that analyzing the above samples according to the information on this form will meet the requirements of the Sampling Plan for Drummed Waste.

Date _____ Authorized Signature _____

7.2 RCRA Sampling Plan Form

Attachment E is the RCRA Sampling Plan Form. Two copies of the form shall be prepared. One copy shall be sent to the Area Supervisor at Plant 1 and used as the instructions for sampling. Plant 1 shall file this copy when sampling is complete. The second copy shall be kept by Waste Technology and maintained as part of the permanent records of sampling and analysis.

After it has been determined how the waste will be sampled, the RCRA Sampling Plan Form is completed by approved FMPC personnel. At the time of this writing, approved personnel includes members of the Sampling Team. The manager of Waste Management will designate which personnel are approved to complete this form. The RCRA Sampling Request Form is contained in a Lotus file for ease of completion.

In the upper right corner of the form, there is space for information to track this form.

Number: Enter the number of the form. The Sampling Plan Forms shall be numbered consecutively for tracking and filing purposes.

Priority: Enter the sampling priority level of the material.

Page of : Enter Page 1 of 1 if only one form is needed for the material. Otherwise, indicate the number of pages that will be required.

The first section of the form is for material identification. Fill in the section as follows:

Material Description: Enter the waste stream name or any appropriate description.

Number of drums in waste stream: Enter the total number of drums contained in the lot(s) of material sampled.

FMPC Lot Marking System Number: Identify the material using the FMPC Lot Marking System - Document Number FMPC 2178.

Drum Numbers: Identify all of the drums in the lot(s) of material using the drum numbers.

MC&A Inventory Numbers: Identify all of the drums in the lot(s) of material using the MC&A Inventory Numbers.

Location of drums: Indicate the building where the drums are stored.

Process knowledge: Describe the origin of the material as much as possible or attach other pertinent information.

The second section of the form is for sampling information. Fill in the section as follows:

Sampling Technique: Indicate which sampling technique to use. (Coliwasa, grain sampler, etc.)

Will samples be preserved? Yes or No

If so, how? Describe the technique to use. (add acid to lower the pH, lower the temperature, etc.)

Holding time for samples: Enter the maximum allowable time between sampling and analysis.

Will composite samples be taken? Yes or No

If yes, use attached form. If composite samples will be taken, attach a form that describes the details for compositing.

Drum Numbers to be sampled and analyzed: Indicate which drums (by drum number) will be sampled and analyzed.

Drum Number to be sampled as extras: Indicate which drums (by drum number) will be sampled, but analyzed only if the results of the first analyses are inconclusive.

Selected samples will be analyzed in duplicate. For liquid waste, the samples must be taken in duplicate. For solid waste, twice the volume of sample needed must be taken and placed in one container. The sample must be blended and split in the laboratory. Therefore, solid waste sample containers must be filled only half-full to allow for complete blending.

The third section contains a table for completion.

Drum No.: List the drum number of each drum that is to be sampled.

Number of containers to be filled: Enter the number of containers of a particular type that are to be filled for the indicated drum.

Sept. 21, 1989 ATTACHMENT E

RCRA Sampling Plan Form

Number:
Priority:
Page of

Identifying Information
Material Description:
Number of drums in waste stream:
FMPC Lot Marking System Number:
Drum Numbers:
MC&A Inventory Numbers:
Location of drums:
Process knowledge or other available descriptive information:

Sampling Information
Sampling Technique:
Will samples be preserved?
If so, how?
Holding time for samples:
Will composite samples be taken?
If yes, use attached form.
Drum Numbers to be sampled and analyzed:
Drum Numbers to be sampled as extras:

If sampled material is solid, fill sample container 1/2 full.
If sampled material is liquid, fill sample container at least 3/4 full

Drum No.	Number of containers to be filled	Container Type	Container Size	Holding Time
---	---	---	---	---

The analyses required are listed on the Analysis Request Form. This form and the Analysis Request Form must be dated and signed by an authorized individual.

I certify that sampling the above drums according to the information on this form will meet the requirements of the Sampling Plan for Drummed Waste.

Date Authorized Signature

Container Type: Enter the type of container. (Plastic, glass)

Container Size: Enter the size of container.

Holding Time: Enter "yes" if the holding time indicated above applies to the sample in the specified container.

If more than one page is required to complete this table, list the Identifying Information at the top of each page. Include the information in the upper right corner to track the forms. The form number shall be the same on all pages necessary to complete the form for a waste stream. Continue the table on each page, including the headings. Sign and date each page.

After the form is completed, it must be dated and signed by a member of the Sampling Team or other authorized person in the space for "Authorized Signature". Plant 1 shall maintain a current list of personnel authorized to sign this form.

7.3 Other Records

Legible photocopies of pages from the field log book shall be sent to Waste Technology each day that samples are taken. These copies will be filed and kept as part of the records maintained on sampling and analysis in Waste Technology.

The chain-of-custody form initiated when samples are taken will be sent to Waste Technology when analysis of the sample is complete. These forms will be filed and kept as part of the records maintained on sampling and analysis in Waste Technology.

8.0 Statistical Evaluation

Statistics are used to determine a confidence interval for the true average or mean waste composition. Statistically, the analytical results for one parameter are collectively called the "sample". If the sample consists of X_1, X_2, ..., X_n the sample mean ($\bar{X}$) is:

$$\bar{X} = \frac{X_1 + X_2 + \ldots + X_n}{n}$$

where n = number of samples taken.

For RCRA determinations, we must establish an 80% confidence interval (CI) for the true mean; i.e., we want to establish a range around $\bar{X}$ in which we can be 80 % certain that the true mean lies. First we must obtain a measure of the variability of X. This is called the sample standard deviation (s) and is defined as:

$$s = \sqrt{\frac{(\bar{X}-X_1)^2 + (\bar{X}-X_2)^2 + \ldots + (\bar{X}-X_n)^2}{n-1}}$$

An equivalent form of this equation which simplifies the calculation is:

$$s = \sqrt{\frac{n(X_1^2 + X_2^2 + \ldots + X_n^2) - (X_1 + X_2 + \ldots + X_n)^2}{n(n-1)}}$$

Note that these calculations are internal functions on many calculators (MEAN and SDEV in the HP41CV, $\bar{x}$ and σ_{n-1} on many TI calculators) and are included in any statistics package for personal computers. (When using a calculator or computer, it is important to input a simple example problem, such as given later, to assure the user that the correct procedure is being followed. For example, it is important that the "sample standard deviation" is used and not the "population standard deviation". The latter replaces (n-1) with (n) in the above equations.)

For this statistical evaluation to be valid, s^2 must be less than $\bar{X}$. If s^2 is not less than $\bar{X}$, a judgement must be made on the need for more sampling or a different statistical treatment. This situation is most likely to occur when analytical results are near the detection limit and significantly lower than the RCRA limit. In such cases, a summary judgement of "non-RCRA" can be made with no further statistical analysis.

The last variable needed to calculate the confidence interval is "t". This variable is a function of the number of samples (n) and serves to widen the confidence interval as the number of samples decreases and confidence is reduced. (The statistical treatment described here is commonly called a "t test".) Values of t for a given number of samples are listed in Table 3.

Finally, the confidence interval (CI) is calculated from the following equation:

$$CI = \overline{X} \pm \frac{(t)(s)}{\sqrt{n}}$$

It can be seen that increasing n (which also decreases t) has the effect of narrowing the confidence interval.

The following is a simple example of how to use these equations. Five representative samples were taken and analyzed for a RCRA component having a limit of 5.0 ppm. The analysis results were 6, 2, 4, 3, and 3 ppm. Does the data justify a finding of non-RCRA?

Statistical Treatment:

X	X^2
6	36
2	4
4	16
3	9
3	9
18	74

$n = 5$

$\overline{X} = 18/5 = 3.60$

$t = 1.533$

$$s = \sqrt{\frac{(5)(74) - 18^2}{(5)(4)}} = 1.517$$

$$CI = 3.60 \pm \frac{(1.533)(1.517)}{\sqrt{5}} = 3.60 \pm 1.04$$

So the 80% confidence interval is 2.56 to 4.64 ppm.

TABLE 3

Values of "t"

Number of Samples, n	Value of "t"
2	3.078
3	1.886
4	1.638
5	1.533
6	1.476
7	1.440
8	1.415
9	1.397
10	1.393
11	1.372
12	1.363
13	1.356
14	1.350
15	1.345
16	1.341
17	1.337
18	1.333
19	1.330
20	1.328
21	1.325
22	1.323
23	1.321
24	1.319
25	1.318
26	1.316
27	1.315
28	1.314
29	1.313
30 (or more)	1.311

Since the high end of the confidence interval is <5 ppm, we can declare the waste non-RCRA for this component. If, for example, the analytical results were: 6, 2, 4, 3, and 5 ppm; the resultant confidence interval becomes 2.92 to 5.08 ppm and therefore the waste cannot be declared non-RCRA. (In this case, it would be prudent to analyze another sample. If a sixth sample analyzed at 4 ppm, the confidence interval using 6, 2, 4, 3, 5, and 4 ppm becomes 3.15 to 4.85 ppm and the waste can be declared non-RCRA. The number of extra samples to analyze in these cases depends on how far the CI extends above the RCRA limit and is essentially a judgement call based on experience.) Note that if $\bar{X}$ is greater than the RCRA limit, no number of additional samples is likely to result in a determination of non-RCRA.

All statistical results shall be legibly recorded, signed, and dated by the person making the calculations. All calculations shall be checked by another individual. All calculations shall be kept in the appropriate Waste Management file. Any additional statistical evaluation required by off-site waste treatment or storage facilities shall also be included in these files.

9.0 Quality Assurance

9.1 Sample Identification

All samples taken at the FMPC shall be identified using the "FMPC LOT MARKING and COLOR CODING SYSTEM" (FMPC 2178), which is an internal document maintained by the staff of the Materials Control and Accountability section. The labeling of samples will be performed according to FMPC SOP 1-C-101, section on records requirements.

9.2 Sample Control and Chain-of-Custody

Transfer of all RCRA and RCRA-suspect samples shall be documented following the procedure in FMPC SOP 1-C-101 on chain-of-custody. The chain-of-custody record is used to track the movement of all samples and as a sample logging source document for the Analytical Laboratories at the FMPC.

9.3 Maintenance of Field Notebook

The FMPC personnel supervising the taking of RCRA samples shall maintain the field notebook. This notebook will include all pertinent field data as listed in SOP 1-C-101.

All entries in the field notebook shall be dated, be legible, and contain accurate and inclusive documentation of the sampling campaign. Since field notebook records are the basis for subsequent written reports, language should be objective and factual. Once completed, these field notebooks become accountable documents and shall be maintained by Waste Management as part of the RCRA sampling files.

9.4 Recording of Information

All sample identification, field notebook, and chain-of-custody records shall be recorded in waterproof non-erasable ink. If errors are made in any of these documents, correction is made by simply crossing a single line through the error and entering the correct information. All corrections shall be initialed and dated.

9.5 Laboratory QA

The FMPC Analytical Laboratory or an off-site laboratory under subcontract shall follow their internal QA plans regarding split sample or spiked sample checks. Liquid sample blanks shall be submitted at least once per calendar quarter. Duplicate sampling may be requested by Waste Management, Analytical, or the QA Department at any time if results become suspect. (The use of multiple random sampling minimizes the need for duplicate samples.)

9.6 Equipment Cleaning

To avoid cross contamination, sampling equipment shall be cleaned thoroughly. The cleaning shall be documented as specified in SOP 1-C-101. Equipment shall be visually inspected for contamination before each use.

9.7 Rinse Water

The clean distilled rinse water to be used for final rinsing of the sampler shall be sampled at the start of each waste stream sampling campaign. This sample will be analyzed for all metals and organics of interest in the waste stream.

9.8 COLIWASA Blank Sample

Before sampling a liquid waste stream, the clean COLIWASA shall be used to take a sample from the clean rinse water container. This sample will be analyzed for all metals and organics of interest in the waste stream.

9.9 Training

Waste Management shall train Plant 1 chemical operators on the correct handling of the sampling equipment and on the filling of sample containers.

9.10 Auditing

The QA Department shall verify the implementation of this sampling plan by field surveillance.

10.0 References

Code of Federal Regulations (CFR) Title 40, Protection of Environment, Part 261, "Identification and Listing of Hazardous Waste"

Title 49 CFR, Transportation, Subchapter C "Hazardous Materials Regulations", Parts 171-177

Test Methods for Evaluating Solid Waste, USEPA document SW-846, Volume II, Field Manual, Physical/Chemical Methods, Chapter Nine, "Sampling Plans", United States Environmental Protection Agency (USEPA), Office of Solid Waste and Emergency Response

Samplers and Sampling Procedures for Hazardous Waste Streams, USEPA document EPA-600/2-80-018, USEPA, dated January 1980

Engineering Support Branch Standard Operating Procedures and Quality Assurance Manual", USEPA, dated April 1, 1986 (Document available in Waste Technology and MC&A)

National Guidance Package for Compliance with Department of Transportation Regulations in the Shipment of Environmental Laboratory Samples, David Weitzman, Office of Occupational Health and Safety (PM-273), USEPA, dated April 13, 1981

Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements, NVO-325, dated October 1988

Waste Acceptance Plan and Analytical Protocol for the K-1435 Toxic Substances Control Act (TSCA) Incinerator, Oak Ridge Gaseous Diffusion Plant (ORGDP), Oak Ridge, Tennessee, K/HS-252, dated January 1989 (Document available in Waste Technology)

Waste Acceptance Criteria for Off-Site Waste Processing in the Waste Experimental Reduction Facility (WERF) Incinerator located at the Idaho National Engineering Laboratory (INEL), Draft (Document available in Waste Technology)

FMPC Standard Operating Procedure SOP 1-C-101, "Sampling Residue and Waste Materials"

FMPC Standard Operating Procedure SOP 20-C-605, "Hazardous Waste Satellite Accumulation Areas"

FMPC Standard Operating Procedure SOP 1-C-605, "Storage of Hazardous Waste"

Analytical Laboratory Quality Assurance Plan AnL-QAP

FMPC-2083, MC&A Manual, Section VIII "Sampling", Section XIV "Statistics".

WMCO:CO(MCA):89-155, D. L. Dunaway to P. J. Levine, "Sampling Requirements For RCRA Waste", dated April 14, 1989

FMPC-2178, Lot Marking and Color Coding System.

APPENDIX

Treatment / Disposal Facility Requirements

This document contains a description of the analytical information required by treatment and disposal facilities that could accept RCRA waste from the FMPC in the future. This information was assembled for the use of the Sampling Team in developing sampling plans for the waste streams at the FMPC. It may also be used to develop a contract for off-site analytical services.

A. Nevada Test Site, NVO-325

The analytical requirements for material sent to NTS are described in "Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements", NVO-325. Restrictions and requirements from this document applicable to FMPC waste are listed below:

1. "Cyanide- and sulfide-bearing wastes in concentrations greater than ten percent by weight as CN^- or S^- will not be accepted."

2. "Mixed waste must not have free liquids as demonstrated by EPA Test Method 9095, "Paint Filter Liquids Test," specified in Title 40 CFR 264.314(c)."

3. "PCB-contaminated waste will not be accepted for disposal at NTS unless the PCB concentration meets municipal solid waste disposal levels."

4. The form required for each waste stream is called the "Waste Stream Characterization Data Sheet". See Attachment A.

Treatment / Disposal Facility Requirements

B. Oak Ridge, K-1435 TSCA Incinerator

The analytical requirements for material sent to the incinerator at the Oak Ridge Gaseous Diffusion Plant (ORGDP) are described in "Waste Acceptance Plan and Analytical Protocol for the K-1435 Toxic Substance Control Act (TSCA) Incinerator", issued January 1989. Restrictions and requirements from this document applicable to FMPC waste are listed below:

1. "Table 1-1 lists the hazardous wastes to be handled at the incinerator, giving the waste category, the hazardous classifications, and the EPA waste numbers." See Attachment B, "Hazardous Waste".

2. Attachment C is Table 4-2, "Rationale for Selection of Waste Analysis Parameters".

3. Waste must not exceed the values specified on Table 2-1, "Maximum Acceptance Levels." See Attachment D.

4. "The generators must use the analytical methods shown on Table 4-1 or alternate methods that are acceptable to regulations and approved by ORGDP." See Attachment E, "Waste Analysis Parameters and Methods".

5. Attachment F is Figure 2-2, "Waste Analysis Form". It must be completed for each waste stream.

6. "The generator may eliminate any of the analytical parameters on this form [Waste Analysis Form - Attachment F] if process knowledge indicates that the test is unnecessary. The generator must provide justification for eliminating any analytical parameters."

7. The results entered in the Metal Analyses section of the Waste Analysis Form must be obtained from total metal analyses, not EP Toxicity or TCLP. (As per conversation with Dave Coleman on August 21, 1989.)

8. "Uranium contaminated material with less than 1 percent ^{235}U must not exceed 0.08 curies per container. For materials containing enriched uranium (^{235}U concentration greater than 1 percent of total isotope presence), U_T concentration cannot exceed 5 ppm of the waste." U_T means total uranium.

9. "Gross alpha, beta, and gamma will be run on all samples as a screening device. If positive, the radionuclides shall be quantified using radionuclide specific analysis. After process knowledge is developed, analysis will be required only on the specific radionuclides known to be present at the facility."

10. "For solids, calculated estimates for the major compounds (greater than 1 percent) are acceptable. A waste description identifying all the material in drums or bulk shipments must be provided (i.e., PCB capacitors and Viton gloves). Organic chlorine, heat content, ash, and bulk density must be quantified."

11. "The contents of drummed solids should be shreddable. Rebar, large pipe, and concrete over six inches in diameter should be excluded."

Treatment / Disposal Facility Requirements

Oak Ridge, K-1435 TSCA Incinerator

12. "Shipments of liquid wastes must comply with the following requirements:

    a. "The listing of major compounds and their concentrations on the Waste Analysis Form can be based on process knowledge. Any compound with concentrations over 1 percent should be listed. If the concentrations are not known within +/- 10 percent for the shipment, they must be analyzed."

    b. "For process known waste, less than percent values or ranges are acceptable for all compounds and elements unless noted below. Ash, organic chlorine, specific gravity, sulfur, fluorine, viscosity, and heating value must be known within 5 percent value."

    c. "PCB, Pb, Be, and Hg data must be present unless written documentation showing absence is provided."

    d. "Each shipment or 16 drum lot must include data from laboratory analysis of the organic chlorine, specific gravity, ash, heat content, viscosity, total uranium concentration, and uranium assay if total uranium concentration is greater than 5 ppm. Uranium sampling and analysis must be done in duplicate. Radionuclides in excess of detectable levels will also require analysis."

       If the total uranium concentration is less than 5 ppm, the uranium isotopes do not have to be analyzed. (As per conversation with Dave Coleman on August 21, 1989.)

       If a lot of the material is composited for sampling and analysis, the following will satisfy the above requirement for uranium analysis. An individual sample from each drum is placed in a composite drum. After all of the individual samples have been placed in the drum, the material is blended if it is not a free flowing liquid. Two samples are taken from the composite drum and analyzed for uranium. (As per conversation with Dave Coleman on August 21, 1989.)

    e. "The compatibility/corrosivity of the liquid with carbon steel, viton, and furan must be quantified."

    f. "For liquids with more than one phase, each phase should be analyzed and the weighted average reported. Phases which constitute less than 5 percent on a volume basis can be neglected."

In the Waste Acceptance Criteria, analysis of chlorine, fluorine, sulfur, organic chlorine, organic fluorine, and organic sulfur are referred to in various places. The actual information that Oak Ridge needs is how much chlorine, fluorine, and sulfur will be released when the material is incinerated. The analyses listed in Attachment E (Table 4-1) will provide the results that are needed. (As per conversation with Dave Coleman on August 21, 1989.)

C. Idaho, WERF Incinerator

The analytical requirements for material sent to the incinerator at the Idaho National Engineering Laboratory (INEL) are described in "Waste Acceptance Criteria for Off-Site Waste Processing in the Waste Experimental Reduction Facility (WERF) Incinerator located at the Idaho National Engineering Laboratory (INEL)", Draft. Restrictions and requirements applicable to FMPC waste are listed below:

1. "Waste streams that are hazardous because they exhibit the characteristic of ignitability or EP Toxicity can be accepted, but those wastes that are corrosive or reactive will not be allowed. Subpart D listed wastes that appear in the WERF Part A permit application can be accepted for incineration. Currently, this list includes EPA waste coded D001 through D011, all F-coded wastes (except those requiring a 99.9999% DRE by 40 CFR 264.343), most P- and U-coded wastes, and some of the K-coded wastes."

2. "The complete list of the physical, chemical, and radiological waste acceptance criteria (WAC) limits are presented in Tables 1 and 2. Table 1 summarizes the radiological and hazardous material WAC limits, and Table 2 summarizes the chemical and physical property limits that are related to proper incinerator operation." See Attachments G and H.

"2.2.1 Limits Required by DOE Order 5820.2A"

3. "Maximum Allowable Concentration of Major Radionuclides. This is controlled by limits that define the maximum gross alpha and beta/gamma content of a particular waste. For liquid waste, the limits are 34 x 10^{-6} Ci/L beta/gamma and 0.1 nCi/g alpha. The solid waste limits are 20 mR/hr beta/gamma (contact) and 0.1 nCi/g alpha."

4. "Free Liquids. Free liquids are not allowed in solid waste. Any liquids to be processed in solid waste must be totally absorbed in an eligible absorbent material with 100% excess absorbent. The total volume of flammable liquid cannot exceed one liter per box."

"2.2.2 Limits Required by Title 40 CFR 260-270"

5. "Principle Organic Hazardous Constituent (POHC). The POHC, if present in the waste, must have a heat of combustion of greater than 432 BTU/lb (must not exhibit a greater difficulty to incinerate than Carbon Tetrachloride (CCl_4)). The only Appendix VIII compound for which this is a concern is Tri-chloroflorometh ane (CCl_3F). Therefore, CCl_3F [freon] must not be present in significant quantity in any waste accepted for processing at WERF."

   To satisfy this requirement, the heat content of the waste must not be less than 432 BTU/lb. (As per conversation with Ray Geimer on August 22, 1989.)

Idaho, WERF Incinerator

6. "Heating Value. The generator must analyze or otherwise determine the heating value of the waste being considered to provide information that will allow the incinerator to operate effectively. It may be necessary to estimate the heating value for some mixed solid waste. The limit on heating value in liquids is 10,000 BTU/lb. There is no limit on the heating value of solid waste, but there should be some benefit to be gained in incinerating the waste (i.e. volume reduction, destruction of a hazardous constituent)."

7. "Viscosity. Liquid waste viscosity is limited to 150 Saybolt Seconds Universal (SSU) to assure the liquid waste system operates properly."

   The viscosity can also be measured in centipoise (cp). The results can be converted to SSU. (As per conversation with Ray Geimer on August 22, 1989.)

8. "Halogen and Sulfur Content. In order to assure incinerator effluents are maintained within regulatory guidelines, the generator must supply the halogen and sulfur content of the waste. Chlorine content of waste will be limited to 20 lb of chlorine per million BTU of waste. Sulfur content is not limited, but will be used to indicate to WERF personnel any decrease in off-gas treatment efficiency."

9. "Lead and Mercury Content. This analysis is required; however, there is no limit specified for either of these constituents. The generator must provide levels of lead and mercury in the waste."

   "2.2.3 Additional Incinerator Regulatory and Operational Limits"

10. "Polychlorinated Biphenyl (PCB) content. The content of PCBs is limited to less than 50 ppm."

11. "Ash Content. The ash content is the residual ash resulting from incineration of a substance. Ash content is only a consideration for liquids, and is limited to less than 1.2% by weight."

12. "Water Content. For liquid waste, there can be no immiscible water layer allowed, so that proper operation of the incinerator liquid feed system is assured. Miscible water in liquid waste is limited only by the overall heating value of the liquid. There is no limit on water content in solid waste, except that it must not exist as free liquid."

13. "Phosphate Content. Phosphates may cause problems with slagging in the incinerator. There is not a limit on phosphate, but the generator must determine if, and in what quantity, phosphates are present."

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Idaho, WERF Incinerator

14. "Prohibited Items. In general, noncombustible items are not allowed in solid waste that is to be incinerated. Some of the prohibited items are: glass, fiberglass, respirators, aerosol cans, and most metallic wastes. This is not an exhaustive list of prohibited items, and any questions concerning a specific item should be addressed to the WERF Off-Site Waste Coordinator."

"3.2 Waste Analysis Plan"

15. "Sampling Methods
A description of the sampling methods used to obtain representative samples of the waste will be included in the WAP [Waste Analysis Plan]. The methods used should be those recognized in either Title 40 CFR 261, Appendix I - Representative Sampling Methods, or in EPA-SW-846 Test Methods for Evaluation Solid Waste. Sampling methods other than these will be acceptable if they provide an equally representative sample, but must be approved by INEL personnel. For a waste stream that the generator will characterize by knowledge of process, the generator will present rationale for not undertaking a sampling and analysis program, and will detail the methods by which sufficient data is to be obtained."

16. "Analytical Procedures
The WAP will define the individual analytical procedures that are used for each of the analyses required. In general, the analytical procedures selected will be industry accepted standards for that particular analysis. Standard procedures can be found in such places as the EPA SW-846 document or in the ASTM standards. Appendix A details the procedure for choosing analytical methods, documents which analyses have required methods, and lists suggested methods for other analyses."

There is no Appendix A at this time. (As per conversation with Ray Geimer on August 22, 1989.)

17. "Quality Assurance/Quality Control (QA/QC)
A vital part of a waste characterization is to establish measures that will assure accuracy of data being collected. It will thus be necessary in the development of a WAP to address QA/QC procedures. This section of the WAP will include, but not be limited to, such things as chain-of-custody procedures, internal QC checks (replicate and spike QC samples, blank samples, etc.), and calibration standardization and maintenance validation. QA/QC procedures will cover external laboratory subcontractors as well as internal functions."

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Treatment / Disposal Facility Requirements

Idaho, WERF Incinerator

Attachment J is the Waste Analysis Form. It was not included in the draft of the Waste Acceptance Criteria. Ray Geimer sent it to the FMPC on August 22, 1989. Additional information regarding the form is as follows:

13. If the material has more than one layer, analyze each layer and report the weighted average.

14. Halogen refers to chlorine and fluorine combined.

15. Analysis of chlorine, fluorine, and sulfur. Idaho would prefer that we report the amount released during combustion. However, we can report the total of each.

16. We can report either total or EP Toxic results for arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. We are not required to report results on any other metal unless it is a major constituent. Space is provided on the form for copper, nickel, zinc, thallium, and hexavalent chromium because this form is used for other purposes.

17. List the major constituents in Section D Chemical Composition. If the total is not 100%, attach a copy of the analysis report.

18. We can use either process knowledge or analytical results for Section D.

Waste Stream Characterization Data Sheet

1. Waste Stream No.: _ _ _ _ - _ _ _ _ _ _ _ _ _ _

2. Physical Characteristics:

   a. Density: _____

   b. Moisture Content: _____

   c. Organic Material Content: _____

3. Radioactive Characteristics:

   a. Is Waste > NRC Class C (see Title 10 CFR 61.55) ?: ____

   b. SWIMS Nuclide Category (circle): 1 2 3 4 5 6 7 8

   c. Radioactive Constituents:

	Nuclide	Specific Activity Range Low	Mean	High	(Units)
(1)					
(2)					
(3)					
(4)					

4. Hazardous Characteristics (for mixed waste):

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

   b. Is this a Restricted Waste (see Title 40 CFR 268)?: ____

   c. Hazardous Constituents:

	EPA Hazardous Waste No.	Chemical Name	Concentration Range Low	Mean	High	(Units)
(1)						
(2)						
(3)						
(4)						

(Attach additional sheets if necessary.)

Figure 2. Example of Waste Stream Characterization Data Sheet

ISSUE DATE: 01/89
REVISION:

Table 1-1. Hazardous Waste

Hazardous Waste	Hazard	EPA Waste Number
Oils	EP toxic, toxic	F001, F002, D004 D005, D006, D007 D008
Solvents and chemicals	Ignitable, toxic, EP toxic	F001, F002, F003 F005, D004, D005 D006, D007, D008 D001
Aqueous wastes	EP toxic, corrosive, toxic	D002, D005, D006, D007, F001, F002
Sludges	Toxic, EP toxic	F001, D011
Solids	Toxic, EP toxic, toxic, corrosive	See note[a]
Lab wastes	EP toxic, toxic, ignitable, corrosive	See note[b]
Discarded chemical products	EP toxic, toxic, ignitable, corrosive	See note[b]

[a]Solids can include contaminated soils, spill cleanup, and other contaminated solid materials. These solids may be contaminated with wastes that have any of the waste numbers listed in this table.

[b]Lab wastes and discarded chemical products may include any of the U or P listed compounds that can be disposed of by incineration.

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Table 4-2. Rationale for Selection of Waste Analysis Parameters

pH, Alkalinity or Acidity	Analyses needed for solutions or slurries to determine proper handling and storage; Indicator of corrositivity to steel may also be characteristic of a particular process waste, therefore, used as a fingerprint parameter
Specific Anions/Cations	These parameters may be run on aqueous, slurry sludge, or inorganic solid samples to account for major constituent or type of acid/base/salt present; wastes containing cyanide and sulfide must be measured at the ppm level because there are possible toxic effects to be considered during handling and storage or incineration
Solids (suspended and size)	Type and concentration of solids are important for aqueous and slurry/sludge samples to determine incineration and pumping/handling characteristics; significant changes in solid concentrations may reflect a change in the waste chemical composition
Selected Organics (PCBs)	Based on data supplied by the generator, major organic compound components, hazardous constituents (PCBs), or priority pollutants may be selected for analysis to verify waste characteristics on a random basis; wastes suspected to contain PCBs will be monitored
Flash Point	Knowledge of this parameter helps to ensure safe handling and storage of a waste; changes, especially towards lower temperature values, must be known to avoid a potential fire/explosion hazard
Elemental Analysis (carbon, hydrogen, sulfur, nitrogen, phosphorus, and organically bound halide)	Knowledge of these parameters is necessary for determination of the incineration system conditions, i.e., computation of stoichiometric air requirements; when information on the chemical nature of waste is well defined these parameters may not be required; changes in key parameters such as phosphorus, sulfur, and halide

Table 4-2. Rationale for Selection of Waste Analysis Parameters - (continued)

	must be known so the adequacy of pollution control equipment can be confirmed
Heavy Metals	Levels of heavy metals, particularly priority pollutant metals, in a waste need to be known to assure that losses to the environment do not occur during incineration; necessary to monitor aqueous waste which may enter the central neutralization facility
Specific Gravity	Specific gravity value is important in calculations to provide a material balance across a treatment process and to give a true value of the amount of wastes being handled; changes in the specific gravity definitely signal a change in the makeup of the waste
Ash Content	Ash content is important for evaluating wastes for incineration to determine potential slag formation, assess particulate loading and determine if the ash handling system is sufficient; changes in ash content may reflect significant changes in the inorganic constituents of the waste
Heat of Combustion (Btu)	This parameter is needed for incineration candidates to determine heat load for proper incineration operation and allow for auxiliary fuel usage as required; changes in Btu level of a waste reflect changes in the organic composition of the waste
Percent Water	Water concentration will determine whether the waste should be treated as an aqueous waste; water concentration can be used to determine storage (especially compatibility) and handling requirements, and provide material balance on solid wastes; changes in water content must be known to assure adequate treatment

Table 4-2. Rationale for Selection of Waste Analysis Parameters - (continued)

Viscosity	Viscosity values will help determine the method of waste handling, blending, and storage; very viscous wastes may require heating or special pumps for transfers; changes in viscosity may affect the handling and storage requirements; important in calculating feed rates
Uranium	Uranium valves required for Criticality Safety of Incinerator
Radionuclide	Required to show compliance with NESHAP permit
Corrositivity/Compatability	Required to ensure waste will not damage the storage and handling equipment.

Table 4-2. Rationale for Selection of Waste Analysis Parameters - (continued)

Viscosity	Viscosity values will help determine the method of waste handling, blending, and storage; very viscous wastes may require heating or special pumps for transfers; changes in viscosity may affect the handling and storage requirements; important in calculating feed rates
Uranium	Uranium values are required for Criticality Safety of Incinerator
Radionuclide	Required to show compliance with NESHAP permit
Corrositivity/Compatability	Required to ensure waste will not damage the storage and handling equipment.

Table 2-1. Maximum Acceptance Levels

Maximum Physical Properties

	Ash %	Viscosity Cp	pH	Corrosivity mm/yr
Drummmed Liquids	8	2000	>6	< 6.35
Bulk Liquids	4.5	1000	8-10	< 6.35
Sludges	40	N/A	>6	< 6.35
Solids	88	N/A	>6	N/A

Maximum Element Level %

	Organic Chlorine	Organic Sulfur	Organic Fluorine
Drummed Liquids	89.0	6.0	85.0
Bulk Liquid	89.0	3.0	25.0
Solids	75.0	3.0	21.0
Sludges	75.0	3.0	21.0

Maximum Metal Level (ppm)

	Aluminum	Cadmium	Chromium	Beryllium	Lead	Zinc	Mercury
Drummed liquids	20,000	1,500	6,000	10	1000	65,000	200
Bulk Liquids	11,000	500	3,300	0.5	400	65,000	60
Solids/Sludges	80,000	800	6,000	4.0	1000	110,000	120

Table 2-1. Maximum Acceptance Levels - (continued)

Maximum Radionuclide Level			
Isotope	Microcuries Per Shipment	Isotope	Microcuries Per Shipment
U_T (<1% ^{235}U)	80,000	^{238}Pu	180
^{99}Tc	25,000	^{239}Pu	515
^{3}H	200,000	^{237}Np	485
^{14}C	30,000	^{228}Th	5
^{36}Cl	15	^{230}Th	0.5
^{125}I	48,500	^{232}Th	180
^{131}I	8,500	^{137}Cs	75
^{32}P	34,000	^{40}K	1100
^{35}S	12,000	^{57}Co	150
^{45}Ca	1,500	^{65}Zn	80
^{51}Cr	2,000		

Table 4-1. Waste Analysis Parameters and Methods

PARAMETER	METHODS	REFERENCES
Chlorine	1. A004	1. "Sampling and Analysis Methods for Hazardous Waste Incineration," EPA-600/8-84-002, February 1984
	2. EPA-9020	2. "Test Methods for Evaluating Solid Waste," Physical and Chemical Methods; USEPA SW-846, 3rd Edition
	3. ASTM-2361	3. ASTM D-2361-85; "Test Method for Chlorine in Coal"
	4. [a]ASTM-3286/ EPA-300.00	4. ASTM D-3286-84; "Test Method for Gross Calorimetric Value of Coal and Coke by the Isothermal Bomb Calorimeter"/ "The Determination of Inorganic Anions in Water by Ion Chromatography," EPA-600/4-84-017, March 1984
Sulfur	1. ASTM-129	1. ASTM D-129-64 (1978); "Test Method for Sulfur in Petroleum Products (General Bomb Method)"
	2. [a]ASTM-3286/ EPA-300.00	2. ASTM D-3286-84; "Test Method for Gross Calorimetric Value of Coal and Coke by the Isothermal Bomb Calorimeter"/"The Determination of Inorganic Anions in Water by Ion Chromatography," EPA-600/4-84-017, March 1984
Phosphorus	1. A021 (ICAP)	1. "Sampling and Analysis Methods for Hazardous Waste Incineration," EPA-600/8-84-002, February 1984.
	2. EPA-6010 (ICAP)	2. "Test Methods for Evaluating Solid Waste," Physical and Chemical Methods; USEPA SW-846, 3rd Edition
Fluorine	1. ASTM-3761	1. ASTM D-3761-84; "Test Method for Total Fluorine on Coal by the Oxygen Bomb Combustion/Ion Selective Electrode Method"
	2. [a]ASTM-3286/ EPA-300.00	2. ASTM D-3286-84; "Test Method for Gross Calorimetric Value of Coal and Coke by the Isothermal Bomb Calorimeter"/ "The Determination of Inorganic Anions in Water by Ion Chromatography," EPA-600/4-84-017, March 1984

Table 4-1. Waste Analysis Parameters and Methods (continued)

PARAMETER	METHODS	REFERENCES
Ash (Liquid)	1. A001	1. "Sampling and Analysis Methods for Hazardous Waste Incineration," EPA-600/8-84-002, February 1984
	2. ASTM-482	2. ASTM D-482-80; "Test Method for Ash from Petroleum Products"
Ash (Solid)	1. A001	1. "Sampling and Analysis Methods for Hazardous Waste Incineration," EPA-600/8-84-002, February 1984
	2. ASTM-3174	2. ASTM D-3174-82; "Test Method for Ash in the Analysis Sample of Coal and Coke from Coal"
Water	1. ASTM-1533	1. ASTM D-1533-83; "Test Method for Water in Insulating Liquids (Karl Fischer Method)"
	2. ASTM-1064	2. ASTM E-1064-85; "Test Method for Water in Organic Liquids by Coulometric Karl Fischer Titration"
Cyanide	1. EPA-335.2	1. "Methods for Chemical Analysis of Water and Wastewater," EPA-600/4 79-020, March 1983
PCB	1. EPA-8080	1. "Test Methods for Evaluating Solid Waste," Physical and Chemical Methods, USEPA SW-846, 2nd Edition
Uranium (Total)	1. Colorimetric	1. TP-0803; "Colorimetric Uranium," ORGDP Analytical Chemistry Department Technical Procedures Manual
	2. Fluorometric	2. TP-0803; "Fluorometric Uranium," ORGDP Analytical Chemistry Department Technical Procedures Manual
	3. EPA-6010	3. "Test Methods for Evaluating Solid Waste," Physical and Chemical Methods,: USEPA SW-846, 3rd Edition
^{235}U Assay	1. Thermal Ionization Mass Spectrometric Method	1. TP-2101; "Thermal Ionization Mass Spectrometric Method," ORGDP Analytical Chemistry Department Technical Procedures Manual
Specific Gravity	1. ASTM-3142	1. ASTM D-3142-84; "Test Method for Specific Gravity or API Gravity of Liquid Asphalts by Hydrometer Method"

Table 4-1. Waste Analysis Parameters and Methods (continued)

PARAMETER	METHODS	REFERENCES
Viscosity	1. ASTM-445	1. ASTM D-445-83; "Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)"
Flash Point (F)	1. EPA-1010	1. "Test Methods for Evaluating Solid Waste," USEPA SW-846, 2nd Edition
Suspended Solids	1. EPA-160.1	1. "Methods for Chemical Analysis of Water and Wastewater," EPA-600/4 79-020, March 1983
Size (wt% >20 mesh)	1. ASTM-310	1. ASTM D-310-69(1980); "Test Method for Size of Anthracite"
pH (Liquid)	1. EPA-9040	1. "Test Methods for Evaluating Solid Waste," Physical and Chemical Methods, USEPA SW-846, 3rd Edition
pH (Organics)	2. EPA-9041	2. "Test Methods for Evaluating Solid Waste," Physical and Chemical Methods, USEPA SW-846, 3rd Edition
pH (Solids)	3. EPA-9045	3. "Test Methods for Evaluating Solid Waste," Physical and Chemical Methods, USEPA SW-846, 3rd Edition
Heating Value Btu/lb	1. ASTM-3286	1. ASTM D-3286-84; "Test Method for Gross Calorific Value of Coal and Coke by the Isothermal Bomb Calorimeter"
	2. ASTM-240	2. ASTM D-240-76 (1980); "Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter"
Number of Phases	1. Visually	
Metals by ICP (Al, Be, Cd, Fe, Li, Na, Pb, Cu, Mg, Mn, Ni, Ti, Zn)	1. EPA-6010	1. "Test Methods for Evaluating Solid Waste," Physical and Chemical Methods, USEPA SW-846, 3rd Edition
Metals by AA (As, Se)	1. EPA-7060	1. "Test Methods for Evaluating Solid Waste," Physical and Chemical Methods USEPA SW-846, 3rd Edition
Mercury by Cold Vapor AA	1. EPA-7470/7471	1. "Test Methods for Evaluating Solid Waste," Physical and Chemical Methods, USEPA SW-846, 3rd Edition

Table 4-1. Waste Analysis Parameters and Methods (continued)

PARAMETER	METHODS	REFERENCES
Technetium-99	1. EC-186	1. EC-186; "Technetium-99 in Water (Radiochemical Method)," Martin Marietta Energy Systems Env. and Effluent Analysis Manual
	2. EC-260	2. EC-260; "Technetium-99 in Air Filters (Radiochemical Method)," Martin Marietta Energy System Env. and Effluent Analysis Manual
	3. EC-355	3. EC-355; "Technetium in Sediment and Soil (Radiochemical Method)," Martin Marietta Energy System Env. Effluent Analysis Manual
Corrosivity Toward Steel	1. EPA-1110	1. "Test Methods for Evaluating Solid Waste," Physical and Chemical Methods, USEPA SW-846, 2nd Edition
Neptunium	1. TP-1635	1. TP-1635; "Neptunium, Alpha Activity," ORGDP Analytical Chemistry Dept. Technical Procedures Manual
Plutonium	1. TP-1635	1. TP-1635; "Plutonium, Alpha Activity," ORGDP Analytical Chemistry Dept. Technical Procedures Manual
Thorium	1. TP-1635	1. TP-1635; "Thorium, Alpha Activity," ORGDP Analytical Chemistry Dept. Technical Procedures Manual
Cesium	1. EC-134	1. EC-134; "Gamma-Ray Emitting Nuclides (Nondestructive Spectrometric Method)" Martin Marietta Energy Systems Env. and Effluent Analysis Manual
Tritium	1. EC-189	1. EC-189; "Tritium in Water" (Radiochemical Method Martin Marietta Energy Systems Env. and Effluent Analysis Manual
Alpha/Beta	1. EPA-900	1. EPA-600/4-80-032; August 1980 "Prescribed Procedure for Measurement of Radioactivity in Drinking Water"
Gamma Activity	1. EC-134	1. EC-134; "Gamma-Ray Emitting Nuclides (Nondestructive Spectrometric Method)" Martin Marietta Energy Systems Env. and Effluent Analysis Manual

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[a]ASTM-2361, ASTM-3286, ASTM-3761, and ASTM-129 all use the bomb calorimeter for sample preparation. Therefore, the solution obtained in ASTM-3286 to determine the heating value can also be used with EPA Method 300.00, "The Determination of Inorganic Anions in Water by Ion Chromatography," to determine chlorine, sulfur, and fluorine.

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WASTE SHIPMENT

DAC _____

Plant _____ Department _____

Waste Stream _____ Date Shipped _____

Customer EPA I.D. No. _____ Sample I.D. No. _____

EPA Waste Characterization No.(s) _____

Total Amount _____ Gallons _____ Lbs _____

Waste Description: PCB ____ Non-PCB ___ Liquids _____ Solids ____ Sludges ___

Drum No.(s) _____

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Figure 2-2. Waste Analysis Form

WASTE ANALYSIS

Disposal Number _____

Laboratory Number _____

Major Compounds >1%	Wt.%	Major Compounds >1%	Wt.%
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Chlorine (Cl)	_____	Wt.%	Sulfur (S)	_____	Wt.%
Phosphorus (P)	_____	Wt.%		_____	ppm
	_____	ppm	Fluorine (F)	_____	Wt.%
Ash	_____	Wt.%		_____	ppm
Cyanide	_____	Wt.%	Water	_____	Wt.%
Uranium (total)	_____	ug/g	PCB	_____	Wt.%
U235 Assay	_____	Wt.%		_____	ppm
			Uranium (total)	_____	ug/g
			U-235 Assay	_____	Wt.%

PHYSICAL PROPERTIES

Sp.Gr.	_____	Viscosity (CP)	_____
Flash Point (F)	_____	Vapor Pressure (mm Hg)	_____
Total Solids (Wt.%)	_____	Size (Wt% >20 mesh)	_____
pH	_____	Heating Value Btu/lb	_____
Number of Phases	_____	Corrosivity	_____
Reactivity	_____		

Figure 2-2. Waste Analysis Form (continued)

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Disposal Number _____

RADIONUCLIDES

Isotope	Microcuries	Isotope	Microcuries
Uranium	_____	Zn-65	_____
Tc-99	_____	I-131	_____
H-3	_____	Np-237	_____
C-14	_____	P-238	_____
Cl-36	_____	Pu-239	_____
I-I25	_____	Th-228	_____
P-32	_____	Th-230	_____
S-35	_____	Th-232	_____
Ca-45	_____	Cs-137	_____
Cr-51	_____	K-~~80~~ 40	_____
CO-57	_____	Beta	_____
Alpha	_____	Gamma	_____

METAL ANALYSES

Element	ug/g	Element	ug/g	Element	ug/g
Al	_____	Ag	_____	As	_____
Ba	_____	Be	_____	Cd	_____
Cr	_____	Cu	_____	Fe	_____
Hg	_____	Li	_____	Mg	_____
Mn	_____	Na	_____	Ni	_____
Pb	_____	Sb	_____	Se	_____
Ti	_____	Tl	_____	Zn	_____

Figure 2.2 Waste Analysis Form (continued)

ATTACHMENT G

DRAFT

Table 1. Parameters, limits and allowance for blending for off-site waste to meet WAC for incineration at WERF

Category	Parameter	Liquid limit	Blending allowed	Solid limit	Blending allowed
Radiological	Low-level waste	Minimum contamination to be classified as LLW	No	Same as liquid	No
	TRU content (measured as alpha levels)	0.1 nCi/g	No	0.1 nCi/g	Yes
	Beta/gamma emitters	34×10^{-6} Ci/L	Yes	20 mR/hr contact	No
	Tritium content	1.5 Ci/L	Yes	0.091 Ci/lb (4 mCi/box maximum)	Yes
	Carbon-14	0.036 Ci/L	Yes	2.3 mCi/lb (4 mCi/box maximum)	Yes
	Fissile material	Trace quantities only	No	Trace quantities only	No
	External contamination limit	200 dpm/cm^2 beta-gamma 20 dpm/cm^2 alpha	No	Same as liquid	No
Hazardous constituents	Principal Organic Hazardous Constituent (POHC)	Heat of combustion for constituent must be > 432 BTU/lb	No	Same as liquid	No
	Pyrophorics, explosives, shock-sensitive reactives	Must not be present	No	Same as liquid	No
	EP Toxic metals (especially lead and mercury)	No limit, but analysis required	NA	Same as liquid	No
	Corrosives	pH less than 12.5 and greater than 2.0	No	NA	NA

00314

4557

ATTACHMENT H

DRAFT

Table 2. Incinerator limits for processing of waste at WERF.

Parameter	Liquid Waste Limit	Blending Allowed	Solid Waste Limit	Blending Allowed
Chlorine content	20 lb chloride per million BTU of waste (100 lb/hr)	Yes	Same as liquid	Yes
Ash content	< 1.2% by weight	Yes	NA	NA
Free Liquids	NA	NA	None allowed	No
Water content	no immiscible water layer	No	No limit, as long as its not in free liquid form	NA
Flammable liquids	NA	NA	No more than 1 Liter/box, totally absorbed in 100% excess absorbent	No
Heating Value	> 10,000 BTU/lb of waste	Yes	No limit, but there must be some benefit in incinerating the waste (i.e. volume reduction, hazardous substance destruction)	NA
Viscosity	150 SSU	Yes	NA	NA
Prohibited Solid Items	NA	NA	Glass, fiber glass, respirators, aerosol cans, metallic wastes, and other non-combustibles[a]	No
Compatibility	Small samples of wastes will be blended, and any heat generation, phase separation, or violent reaction will not be acceptable.	No	Same as liquid	No

[a]Buttons, snaps, zippers, small nails, staples and other similar items with small amounts of metal are acceptable.

ATTACHMENT J

EG&G Idaho Inc
FORM EG&G 658
(Rev. 09-87)

GENERATOR'S HAZARDOUS WASTE MATERIAL PROFILE SHEET

Waste Profile Sheet Code

Facility:

A. General Information

Generator Name: _____ Charge No. _____

Facility Address: _____ Organization No. _____

Technical Contact: _____ Title: _____ Phone: _____

Name of Waste: _____

Process Generating Waste: _____

B. Physical Characteristics of Waste

Color

Physical state @ 70°F
- ☐ Solid
- ☐ Liquid
- ☐ Semi-solid
- ☐ Powder

Layers
- ☐ Multilayered
- ☐ Bi-layered
- ☐ Single phased

Free Liquids
- ☐ Yes ☐ No
- Volume _____ %

pH:
- ☐ <2
- ☐ 2—4
- ☐ 4.1—6.9
- ☐ 7
- ☐ 7.1—10 ☐ N/A
- ☐ 10.1—12.5
- ☐ >12.5
- ☐ Exact _____

Specific Gravity
- ☐ 0.8
- ☐ 0.8—1.0
- ☐ 1.1—1.2
- ☐ Exact _____
- ☐ 1.3—1.4
- ☐ 1.5—1.7
- ☐ >1.7

Flash Point
- ☐ 70°F
- ☐ 70°F—100°F
- ☐ 101°F—139°F
- ☐ 140°F—200°F
- ☐ No Flash
- ☐ >200°F
- ☐ Exact _____
- ☐ Closed Cup
- ☐ Open Cup

C. Incineration Information

_____ Btus
Heat of Combustion

_____ %
Ash Content

_____ %
Halogen Content

D. Chemical Composition (Totals must add to 100% or attach analysis sheet)

_____	___ %
_____	___ %
_____	___ %
_____	___ %
_____	___ %
_____	___ %
_____	___ %
_____	___ %
_____	___ %
_____	___ %

E. Metals ☐ Total (ppm) ☐ EPA Extraction Procedure (mg/L)

Arsenic (As)	_____	Selenium (Se)	_____
Barium (Ba)	_____	Silver (Ag)	_____
Cadmium (Cd)	_____	Copper (Cu)	_____
Chromium (Cr)	_____	Nickel (Ni)	_____
Mercury (Hg)	_____	Zinc (Zn)	_____
Lead (Pb)	_____	Thallium (Tl)	_____
Chromium-Hex (Cr+6)	_____		

F.

PCB _____ ppm

☐ Oil ☐ Transformers ☐ Capacitors ☐ Debris

G. Reactivity Characteristics: ☐ None

- ☐ Pyrophoric
- ☐ Explosive
- ☐ Shock-sensitive
- ☐ Chemically unstable
- ☐ Water-reactive
- ☐ Cyanide or sulfides

H. ☐ New waste stream

If new stream, provide representative sample in one-liter (quart) glass or plastic container.

☐ Sample sent.

I. Present volume to be shipped to HWSF

_____ Drums

_____ Gallons

_____ Pounds

J. _____ Anticipated volume per year.

- ☐ Drums
- ☐ Gallons
- ☐ Pounds
- ☐ Cu. feet
- ☐ Cu. yards
- ☐ Tons

K. ☐ Radioactive

☐ Nonradioactive

If radioactive, attach spectral analysis.

☐ Spectral analysis attached.

Principal Nuclide(s):	Activity (Ci):
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Total Activity: _____ Ci

Specific Activity: _____ Ci/g

L. Special handling, procedures, comments: _____

I hereby certify that all information submitted in this and all attached documents is complete and accurate, and that all known or suspected hazards have been disclosed.

_____ Authorized Signature _____ Title _____ Date

Copies 1 & 2 — Waste Management Copy 3 — Generator Retain

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

1.0 PURPOSE

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

2.0 SCOPE

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

3.0 DEFINITIONS

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

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

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

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

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

Fixed Contamination - Radioactive contamination that is not readily removable.

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

3.0 **DEFINITIONS** (cont.)

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

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

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

Mixed Waste - Contains RCRA constituents and radiological contamination.

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

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

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

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

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

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

3.0 DEFINITIONS (cont.)

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

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

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

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

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

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

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

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

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

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

4.0 RESPONSIBILITIES

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

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

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

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

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

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

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

4.1.7 Ensuring that waste minimization is accomplished.

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

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

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

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

4.0 RESPONSIBILITIES (cont.)

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

4.2.1 Developing a RCRA project file for each project.

4.2.2 Ensuring that an adequate waste sampling request is developed.

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

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

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

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

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

4.3.3 Sampling asbestos material or material that may contain asbestos.

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

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

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

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

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

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

4.5 **Environmental Restoration** shall be responsible for the following:

4.5.1 Providing CERCLA integration guidance.

4.0 RESPONSIBILITIES (cont.)

4.5.2 Maintaining the Administrative Record.

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

4.5.4 Reviewing RSE documents prior to submitting to DOE.

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

4.6.1 Inspecting waste containers to verify container integrity.

4.6.2 Verifying preparation of containers before they are filled.

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

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

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

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

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

4.7.1 Maintaining an inventory of filled containers.

4.7.2 Producing documentation to move filled containers to storage.

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

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

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

4.8.1.2 Initiating RD/RC requests for maintenance projects.

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

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.

7.0 PROCEDURE

7.1 Pre-project Planning/Estimating

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

PROJECT MANAGEMENT & MAINTENANCE (PM&M)

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

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

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

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

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

7.0 PROCEDURE (cont.)

PROJECT MANAGEMENT & MAINTENANCE (PM&M)

7.1.4 Forward preliminary project information to Environmental Engineering.

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

ENVIRONMENTAL ENGINEERING

7.1.5 Initiate a RCRA Project File for each project.

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

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

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

7.1.8 Document the walkdown using process and historical knowledge.

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

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

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

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

7.1.12 Submit the Waste Sampling Request to Environmental Monitoring.

ENVIRONMENTAL MONITORING

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

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

7.0 PROCEDURE (cont.)

ENVIRONMENTAL MONITORING

7.1.15 Take samples in accordance with the sampling plan.

7.1.16 Submit samples to the analytical lab for analysis.

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

ENVIRONMENTAL ENGINEERING

7.1.18 Track and expedite lab analysis.

7.1.19 Update information for projects on the RCRA priority list.

ENVIRONMENTAL MANAGEMENT

7.1.20 Perform analysis of samples per the applicable department procedures.

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

7.1.21 Forward analysis results to Environmental Engineering and Environmental Monitoring.

ENVIRONMENTAL ENGINEERING

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

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

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

WASTE MANAGEMENT

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

7.1.26 Provide disposition location for all waste streams.

7.0 PROCEDURE (cont.)

PROJECT MANAGEMENT & MAINTENANCE

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

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

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

7.1.29 Obtain required approvals for the completed CWID.

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

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

PROJECT MANAGEMENT

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

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

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

ENVIRONMENTAL RESTORATION

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

7.1.35 Submit the RSE to DOE for approval.

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

7.0 PROCEDURE (cont.)

PROJECT MANAGEMENT

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

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

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

7.2 Controlling and Disposing of Uncontaminated Waste

PROJECT MANAGEMENT

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

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

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

7.2.2 Uncontaminated Soil

PROJECT MANAGEMENT

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

RADIATION SAFETY

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

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

7.0 PROCEDURE (cont.)

RADIATION SAFETY

7.2.2.3 Complete a Radiological Survey Report.

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

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

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

NOTE: A survey report is required for each load.

7.2.3 Uncontaminated Debris and Waste

PROJECT MANAGEMENT

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

RADIATION SAFETY

7.2.3.2 Survey the debris and waste to identify contaminated spots.

7.2.3.3 Notify the PM/PE of survey results.

PROJECT MANAGEMENT

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

RADIATION SAFETY

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

PROJECT MANAGEMENT & MAINTENANCE (PM&M)

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

7.0 PROCEDURE (cont.)

PROJECT MANAGEMENT & MAINTENANCE (PM&M)

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

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

NOTE: Waste shall not remain outside the dumpster overnight.

IRS&T

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

PROJECT MANAGEMENT

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

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

7.3 Controlling and Disposing of Contaminated Waste

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

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

PROJECT MANAGEMENT & MAINTENANCE

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

7.0 PROCEDURE (cont.)

PROJECT MANAGEMENT & MAINTENANCE

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

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

SITEWIDE QUALITY ASSURANCE

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

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

NOTE: Packaging shall be in accordance with the SSHP.

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

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

7.3.5 Install a status indicator on the container.

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

PROJECT MANAGEMENT & MAINTENANCE

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

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

SITE SERVICES

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

7.0 PROCEDURE (cont.)

SITE SERVICES

7.3.10 Weigh the material in accordance with SSOP-0024.

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

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

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

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

PROJECT MANAGEMENT

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

8.0 APPLICABLE DOCUMENTS

8.1 Drivers

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

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

8.2 References

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

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

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

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

9.0 APPLICABLE FORMS

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

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

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

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

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

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

10.0 FIGURES

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

10.2 Figure 2, "Construction Waste Identification/Disposition"

10.3 Figure 3, "Property Disposal Request"

10.4 Figure 4, "Environmental Media Sampling Request"

10.5 Figure 5, "Construction Excavation/Penetration Permit"

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

10.7 Figure 7, "Construction Waste Requirements"

TABLE 1
CONTAMINATED WASTE PACKAGING REQUIREMENTS

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

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

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

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

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

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

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

Category 2
Greater than 100 pCi/g, nonhazardous

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 21 of 32
Title: MANAGEMENT OF SOIL, DEBRIS, AND WASTE FROM A PROJECT		DOCUMENT NO: SSOP-0044 REVISION NO. 0
Authorization: H. F. Daugherty, President	Supersedes: SSOP-0044I, Dated 02-19-92	Effective Date: 06-19-92

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:	RUST (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, valved, purged and tagged		
2. Pipelines under pressure, tagged (describe on back sheet)		
* 3. Machinery and equipment safe for work to proceed		
4. Construction excavation/penetration permit required (hidden services - electrical, piping, etc.)		
5. Daily/Weekly renewal of Work Permit by WEMCO necessary		
6. All process equipment, parts and supplies will have been/have been removed or protected by operations		

FIRE PREVENTION	YES	NO
1. Flammable materials in area (describe on back sheet)		
2. Explosive atmosphere test required (to be performed by WEMCO)		
3. Non-sparking tools required		
4. 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 fireproof 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)		

MINIMUM SPECIAL REQUIREMENTS

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

MINIMUM PROTECTIVE EQUIPMENT REQUIRED

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

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

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

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

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

A. For Design Purposes - The undersigned believe that the information provided in this survey is accurate for the conditions expected in the work are 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 ES&H Work Survey is valid pursuant to the compliance of the recipients with the conditions stated herein. This Survey shall be voided and a new survey completed for posting should conditions in the work area change and force a modification on the information provided herein.

INDUSTRIAL HYGIENE REP.: PRINTED / DATE:	SAFETY & FIRE REP.: PRINTED / DATE:	WASTE TECHNOLOGY REP.: PRINTED / DATE:	NUCLEAR SAFETY REP.: PRINTED / DATE:
SIGNATURE	SIGNATURE	SIGNATURE	SIGNATURE
WEMCO PROJECT ENGINEER: PRINTED / DATE:	ENVIRONMENTAL COMPLIANCE REP.: PRINTED / DATE:	RADIOLOGICAL SAFETY REP.: PRINTED / DATE:	PRINTED / DATE:
SIGNATURE	SIGNATURE	SIGNATURE	SIGNATURE

FS-F-2717 (REV. 4/30/92)

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

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 ESAH work release 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.		

FMPC-2717 Revised (REV 4/29/92)

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

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 23 of 32
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Authorization: H. F. Daugherty, President	Supersedes: SSOP-0044I, Dated 02-19-92	Effective Date: 06-19-92

FEED MATERIALS PRODUCTION CENTER
CONSTRUCTION WASTE IDENTIFICATION/DISPOSITION FORM

PART I - PROJECT DESCRIPTION Date ___/___/___

Project Title _____ WBS Project No.: _____

Project Description _____

Project Location (include location drawings, if available) _____

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

PART II - CONSTRUCTION WASTE DETAILS Date ___/___/___

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

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

PART III - FUTURE USE MATERIAL OWNERSHIP AND DISPOSITION

OWNER	MATERIAL DESCRIPTION	DISPOSITION LOCATION

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

FMPC-PHSA-2716 (Rev. 1/6/91)

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

Fernald Site
CONTROLLER - GENERAL ACCOUNTING
PROPERTY DISPOSAL REQUEST

JOURNAL VOUCHER NO | CONTROL NO

FOR GENERAL ACCOUNTING USE ONLY

COST
- Basic
- Other
- Accumulated Depreciation
- Net Book Cost

Acquisition Date: | R.U. No

Estimated Cost:

Date:

SECTION — A

DESCRIPTION | LOCATION

MAINTS NO | EQUIPMENT NO

I.D. NO. | BAR CODE NUMBER | DOES UNIT CONTAIN PRECIOUS OR CRITICAL MATERIALS? ☐ YES ☐ NO IF YES, TYPE:

MANUFACTURER

MODEL NO. | SERIAL NO.

MSF NO. MATERIAL EVALUATION FORM:

SIZE OR CAPACITY

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

SECTION — B

☐ SURPLUS ☐ NON-SURPLUS

PHYSICAL CLASSIFICATION		DISPOSAL CONDITION CODE								
Excess		1	2	3	4	5	6	7	8	9

1 = Unused — good
2 = Unused — fair
3 = Unused — poor
4 = Used — good
5 = Used — fair
6 = Used — poor
7 = Repairs Required — good
8 = Repairs Required — fair
9 = Repairs Required — poor

Salvage | REASON FOR CLASSIFICATION AS SALVAGE: | REASON TO RECLASSIFY AS SCRAP BY SALVAGE & DISPOSAL SECT

Scrap | REASON FOR CLASSIFICATION AS SCRAP | CLASSIFIED BY | EXCESS DISPOSAL COORDINATOR & DATE

DOE Scrap Approval | SIGNATURE & DATE: | APPROVED BY | PROCUREMENT DIRECTOR & DATE

ADP EQUIPMENT: ☐ Information Erased from Hard Disk ☐ Information Not Erased from Hard Disk

SECTION — C

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

INITIATOR	STAFF MANAGER
PRINT OR TYPE:	PRINT OR TYPE:
SIGNATURE:	SIGNATURE:

SECTION — D

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

SECTION — E

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

PROPERTY DISPOSAL REQUEST
FORM FMPC-CONST-563
Figure 3

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 25 of 32
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Authorization: H. F. Daugherty, President	Supersedes: SSOP-0044I, Dated 02-19-92	Effective Date: 06-19-92

ENVIRONMENTAL MEDIA SAMPLING REQUEST #_____

(To be completed by requester)

Project Name: _____ Project/WO #: _____

Requester: _____ Phone #: _____

Field Contact: _____ Phone #: _____

Charge #: _____

PROJECT INFORMATION

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

Objective: _____

Scope of Work: _____

Requested completion date: _____

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

Special instructions: _____

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

* Soil depths greater than 10 ft attach additional instructions.

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

Analysis Support Level	A	B	C	D	E

CONCURRENCE

Environmental Engineering: _____ Date: _____

Facility Material Evaluation: _____ Date: _____

Requester Signature: _____ Date: _____

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

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

TABLE 1 TCLP (Full Spectrum)

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

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

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

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

TABLE 2 METALS

__ TCLP __ TOTALS

METALS

Arsenic	Lead
Barium	Mercury
Cadmium	Selenium
Chromium	Silver

TABLE 3 PEST/HERB

__ TCLP __ TOTALS

PESTICIDE/HERBICIDE

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

TABLE 4 VOA/SEMI VOA

__ TCLP __ TOTALS

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

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

TABLE 5 RAD

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

TABLE 7

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

TABLE 6 TOTAL VOA

- Acetone
- Benzene
- Carbon Disulfide
- Carbon Tetrachloride
- Chlorinated Fluorocarbon
- Chlorobenzene
- Chloroethane
- Chloromethane
- 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

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

FEED MATERIALS PRODUCTION CENTER

CONSTRUCTION EXCAVATION/PENETRATION PERMIT

Issued to: _____ Date Issued: _____

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

WMCO Project/Title No.: _____/_____

Plant: _____ Location: _____

Scope of Work: _____

_____

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

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

_____

_____

Drawings: _____

_____

Special Hazards and/or Precautions: _____

_____

Disposal of Excavated Material: Yes ____ No ____

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

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

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

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

____ Civil Engineer _____ ____ Electrical Engineer _____

____ Utilities Engineer _____ ____ Others _____

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

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

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

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

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

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR

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

PLANT	PROD. MBA
PLANT TO	MBA TO

WASTE DESCRIPTION AND COMMENTS

PACKAGE TYPE	
PACKAGE SIZE	

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE

SUPERVISOR SIGNATURE DATE

FMPC-CONT 1945-XX (REV 12/19/88)

U.S. GPO 1990-751-418

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

SOIL, DEBRIS AND WASTE REQUIREMENTS

I SOIL

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

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

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

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

II DEBRIS

A. RUBBLE

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

B. METAL

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

CONSTRUCTION WASTE REQUIREMENTS
Figure 7 (Sheet 1 of 3)

SOIL, DEBRIS AND WASTE REQUIREMENTS

B. METAL

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

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

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

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

C. PROCESS EQUIPMENT

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

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

D. WOOD

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

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

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

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

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

CONSTRUCTION WASTE REQUIREMENTS
Figure 7 (Sheet 2 of 3)

SOIL, DEBRIS AND WASTE REQUIREMENTS

E. ASBESTOS

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

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

F. POLYCHLORINATED BIPHENOLS (PCBs)

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

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

G. OTHER

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

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

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

CONSTRUCTION WASTE REQUIREMENTS
Figure 7 (Sheet 3 of 3)

RECORD OF ISSUE/REVISIONS

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

APPENDIX C

METAL COATED WITH LEAD-BASED PAINT

From: C. S. Waugh

WEMCO:EC&QA(OU3/FME):91-390

Date: October 23, 1991

Subject: **METAL COATED WITH LEAD-BASED PAINT**

To : S. J. Lund

References:

1. Letter, DOE-2152-91, R. E. Tiller to P. Pardi, Ohio EPA, "CHARACTERIZATION OF METAL COATED WITH LEAD-BASED PAINT", dated September 16, 1991.

2. Regulatory Contact Report, D. J. Schultheisz, ERM, with M. Hayes, OEPA, October 11, 1991.

3. Memo, EC&QA:(OU3/FME):91-451, C. S. Waugh to S. J. Lund, "CONSTRUCTION PROJECTS AFFECTED BY THE PRESENCE OF LEAD-BASED PAINT", dated August 29, 1991.

This memo summarizes the methodology to be used at the FEMP for determining if process equipment and other metal wastes coated with lead-based paint generated from construction projects contain levels of lead above the regulatory level for the Toxicity Characteristic (TC). The proposed methodology has been submitted to Ohio EPA for review and verbal concurrence received (References 1 and 2). This methodology involves modification of the current method used to make this determination.

Currently, painted equipment is tested to determine if it fails the TC for lead by scraping paint from the surface of the equipment and analyzing the paint for lead via the Toxicity Characteristic Leaching Procedure (TCLP). If the paint fails the TC for lead (i.e., extract concentrations greater than the regulatory level of 5 ppm), then the equipment is assumed to fail the TC for lead.

A direct application of the TCLP would require grinding the entire waste form to less than 9.5 mm and subjecting 100 grams of the material to the TCLP extraction. Because grinding solid metal waste forms (e.g., structural steel) is an arduous task at best, an alternative approach has been developed by Facilities & Materials Evaluation (FME) to yield compatible results. Under the proposed approach results from TCLP analysis of the paint are mathematically combined on a mass basis with results from TCLP analysis of the substrate

material. Process knowledge may be used to determine that the substrate material would not yield detectable results from a TCLP analysis (e.g., in the case of steel).

Methodology for Evaluating Effect of Lead-Based Paints:

The methodology for evaluating equipment and other material for the presence of leachable lead is based on a combination of knowledge of the waste and sampling and analysis data. Knowledge of the waste includes such items as characteristics of the material itself (usually steel), size and shape of the material, and portion of the surface area coated with the paint in question.

The required information for calculation of TC levels is as follows:

1) **TCLP analysis of the lead-based paint** - using available analysis of lead paint, a standard value for TC leachability may be calculated. Waste may be categorized as either process equipment (including piping) or as building material (including window frames, concrete block, and structural wood). TCLP values for lead for each category and calculations of mean, standard deviation, and confidence interval may be found in Attachment 1. An 80% confidence interval has been used (i.e., there is an 80% chance the value will fall within the calculated interval).

   From the attached calculations, 50.1 ppm is the high end of the interval for process equipment, and 0.95 is the high end for building material. These values will be used to estimate overall leachability.

2) **Thickness of the paint** - the thickness of the paint may be assumed from documented pin gauge measurements. These measurements, from various sources, indicate that the typical paint thickness (as per FEMP specifications) is approximately 5 mil (5/1000 inch). Therefore, a conservative value of 10 mil will be used in initial calculations.

3) **Density of the paint** - the density of lead oxide crystal is approximately 500 lb./cu.ft. This conservative value will be assumed for the density of the paint.

4) **Density of the substrate material** - the density of

carbon steel is roughly the same as the density of lead oxide (482 lb./cu.ft.). The density of structural wood may be taken as roughly 45 lb./cu.ft., and the density of concrete is approximately 150 lb./cu.ft.

5) **Thickness of the substrate material** - thickness of the substrate must be determined for each item being evaluated.

The calculation is then as follows:

$$TC = [(h * \varrho_p * TCLP)/\{(H * \varrho_s) + (h * \varrho_p)\}] * S\%$$

where

TC	=	Calculated leachability of entire waste form
h	=	Paint thickness (inches)
ϱ_p	=	Paint density (lb./cu. ft.)
TCLP	=	TCLP analysis result for paint alone (ppm)
H	=	Substrate thickness (inches)
ϱ_s	=	Substrate density (lb./cu. ft.)
S%	=	Percentage of Substrate surface that is painted

For carbon steel, ϱ_p can be assumed to equal ϱ_s. If the percentage of the substrate that is painted is not known, assume 100%. An example of this calculation for the Plant 6 Conveyor is given in Attachment 2.

Using the basic assumptions for TCLP value, paint thickness, and assuming equivalent density for steel and lead, the equation simplifies to:

$$TC = (h * TCLP)/(H + h) \quad \text{for 100\% painted surface}$$

Thus, it may be seen that the ratio of paint thickness to substrate thickness is the limiting factor. For TC to be < 5 ppm (the regulatory level), the substrate thickness must be at least nine (9) times the paint thickness, if TCLP = 50.1 ppm. For a paint thickness of 10 mil, the substrate thickness must be at least 90 mil (0.09, or < 1/10 inch). When actual paint thickness or TCLP results are available they should be used in the equation in lieu of the default values. Actual values in many cases will be lower than the default values.

For wood and concrete materials, the densities of these materials must be taken into account. Attachment 3 provides guidance for estimating TC based on substrate thickness.

In summary, the procedure for estimating the TC for lead-based paint follows three steps:

1) Assume the high level of leachability and a paint thickness greater than that specified by FEMP specifications (approximately 5/1000 inch). Calculate the TC level for the material as a whole using known dimensions. If the material fails (TC greater than regulatory level), then

2) Assume the high level of leachability and measure paint thickness via multiple pin gauge assessments. Repeat the calculation. If the material still fails, then

3) Take scrapings from the paint in question. Perform TCLP and use the analytical results in recalculation.

This approach takes what FME believes to be a technically defensible and easily implemented approach to assessing the regulatory impact of lead-based paint on process equipment. This approach should limit sampling and analysis requirements for making determinations. A list of construction projects requiring additional information on substrate (metal) thickness was provided to you in Reference 3.

If you have any questions regarding this issue, please contact Neal Frink at extension 8921 or myself at extension 6777.

Carolyn S. Waugh, Manager
Facilities and Materials Evaluation
Operable Unit 3 Compliance

NAF:naf

ATTACHMENT 1

CALCULATION OF TCLP LEVELS IN LEAD-BASED PAINT

TCLP levels for use in calculations are calculated as follows:

For Process Equipment:

Data:

Level (ppm)	Source (Location)
4.52	Dust Collector Plant 2/3
11.0	Dust Collector Plant 2/3
<1.0	Material Handling Plant 1 (Conveyor)
45.4	Material Handling Plant 1 (Piping)
119.0	Dust Collector G43
41.3	Dust Collector G43
10.8	Dust Collector 62
7.8	Dust Collector 62

TCavg = 30.1 ppm, standard deviation s = 39.6. To calculate the 80% confidence interval using the standard t-test, t = 1.415 (for 7 degrees of freedom and 0.1 tail area probability). Thus, interval = $TCavg \pm (t * s/(8)^{0.5})$ = 10.1 to 50.1. Use 50.1 (the high end of the interval) in initial calculations.

For Building Material:

Data:

Level (ppm)	Source (Location)
1.31	Window Frames - ADM Bldg.
1.13	Window Frames - ADM Bldg.
0.2	Window Frames - ADM Bldg.
0.2	Window Frames - ADM Bldg.
<0.03	Concrete Block - ADM Bldg.
<0.15	Concrete Block - ADM Bldg.
0.864	Wood - Security Bldg.
1.44	Fire Door Replacement - ADM Bldg.

TCavg = 0.66 ppm, standard deviation s = 0.58. To calculate the 80% confidence interval using the standard t-test, t = 1.415 (for 7 degrees of freedom and 0.1 tail area probability). Thus, interval = $TCavg \pm (t * s/(8)^{0.5})$ = 0.37 to 0.95. Use 0.95 (the high end of the interval) in initial calculations.

ATTACHMENT 2

SAMPLE CALCULATION FOR PLANT 6 CONVEYOR

The Plant 6 Conveyor System is made of structural steel 3/16" (187.5 mil) thick. The conveyor rollers make up 30% of the weight and are not painted. There have been 26 pin gauge measurements of the paint thickness, which have the following statistical characteristics:

Average thickness = 4.723 mil (max 10.1, min 1.4)
Standard deviation = 2.16
n (# measurements) = 26
t (for n-1 degrees of freedom, 80% confidence) = 1.316

Thus, the value used in the equation for paint thickness in this case is

$$4.723 + (1.316 * 2.16/26^{0.5}) = 4.723 + 0.557 = 5.28 \text{ mil}$$

The estimated leachability of the conveyor is

$$[(50.1 \text{ ppm} * 5.28 \text{ mil})/187.5 \text{ mil}] * 0.70 = 1.411 * 0.70 = 0.9877 \text{ ppm}$$

The factor of 0.70 takes into account the 30% of the material that is not painted.

The calculated level of 0.9877 ppm is well below the regulatory level of 5 ppm.

ATTACHMENT 3
SUBSTRATE THICKNESS VS. PAINT THICKNESS

For purposes of initial estimate, calculation of overall TC values can be reduced to threshold ratios of substrate thickness to paint thickness. The three cases follow, assuming TC paint leachability of 50.1 ppm. In all cases, h = paint thickness and H = substrate thickness. This calculation applies to initial estimate only (step 1 on page 3). THIS IS NOT A WORKSHEET.

CASE 1: Structural Steel Equipment

Assume Paint density = Substrate density then

5 ppm > 50.1 ppm * (h/[H + h])
0.1 > h/[H + h]
H > 9 * h

So steel substrate thickness must be at least 9 times the paint thickness.

CASE 2: Structural Wood

Paint density = 500 lb./cu.ft.
Wood density = 45 lb./cu.ft.

5 ppm > 50.1 ppm * ({500 * h}/[{45 * H} + {500 * h}])
0.1 > 500h/[45H + 500h]
4.5 • H > 450 * h
H > 100 * h

So wooden substrate must be at least 100 times the paint thickness. For 10 mil paint thickness, the wood must be 1000 mil, or 1 inch.

CASE 3: Concrete

Paint density = 500 lb./cu.ft.
Concrete density = 150 lb./cu.ft.

5 ppm > 50.1 ppm * ({500 * h}/[{150 * H} + {500 * h}])
0.1 > 500h/[150H + 500h]
15 * H > 450 * h
H > 30 * h

So concrete substrate must be at least 30 times the paint thickness. For 10 mil paint thickness, the concrete must be 300 mil, or 0.3 inch.

As stated in Attachment 1, wood and concrete would likely have much lower TCLP levels than process equipment or other structural steel. Also, building materials would not use the leachability estimate of 50.1 ppm.

c: w/att.
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