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DOCUMENTATION SUPPORTING FERNALD ENVIRONMENTAL MANAGEMENT PROJECT REMOVAL OF WASTE INVENTORIES THORIUM MANAGEMENT PROCEDURES "TO BE OVERPACKED"

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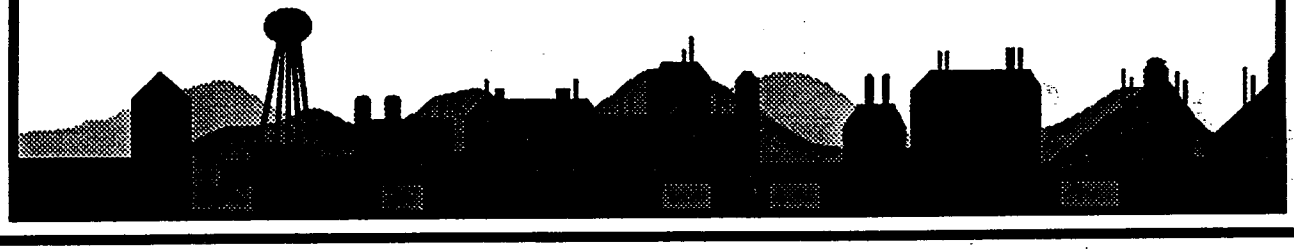
DOCUMENTATION SUPPORTING FERNALD ENVIRONMENTAL MANAGEMENT PROJECT REMOVAL OF WASTE INVENTORIES

THORIUM MANAGEMENT PROCEDURES "TO BE OVERPACKED" REMOVAL ACTION NO. 9



9-20-91

Attachment to: e-41815 + doe-2295-91 + DOE-936

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*NOTE: Copies will be made available on request.

REMOVAL ACTION NO. 9

REMOVAL OF WASTE INVENTORIES

THORIUM MANAGEMENT PROCEDURES "TO BE OVERPACKED"

Introduction

In May, 1991 the U.S. EPA, Ohio EPA, and Department of Energy (DOE) entered into negotiations concerning a possible modification to the 1990 Consent Agreement pertaining to the Fernald Environmental Management Project (FEMP). Consistent with these negotiations, DOE agreed to reconfigure the existing Thorium Management Program into a removal action consistent with Section IX of the Consent Agreement and the provisions of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This removal action is defined as No. 9, termed Removal of Waste Inventories, under the draft language of the Consent Agreement.

During the negotiation process a consensus position was reached between the agencies and the DOE establishing that, in lieu of a removal action work plan, the DOE would submit a compendium of existing procedures and documentation for the Thorium Management Program. This deliverable has been compiled to fulfill the terms of the agreement for Removal Action No. 9 pertaining to an October 1, 1991 deliverable for Thorium Management Procedures for materials "To Be Overpacked" for storage and/or future shipment.

Provided with this submittal is a brief background on the Thorium Management Program and the Consent Agreement negotiations, an overview of the pertinent site policies and procedures, and a compilation of significant facility documentation controlling the ongoing program.

Background

The FEMP served as the DOE repository for thorium material during the facility's production operation history. The FEMP facility currently maintains an inventory of over 15,000 containers of thorium within five separate warehouse facilities.

On the following page is presented a table entitled "Current Thorium Storage Locations and Status" that provides a brief summarization of the location and condition of the site inventory of thorium containers and associated warehouses. This deliverable focuses on the thorium inventories which require overpacking to support continued storage and/or off-site disposition. As identified in the table, 1760 overpack containers of thorium materials are presently stored in Building 60. These Building 60 thorium inventories were previously addressed under the compendium of existing procedures submitted for the LLW Management Program and "Ready-To-Ship" Thorium Material portion of Removal Action No. 9.

In August, 1985, the FEMP initiated an off-site shipment program involving the transfer of low level waste inventories to the Nevada Test Site (NTS). This program involves the characterization, treatment, packaging, and transport of

CURRENT THORIUM STORAGE LOCATIONS AND STATUS

BUILDING NUMBER	NUMBER OF CONTAINERS	CONDITION OF CONTAINERS	CONDITION OF WAREHOUSE
▸ 64	Middle Bay → 181 North Bay → 201 South Bay → 9	GOOD	FAIR TO GOOD (Doors and windows in need of repair.)
▸ 65	5,591	POOR TO FAIR	POOR TO FAIR (Doors, windows, and roof in need of repair.)
▸ 67	6,027	FAIR TO POOR (Some exterior drum corrosion evident.)	GOOD
▸ 68	1,314	GOOD (Minimal exterior drum corrosion evident.)	GOOD
▸ 60	1,760	EXCELLENT (All containers overpacked.)	GOOD

REMOVAL ACTION NO. 9

REMOVAL OF WASTE INVENTORIES (CONT'D)

Background (con't)

waste in a manner which is in full compliance with DOE Orders, DOT shipping requirements, and NTS waste acceptance criteria. Focus is currently being applied to gain authorization to ship FEMP thorium inventories to NTS for disposal. Activities are currently underway at the FEMP to characterize, repack/overpack, and stage existing thorium inventories in a configuration which is readily available for shipment upon receipt of formal approval to do so.

Thorium inventories are stored within the FEMP Production Area, which is maintained as a radiologically-controlled area requiring strict access and worker health and safety controls. These inventories are considered a component of Operable Unit 3 of the sitewide Remedial Investigation/ Feasibility Study (RI/FS) being conducted pursuant to the Consent Agreement.

In May, 1991 negotiations were initiated between representatives of DOE, Ohio EPA, and U.S. EPA regarding a possible modification to the Consent Agreement. In these negotiations it was agreed that DOE would submit a compilation of existing procedures and other documentation to support the reconfiguration of the existing Thorium Management Program into a removal action under the terms of the Consent Agreement and would continue ongoing activities consistent with current procedures while the U.S.EPA was reviewing the submittal. This position was established in an attempt to provide for the continuity of ongoing site operations, the elimination of unnecessary or duplicative documentation and the desire not to adversely impact ongoing cleanup initiatives. Consistent with this position, it was agreed that additional procedures and policies developed to govern planned work activities or modifications to submitted procedures would be provided as a supplement to this package. Specifically, the DOE has agreed to supplement this package to incorporate any additional procedures to support ongoing or proposed work activities as part of a subsequent deliverable submitted pursuant to Phase III removal actions under the Consent Agreement. Additionally, it was agreed as part of the negotiation process, that procedural or policy changes required to the program resultant from U.S. EPA and Ohio EPA comments will be expeditiously transitioned into ongoing operations so as not to adversely impact cleanup progress.

Thorium Management Program

The FEMP Thorium Management Program represents a cohesive management approach enveloping the characterization, packaging, storage, transport, and disposal of inventoried thorium materials. Work elements are conducted and controlled through a hierarchy of site documentation. Figure 1 presents a brief summary of the hierarchy of documentation supporting site operations at the FEMP. As identified in the figure, program documentation is prepared to fulfill the driving statutory, DOE, and corporate requirements. These drivers result in a series of FEMP site and individual supporting departmental policies and procedures

REMOVAL ACTION NO. 9

REMOVAL OF WASTE INVENTORIES (CONT'D)

Thorium Management Program (con't)

controlling the conduct of every aspect of program operations. The primary driving requirement of the FEMP Thorium Management Program is DOE Order 5820.2A, entitled Radioactive Waste Management, which defines the policies and minimum requirements for the management of radioactive wastes at DOE facilities. All operations performed by contractors or subcontractors at DOE facilities are required to be conducted in accordance with the provisions of this Order. A copy of this DOE Order is provided in the attachment.

As identified in the figure and as further described in the Attachment (See IN-FEMP 6007), management directives and supporting organization charters are established to fulfill driving regulatory or management requirements. Consistent with the management directives, site level documentation (i.e. Documentation governing the conduct of work across the site, as opposed to discrete departments) is compiled to establish the interrelationship and requirements of site organizations. On the basis of the site level documentation, individual supporting departments typically prepare specific procedures detailing the conduct of operations to fulfill a program requirement as defined in the site level documentation.

The hierarchy of documentation supports every aspect of operation at the FEMP including, but not limited to, health and safety, training, quality control and assurance, laboratory services and waste management operations. Since the focus of this submittal is on the existing documentation supporting ongoing thorium management operations, other supporting documentation such as quality assurance, health and safety and laboratory services plans and procedures have not been included within this submittal. A Site Document Index is provided in the attachment providing a listing of these available site documents. Supporting documentation other than that specifically provided in the attachment is available upon request.

Figure 2 provides a simplified logic diagram defining the interrelationship between the major components of the waste management program. Table 1 presents a summarization of the key site documentation supporting each of these major program components. Copies of the current version, effective August 1, 1991, of this key site documentation, except as specifically defined within Table 1, are provided in the Attachment.

It should be recognized that revisions to existing policies and procedures to respond to evolving program needs or unique site conditions is an integral part of a successful program. The site documentation provided in the Attachment is intended to be a living baseline, meeting current site needs while retaining the flexibility to respond to changes in an efficient manner. Frequent changes or updates to the provided documentation is expected and necessary to ensure the continuity of operations.

Thorium Management Program (con't)

Revisions or updates to the provided documentation will be provided to U.S. EPA as a Phase III submittal for Removal Action No. 9.

Integration With Operable Unit 3 RI/FS

As previously noted, the existing FEMP Thorium inventory lies within the purview of Operable Unit 3 of the ongoing sitewide Remedial Investigation/ Feasibility Study (RI/FS).

Consistent with the provisions of the NCP, removal actions shall be appropriately integrated with ongoing RI/FSs so as to ensure appropriate documentation is provided into the Administrative Record to record actions taken which may affect pre-existing site conditions relative to the Operable Unit and the known source term associated therewith, and to ensure the removal action supports potential final remedial objectives. Within the FEMP Administrative Record, a separate file will be established for placement of supporting documentation pertaining to Removal of Waste Inventories Removal Action #9. Included in the Administrative Record file will be all key program documentation, including this Work Plan submittal consisting of current Thorium Management Program work procedures, and a compilation of appropriate materials disposition/off-site shipping records for thorium materials encompassed within this Removal Action.

The implementation of Removal of Waste Inventories - Thorium Management Program activities clearly supports the remedial objectives for Operable Unit 3 by providing a necessary preliminary step for preparation of these areas for subsequent remedial activities. The Thorium Management Program actions are consistent with final remedial actions based on the fact that mitigation of personnel/environmental risk and safe, permanent disposition of FEMP wastes/materials are ultimate goals. Establishment of safe storage configuration and/or off-site disposition of thorium materials currently in inventory at the FEMP will allow for the development of permanent disposition for the large quantities of remedial wastes. In addition, characterization of these materials will not be required as part of the RI/FS remedial activities, thus resulting in a cost and schedular avoidance to that program.

Close coordination will be maintained with the ongoing RI/FS for Operable Unit 3 to ensure that planned Thorium Management Program Removal Action activities appropriately support RI/FS field investigations and alternative evaluations by incorporating interim clean-up of source term into baseline risk determination and Operable Unit 3 site characterizations.

FIGURE 1

DOCUMENT HIERARCHY

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DRIVERS

- DOE ORDERS
- STATE & FEDERAL LAWS
- CORPORATE DIRECTIVES
- CONTRACTUAL AGREEMENTS

POLICY & MANAGEMENT DIRECTIVES

- DEPARTMENT & COMMITTEE CHARTERS
- POLICY & PROCEDURES

CHARTER - A DOCUMENT DEFINING THE WORK SCOPE & RESPONSIBILITIES OF A DEPARTMENT, COMMITTEE, COUNCIL, BOARD OR FUNCTION.

POLICY & PROCEDURE - A STATEMENT OF MANAGEMENT POLICY FOLLOWED BY A SERIES OF ADMINISTRATIVE INSTRUCTIONS, INCLUDING RESPONSIBILITIES & PRINCIPAL ACTIONS AFFECTING TWO OR MORE DEPARTMENTS.

SITE OPERATING & INTERFACING DOCUMENTS

- PLANS
- INFORMATION DOCUMENTS
- REQUIREMENTS DOCUMENTS
- SITE OPERATING DOCUMENTS

PLAN - A DOCUMENT IDENTIFIED AS REQUIRED BY A DRIVER OR INFORMATION DEFINING ACTIONS TO BE TAKEN TO MEET A REQUIREMENT

INFORMATION DOCUMENT - INFORMATION COMPILED ON A SUBJECT AND PRESENTED TO BE INFORMATIVE FOR PERSONNEL OF THE FWPC OR AS REQUIRED BY EXTERNAL ORGANIZATIONS

REQUIREMENTS DOCUMENT - A DOCUMENT DEFINING REQUIREMENTS FOR AN ACTIVITY AFFECTING TWO OR MORE WMCO ORGANIZATIONS

SITE OPERATING DOCUMENT - A PROCEDURE THAT PROVIDES DETAILED OPERATING INSTRUCTIONS FOR AN ACTIVITY TO TWO OR MORE WMCO ORGANIZATIONS

DEPARTMENT DOCUMENTS

- DEPARTMENT PROCEDURES
- PLANS
- MANUALS

DEPARTMENT PROCEDURE - A PROCEDURE THAT PROVIDES INSTRUCTIONS TO ONLY ONE WMCO ORGANIZATION

PLANS - A DOCUMENT IDENTIFIED AS REQUIRED BY A DRIVER FOR ONLY ONE WMCO ORGANIZATION IN ORDER TO MEET A REQUIREMENT

MANUALS - A DOCUMENT THAT PROVIDES DETAILED REQUIREMENTS/INSTRUCTIONS AFFECTING ONLY ONE WMCO ORGANIZATION

LOGIC DIAGRAM: WASTE MANAGEMENT

FEMP

Legend

1. Generate Waste
2. Sample & Characterize
3. Package for Storage
4. Storage
5. Package for Disposal
6. Load & Transport Waste
7. Disposal Facility Requirements and Criteria
8. FEMP Obtains Approval to Ship for Disposal
9. Waste Analysis & Characterization Plans Developed & Implemented
10. Waste Minimization Plans Developed
11. Waste Minimization Activities Fully Implemented

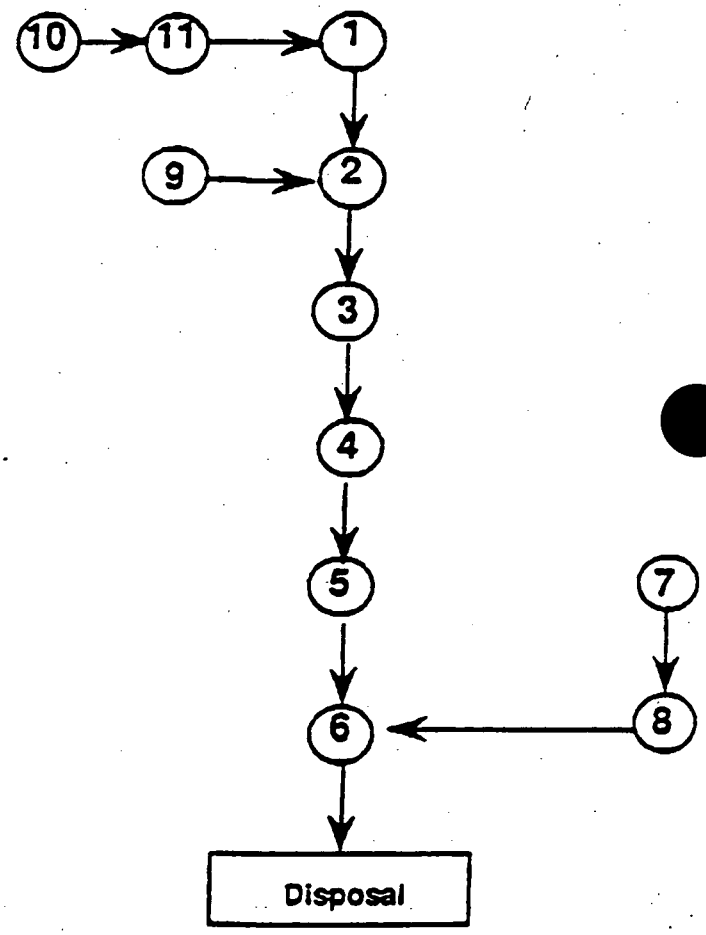

FIGURE 2

TABLE I
IMPLEMENTING PROCEDURES

STEP	PROCEDURE	COMMENTS
General	U.S. Department of Energy Order 5820.2A	To establish policies, guidelines, and minimum requirements by which the Department of Energy (DOE) manages its radioactive and mixed waste and contaminated facilities.
	FMPC-6007, Site Document System	This site procedure defines the system of documents by which the FMPC is managed and details the requirements for development, preparation and control of these documents.
	SDI-100, Site Document System Index	This document includes a listing of current site documents and department documents.
	SSOP-0023, Deviation and Corrective Action Reporting	This procedure identifies the assigned responsibilities and required actions for identifying, documenting, evaluating and providing dispositions and corrective action plans for deviations and corrective actions observed during audits, reviews, surveillances, inspections or tests performed at the Site by both internal and external organizations, as well as the evaluation of supplier-proposed dispositions and corrective actions plans.
	RM-FMPC-0002, Centralized Training Program Manual	This site manual establishes the requirements for all personnel involved in the development and delivery of training. The manual is prepared in accordance with DOE Order 5480.18. The manual also references the U.S. DOE Training Accreditation Program (TAP) Manuals. Copies of this document will be made available upon request.
	FMPC-2139, FMPC Quality Assurance Plan	This site manual incorporates the policies for achieving or exceeding the required quality levels in the operation of the Site. The program is based on the criteria specified in ANSI/ASME NQA-1. Oak Ridge or 5700.6 and DOE Order 5700.6B specify NQA-1 as the preferred standard for Quality Assurance. Copies of this document will be made available upon request.

STEP	PROCEDURE	COMMENTS
General (continued)	FMPC Site Health and Safety Plan	This site plan provides the overall means for planning and implementing the job site characterization, health, and safety training and job orientation for personnel. Copies of this document will be made available upon request.
	FMPC-2214, Environmental Restoration and Waste Management Site Specific Plan	This document provides the public and other outside organizations, such as EPA, with a summary-level look at the site environmental management and waste management activities. Copies of this document will be made available upon request.
	Thorium Overpacking Project Specific Health and Safety Plan for Buildings 67, 68, and the Middle Bay of 64	The purpose of this plan is to describe the specific health and safety concerns and the controls used to reduce employee exposures while overpacking the containers of thorium in Buildings 64, 67, and 68.
Step 1. Generate Waste	FMPC-307, Control and Accountability of Nuclear Materials	This site policy implements the responsibilities regarding Nuclear Materials and requirements for nuclear materials control and accountability program planning and management as contained in Materials Control and Accountability (MC&A) Manuals, FMPC-2083 and PL-FMPC-3006.
	SOP 1-C-604, Inspection of Containerized Refuse Material and Drummed Residues	The purpose of this department operating procedure is to provide the steps for the inspection of containerized waste residues and refuse material.
Step 2. Sample and Characterize	SOP 1-C-101, Sampling Residue and Waste Materials	The purpose of this department operating procedure document is to establish the procedure for taking representative samples of residues and waste at Plant 1 and Resource Conservation and Recovery Act (RCRA) storage facilities.
Step 3. Package for Storage	FMPC-314, Packaging, On-Site Movement and Off-Site Shipment of Material	This site procedure delineates the requirements and assigns the responsibilities for ensuring that materials, including uranium products, waste and nonhazardous miscellaneous items, are properly packaged, marked, labeled, loaded, and secured for transportation both on site and off site.

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STEP	PROCEDURE	COMMENTS
Step 3. Package for Storage (continued)	SOP 20-C-600, Overpacking Defective Containers	The purpose of this department procedure is to establish the procedure for overpacking defective containers.
	FMPC 2178, FMPC Lot Marking and Color Coding System	The keystone of effective nuclear materials control is accurate and complete identification and segregation of each distinct material so that an appropriate uranium or thorium content and isotopic level may be determined and applied toward the construction of material balances. This site level booklet has been prepared to describe and illustrate the use of the lot marking and color coding system employed at the FMPC.
	SOP 20-C-618, Completing the Low Level Radioactive Waste (LLRW) Container Data Sheet	The purpose of this department procedure is to provide the procedure for completing the LLRW data sheet needed to certify packaged waste for disposal.
Step 4. Storage	Drum Management Plan	The purpose of the Feed Materials Production Center Drum Management Plan is to set forth the program that is in place to minimize environmental impact of stored, drummed materials at the FMPC. The sections contained in this plan outline the aggressive operational actions and administrative controls which have been implemented to enhance FMPC drum storage.
	SOP 1-C-608, Storage of Radioactive Material	The purpose of this departmental procedure is to provide the requirements for storing radioactive material.

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STEP	PROCEDURE	COMMENTS
Step 5. Package for Disposal	SOP 20-C-601, Packaging Low Level Radioactive Waste (LLRW) for Off-Site Disposal	This departmental procedure provides for the packaging contaminated waste for off-site disposal.
	EQP 12.03, Certification of Waste Package Examination and Sealing for Off-Site Shipment	This quality departmental procedure outlines the method for the certification of waste materials at the Feed Materials Production Center (FMPC) prior to off-site shipment, and is applicable to low level radioactive waste only.
Step 6. Loading and Transport	SOP 1-C-602, Low Level Radioactive Waste Shipment Preparation	This departmental procedure provides the procedure for preparing low level radioactive waste for shipment off site.
	SOP TRF-46-C-110, Preparation and Shipment of Radioactive Materials (Low Level Wastes)	This procedure shall apply to WMCO's Traffic and Transportation Departments in ensuring that low level radioactive wastes (radioactive materials) are properly packaged, marked, labeled, loaded, and secured, and proper shipping documents are in full compliance with WMCO, DOT/DOE and NTS regulations and directives.
	SP-P-35-009, Radioactive Material Shipping and Receiving	This departmental procedure sets administrative guidelines for the shipping and receiving of Radioactive Material at the FMPC.
	EQP-12.04, Certification of loading and Shipment of Low Level Radioactive Waste	This procedure establishes a detailed method for the certification of low level radioactive waste packages the loading of low level radioactive waste materials and the examination of highway transport vehicles for exclusive use shipments only at the FMPC to ensure compliance with applicable federal regulations.

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STEP	PROCEDURE	COMMENTS
Step 7. Disposal Facility Requirements and Criteria	NVO-325	This document establishes U.S. Department of Energy Nevada Operations Office (DOE/NV) defense radioactive waste acceptance criteria and requirements for waste certification and transfer. These criteria and requirements apply to all waste received at the NTS Area 3 and Area 5 Radioactive Waste Management Sites (RWMS) for storage or disposal. The generator approval process also is outlined. The requirements in this document apply to both on-site and off-site waste generators and replace the requirements of NVO-185, Rev. 4, Operational radioactive Defense Waste Management Plan for the Nevada Test Site dated January 1985. (NVO-185 will continue to exist as a DOE/NV defense low level waste management program planning document.)
Step 8. Fernald Site Obtains Approval to Ship for Disposal	Waste Application	The purpose of the waste application is to formalize and request approval for the methods employed by the FMPC to ship waste to the disposal facility.
	FMPC 707, Audit Program	This procedure describes the responsibilities and requirements for planning, performing, and documenting formal audits of WMCO activities and of WMCO's suppliers of equipment and services. Included are the audits and appraisals required by DOE Orders and directives.

STEP	PROCEDURE	COMMENTS
Step 9. Waste Analysis & Characterization Plans Developed & Implemented	SOP 1-C-101, Sampling Residue and Waste Materials	The purpose of this document is to establish the procedure for taking representative samples of residues and waste at Plant 1 and Resource Conservation and Recovery Act (RCRA) storage facilities.
	FMPC 2185, Sampling Plan for Drummed Waste at the FMPC	This plan summarizes the steps required to determine sampling methods, sample analysis, statistical evaluation of data, and analytical quality assurance for waste determination. Copies of this document will be provided upon request.
Step 10. Waste Minimization Plans Developed	Waste Minimization Plan	The purpose of this plan is to establish the FMPC Waste Minimization and Pollution Prevention Awareness Program. The plan specifies those activities and methods that will be employed to reduce the quantity and toxicity of wastes generated at the FMPC. In addition to establishing the FMPC Waste Minimization and Pollution Prevention Awareness Program, this plan also meets legal requirements, educates FMPC personnel, sets goals, and plans actions regarding waste minimization and pollution prevention.
Step 11. Waste Minimization Activities Fully Implemented	SOP 01-104, Segregation of Wooden Pallets	The purpose of this departmental procedure is to provide criteria to segregate wooden pallets into four categories: 1. repairable, 2. reusable, 3. nonrepairable, and 4. out-of-specification.

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U.S. Department of Energy

Washington, D.C.

ORDER

DOE 5820.2A

9-26-88

SUBJECT: RADIOACTIVE WASTE MANAGEMENT

1. PURPOSE. To establish policies, guidelines, and minimum requirements by which the Department of Energy (DOE) manages its radioactive and mixed waste and contaminated facilities.

2. CANCELLATION. DOE 5820.2, RADIOACTIVE WASTE MANAGEMENT OF 2-6-84.

3. SCOPE. The provisions of this Order apply to all DOE elements and, as required by law and/or contract and as implemented by the appropriate contracting officer, all DOE contractors and subcontractors performing work that involves management of waste containing radioactivity and/or radioactively contaminated facilities for DOE under the Atomic Energy Act of 1954, as amended (Public Law 83-703).

4. EXCLUSION. This Order does not apply to the management by the Department of commercially generated spent nuclear fuel or high-level radioactive waste, nor to the geologic disposal of high-level waste produced by the Department's activities and operations. Such materials are managed by the Office of Civilian Radioactive Waste Management under the requirements of the Nuclear Waste Policy Act of 1982, as amended (Public Law 97-425).

5. POLICY. Radioactive and mixed wastes shall be managed in a manner that assures protection of the health and safety of the public, DOE, and contractor employees, and the environment. The generation, treatment, storage, transportation, and/or disposal of radioactive wastes, and the other pollutants or hazardous substances they contain, shall be accomplished in a manner that minimizes the generation of such wastes across program office functions and complies with all applicable Federal, State, and local environmental, safety, and health laws and regulations and DOE requirements.

6. REFERENCES. (See Attachment 1.)

7. DEFINITIONS. (See Attachment 2.)

8. RESPONSIBILITIES.

   a. Assistant Secretary for Defense Programs (DP-1) has authority for establishing policy for the management of DOE waste and assuring that DOE waste generated by operations and activities under DP-1 cognizance, or any other waste within the purview of DP-1, is managed according to the requirements of this Order. DP-1 also has general responsibility for assuring that

DISTRIBUTION:

All Departmental Elements

INITIATED BY:

Office of Defense Waste and Transportation Management

DP-1 programmatic decisions include waste management considerations when appropriate. Specific responsibilities include:

(1) Assuring the safe storage and disposal of all DOE waste other than that managed by NE-1 and RW-1;

(2) Implementing new and alternative technologies and processes to improve management of DP waste;

(3) Developing and operating the Waste Isolation Pilot Plant, a facility near Carlsbad, New Mexico, for conducting research and development to demonstrate the safe disposal of radioactive waste from defense activities and programs of the United States exempted from regulation by the Nuclear Regulatory Commission;

(4) Conducting research and development for DOE waste transportation systems and providing for safe, efficient, and economic transport of materials, pursuant to DOE 1540.1;

(5) Managing DP contaminated facilities, including those that are surplus to program needs;

(6) Assuring that the environmental, safety, health, transportation, quality assurance, unusual occurrence, construction project management, real estate management, and facility design requirements set forth in DOE Orders are implemented for DP-1 waste management programs; and

(7) Supporting the information needs of the Integrated Data Base program on defense program activities and jointly managing and funding the program in cooperation with NE-1 and RW-1 (see Attachment 1, page 3, paragraph 23).

b. Director of Defense Waste and Transportation Management (DP-12) is charged with carrying out DP-1 waste management responsibilities for oversight of the waste management complex, for interpreting waste management policy, and for implementing the requirements of this Order for waste management facilities and operations funded by DP-12. Specific responsibilities include:

(1) Management of storage, treatment, and disposal operations for defense waste;

(2) Managing defense contaminated facilities that are excess to programmatic needs;

(3) Reviewing and approving new or alternative waste management practices;

(4) Conducting research and development for DOE waste transportation systems and providing for safe, efficient, and economic transport of materials, pursuant to DOE 1540.1;

(5) Conducting independent health, safety, and quality assurance audits of field waste management organizations, in cooperation with EH-1, to assess compliance with the requirements of this Order;

(6) Issuing, in consultation with EH-1, approval of exemptions from the requirements of this Order (paragraph 9) that are proposed by other Headquarters or field organizations;

(7) Issuing in consultation with EH-1 and Headquarters program organizations updated waste management guidance; and

(8) Approving documents, reports, and plans, as required by this Order, for DP programs and activities.

c. Director of Civilian Radioactive Waste Management (RW-1) is responsible for selected research and development, siting, construction, operation, and management activities assigned to the Secretary of Energy by the Nuclear Waste Policy Act of 1982 (Public Law 97-425) for the interim storage and disposal of high-level waste and spent nuclear fuel. Specific responsibilities include the following:

(1) The long-term care, in cooperation with NE-1, of closed commercial low-level waste sites transferred to DOE;

(2) Lead responsibility, in cooperation with NE-1 and DP-1, for the Integrated Data Base program (see Attachment 1, page 3, paragraph 23);

(3) Assurance that the requirements of DOE Orders are met for all waste management activities under RW-1 purview; and

(4) Independent health, safety, and quality assurance audits of field waste management organizations in cooperation with EH-1, to assess compliance with the requirements of this Order.

d. Assistant Secretary for Nuclear Energy (NE-1) is responsible for assuring that waste generated by operations funded by NE-1 is managed according to the requirements of this Order and that NE-1 program decisions include waste management considerations, as appropriate. Specific responsibilities include:

(1) Managing DOE wastes from NE-1 operations and activities, including the breeder reactor, space nuclear, naval reactor, and remedial action programs, as well as the Three Mile Island and West Valley projects;

(2) Managing waste generated by DOE enrichment operations and disposed at sites located at the Oak Ridge, Portsmouth, and Paducah gaseous diffusion plants;

(3) Managing any greater than Class C low-level waste, as defined in Section 3(b)(1)(D) of Public Law 99-240, which may be accepted by the Department for disposal in cooperation with DP-1;

(4) Developing and implementing alternative technologies and processes to support storage and disposal of waste or spent fuel generated by NE-1 operations;

(5) Managing NE-1 contaminated facilities, including those that are surplus to program needs, and waste storage/disposal sites;

(6) Developing and implementing commercial applications for waste byproducts;

(7) Assuring that environmental, safety, health, transportation, quality assurance, unusual occurrence, construction project management, real estate management, and facility design requirements set forth in DOE Orders, are implemented for NE-1 waste management programs;

(8) Conducting independent health, safety, and quality assurance audits of field waste management operations in cooperation with EH-1 to assess compliance with the requirements of this Order; and

(9) Supporting the information needs of the Integrated Data Base program on civilian nuclear program activities in cooperation with DP-1 and RW-1 (see Attachment 1, page 3, paragraph 23).

e. Assistant Secretary for Environment, Safety and Health (EH-1) is responsible for providing an independent overview of DOE radioactive waste management and decommissioning programs to determine compliance with DOE environment, safety, and health requirements and applicable Environmental Protection Agency (EPA) and state regulations. Specific responsibilities include:

(1) Advising the Secretary of the status of Departmental compliance with the requirements of this Order and applicable provisions of DOE 5480.1B, and EH Orders.

(2) Conducting independent appraisals and audits of DOE waste management and decommissioning programs consistent with the requirements of DOE 5482.1B.

(3) Reviewing site Waste Management Plans and Decommissioning Project Plans with regard to compliance with DOE environment, safety, and health requirements.

f. Director, Naval Nuclear Propulsion Program: Executive Order 12344, statutorily prescribed by PL 98-525 (42 USC 7158 note), establishes the responsibilities and authority of the Director, Naval Nuclear Propulsion Program (who is also the Deputy Assistant Secretary for Naval Reactors within the Department) over all facilities and activities which comprise the Program, a joint Navy-DOE organization. The policy principle promoted by these executive and legislative actions is cited in the Executive Order as "...preserving the basic structure, policies and practices developed for this Program in the past...". Accordingly, The Naval Propulsion Program is exempt from the provisions of this Order. The Director shall maintain an environmental protection program to assure compliance with applicable environmental statutes and regulations. The Director and EH-1 shall exchange information and cooperate as appropriate to facilitate exercise of their respective responsibility.

g. Directors of other Headquarters Program Organizations are responsible for implementing the requirements of this Order for all DOE waste generated by their programs until it is transferred to a DOE or licensed storage/disposal site. For all contaminated facilities under their jurisdiction, they are responsible for assuring that their programmatic decisions include waste management considerations, as appropriate, and for implementing the requirements of other applicable DOE Orders for their waste management programs.

h. Office of General Counsel (GC-1) provides legal advice to program organizations regarding DOE waste management and decommissioning activities involving DOE-owned and privately owned sites; renders legal opinion on DOE authority to undertake remedial action and other waste management activities; and renders legal opinions on, and concurs in, program actions to comply with the National Environmental Policy Act, the Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation, and Liability Act, the Superfund Amendments and Reauthorization Act, and other legal authorities in conjunction with proposed waste management and decommissioning activities.

i. Assistant Secretary, Management and Administration (MA-1) is responsible for providing contractual and business advice to program organizations regarding DOE waste management activities, including use of DOE management and operating contractors in such activities.

j. Heads of Field Organizations are responsible for all activities that affect the treatment, storage, or disposal of waste in facilities under their jurisdiction regardless of where the waste is generated. Heads of field organizations with treatment, storage or disposal facilities responsibility have the authority for establishing waste management requirements at that facility (e.g., setting waste acceptance criteria, waste certification, verification of contents of waste shipped or to be shipped, concurring in waste reduction plans). In addition, they are responsible for assuring that the day-to-day waste management and surplus facility

operations at their sites are conducted in compliance with the requirements of this Order and comply with all applicable Federal, State, and local statutes. Specific responsibilities include the following:

(1) Preparing annual updates of the Waste Management Plans for all operations under their purview according to the format in the Waste Management Plan Outline, Chapter VI. These Plans shall be submitted in December of each year and be distributed to DP-12, EH-1, and other appropriate Headquarters organizations for review and comment.

(2) Preparing supplements to this Order that identify specific detailed requirements for waste management practices and procedures conducted at their sites.

(3) Overseeing fiscal responsibility for transporting waste and establishing of fees to recover the incremental costs for storage and disposal of DOE waste at their sites.

(4) Establishing waste acceptance criteria and reviewing waste minimization plans of other field organization's facilities that generate radioactive, hazardous, or mixed waste that will be treated, stored or disposed of at facilities under their purview.

(5) Auditing any waste generating organization that ships waste to their sites for treatment, storage, or disposal to assure compliance with established waste acceptance criteria.

(6) Maintaining environmental, safety, and health programs for all DOE waste management operations under their purview.

(7) Managing contaminated facilities under their purview according to the requirements of this Order and guidance provided by Headquarters program offices, providing program secretarial officers with the necessary characterizational and engineering data for contaminated facilities, and developing site-specific priorities, schedules, and costs for remedial actions.

(8) Assuring that the requirements of the Order, applicable to contractors and subcontractors whose contracts fall within the scope of the Order, are properly reflected in the contract document.

(9) Defining and assuring that required quality assurance activities are established and implemented for all waste management activities under their purview, pursuant to the requirements of DOE 5700.6B and reporting unusual occurrences pursuant to the requirements of DOE 5000.3.

(10) Providing information, as requested, to the Integrated Data Base Program, Oak Ridge National Laboratory, for all types of waste under

their purview, including: high-level waste; transuranic waste; low-level waste; naturally occurring and accelerator produced radioactive material; mixed waste; and wastes from decommissioning activities (see Attachment 1, page 3, paragraph 23).

k. Manager of Albuquerque Operations Office is responsible, in addition to the responsibilities identified in paragraph 8j, for use of certified packaging, standard containers, transportation, waste acceptance criteria, and all other aspects related to transuranic waste emplacement at the Waste Isolation Pilot Plant. Within the Albuquerque Operations Office, a standing committee, the Waste Isolation Pilot Plant-Waste Acceptance Criteria Certification Committee, is responsible for review, audit, and approval of generator transuranic waste certification programs and activities. The Manager of the Albuquerque Operations Office, as Head of the Waste Isolation Pilot Plant project office, also has responsibility for the design, construction, technology development, and operational activities leading to permanent isolation of transuranic waste from the biosphere.

9. EXEMPTIONS. Exemptions from the requirements of this Order may be granted only with the approval of DP-12 in consultation with EH-1. New or alternate waste management practices that are based on appropriate documented safety, health protection, and economic analyses may be proposed by field organizations and adopted with the approval of DP-12 and EH-1.

10. IMPLEMENTING PROCEDURES AND REQUIREMENTS. Within 6 months of the date of issuance of this Order, Heads of Field Elements shall prepare and submit to appropriate Headquarters program organizations an implementation plan describing schedules, costs, and quality assurance activities for compliance with the requirements of this Order with copies to EH-1 for review and comment. Specific guidance for the plan will be issued by DP-12 under separate cover. Thereafter, the status of compliance with the requirements of this Order shall be reported to the appropriate Headquarters program organization in the annual update of the Waste Management Plans.

11. CLEARANCE UNDER THE PAPERWORK REDUCTION ACT OF 1980. This directive has been determined to contain information collections under the provisions of 5 CFR 1320, "Controlling Paperwork Burdens on the Public." The Office of Management and Budget (OMB) has issued a clearance to the Department (OMB No. 1910-0900) for these information collections.

BY ORDER OF THE SECRETARY OF ENERGY:

LAWRENCE F. DAVENPORT
Assistant Secretary
Management and Administration

CHAPTER III

MANAGEMENT OF LOW-LEVEL WASTE

1. PURPOSE. To establish policies, requirements and guidelines, for managing the Department's solid low-level waste.

2. POLICY.

   a. DOE-low-level waste operations shall be managed to protect the health and safety of the public, preserve the environment of the waste management facilities, and ensure that no legacy requiring remedial action remains after operations have been terminated.

   b. DOE-low-level waste shall be managed on a systematic basis using the most appropriate combination of waste generation reduction, segregation, treatment, and disposal practices so that the radioactive components are contained and the overall system cost effectiveness is maximized.

   c. DOE-low-level waste shall be disposed of on the site at which it is generated, if practical, or if on-site disposal capability is not available, at another DOE disposal facility.

   d. DOE-low-level waste that contains non-radioactive hazardous waste components (mixed waste) shall conform to the requirements of this order, applicable EH Orders, and shall also be regulated by the appropriate regional authorities under the Resource Conservation and Recovery Act.

3. REQUIREMENTS.

   a. Performance Objectives. DOE-low-level waste that has not been disposed of prior to issuance of this Order shall be managed on the schedule developed in the Implementation Plan (See page 7, paragraph 10) to accomplish the following:

      (1) Protect public health and safety in accordance with standards specified in applicable EH Orders and other DOE Orders.

      (2) Assure that external exposure to the waste and concentrations of radioactive material which may be released into surface water, ground water, soil, plants and animals results in an effective dose equivalent that does not exceed 25 mrem/yr to any member of the public. Releases to the atmosphere shall meet the requirements of 40 CFR 61. Reasonable effort should be made to maintain releases of radioactivity in effluents to the general environment as low as is reasonably achievable.

(3) Assure that the committed effective dose equivalents received by individuals who inadvertently may intrude into the facility after the loss of active institutional control (100 years) will not exceed 100 mrem/yr for continuous exposure or 500 mrem for a single acute exposure.

(4) Protect ground water resources, consistent with Federal, State and local requirements.

b. Performance Assessment.

(1) Field organizations with disposal sites shall prepare and maintain a site specific radiological performance assessment for the disposal of waste for the purpose of demonstrating compliance with the performance objectives stated in paragraph 3a.

(2) Each field organization shall, for each DOE reservation within its cognizance, prepare and maintain an overall waste management systems performance assessment supporting the combination of waste management practices used in generation reduction, segregation, treatment, packaging, storage, and disposal. Background and guidance on waste management systems performance assessment is provided in Attachment 1, page 3, paragraph 21.

(3) Where practical, monitoring measurements to evaluate actual and prospective performance should be made at locations as required, within and outside each facility and disposal site. Monitoring should also be used to validate or modify the models used in performance assessments.

c. Waste Generation.

(1) Technical and administrative controls shall be directed to reducing the gross volume of waste generated and/or the amount of radioactivity requiring disposal. Waste reduction efforts shall include consideration of process modification, process optimization, materials substitution and decontamination.

(2) Waste Generation Reduction. All DOE-low-level waste generators shall establish auditable programs (goals, incentives, procedures, and reports) to assure that the amount of low-level waste generated and/or shipped for disposal is minimized.

(3) Waste Segregation. Each DOE-low-level waste generator shall separate uncontaminated waste from low-level waste to facilitate cost effective treatment and disposal.

(4) Waste Minimization. Each DOE-low-level waste generator preparing a design for a new process or process change shall incorporate principles into the design that will minimize the generation of low-level waste.

d. Waste Characterization.

(1) Low-level waste shall be characterized with sufficient accuracy to permit proper segregation, treatment, storage, and disposal. This characterization shall ensure that, upon generation and after processing, the actual physical and chemical characteristics and major radionuclide content are recorded and known during all stages of the waste management process.

(2) Waste characterization data shall be recorded on a waste manifest, as required by paragraph 3m, and shall include:

(a) The physical and chemical characteristics of the waste.

(b) Volume of the waste (total of waste and any solidification or absorbent media).

(c) Weight of the waste (total of waste and any solidification or absorbent media).

(d) Major radionuclides and their concentrations.

(e) Packaging date, package weight, and external volume.

(3) The concentration of a radionuclide may be determined by direct methods or by indirect methods such as use of scaling factors which relate the inferred concentration of one radionuclide to another that is measured, or radionuclide material accountability, if there is reasonable assurance that the indirect methods can be correlated with actual measurements.

e. Waste Acceptance Criteria.

(1) Waste shipped from one field organization to another for treatment, storage or disposal shall be done in accordance with the requirements established by the operations office having responsibility for operations of the receiving facility.

(2) Waste acceptance criteria shall be established for each low-level waste treatment, storage, and disposal facility, and submitted to the cognizant field organization.

(3) Generators of waste shall implement a low-level waste certification program to provide assurance that the waste acceptance criteria for

any low-level waste treatment, storage, or disposal facility used by the generator are met. Generators and facilities receiving the waste are jointly responsible for assuring compliance with waste acceptance criteria. Generators are financially responsible for actions required due to nonconformance.

(4) Generator low-level waste certification programs shall be subject to a periodic audit by operators of facilities to which the waste is sent by the generator.

(5) The waste acceptance criteria for storage, treatment, or disposal facilities shall address the following issues:

(a) Allowable quantities/concentrations of specific radioisotopes to be handled, processed, stored or disposed of;

(b) Criticality safety requirements (waste forms and geometries);

(c) Restrictions regarding low-level waste classified for security reasons;

(d) External radiation and internal heat generation;

(e) Restrictions on the generation of harmful gases, vapors, or liquids in waste;

(f) Chemical and structural stability of waste packages, radiation effects, microbial activity, chemical reactions, and moisture;

(g) Restrictions for chelating and complexing agents having the potential for mobilizing radionuclides; and

(h) Quantity of free liquids.

f. Waste Treatment.

(1) Waste shall be treated by appropriate methods so that the disposal site can meet the performance objectives stated in paragraph 3a.

(2) Waste treatment techniques such as incineration, shredding, and compaction to reduce volume and provide more stable waste forms shall be implemented as necessary to meet performance requirements. Use of waste treatment techniques to increase the life of the disposal facility and improve long-term facility performance, by improved site stability and reduction of infiltrating water, is required to the extent it is cost effective.

(3) The development of large scale waste treatment facilities shall be supported by appropriate the National Environmental Policy Act documentation in addition to the following:

(a) A document shall be prepared that analyzes waste streams needing treatment, treatment options considered and a rationale for selection of proposed treatment processes;

(b) A construction design report including projected waste throughputs and treatment methods, construction and operating cost estimates; and

(c) A Safety Analysis Report.

(4) Operation of waste treatment facilities shall be supported by adequate documentation including the following:

(a) Operation and maintenance procedures;

(b) Personnel training and qualification procedures;

(c) Monitoring and emergency response plans; and

(d) Records shall be maintained for each package of low-level waste that enters and leaves the treatment facility.

g. Shipment.

(1) The volume of waste and number of shipments of low-level waste shall be minimized and the shipments will be conducted based on plans developed by field organizations. Off site shipment of low-level waste shall be in compliance with DOE 1540.1.

(2) Generators shall provide an annual forecast in the third quarter of the fiscal year to the field organizations managing the off-site disposal facility to which the waste is to be shipped.

(3) Generators must receive advance approval from the receiving facility and shall certify prior to shipment that waste meets the receiving facility waste acceptance criteria. The certification program shall be auditable and able to withstand independent review.

(4) Each package of waste must comply with the labeling requirements of DOE 1540.1.

h. Long-Term Storage.

(1) Low-level waste shall be stored by appropriate methods, to achieve the performance objectives stated in paragraph 3a.

(2) Records shall be maintained for all low-level waste that enters and leaves the storage facility, (see paragraph 3m).

(3) The development and operation of a waste storage facility shall be supported by the following documentation (two or more of these may be combined for convenience):

(a) An analysis which identifies the need for the storage facility;

(b) A Construction Design Report, including projected waste planned for storage; construction and operating cost estimates;

(c) A Safety Analysis Report and appropriate National Environmental Policy Act documentation; and

(d) Operational procedures and plans.

(4) Storage of waste to allow for nuclides to decay or storage of wastes until they can be disposed of by approved methods are acceptable.

i. Disposal.

(1) Low-level waste shall be disposed of by methods appropriate to achieve the performance objectives stated in paragraph 3a, consistent with the disposal site radiological performance assessment in paragraph 3b.

(2) Engineered modifications (stabilization, packaging, burial depth, barriers) for specific waste types and for specific waste compositions (fission products, induced radioactivity, uranium, thorium, radium) for each disposal site shall be developed through the performance assessment model (see paragraph 3b(1)). In the course of this process, site specific waste classification limits may be developed if operationally useful in determining how specific wastes should be stabilized and packaged for disposal.

(3) An Oversight and Peer Review Panel of DOE, contractor, and other specialists in performance assessments will be selected by DP-12, with participation by EH-1 and operations office representatives. Through consultation and review, this panel shall ensure consistency and technical quality around the DOE complex in the development and application of performance assessment models that include site specific geohydrology and waste composition.

(4) Disposition of waste designated as greater-than-class C, as defined in 10 CFR 61.55, must be handled as special cases. Disposal systems for such waste must be justified by a specific performance assessment through the National Environmental Policy Act process and with the concurrence of DP-12 for all DP-1 disposal facilities and of NE-20 for those disposal facilities under the cognizance of NE-1.

(5) The following are additional disposal requirements intended either to improve stability of the disposal site or to facilitate handling and provide protection of the health and safety of personnel at the disposal site:

(a) Waste must not be packaged for disposal in cardboard or fiberboard boxes, unless such boxes meet DOT requirements and contain stabilized waste with a minimum of void space. For all types of containers, void spaces within the waste and between the waste and its packaging shall be reduced as much as practical.

(b) Liquid wastes, or wastes containing free liquid, must be converted into a form that contains as little freestanding and noncorrosive liquid as is reasonably achievable, but, in no case, shall the liquid exceed 1 percent of the volume of the waste when the waste is in a disposal container, or 0.5 percent of the volume of the waste processed to a stable form.

(c) Waste must not be readily capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures, or of explosive reaction with water.

(d) Waste must not contain, or be capable of generating, quantities of toxic gases, vapors, or fumes harmful to persons transporting, handling, or disposing of the waste. This does not apply to radioactive gaseous waste packaged as identified in paragraph 3i(5)(e).

(e) Waste in a gaseous form must be packaged at a pressure that does not exceed 1.5 atmospheres at 20°C.

(f) Waste must not be pyrophoric. Pyrophoric materials contained in waste shall be treated, prepared, and packaged to be nonflammable.

(6) Waste containing amounts of radionuclides below regulatory concern, as defined by Federal regulations, may be disposed without regard to radioactivity content.

(7) <u>Disposal Site Selection</u>.

(a) Disposal site selection criteria (based on planned waste confinement technology) shall be developed for establishing new low-level waste disposal sites.

(b) Disposal site selection shall be based on an evaluation of the prospective site in conjunction with planned waste confinement technology, and in accordance with the the National Environmental Policy Act process.

(c) The disposal site shall have hydrogeologic characteristics which, in conjunction with the planned waste confinement technology, will protect the groundwater resource.

(d) The potential for natural hazards such as floods, erosion, tornadoes, earthquakes, and volcanoes shall be considered in site selection.

(e) Site selection criteria shall address the impact on current and projected populations, land use resource development plans and nearby public facilities, accessibility to transportation routes and utilities, and the location of waste generation.

(8) Disposal Facility and Disposal Site Design.

(a) Design criteria shall be established prior to selection of new disposal facilities, new disposal sites, or both. These design criteria shall be based on analyses of physiographic, environmental, and hydrogeological data to assure that the policy and requirements of this Order can be met. The criteria shall be also based on assessments of projected waste volumes, waste characteristics, and facility and disposal site performance.

(b) Disposal units shall be designed consistent with disposal site hydrology, geology, and waste characteristics and in accordance with the National Environmental Policy Act process.

(9) Disposal Facility Operations.

(a) Field organizations shall develop and implement operating procedures for low-level waste disposal facilities that protect the environment, health and safety of the public, and facility personnel; ensure the security of the facility; minimize the need for long-term control; and meet the requirements of the closure/post-closure plan.

(b) Permanent identification markers for disposal excavations and monitoring wells shall be emplaced.

(c) Operating procedures shall include training for disposal facility operating personnel, emergency response plans, and a system of reporting unusual occurrences according to DOE 5000.3.

(d) Waste placement into disposal units should minimize voids between containers.

(e) Operations are to be conducted so that active waste disposal operations will not have an adverse effect on filled disposal units.

j. Disposal Site Closure/Post Closure.

(1) Field organizations shall develop site-specific comprehensive closure plans for new and existing operating low level waste disposal sites. The plan shall address closure of disposal sites within a 5-year period after each is filled and shall conform to the requirements of the National Environmental Policy Act process. Performance objectives for existing disposal sites shall be developed on a case-by-case basis as part of the National Environmental Policy Act process.

(2) During closure and post closure, residual radioactivity levels for surface soils shall comply with existing DOE decommissioning guidelines.

(3) Corrective measures shall be applied to new disposal sites or individual disposal units if conditions occur or are forecasted that could jeopardize attainment of the performance objectives of this Order.

(4) Inactive disposal facilities, disposal sites, and disposal units shall be managed in conformance with the Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation, and Liability Act, and the Superfund Amendments and Reauthorization Act, or, if mixed waste is involved, may be included in permit applications for operation of contiguous disposal facilities.

(5) Closure plans for new and existing operating low-level waste disposal facilities shall be reviewed and approved by the appropriate field organization.

(6) Termination of monitoring and maintenance activity at closed facilities or sites shall be based on an analysis of site performance at the end of the institutional control period.

k. Environmental Monitoring.

(1) Each operational or non-operational low-level waste treatment, storage, and disposal facility shall be monitored by an environmental monitoring program that conforms with DOE 5484.1 and, at a minimum, meet the requirements of paragraph 3K(2) through 3K(4).

(2) The environmental monitoring program shall be designed to measure: (a) operational effluent releases; (b) migration of radionuclides; (c) disposal unit subsidence; and (d) changes in disposal facility and disposal site parameters which may affect long-term site performance.

(3) Based on the characteristics of the facility being monitored, the environmental monitoring program may include, but not necessarily be limited to, monitoring surface soil, air, surface water, and, in the subsurface, soil and water, both in the saturated and the unsaturated zones.

(4) The monitoring program shall be capable of detecting changing trends in performance sufficiently in advance to allow application of any necessary corrective action prior to exceeding performance objectives. The monitoring program shall be able to ascertain whether or not effluents from each treatment, storage, or disposal facility or disposal site meet the requirements of applicable EH Orders.

l. Quality Assurance. Consistent with DOE 5700.6B, the low-level waste operational and disposal practices shall be conducted in accordance with applicable requirements of American National Standards Institute/American Society of Mechanical Engineers Nuclear Quality Assurance-1 (See Attachment 1, page 5, paragraph 48) and other appropriate national consensus standards.

m. Records and Reports.

(1) Each field organization shall develop and maintain a record keeping system that records the following: a historical record of waste generated, treated, stored, shipped, disposed of, or both, at the facilities under its cognizance. The data maintained shall include all data necessary to show that the waste was properly classified, treated, stored, shipped, and/or disposed of. The data maintained in the system shall be based on the data recorded on waste manifests.

(2) Waste Manifest. Records shall be kept and accompany each waste package from generator through final disposal. The manifest shall contain data necessary to document the proper classification, and assist in determining proper treatment, storage, and disposal of the waste. Waste manifests will be kept as permanent records. At a minimum, the following data will be included:

(a) Waste physical and chemical characteristics,

(b) Quantity of each major radionuclide present,

(c) Weight of the waste (total of waste and any solidification or absorbent media),

(d) Volume of the waste (total of waste and any solidification or absorbent media), and

(e) Other data necessary to demonstrate compliance with waste acceptance criteria.

CHAPTER IV

MANAGEMENT OF WASTE CONTAINING AEA 11e(2) BYPRODUCT MATERIAL AND NATURALLY OCCURRING AND ACCELERATOR PRODUCED RADIOACTIVE MATERIAL

1. PURPOSE. To establish policies and guidelines for managing DOE waste containing byproduct material, as defined by section 11e(2) of the Atomic Energy Act of 1954, as amended, and Naturally Occurring and Accelerator Produced Radioactive Material.

2. POLICY. DOE waste containing naturally occurring and accelerator produced radioactive material or byproduct material as defined by section 11e(2) of the Atomic Energy Act, as amended, or similarly contaminated residues derived from DOE remedial actions, shall be stored, stabilized in-place, and/or disposed of consistent with the requirements of the residual radioactive material guidelines contained in 40 CFR 192. Small volumes of DOE waste containing 11e(2) byproduct material or naturally occurring and accelerator produced radioactive material may be managed as low-level waste in accordance with the requirements of Chapter III of this Order. If the waste is classified as mixed waste, management also must be in compliance with the requirements of the Resource Conservation and Recovery Act.

3. REQUIREMENTS.

   a. Waste Management.

      (1) Waste covered under this chapter in quantities too large for acceptance at DOE low-level waste disposal sites shall be managed according to the requirements of 40 CFR 192, and disposed of at specially designated DOE sites or tailing disposal sites established under the Uranium Mill Tailings Radiation Control Act of 1978 (Public Law 95-604). These disposal sites should be identified and developed as needed in support of DOE remedial actions, and will normally be located in the State in which the wastes are generated.

      (2) With the approval of the appropriate field organization, small volumes of 11(e) byproduct material and naturally occurring and accelerator produced radioactive material waste may be disposed of at DOE low-level waste sites in accordance with the requirements of Chapter III of this Order.

      (3) All DOE waste containing:

         (a) Naturally occurring and accelerator produced radioactive material mixed with the Resource Conservation and Recovery Act hazardous chemicals shall be managed as hazardous waste under the Resource Conservation and Recovery Act.

(b) Byproduct 11e(2) (or a combination of 11e(2) byproduct and naturally occurring and accelerator produced radioactive material) mixed with the Resource Conservation and Recovery Act hazardous chemicals, shall be managed consistent with both the Resource Conservation and Recovery Act and 40 CFR Part 192.

b. Quality Assurance. Consistent with DOE 5700.6B, waste management practices shall be conducted in accordance with applicable requirements of American National Standards Institute/American Society of Mechanical Engineers Nuclear Quality Assurance-1 (reference 48) and other appropriate national consensus standards.

WESTINGHOUSE MATERIALS COMPANY OF OHIO SITE DOCUMENT PROGRAM		INTERIM Page 1 of 14
Title: SITE DOCUMENT SYSTEM		DOCUMENT NO: IN-FMPC-6007
Authorization: W. H. Britton, President	Supercedes: IN-FMPC-103, Dated 2-28-91	Issue Date: 06-28-91 Expiration Date: 08-28-91

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1.0 POLICY

Westinghouse Materials Company of Ohio (WMCO) shall operate the Feed Materials Production Center (FMPC) in compliance with Department of Energy (DOE) contractual requirements, Westinghouse Corporate Directives, and state and federal laws. An integrated system of documents shall implement these identified requirements.

2.0 SCOPE

This procedure defines the system of documents by which the FMPC is managed and details the requirements for development, preparation and control of these documents.

3.0 DEFINITIONS

3.1 Site Document System - The system of procedural documents governing the performance of administrative, technical, and operational activities at the FMPC. The document hierarchy is described in Figure 1.

3.2 Drivers - Operational and administrative requirements imposed on WMCO by agreement, law, contract, DOE Directives, or Corporate Directives.

3.3 Policy and Management Directives - Documents by which the WMCO President delegates responsibility for implementing requirements imposed by the drivers.

3.4 Site Operating and Interfacing Documents - Detailed instructions or requirements necessary to manage operations requiring participation by two or more departments.

3.5 Department Document - A document providing administrative, technical, or operating instructions to personnel within that department.

3.6 Interim Document - A document issued to satisfy an urgent need as identified by the WMCO President or Staff Manager. Any site document may be selected for issue as an Interim document with an expiration date of sixty days from issue.

3.7 Document Owner - The Staff Manager having primary responsibility for sitewide implementation of a driver or a manager other than a Staff Manager having a need for the document to permit safe and effective operation of activities for which they have primary responsibility. This manager may be the Staff Manager or manager designated by the responsible Staff Manager.

3.0 DEFINITIONS (cont.)

3.8 Procedure Technical Representative (PTR) - An individual that prepares the technical content of a site or department document at the request of the document owner.

3.9 Significant Review Comment (SRC) - A review comment that is considered by the reviewer to require satisfactory resolution before the document is acceptable for issue. SRC comments are only based on technical inaccuracies, noncompliance, or inconsistencies with established requirements, laws, regulations, and/or procedures.

3.10 Documentation Control (DC) - An organization within the Performance Assessment & Communications Department charged with developing, maintaining, and implementing a site document system.

4.0 RESPONSIBILITIES

4.1 Document Owner - Responsible for preparing, revising, and approving a document for their area of responsibility.

4.2 Staff Manager - Responsible for preparing and approving their department charter and those site documents which implement their chartered responsibilities and identifying those documents which require mandatory training or which require trained, qualified, and certified employees. Coordinates the required department review for the site documents which affect the department by evaluating and consolidating comments to reflect a single department position.

4.3 WMCO President - Responsible for authorizing the issue of documents which define and establish WMCO Policies and Management Directives.

4.4 WMCO Management - Responsible for reviewing issued site documents for applicability to their operation, assuring affected personnel are informed and trained to applicable documents, and ensuring implementation of issued document(s).

4.5 Documentation Control (DC) - A group within the Performance Assessment & Communications Department having responsibility for establishing and maintaining a controlled centralized document system that is capable of translating external and internal customer requirements into process logic, and facilitating the development or update of the required procedure necessary to accomplish the WMCO mission.

4.6 WMCO Employees - WMCO employees shall identify site document deficiencies to their supervisor/manager.

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5.0 GENERAL

5.1 Site Document System Description

5.1.1 The Site Document System consists of all the actions necessary to control and record; a) review of drivers, b) development of documents, c) document reviews, d) document approvals, e) issue and distribution, f) document revisions, and g) cancellation. The types of documents in this system and their relationships are shown in Figure 1.

5.1.2 A Site Policy and Procedure shall identify how a particular driver will be implemented by describing the necessary actions and identifying the position and/or organization(s) responsible for those actions. Detailed instructions, when necessary, shall be implemented through other site documents or department procedures.

5.1.3 Topical Manuals which have site applicability and were previously issued through the FMPC Library Report System shall be considered a site document.

5.1.4 Technical reports shall be issued through the FMPC Library Report System.

5.2 Document Initiation

5.2.1 Drivers enter the Site Document System by: formal transmittal of a driver to the President; formal transmittal of DOE Directives through the DOE Directives Administrator (Refer to FMPC-605); laws and regulations ; or direct communication with a staff manager having responsibility for the implementing actions. Regardless of the route that the driver enters, a staff manager evaluates the driver for applicability to WMCO operations and initiates actions to implement the driver.

5.2.2 A department charter shall be prepared by each staff manager as directed by the WMCO President and shall follow the guidelines provided in this procedure.

5.3 Document Preparation, Review, and Approval

5.3.1 The document owner may designate a PTR to identify document needs to DC and prepare a preliminary draft of the document.

5.0 GENERAL (cont.)

5.3.2 The document owner or the PTR is responsible for resolving and documenting resolution of review comments. At the request of the document owner or PTR, DC will facilitate or resolve comments.

5.3.3 Reviewers may indicate comments critical for incorporation. Comments should be marked as SRC (Significant Review Comment) only when based on technical inaccuracies, noncompliance, or inconsistencies with established requirements, laws, regulations, and/or procedures. Comments which are questioned as being SRC by the document owner are referred to DC for decision on final disposition.

5.3.4 A procedure development team may be formed for development, review or approval of documents.

5.3.5 Unless a document requires extensive (50% or more) revision, changes shall be identified with a vertical bar or an "R" in the left margin of each revision line at the line of revision.

5.3.6 Plans and Information Documents have no established format unless required by a driver.

5.3.7 Document format, content guidelines, word processing requirements are identified in Figures 2, 3, and Table 1.

5.3.8 Required document approvals are identified in Table 2.

5.4 Document Issue and Control

5.4.1 Full compliance with the requirements of site documents is expected. Site documents are effective on the date they are issued. If a manager cannot comply with the requirements of the document as of the document issue date, the manager must take whatever actions are necessary to bring their organization into compliance as expeditiously as possible.

5.4.2 DC has the authority, without site review, to identify and correct minor editorial changes or corrections which do not impact technical content. These changes shall be identified by "replacement pages" and be transmitted by controlled distribution.

5.0 GENERAL (cont.)

5.4.3 Cancellation of a document shall require the same review and authority as an issued document. DC will cancel existing documents when a document is assigned a new number, superseded by another document, or required strictly for records management purposes.

5.4.4 Each Site Document shall be reviewed at least annually by the responsible department. DC shall notify the responsible staff manager when an annual review is required.

5.4.5 A Site Document Index shall be issued each month to include site and department documents. The index includes current documents.

5.4.6 Documents are authorized for issue by individuals identified in Table 2.

5.4.7 DC shall maintain review, issue, control, and history records for Site Documents.

5.4.8 Holders of controlled documents are responsible for maintaining the current version of documents in their possession.

5.5 Department Documents

5.5.1 Department documents shall be prepared in accordance with a department document program approved and authorized by the department manager and shall contain the elements listed in Table 3. If requested, DC will assist the department in developing and/or administering a department program.

5.5.2 If requested by a department, DC may assist in document development and approval.

5.5.3 Department documents shall be formally reviewed at minimum every two years by the responsible department and a record of the review must be maintained.

5.5.4 The first day of each month, a current list of issued or revised department documents shall be transmitted by each department to DC for inclusion in the Site Document Index.

5.5.5 Department procedures shall not assign responsibilities to personnel in other departments.

5.0 GENERAL (cont.)

5.6 Control Of Documents to Subcontractors

5.6.1 A document issued and controlled through the Site Document System, the FMPC Library, or a department procedure program, shall be transmitted by Documentation Control to a subcontractor by request of the contract administrator.

6.0 PROCEDURE

6.1 Review Applicability of Drivers

STAFF MANAGER

6.1.1 Review the driver for applicability in functional area of responsibility.

NOTE: DOE Directives are reviewed in accordance with FMPC-605, DOE Directives Administration.

6.1.2 Take appropriate implementation actions and maintain records of the implementation actions.

6.2 Preparation, Review, and Issue or Revision of a Site Document

DOCUMENT OWNER

6.2.1 Identify the need for, or a change to, a site document and provide a preliminary draft to DC.

DOCUMENT OWNER/DC

6.2.2 Jointly develop an action plan for development, preparation, review, and issue of a document.

NOTE: Document Owner may designate a PTR to develop this action plan.

DC

6.2.3 Facilitate document review/approval.

6.2.4 Assist the PTR as identified in the action plan in resolving review comments.

6.0 **PROCEDURE** (cont.)

6.2.5 Prepare final document.

6.2.6 Obtain authorization.

6.2.7 Issue and control the document.

7.0 **APPLICABLE DOCUMENTS**

7.1 Drivers - DOE Order 5700.6B, Quality Assurance

7.2 Reference Documents - FMPC-605, DOE Directives Administration

8.0 **APPLICABLE FORMS**

None

9.0 **ATTACHMENTS**

None

TABLE 1

DOCUMENT WORD PROCESSING REQUIREMENTS

DOCUMENT TYPE	WORD PROCESSING MARGIN REQUIREMENTS
1. Department/Committee Charter	Left 1.0 inch Bottom 0.5 inch, Right 1.0 inch
2. Policy & Procedure	Left 1.0 inch Bottom 0.5 inch, Right 1.0 inch
3. Plan	NONE
4. Information Documents	NONE
5. Requirement Documents	As identified for specific documents
6. Site Operating Documents	As identified for specific documents

TABLE 2

DOCUMENT APPROVAL AND AUTHORIZATION

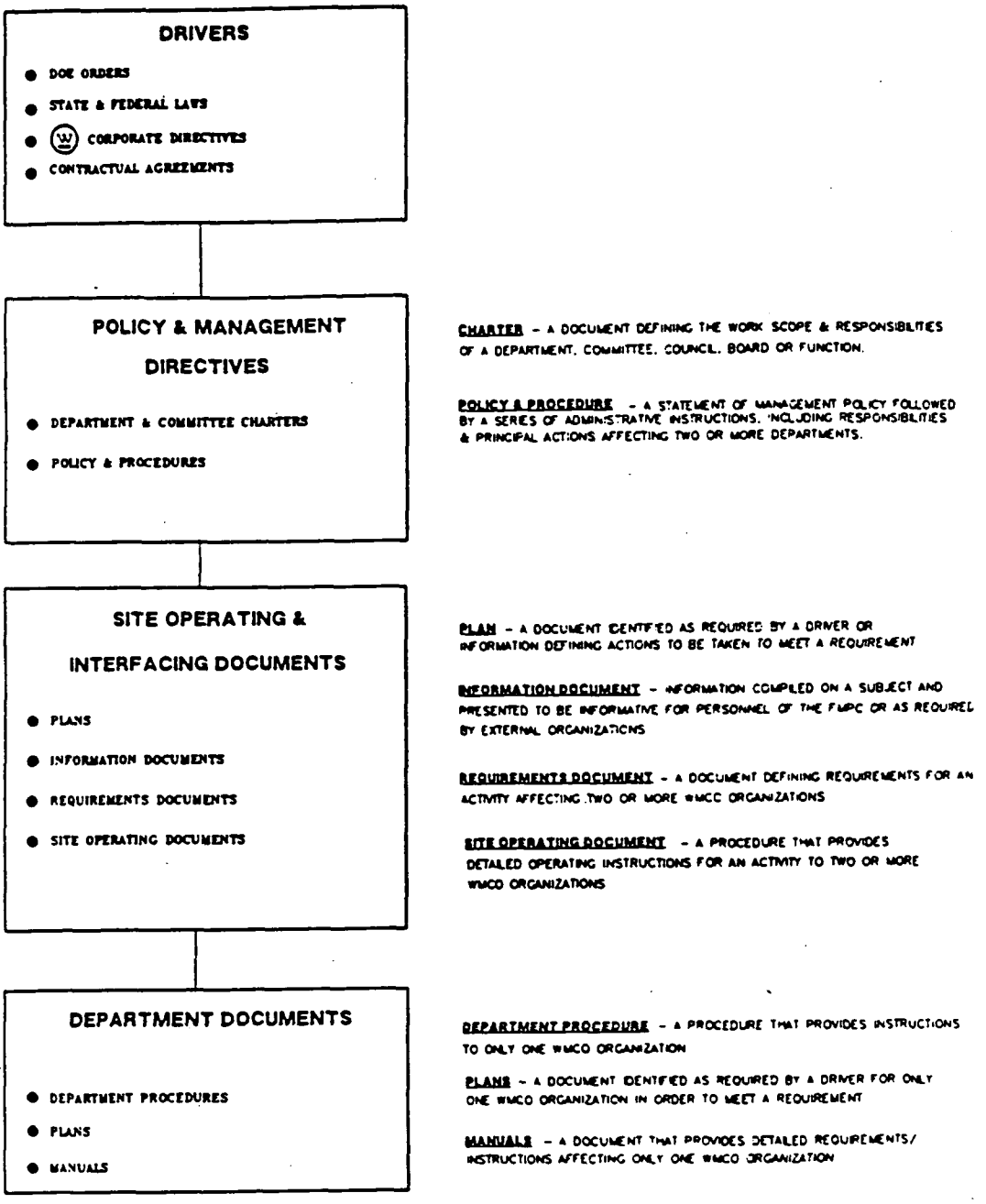
Document Type	Approval	Authorization
Interim Site Document	Staff Manager responsible for area of subject document	WMCO President
Policy and Procedure	Affected Staff Managers	WMCO President
Charter	Affected Staff Managers	WMCO President
Plan	Affected Staff Managers	WMCO President
Information Documents	Staff Manager responsible for area of subject document	Staff Manager responsible for area of subject document
Requirements Documents	Affected Staff Managers	WMCO President
Site Operating Documents	Affected Staff Managers	WMCO President
Department Documents	As identified by department document program	Department Mgr. or as identified by department program

TABLE 3

DEPARTMENT PROCEDURE SYSTEM ELEMENTS

1. Program description
2. Initiation of a new document or revision to an existing document
3. Identification of format for each type of document
4. Processing and review/approval for new or changes to documents
5. Identification of documents
6. Temporary Changes
7. Required approvals
8. Cancellation of Documents
9. Issuing authority
10. Document control
11. Records maintenance

WMCO DOCUMENT HIERARCHY



SITE DOCUMENT PROGRAM HIERARCHY
Figure 1

CHARTER FORMAT AND CONTENT GUIDELINES

1.0 FUNCTION

Develop a statement of the purpose for the committee, council, board, or department.

2.0 MEMBERSHIP

List by title those individuals who serve as members and describe briefly how and by whom members are chosen.

3.0 FUNCTION/RESPONSIBILITIES

Include the function of the committee, council, board, or department and, if appropriate, the unique responsibilities of the members. State the authority of the committee, council, or board. Do not include responsibilities that are standard for any organization, such as the chairperson "chairs" the committee or the members participate in the meetings.

4.0 APPLICABLE DOCUMENTS

Include in this section the specific documents that are applicable to the particular committee, council, board, or department. If no documents exist, state "NONE".

4.1 Drivers - Administrative requirements creating need for the document.

4.2 Reference Documents - Documents required to complete actions or portions of actions identified in the document.

CHARTER FORMAT AND CONTENT GUIDELINES
Figure 2

POLICY AND PROCEDURE FORMAT AND CONTENT GUIDELINES

1.0 POLICY

Provide a precise statement of the action(s) necessary to meet DOE Orders, Westinghouse Corporate Management Directives, or other identified requirements.

2.0 SCOPE

Describe briefly the purpose of the document and the functions, tasks, or situations that the procedure would be applicable.

3.0 DEFINITIONS

Define those unique terms used in the document that are important to the understanding of the document. Exclude from this section acronyms and abbreviations if the intent of inclusion is only identification and not definition.

4.0 RESPONSIBILITIES

Identify, by title, the individual or group responsible for the required action. This section shall provide an overview of the individual/organization actions and activities which, in a procedure, are presented in greater detail in Section 6.0.

5.0 GENERAL

Include explanatory information that is not specific to the procedure section but is necessary for the clarity and understanding of the document. If there are no general items, indicate by "None". Include figures and tables and locate as placed in this procedure.

6.0 PROCEDURE

6.1 Subsection Title Describing Following Series of Actions

WMCO EMPLOYEE (Title of WMCO employee or group responsible for completing the accompanying action steps)

POLICY AND PROCEDURE FORMAT AND CONTENT GUIDELINES
Figure 3 (Sheet 1 of 2)

POLICY AND PROCEDURE FORMAT AND CONTENT GUIDELINES (cont.)

6.0 PROCEDURE (cont.)

6.1.1 Indicate employee or group action in progressive order.

NOTE: Notes place emphasis on the continuity and logical sequence of actions. The use of notes within Section 6.0 shall be restricted to information necessary for user understanding of a particular procedural step. Notes shall not contain action steps.

7.0 APPLICABLE DOCUMENTS

7.1 Drivers - Administrative requirements creating need for the document.

7.2 Reference Documents - Documents required to complete actions or portions of actions identified in the document. Reference only issued documents.

8.0 APPLICABLE FORMS

List forms and form numbers used in the P&P.

9.0 ATTACHMENTS

Attachments should only supplement information contained in the procedure. The attachment shall not be used to direct procedure activities. Information in the attachment shall be within the borders of the formatted page and be identified at the bottom.

POLICY AND PROCEDURE FORMAT AND CONTENT GUIDELINES
Figure 3 (Sheet 2 of 2)

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AUG 1991

SITE DOCUMENT SYSTEM INDEX

WESTINGHOUSE MATERIALS COMPANY OF OHIO

FEED MATERIALS PRODUCTION CENTER

AUGUST 1, 1991

(Supersedes Index Dated July 1, 1991)

SITE DOCUMENT SYSTEM INDEX
AUGUST 1, 1991

TABLE OF CONTENTS

SECTION	TITLE	PAGE
	Introduction	i
1	Policies and Procedures	1-1 thru 1-3
2	Charters	2-1
3	Site Standard Operating Procedures (SSOP)	3-1
4	Interim Documents	4-1
5	Plans	5-1
6	Manuals (Site Documents & Topical Manuals)	6-1 thru 6-2
7	Department Documents	
7.1	Site Services	7.1-1 thru 7.1-20

SITE DOCUMENT SYSTEM INDEX
AUGUST 1, 1991

INTRODUCTION

The Site Document System Index includes a listing of current Site Documents and Department Documents. Site documents are listed in Sections 1 through 6 and department documents in Section 7. Site documents listed in Sections 1 through 4 should be placed in the Site Document Binder with the exception of Interim Documents that may be permanently bound or in a seperate binder. Manuals and Plans should be placed near the binder of site documents. Department documents are listed only as a reference source.

The index is issued once each month. As new documents are issued or cancelled, it is suggested a hand entry be made in the index.

Questions pertaining to cancelled documents or the Site Document System Index may be directed to Documentation Control, Extensions 6545/6610.

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SITE DOCUMENT SYSTEM INDEX
AUGUST 1, 1991

TYPE	DOCUMENT.NO	TITLE	ISSUE DATE	REV. NO.	DOC. OWNER	SUPERSEDES
SITE-PP	FMPC-0101	WMCO MANAGEMENT PHILOSOPHY	01/12/90	1	MOHR	NONE
SITE-PP	FMPC-0102	TRAINING	01/16/91	1	VOLPE	NONE
SITE-PP	FMPC-0105	ACCESS OF PERSONNEL, VISITORS AND VEHICLES TO THE FMPC	12/16/88	1	VOLPE	NONE
SITE-PP	FMPC-0106	EMPLOYMENT AND INDOCTRINATION OF NEW PERSONNEL	04/04/88	0	CRISLER	NONE
SITE-PP	FMPC-0110	DRUG-FREE WORKPLACE/SUBSTANCE ABUSE	08/18/89	1	CRISLER	NONE
SITE-PP	FMPC-0113	WORKERS' COMPENSATION CLAIMS	12/16/88	0	CRISLER	NONE
SITE-PP	FMPC-0121	SEXUAL HARASSMENT	11/21/89	2	CRISLER	NONE
SITE-PP	FMPC-0122	OPEN COMMUNICATION OF EMPLOYEE CONCERNS	02/26/90	1	CRISLER	NONE
SITE-PP	FMPC-0124	EQUAL EMPLOYMENT OPPORTUNITY	04/23/90	2	CRISLER	NONE
SITE-PP	FMPC-0125	EMERGENCY MANAGEMENT	02/26/90	0	VOLPE	NONE
SITE-PP	FMPC-0126	EMPLOYEE ASSISTANCE PROGRAM	12/11/89	0	CRISLER	NONE
SITE-PP	FMPC-0302	REQUEST FOR PURCHASE	06/04/90	2	WEDDLE	NONE
SITE-PP	FMPC-0303	MANAGEMENT OF GOVERNMENT PROPERTY	02/15/89	0	REED	NONE
SITE-PP	FMPC-0304	HANDLING OF CONTROLLED SUBSTANCES AND SELECTED CHEMICALS	10/19/88	0	CRISLER	NONE
SITE-PP	FMPC-0306	CONTRACT ADMINISTRATION	02/01/88	0	WEDDLE	NONE
SITE-PP	FMPC-0307	CONTROL AND ACCOUNTABILITY OF NUCLEAR MATERIALS	05/28/91	3	REED	NONE
SITE-PP	FMPC-0309	MANAGEMENT OF WMCO SITE PRECIOUS METALS	08/05/88	0	REED	NONE
SITE-PP	FMPC-0310	PERSONAL COMPUTER PROCUREMENTS	07/27/90	2	REED	NONE
SITE-PP	FMPC-0314	PACKAGING, ON-SITE MOVEMENT AND OFF-SITE SHIPMENT OF MATERIAL	12/31/90	2	SAVAGE	NONE
SITE-PP	FMPC-0315	CONTROL OF PURCHASED SUPPLIES AND SERVICES	07/10/89	1	WEDDLE	NONE
SITE-PP	FMPC-0316	8 (A) VENDOR PROGRAM	06/04/90	2	WEDDLE	NONE
SITE-PP	FMPC-0317	TECHNICAL EVALUATION OF A PROPOSAL	03/24/88	0	WEDDLE	NONE
SITE-PP	FMPC-0319	MATERIAL COMPATIBILITY PRACTICES	01/26/90	0	VOLPE	NONE
SITE-PP	FMPC-0402	FOREIGN TRAVEL	07/26/90	0	REED	NONE
SITE-PP	FMPC-0408	TRAVEL AND SEMINAR AUTHORIZATION AND REPORTING	05/24/88	0	REED	NONE
SITE-PP	FMPC-0412	MANAGEMENT CONTROL SYSTEM POLICY	12/02/88	0	REED	NONE
SITE-PP	FMPC-0503	FMPC SPILL INCIDENT REPORTING AND CLEANUP	10/25/88	0	SAVAGE	NONE
SITE-PP	FMPC-0505	RADIATION CONTROL	12/02/88	0	VOLPE	NONE
SITE-PP	FMPC-0506	EXPOSURE OF THE FERTILE FEMALE AND FETUS TO IONIZING RADIATION	01/27/89	1	VOLPE	NONE
SITE-PP	FMPC-0508	SAFETY ANALYSIS DOCUMENTATION PROGRAM	10/31/88	1	VOLPE	NONE
SITE-PP	FMPC-0511	CONTROL OF ENTRY TO THE WASTE STORAGE AREA	08/24/90	1	DECHTER	NONE
SITE-PP	FMPC-0512	CONFIGURATION CONTROL OF SAFETY SYSTEMS, DESIGN FEATURES FOR SAFETY, AND OSR-AFFECTED PROCEDURES	10/31/88	0	VOLPE	NONE
SITE-PP	FMPC-0515	ISSUANCE AND IMPLEMENTATION OF RADIATION WORK PERMITS	05/22/87	0	VOLPE	NONE
SITE-PP	FMPC-0516	CONTROL OF PERMITS FOR ACCOMPLISHING HAZARDOUS WORK	04/23/91	2	VOLPE	NONE
SITE-PP	FMPC-0517	NUCLEAR CRITICALITY SAFETY	05/01/89	0	VOLPE	NONE
SITE-PP	FMPC-0518	COMPLETION OF NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) DOCUMENTATION	05/07/90	1	SAVAGE	NONE

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TYPE	DOCUMENT.NO.	TITLE	ISSUE DATE	REV. NO.	DOC. OWNER	SUPERSEDES
SITE-PP	FMPC-0519	MANAGEMENT OF HAZARDOUS WASTE	07/28/89	0	COYLE	NONE
SITE-PP	FMPC-0602	COMMITMENT CONTROL	11/30/89	2	MOHR	NONE
SITE-PP	FMPC-0603	REQUESTING INFORMATION SYSTEMS SERVICES	11/21/89	0	REED	NONE
SITE-PP	FMPC-0604	PROTECTION OF SENSITIVE UNCLASSIFIED INFORMATION	10/15/87	0	REED	NONE
SITE-PP	FMPC-0605	DOE DIRECTIVES ADMINISTRATION	11/30/89	1	MOHR	NONE
SITE-PP	FMPC-0606	CLASSIFICATION AND SAFEGUARD OF CLASSIFIED INFORMATION	02/27/90	1	VOLPE	NONE
SITE-PP	FMPC-0608	PREPARATION AND RELEASE OF TECHNICAL INFORMATION	03/08/90	3	COYLE	NONE
SITE-PP	FMPC-0609	RECORDS MANAGEMENT	09/26/90	1	MOHR	NONE
SITE-PP	FMPC-0611	CONTROL OF FORMS	02/07/90	1	MOHR	NONE
SITE-PP	FMPC-0612	WMCO PERSONNEL CONTACTS WITH REGULATORY AGENCIES	01/13/89	1	SAVAGE	NONE
SITE-PP	FMPC-0614	UNCLASSIFIED COMPUTER SECURITY PROGRAM	04/23/90	0	REED	NONE
SITE-PP	FMPC-0702	DEVELOPMENT AND CONTROL OF DESIGN	03/05/90	1	COYLE	NONE
SITE-PP	FMPC-0704	MINOR EVENT REPORTING SYSYEM	08/24/89	2	DECHTER	NONE
SITE-PP	FMPC-0705	OPERATIONAL READINESS PROCESS	05/14/90	2	DECHTER	NONE
SITE-PP	FMPC-0707	AUDIT PROGRAM	10/27/89	1	MOHR	NONE
SITE-PP	FMPC-0708	PERSONNEL CERTIFICATION	12/15/89	2	VOLPE	NONE
SITE-PP	FMPC-0709	CONDUCT OF QUALITY ASSURANCE SURVEILLANCE ACTIVITY	12/02/88	1	SAVAGE	NONE
SITE-PP	FMPC-0710	QUALITY ASSURANCE PLANS	12/15/89	2	SAVAGE	NONE
SITE-PP	FMPC-0711	QUALITY LEVELS	12/15/89	1	SAVAGE	NONE
SITE-PP	FMPC-0712	VULNERABLILITY AND RISK ASSESSMENT AND MANAGEMENT	04/04/89	0	VOLPE	NONE
SITE-PP	FMPC-0714	PRODUCTION ORDER MANAGEMENT SYSTEM	12/29/89	1	DECHTER	NONE
SITE-PP	FMPC-0715	FMPC WORK REQUEST SYSTEM	03/02/89	0	DECHTER	NONE
SITE-PP	FMPC-0716	CONTROL OF PROCESSES	06/20/90	1	DECHTER	NONE
SITE-PP	FMPC-0717	INSPECTION	12/15/89	2	SAVAGE	NONE
SITE-PP	FMPC-0718	MEASURING AND TEST EQUIPMENT CALIBRATION AND CONTROL	01/12/90	2	DECHTER	NONE
SITE-PP	FMPC-0720	CONTROL OF CONSTRUCTION WASTE	11/10/88	0	WEDDLE	NONE
SITE-PP	FMPC-0721	PLANT TEST AUTHORIZATION	09/06/89	2	DECHTER	NONE
SITE-PP	FMPC-0722	ENGINEERING SERVICES	01/12/90	1	COYLE	NONE
SITE-PO	PO-FMPC-1001	CONDUCT OF OPERATIONS POLICY	08/24/90	0	DECHTER	NONE
SITE-PP	PP-FMPC-0104	SIGNATURE AUTHORIZATION FOR DISBURSEMENTS	04/05/91	0	REED	FMPC-0104
SITE-PP	PP-FMPC-0123	SMOKING RESTRICTIONS AND CONTROL	03/28/91	0	CRISLER	FMPC-0123
SITE-PP	PP-FMPC-0312	DISPOSAL OF NON-CONTAMINATED WASTE FROM NONPROCESS AREAS	01/29/91	0	DECHTER	FMPC-0312
SITE-PP	PP-FMPC-0610	PATENT AND INVENTION DISCLOSURE	07/31/91	0	COYLE	NONE
SITE-PP	PP-FMPC-0706	DEVIATION CORRECTIVE ACTION	06/27/91	0	SAVAGE	NONE
SITE-PP	PP-FMPC-0719	ENERGY CONTROL (LOCKOUT AND TAGOUT)	02/15/91	0	DECHTER	FMPC-0719
SITE-PP	PP-FMPC-5003	CORRESPONDENCE DIRECTIVE	12/13/90	0	MOHR	NONE
SITE-PP	PP-FMPC-5004	RESPONSE TO PUBLIC INFORMATION REQUESTS	11/16/90	0	MOHR	FMPC-0618
SITE-PP	PP-FMPC-5007	TYPE A, B, AND C, INVESTIGATIONS	04/16/91	0	VOLPE	NONE
SITE-PP	PP-FMPC-5010	MANAGEMENT OF LOW-LEVEL WASTE (LLW)	12/26/90	0	DECHTER	NONE
SITE-PP	PP-FMPC-5012	MANAGEMENT OF TELECOMMUNICATIONS EQUIPMENT AND SERVICES	01/31/91	0	REED	NONE
SITE-PP	PP-FMPC-5013	ACQUISITION OF AUTOMATED DATA PROCESSING EQUIPMENT, SOFTWARE AND SERVICE	04/16/91	0	REED	NONE

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TYPE	DOCUMENT.NO	TITLE	ISSUE DATE	REV. NO.	DOC. OWNER	SUPERSEDES
SITE-PP	PP-FMPC-5014	MANAGEMENT INSPECTION OF FACILITIES PROGRAM (MIFP)	03/26/91	0	MOHR	NONE
SITE-PR	PR-FMPC-4006	OCCURRENCE REPORTS	11/16/90	0	VOLPE	FMPC-0703

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TYPE	DOCUMENT.NO	TITLE	ISSUE DATE	REV. NO.	DOC. OWNER	SUPERSEDES
SITE-CH	CH-FMPC-0204	JOINT WMCO-DOE CHANGE CONTROL BOARD CHARTER	05/21/91	0	WEDDLE	NONE
SITE-CH	CH-FMPC-0209	INDEPENDENT SAFETY REVIEW COMMITTEE CHARTER	01/31/91	0	VOLPE	FMPC-0209
SITE-CH	CH-FMPC-0215	SITE SERVICES DEPARTMENT CHARTER	07/05/91	0	DECHTER	FMPC-0215
SITE-CH	CH-FMPC-0220	CONTROLLER CHARTER	07/05/91	0	REED	FMPC-0220
SITE-CH	CH-FMPC-0222	OFFICE OF COUNSEL CHARTER	07/27/91	0	BRADLEY	FMPC-0222
SITE-CH	CH-FMPC-0230	INDUSTRIAL, RADIOLOGICAL SAFETY AND TRAINING DEPARTMENT CHARTER	06/03/91	0	VOLPE	FMPC-0230
SITE-CH	CH-FMPC-2000	PERFORMANCE ASSESSMENT AND COMMUNICATIONS	07/18/91	0	MOHR	NONE
SITE-CH	CH-FMPC-2001	TECHNICAL REVIEW BOARD CHARTER	12/26/90	0	WEDDLE	FMPC-0206
SITE-CH	CH-FMPC-2002	JOINT WESTINGHOUSE MATERIALS COMPANY OF OHIO-DEPARTMENT OF ENERGY PRIORITY MANAGEMENT BOARD	04/22/91	0	REED	NONE
SITE-CH	CH-FMPC-2004	PROJECT MANAGEMENT AND ACQUISITION DEPARTMENT CHARTER	07/05/91	0	WEDDLE	NONE
SITE-CH	CH-FMPC-2006	COST EFFICIENCY PROGRAM CHARTER	07/22/91	0	GRUMSKI	NONE
SITE-CH	FMPC-0201	PUBLIC AFFAIRS AND COMMUNICATIONS DEPARTMENT CHARTER	10/27/89	1	MOHR	NONE
SITE-CH	FMPC-0202	STRATEGIC MANAGEMENT BOARD CHARTER	06/30/89	0	DECHTER	NONE
SITE-CH	FMPC-0203	ALARA COMMITTEE CHARTER	11/03/89	0	VOLPE	NONE
SITE-CH	FMPC-0208	SUBCONTRACT REVIEW COMMITTEE CHARTER	08/14/89	1	WEDDLE	NONE
SITE-CH	FMPC-0210	BEST MANAGEMENT PRACTICES COMMITTEE CHARTER	06/02/89	2	SAVAGE	NONE
SITE-CH	FMPC-0211	PATENT REVIEW COMMITTEE CHARTER	07/19/90	1	COYLE	NONE
SITE-CH	FMPC-0212	ENVIRONMENTAL COUNCIL CHARTER	11/03/89	0	COYLE	NONE
SITE-CH	FMPC-0217	TECHNICAL DIRECTOR CHARTER	07/29/88	0	COYLE	NONE
SITE-CH	FMPC-0221	HUMAN RESOURCES DEPARTMENT CHARTER	10/27/89	1	CRISLER	NONE
SITE-CH	FMPC-0223	SITE REMEDIATION DEPARTMENT CHARTER	07/29/88	0	COYLE	NONE
SITE-CH	FMPC-0224	FMPC FIREARMS SAFETY COMMITTEE CHARTER	12/29/89	1	VOLPE	NONE
SITE-CH	FMPC-0225	ADMINISTRATION DEPARTMENT CHARTER	10/27/89	0	WEDDLE	NONE
SITE-CH	FMPC-0226	QUALITY DEPARTMENT CHARTER	02/12/90	0	SAVAGE	NONE
SITE-CH	FMPC-0228	PERFORMANCE ASSESSMENT DEPARTMENT CHARTER	10/27/89	0	MOHR	NONE
SITE-CH	FMPC-0231	COMPUTER SYSTEMS STEERING COMMITTEE CHARTER	04/12/90	0	REED	NONE
SITE-CH	FMPC-0232	WMCO TOTAL QUALITY COUNCIL CHARTER	02/12/90	0	MOHR	NONE
SITE-CH	FMPC-0233	TRANSPORTATION SAFETY COMMITTEE CHARTER	05/14/90	0	DECHTER	NONE
SITE-CH	FMPC-0234	READINESS REVIEW BOARD CHARTER	08/03/90	0	VOLPE	NONE
SITE-CH	FMPC-0235	OPERATIONAL EXCELLENCE BOARD CHARTER	07/02/90	0	DECHTER	NONE

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TYPE.....	DOCUMENT.NO.....	TITLE.....	ISSUE... DATE	REV. NO.	DOC..... OWNER	SUPERSEDES
SITE-SSOP	SSOP-0002	COMPLETING THE MATERIAL EVALUATION FORM	04/16/91	2	DECHTER	NONE
SITE-SSOP	SSOP-0003	RECEIVING, ON-SITE MOVEMENT AND OFF-SITE SHIPMENT OF NON-RADIOACTIVE HAZARDOUS WASTE	01/30/91	0	WEDDLE	NONE
SITE-SSOP	SSOP-0005	CLEARANCE DOCUMENT PREPARATION FOR ACQUISITION PLAN CHANGE	04/16/91	0	REED	NONE
SITE-SSOP	SSOP-0006	PREPARING AN ACQUISITION PLAN FOR COMPUTER-RELATED PURCHASES	04/16/91	0	REED	NONE
SITE-SSOP	SSOP-0007	OBTAINING SIGNATURE AUTHORIZATION FOR THE APPROVAL OF DISBURSEMENTS	04/16/91	0	REED	NONE
SITE-SSOP	SSOP-0014	DOCUMENTATION OF A SUBJECT MATTER EXPERT (SME)	06/03/91	0	VOLPE	NONE
SITE-SSOP	SSOP-0023	DEVIATION AND CORRECTIVE ACTION REPORTING	06/27/91	0	SAVAGE	NONE

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TYPE	DOCUMENT.NO	TITLE	ISSUE DATE	EXPIRATION DATE	DOC OWNER	SUPERSEDES
SITE-INTERIM	IN-FMPC-6007	SITE DOCUMENT SYSTEM	06/28/91	08/28/91	BECKMAN	NONE
SITE-INTERIM	IN-FMPC-6008	VITAL RECORDS PROTECTION	07/22/91	09/22/91	MOHR	NONE

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PE.....	DOCUMENT.NO.....	TITLE.....	ISSUE... DATE	REV. NO.	REVISION.. DATE	DOC..... OWNER	SUPERSEDES
SITE-PL	PL-FMPC-3001	LABORATORY CHEMICAL HYGIENE PLAN	01/15/91	0		VOLPE	NONE
SITE-PL	PL-FMPC-3002	ASBESTOS MANAGEMENT PLAN	09/28/90	0		VOLPE	NONE
SITE-PL	PL-FMPC-3006	MATERIALS CONTROL AND ACCOUNTABILITY PLAN	01/14/91	1	06/18/91	REED	FMPC-2115

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TYPE	DOCUMENT.NO	TITLE	ISSUE DATE	REV. NO.	REVISION DATE	DOC OWNER	SUPERSEDES
SITE-DOC	FMPC-2040	FMPC WASTE MANAGEMENT PLAN	12/31/86	1		COYLE	NONE
SITE-DOC	FMPC-2043	FMPC SAFEGUARDS AND SECURITY PLAN	03/01/90	1		VOLPE	NONE
SITE-DOC	FMPC-2046	FMPC EMERGENCY PLAN	04/01/90	1		VOLPE	NONE
SITE-DOC	FMPC-2048	FMPC ENVIRONMENTAL, SAFETY AND HEALTH MANAGEMENT PLAN	09/01/86	0		VOLPE	NONE
SITE-DOC	FMPC-2055	CLASSIFICATION GUIDE FOR THE FMPC	09/23/86	0		DECHTER	NONE
SITE-DOC	FMPC-2066	T-HOPPER SHIPPING CONTAINER HANDLING PROCEDURES & CONTAINER CRITERIA	08/31/87	0		DECHTER	NONE
SITE-DOC	FMPC-2070	STYLE AND FORMAT GUIDE FOR SCIENTIFIC AND TECHNICAL REPORTS, CORRESPONDENCE AND OTHER PRESENTATIONS	06/01/90	0		MOHR	NONE
SITE-DOC	FMPC-2081	SUPERVISOR'S EMPLOYEE RELATIONS MANUAL	05/01/87	0		CRISLER	NONE
SITE-DOC	FMPC-2084	FMPC RADIATION CONTROL MANUAL	04/30/91	6		VOLPE	NONE
SITE-DOC	FMPC-2086	FMPC HAZARD COMMUNICATION STANDARD WRITTEN PROGRAM	11/06/90	1		VOLPE	NONE
SITE-DOC	FMPC-2089	THE ONSITE TRANSPORTATION OF RADIOACTIVE AND NONRADIOACTIVE HAZARDOUS MATERIALS	08/23/90	0		SAVAGE	NONE
SITE-DOC	FMPC-2092	FMPC WELDING PROGRAM	05/01/88	0		DECHTER	NONE
SITE-DOC	FMPC-2100	OPERATIONAL SAFETY REQUIREMENTS FOR THE SOUTH AMMONIA STORAGE FACILITY	11/01/87	0		DECHTER	NONE
SITE-DOC	FMPC-2112	FMPC NUCLEAR CRITICALITY SAFETY GUIDE	09/01/89	0		VOLPE	NONE
SITE-DOC	FMPC-2113	PRINCIPLES OF NUCLEAR SAFETY	07/08/87	0		VOLPE	NONE
SITE-DOC	FMPC-2114	ENVIRONMENTAL, SAFETY, HEALTH & WASTE MANAGEMENT PLAN	03/20/89	2		VOLPE	
SITE-DOC	FMPC-2116	IMPLEMENTING FMPC POLICIES AND PROCEDURES FOR SYSTEM SAFETY ANALYSIS	01/01/89	0		VOLPE	NONE
SITE-DOC	FMPC-2117	TOPICAL MANUAL FOR NUCLEAR CRITICALITY SAFETY	01/01/89	0		VOLPE	NONE
SITE-DOC	FMPC-2128	FMPC INDUSTRIAL HYGIENE AND SAFETY MANUAL	04/04/89	0		VOLPE	NONE
SITE-DOC	FMPC-2133	FMPC WASTE MINIMIZATION PLAN	07/22/88	0		COYLE	NONE
SITE-DOC	FMPC-2136	FMPC PROJECT MANAGEMENT SYSTEM APPLICATION GUIDE	06/08/88	0		REED	NONE
SITE-DOC	FMPC-2139	FMPC QUALITY ASSURANCE PLAN	03/01/90	0		SAVAGE	NONE
SITE-DOC	FMPC-2148	FMPC PERSONNEL ACCOUNTABILITY	02/01/89	0		VOLPE	NONE
SITE-DOC	FMPC-2152	FMPC RESPIRATORY PROTECTION MANUAL	04/27/90	0		VOLPE	NONE
SITE-DOC	FMPC-2171	STANDARD SPECIFICATIONS FOR DUST COLLECTOR EQUIPMENT	01/01/89	0		WEDDLE	NONE
SITE-DOC	FMPC-2175	ABANDONED-IN-PLACE (AIP) EQUIPMENT PROGRAM PLAN	06/01/89	0		COYLE	NONE
SITE-DOC	FMPC-2176	OPERATIONAL SAFETY REQUIREMENTS FOR THE REMOVAL AND OVERPACKING PROGRAM FOR THE 212 CONTAINERS OF THORIUM METALS	12/01/89	0		COYLE	NONE
SITE-DOC	FMPC-2178	FMPC LOT MARKING AND COLOR CODING SYSTEM	07/01/89	0		REED	NONE
SITE-DOC	FMPC-2181	IMPLEMENTING FMPC POLICIES AND PROCEDURES FOR PLANT TEST AUTHORIZATION	08/01/89	0		COYLE	NONE
SITE-DOC	FMPC-2184	OFFSITE SOILS REMOVAL	08/01/89	0		COYLE	NONE
SITE-DOC	FMPC-2185	SAMPLING PLAN FOR DRUMMED WASTE AT THE FMPC	10/01/89	0		COYLE	NONE
SITE-DOC	FMPC-2194	FMPC SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN	07/25/90	0		COYLE	FMPC-2065

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TYPE.....	DOCUMENT.NO.....	TITLE.....	ISSUE... DATE	REV. NO.	REVISION.. DATE	DOC..... OWNER	SUPERSEDES
SITE-DOC	FMPC-2201	PROJECT MANAGEMENT PROCEDURES	05/01/90	0		WEDDLE	FMPC-2063
SITE-DOC	FMPC-2205	POLLUTION PREVENTION AWARENESS/WASTE MINIMIZATION PROGRAM PLAN	05/01/90	0		DECHTER	NONE
SITE-DOC	FMPC-2207	FMPC RESTORATION QUALITY ASSURANCE PROGRAM PLAN	06/01/90	0		VOLPE	NONE
SITE-DOC	FMPC-2208	NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE PLAN FOR FMPC	05/01/90	0		SAVAGE	NONE
SITE-DOC	FMPC-2214	ENVIRONMENTAL RESTORATION AND WASTE MANAGEMENT SITE SPECIFIC PLAN	07/01/90	0		WEDDLE	NONE
SITE-DOC	OM-FMPC-0001	EVENT NOTIFICATION AND REPORTING	12/03/90	0		VOLPE	FMPC-2182
SITE-DOC	RM-FMPC-0001	FMPC GENERAL DESIGN CRITERIA MANUAL	09/28/90	0		COYLE	FMPC-2069
SITE-DOC	RM-FMPC-0002	CENTRALIZED TRAINING PROGRAM MANUAL	01/29/91	0		VOLPE	NONE

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TYPE	DOCUMENT.NO	TITLE	DOC. OWNER	ISSUE DATE	REV. NO.	REVISION DATE
DEPT	PO-D-001	OPERATIONS DOCUMENT PROGRAM	DECHTER	07/13/90	0	
DEPT	PO-D-002	INITIATION, PROCESS, AND,ISSUE OF A PROCEDURE	DECHTER	07/13/90	0	
DEPT	PO-D-003	INITIATION, PROCESS, AND ISSUE OF A CHANGE IN OPERATION (CIO)	DECHTER	07/13/90	0	
DEPT	PO-D-004	DOCUMENT FORMAT	DECHTER	07/13/90	0	
DEPT	PO-D-005	INITIATION, REVIEW, AND ISSUE OF DEPARTMENT/SECTION PROCEDURES AND MANUALS	DECHTER	07/13/90	0	
DEPT	PO-D-006	CALCULATION OF DRUM EQUIVALENTS FOR FMPC WASTE VOLUMES	DECHTER	02/17/88	0	
DEPT	PO-D-007	DOCUMENT PERIODIC REVIEW PROGRAM	DECHTER	07/13/90	0	
DEPT	PO-D-008	OPERATIONS PROJECTS WORK PROGRAM	DECHTER	12/21/88	0	
DEPT	PO-D-009	OPERATOR ACKNOWLEDGEMENT OF PROCEDURE CHANGES	DECHTER	07/13/90	0	
DEPT	PO-D-011	DOCUMENT INCORPORATION OF SAFETY RELATED INFORMATION	DECHTER	07/13/90	0	
DEPT	PO-D-012	FACILITY/PROCESS STARTUP	DECHTER	12/17/90	0	
DEPT	PO-D-013	SAFETY AND HOUSEKEEPING	DECHTER	09/15/89	1	05/10/91
DEPT	PO-D-014	OPERATIONS ORGANIZATIONS AND RESPONSIBILITIES	DECHTER	08/24/90	0	
DEPT	PO-D-015	SHIFT PRACTICES AND OPERATING PRACTICES	DECHTER	08/24/90	0	
DEPT	PO-D-016	COMMUNICATIONS	DECHTER	08/24/90	0	
DEPT	PO-D-017	INVESTIGATION OF ABNORMAL EVENTS	DECHTER	08/24/90	0	
DEPT	PO-D-018	NOTIFICATIONS - REPORTING OF NON-ROUTINE EVENTS	DECHTER	08/24/90	0	
DEPT	PO-D-019	EQUIPMENT STATUS AND CONTROL	DECHTER	08/24/90	0	
DEPT	PO-D-020	INDEPENDENT VERIFICATION	DECHTER	08/24/90	0	
DEPT	PO-D-021	LOGKEEPING	DECHTER	08/24/90	0	
DEPT	PO-D-022	SHIFT TURNOVER	DECHTER	08/24/90	0	
DEPT	PO-D-023	SHIFT ORDERS	DECHTER	08/24/90	0	
DEPT	PO-D-024	CONTROL OF OPERATOR AIDS	DECHTER	08/24/90	0	
DEPT	PO-D-025	EQUIPMENT LABELING	DECHTER	08/24/90	0	
MANUAL	M-100	STANDARD FOR CONDUCT OF OPERATIONS AT THE FEED MATERIALS PRODUCTION CENTER	DECHTER	08/24/90	0	
MANUAL	M-101	STANDARD FOR CONDUCT OF OPERATIONS AT THE FEED MATERIALS PRODUCTION CENTER FACILITY ASSESSMENT RECORDS	DECHTER	08/24/90	0	
PS	14-P-101	PRODUCT SPECIFICATION: DEPLETED URANIUM TWO-INCH THICK FLAT BILLETS	DECHTER	11/24/86		02/24/89
SECT	PO-S-01-001	STORAGE AND HANDLING OF EMPTY L-LRW WASTE CONTAINERS	DECHTER	09/30/87	0	
SECT	PO-S-01-002	INTERNAL AUDIT PROGRAM	DECHTER	09/29/87	0	
SECT	PO-S-01-003	INTERNAL INSPECTION	DECHTER	09/20/87	0	
SECT	PO-S-03-001	REAL PROPERTIES INSPECTIONS	DECHTER	11/04/88	0	
SECT	PO-S-04-001	EMISSION CONTROL ACTION PROGRAM AIR POLLUTION EMERGENCY EPISODES	DECHTER	09/20/88	0	
SECT	RE-S-01-001	OPERATION OF RADON TREATMENT SYSTEM	DECHTER	06/15/89	1	
SECT	RE-S-01-002	RADON MONITORING AND SAMPLING CHECKLIST FOR K-65 SILOS	DECHTER	06/15/89	1	
MS	01-BE-410-02	DRUM PAINTING AND DRYING	GARDNER	04/18/89		
MS	02-BN/E-410-02	DISSOLUTION OF URANIUM METAL IN THE	GARDNER	07/10/89		

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		METAL DISSOLVER				
MS	06-BN/E-430-01	WATER TREATMENT	GARDNER	09/26/79		05/25/87
MS	08-BE-420-01	ROTEX SCREENING ENRICHED MATERIALS	GARDNER	11/30/67		01/11/82
MS	08-BN/E-490-02	DISPOSAL OF WASTE FILTRATE AND EFFLUENTS	GARDNER	03/13/86		
MS	09-BE-490-01	MANUFACTURING SPECIFICATION PROCESSING WASTES IN SUMP	GARDNER	10/26/67		02/07/83
PSS	20-PS-300-01	NITRIC ACID (COMMERCIAL GRADE)	GARDNER	03/15/84		
PSS	20-PS-300-02	ALUMINA	GARDNER	07/10/89	0	
PSS	20-PS-300-03	SODA ASH (COMMERCIAL GRADE)	GARDNER	09/07/89	0	
PSS	20-PS-300-05	MAGNESIUM OXIDE (MGO)	GARDNER	07/10/89	0	
PSS	20-PS-300-06	NITROGEN (COMMERCIAL GRADE)	GARDNER	09/20/89	0	
PSS	20-PS-300-10	AQUEOUS SODIUM HYDROXIDE (COMMERCIAL GRADE)	GARDNER	07/05/89	0	
PSS	20-PS-300-11	MAGNESIUM (GROUND)	GARDNER	10/09/89	0	
PSS	20-PS-300-12	SILICON POWDER	GARDNER	11/07/89	0	
PSS	20-PS-300-13	IRON (POWDER)	GARDNER	09/05/89	0	
PSS	20-PS-300-18	HYDROCHLORIC ACID (SUB-COMMERCIAL GRADE)	GARDNER	10/12/90	0	
PSS	20-PS-300-19	FILTER AID	GARDNER	10/09/68	0	
PSS	20-PS-300-20	HYDRATED LIME (COMMERCIAL GRADE)	GARDNER	07/06/89	0	
PSS	20-PS-300-21	BULK QUICK LIME	GARDNER	06/16/89	0	
PSS	20-PS-300-22	FLAKE CAUSTIC SODA (TECHNICAL GRADE)	GARDNER	07/18/89	0	
PSS	20-PS-300-29	SODIUM CARBOXYMETHYL CELLULOSE (CMC)	GARDNER	09/20/89		
PSS	20-PS-400-01	CROSS REFERENCE LIST OF DUST COLLECTOR FILTER BAGS IDENTIFICATION/STORES NUMBERS	GARDNER	01/10/90	0	
PSS	20-PS-400-03	VENDOR SPECIFICATION AND CERTIFICATION REQUIREMENTS FOR POLYPROPYLENE FELT FILTER BAGS - SPENCER PORTABLE VACUUM UNITS	GARDNER	10/19/87	0	
PSS	20-PS-400-04	WOOL FELT FILTER BAGS FOR MICRO-PULSAIRE DUST COLLECTORS	GARDNER	11/16/89	0	
PSS	20-PS-400-05	CANTON FLANNEL FILTER BAGS FOR HOFFMAN DUST COLLECTORS	GARDNER	11/16/89	0	
PSS	20-PS-400-06	FELT FILTER BAGS FOR TURNER-HAWS DUST COLLECTORS	GARDNER	11/06/89	0	
PSS	20-PS-400-07	POLYESTER FELT, PTFE MEMBRANE LAMINATED FILTER BAGS FOR DAY DUST COLLECTORS	GARDNER	11/07/89	0	
PSS	20-PS-400-08	VENDOR SPECIFICATION AND CERTIFICATION REQUIREMENTS FOR WOOL FELT DUST COLLECTOR BAGS (DAY AND AMERJET COLLECTORS)	GARDNER	12/08/87	0	
PSS	20-PS-400-09	SATEEN WEAVE COTTON DUST FILTER BAGS FOR WHEELABRATOR DUST COLLECTORS	GARDNER	06/27/85		11/12/85
PSS	20-PS-400-10	VENDOR SPECIFICATION AND CERTIFICATION REQUIREMENTS FOR POLYPROPYLENE FELT FILTER BAGS - HOFFMAN PORTABLE VACUUM UNITS	GARDNER	10/16/87	0	
PSS	20-PS-400-11	POLYESTER FELT, PTFE MEMBRANE LAMINATED DUST FILTER BAGS FOR MIKRO-PULSAIRE DUST COLLECTORS	GARDNER	04/12/90	0	
PSS	20-PS-400-12	POLYESTER FELT, PTFE MEMBRANE LAMINATED DUST FILTER BAGS FOR TURNER-HAWS DUST COLLECTORS	GARDNER	01/03/90	0	
PSS	20-PS-400-20	WOOL/NYLON FILTER BAGS FOR THE UNITED CONVEYOR DUST COLLECTOR	GARDNER	07/26/90	1	08/07/90
PSS	20-PS-400-21	COTTON DUST FILTER BAGS-INVINCIBLE PORTABLE	GARDNER	11/02/89	0	

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		VACUUM UNITS				
PSS	20-PS-400-22	POLYESTER FELT, PTFE MEMBRANE DUST FILTER BAGS FOR DRACCO DUST COLLECTOR	GARDNER	07/18/89		
PSS	20-PS-400-23	POLYESTER DUST FILTER BAGS FOR GENERAL RESOURCE COLLECTORS	GARDNER	07/27/89		
PSS	20-PS-400-25	VENDOR SPECIFICATION AND CERTIFICATION REQUIREMENTS FOR POLYPROPYLENE FELT FILTER BAGS - HOFFMAN PORTABLE VACUUM UNITS	GARDNER	10/27/87		
PSS	20-PS-400-26	HEPA FILTER ELEMENTS FOR HOFFMAN/SPENCER VACUUM CLEANERS	GARDNER	07/26/88		
PSS	20-PS-400-27	FILTER BAG FOR HOFFMAN DUST COLLECTOR MODEL HV150A4	GARDNER	11/16/89	0	
PSS	20-PS-400-28	KNIT POLYESTER BAGS FOR THE SPENCER DUST COLLECTORS	GARDNER	05/17/90	0	
PSS	20-PS-400-29	HEPA FILTER ELEMENTS FOR GENERAL DYNAMICS PORTABLE HEPA FILTERATION DEVICE	GARDNER	03/18/91	0	
PSS	20-PS-400-30	HEPA FILTER ELEMENTS FOR BARTLETT PORTABLE VENTILATION DEVICES	GARDNER	05/23/91	0	
SOP	01-103	INDUSTRIAL CLEANING OF PRODUCTION OPERATIONS FACILITIES AND EQUIPMENT	GARDNER	07/09/87		
SOP	01-104	SEGREGATION OF WOODEN PALLETS	GARDNER	06/23/87		
SOP	01-107	OPERATION OF GENIE LIFT MODEL PL36PDC	GARDNER	09/09/87		
SOP	01-108	OPERATION OF ANTHES MODEL RZ-40 ROTO-ZOOM AERIAL LIFT	GARDNER	12/22/87		
SOP	01-C-101	SAMPLING RESIDUES AND WASTE MATERIALS	GARDNER	06/16/89	2	03/11/91
SOP	01-C-301	DRUM CLEANING AND DECONTAMINATION	GARDNER	02/20/90	0	
SOP	01-C-302	DRUM PAINTING AND DRYING	GARDNER	01/15/90		
SOP	01-C-304	REROLLING 30 GALLON DRUMS AND EXPANDING 55 GALLON DRUMS	GARDNER	01/11/89		
SOP	01-C-305	BALING SCRAP METAL DRUMS	GARDNER	03/22/90	0	
SOP	01-C-306	CRUSHING SCRAP DRUMS	GARDNER	09/26/89	0	
SOP	01-C-602	LOW LEVEL RADIOACTIVE WASTE (L-LRW) SHIPMENT PREPARATION	GARDNER	08/23/90	2	06/11/91
SOP	01-C-604	INSPECTION OF CONTAINERIZED REFUSE MATERIAL AND DRUMMED RESIDUES	GARDNER	09/07/89	0	
SOP	01-C-605	STORAGE OF HAZARDOUS WASTE	GARDNER	04/26/90	1	03/28/91
SOP	01-C-606	HAZARDOUS WASTE SHIPMENT PREPARATION	GARDNER	06/14/89		
SOP	01-C-608	STORAGE OF RADIOACTIVE MATERIAL	GARDNER	08/13/90	0	
SOP	01-C-609	PLANT 1 STORAGE INSPECTION	GARDNER	06/12/90	0	
SOP	01-C-701	PLANT 1 DUST COLLECTORS	GARDNER	05/24/89		
SOP	01-C-803	PREPARATION OF ENRICHED URANIUM(<20% U235) FOR OFFSITE SHIPMENT	GARDNER	07/20/88		
SOP	01-C-902	DISPOSAL OF PLANT 1 EFFLUENT	GARDNER	09/14/90	0	
SOP	01-C-903	PLANT 1 NUCLEAR MATERIALS INVENTORY	GARDNER	07/18/89		
SOP	01-C-904	OPERATOR SCALE CHECKING IN PLANT 1	GARDNER	04/22/88	0	06/06/91
SOP	01-C-905	PRODUCTION NUCLEAR MATERIALS(NM) RECEIVING, STORING, AND HANDLING	GARDNER	09/01/88		
SOP	01-C-911	PLANT 1 EMERGENCIES	GARDNER	07/05/91	0	
SOP	01-C-915	CLEANING OF CONTAMINATED METAL AND EQUIPMENT	GARDNER	12/28/87	1	05/06/91
SOP	01-C-916	PLANT 1 HOISTS AND CRANES	GARDNER	05/09/88		
SOP	01-C-917	DECONTAMINATION BUILDING 69 CRANE	GARDNER	05/20/88		

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SOP	01-C-918	THORIUM OVERPACKING	GARDNER	12/05/89	2	08/10/90
SOP	02-C-601	REFINERY SUMP	GARDNER	04/10/91	0	
SOP	02-C-904	REFINERY NM INVENTORY	GARDNER	05/03/89		
SOP	02-C-909	OPERATOR SCALE CHECKING IN THE REFINERY	GARDNER	04/13/88		
SOP	02-C-910	INSPECTING REFINERY CONTROL FLOOR AREAS AND SUMPS AND OPERATING MANUAL SUMP PUMPS	GARDNER	03/10/89		
SOP	02-C-914	PREVENTING URANIUM LOSSES THROUGH THE STORM SEWER TO THE ENVIRONMENT (RESPONDING TO PH ALARMS)	GARDNER	02/01/89		
SOP	02-C-916	REFINERY EMERGENCIES	GARDNER	12/07/88		
SOP	02-C-918	INSPECTION OF REFINERY SAFETY SHOWER/EYE BUBBLER STATIONS	GARDNER	06/10/88		
SOP	02-C-923	TRASH BALER OPERATION	GARDNER	10/21/87		09/01/89
SOP	02-C-924	PLANT 2/3 HOISTS AND CRANES	GARDNER	06/07/88		
SOP	04-C-701	PLANT 4 DUST COLLECTORS	GARDNER	12/07/88	1	03/06/90
SOP	04-C-804	MOBILE HOPPER DISCHARGE STATION OPERATION AND PACKAGING DEPLETED UF4	GARDNER	03/07/89		
SOP	04-C-810	LOADING DHF DUMPSTER AT THE TANK FARM	GARDNER	03/20/90	0	
SOP	04-C-900	TANK FARM SUMP	GARDNER	12/02/89	0	
SOP	04-C-901	OPERATOR SCALE CHECKING IN PLANT 4	GARDNER	02/14/89		
SOP	04-C-903	PLANT 4 NUCLEAR MATERIAL INVENTORY	GARDNER	07/19/89		
SOP	04-C-905	INSPECTING PLANT 4 FLOOR CONTROL AREAS AND SUMPS	GARDNER	06/27/90	0	
SOP	04-C-906	INSPECTING AND SHIPPING UO3 T-HOPPERS	GARDNER	12/07/88		
SOP	04-C-909	PLANT 4 EMERGENCIES	GARDNER	05/07/90	0	
SOP	04-C-910	PLANT 4 HOISTS AND CRANES	GARDNER	07/15/88		
SOP	05-C-106	COLLECTION AND DISPOSAL OF REDUCTION AREA RESIDUES	GARDNER	09/20/89		
SOP	05-C-209	COLLECTION AND DISPOSITION OF RESIDUES IN THE REMELT AREA	GARDNER	07/25/89		
SOP	05-C-701	OPERATION OF PLANT 5 BAGHOUSE TYPE DUST COLLECTORS	GARDNER	09/27/89	1	11/27/90
SOP	05-C-703	PLANT 5 CARTRIDGE FILTER DUST COLLECTION SYSTEM	GARDNER	04/10/89		
SOP	05-C-901	INSPECTING FLOOR CONTROL AREA AND SUMPS DAILY AND QUARTERLY	GARDNER	11/19/90	0	
SOP	05-C-902	OPERATOR SCALE CHECKING IN PLANT 5	GARDNER	06/22/89		
SOP	05-C-903	SUMP SYSTEM	GARDNER	12/19/79		06/04/84
SOP	05-C-909	PLANT 5 EMERGENCIES	GARDNER	07/18/90	0	
SOP	05-C-910	PLANT 5 HOISTS AND CRANES	GARDNER	11/23/88		
SOP	05-C-911	PLANT 5 NUCLEAR MATERIAL INVENTORY	GARDNER	11/22/88		
SOP	06-C-701	OPERATION OF PLANT 6 DUST COLLECTION EQUIPMENT	GARDNER	02/01/89	0	
SOP	06-C-902	PLANT 6 MACHINING AND PICKLING AREAS NUCLEAR MATERIAL INVENTORY	GARDNER	11/02/88		
SOP	06-C-903	OPERATOR SCALE TESTING IN PLANT 6	GARDNER	03/20/89		
SOP	06-C-906	PLANT 6 HOISTS AND CRANES	GARDNER	10/13/88		
SOP	06-C-909	PLANT 6 EMERGENCIES	GARDNER	08/25/78		03/13/87
SOP	06-C-910	INSPECTING PLANT 6 FLOOR CONTROL AREAS, TRENCHES, AND SUMPS DAILY AND QUARTERLY	GARDNER	11/28/79		

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SOP	06-C-911	PLANT 6 PERCHED GROUNDWATER EXTRATION REMOVAL SYSTEM OPERATING PROCEDURE	GARDNER	05/21/91	0	
SOP	08-C-104	MAKEUP OF PRECOAT SLURRY AND PRECOATING ROTARY VACUUM FILTERS	GARDNER	02/21/89		
SOP	08-C-105	RECEIVING AND DISTRIBUTION OF 50% AQUEOUS CAUSTIC SODA	GARDNER	03/10/86		08/03/87
SOP	08-C-114	FILTRATION OF RAFFINATES	GARDNER	03/10/86		01/27/88
SOP	08-C-115	FILTRATION OF URANIUM BEARING SLOPS	GARDNER	07/05/89	1	08/08/90
SOP	08-C-116	FILTERING REFINERY THICKENER UNDERFLOW	GARDNER	07/05/91	0	
SOP	08-C-201	ROTEX SCREENING	GARDNER	07/18/90	0	
SOP	08-C-207	OXIDATION FURNACE NO. 1	GARDNER	01/11/82		09/12/83
SOP	08-C-504	PLANT 8 NUCLEAR MATERIAL INVENTORY	GARDNER	07/27/89		
SOP	08-C-701	PLANT 8 BAGHOUSE DUST COLLECTOR OPERATION	GARDNER	08/22/90	0	
SOP	08-C-901	DRUM WASHER	GARDNER	06/08/77		09/15/87
SOP	08-C-902	ISOTOPIC CHANGEOVER, CLEANUP, AND INSPECTION	GARDNER	12/29/69		06/09/87
SOP	08-C-905	OPERATOR SCALE CHECKING IN PLANT 8	GARDNER	05/04/88		
SOP	08-C-913	INSPECTING PLANT 8 FLOOR CONTROL AREAS AND SUMPS	GARDNER	02/27/86	1	03/06/90
SOP	08-C-914	PLANT 8 EMERGENCIES	GARDNER	07/15/91	0	
SOP	08-C-915	INSPECTION OF PLANT 8 SAFETY SHOWER AND EYE BUBBLER STATIONS	GARDNER	08/16/88		
SOP	08-C-916	TRANSFERRING THORIUM CONTAMINATED WASTE WATER FROM THE REPACKAGING OPERATION	GARDNER	01/05/90	0	
SOP	09-C-701	PLANT 9 MACHINING AREA DUST COLLECTOR PRECIPITRON OPERATION	GARDNER	04/13/89		
SOP	09-C-902	SOUTHEAST PAD SUMP AND FILTER AND NORTHWEST PAD SUMP	GARDNER	06/18/68		05/07/87
SOP	09-C-903	PLANT 9 NUCLEAR MATERIAL INVENTORY	GARDNER	03/08/89		
SOP	09-C-904	OPERATOR SCALE CHECKING IN PLANT 9	GARDNER	02/09/88		
SOP	09-C-905	INSPECTING PLANT 9 FLOOR CONTROL AREAS AND SUMPS DAILY AND QUARTERLY	GARDNER	02/18/81		03/20/84
SOP	09-C-909	PLANT 9 EMERGENCIES	GARDNER	10/27/88		
SOP	09-C-910	PLANT 9 HOISTS AND CRANES	GARDNER	06/01/89		
SOP	11-C-215	PILOT PLANT NUCLEAR MATERIAL INVENTORY	GARDNER	04/14/89		
SOP	11-C-217	OPERATION OF PILOT PLANT SUMP SYSTEM	GARDNER	06/20/73		01/07/87
SOP	11-C-238	PILOT PLANT DUST COLLECTORS	GARDNER	10/11/89	0	
SOP	11-C-240	PILOT PLANT EMERGENCIES	GARDNER	04/04/91	0	
SOP	11-C-243	INSPECTING PILOT PLANT FLOOR CONTROL AREAS AND SUMPS DAILY AND QUARTERLY	GARDNER	09/25/81		
SOP	11-C-254	DCS ROOM FIRE/SMOKE DETECTOR SYSTEM	GARDNER	06/13/86		01/08/87
SOP	11-C-901	PILOT PLANT HOIST AND CRANES	GARDNER	08/16/89	0	
SOP	20-C-001	CHANGES TO FORM ENTRIES	GARDNER	08/17/90	0	
SOP	20-C-101	MOVING AND STORING NUCLEAR MATERIALS' ONSITE AT THE FMPC	GARDNER	09/19/75		10/15/82
SOP	20-C-102	NUCLEAR SAFETY FOR RECEIVING, STORING, REPACKAGING AND MOVING ENRICHED URANIUM MATERIALS <20% 235U FROM OFFSITE	GARDNER	01/30/76	1	07/23/85
SOP	20-C-104	OPERATION OF ALLEGANY TECHNOLOY ELECTRONIC PORTABLE HANGING SCALE MODEL CM30K	GARDNER	11/22/89	0	
SOP	20-C-201	UNSCHEDULED OR EMERGENCY NUCLEAR MATERIAL	GARDNER	08/20/90	0	

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		INVENTORY				
SOP	20-C-600	OVERPACKING DEFECTIVE CONTAINERS	GARDNER	03/06/91	0	
SOP	20-C-601	PACKAGING LOW LEVEL RADIOACTIVE WASTE (L/LRW) FOR OFF-SITE DISPOSAL	GARDNER	07/12/90	0	
SOP	20-C-602	INSPECTION AND OPERATION OF NILFISK PORTABLE VACUUM UNITS	GARDNER	07/09/90	0	
SOP	20-C-603	REMOVAL AND REPLACEMENT OF NILFISK PORTABLE VACUUM UNIT FILTERS AND DUST BAG	GARDNER	06/15/88		
SOP	20-C-604	CONTROL AND UTILIZATION OF CONTAMINATED TRASH DUMPSTERS	GARDNER	05/24/88	1	12/27/90
SOP	20-C-605	ESTABLISHMENT AND CONTROL OF SATELLITE ACCUMULATION AREAS	GARDNER	11/16/90	0	06/21/91
SOP	20-C-606	HAZARDOUS MATERIAL SPILL CLEAN-UP	GARDNER	10/12/89	0	
SOP	20-C-609	INSPECTION OF SAFETY BELTS, HARNESSES, AND LANYARDS	GARDNER	01/16/91	0	
SOP	20-C-610	BIRD CARCASS AND DROPPING REMOVAL	GARDNER	10/27/89	0	
SOP	20-C-611	ASSEMBLY/DISASSEMBLY OF SCAFFOLDING	GARDNER	02/15/91		
SOP	20-C-613	EMPTYING LIQUID HAZARDOUS WASTE STORAGE CONTAINERS	GARDNER	03/09/90	1	03/11/91
SOP	20-C-616	INSPECTION OF OUT OF SERVICE HAZARDOUS WASTE MANAGEMENT UNITS	GARDNER	11/28/90	0	
SOP	20-C-618	COMPLETING THE LOW LEVEL RADIOACTIVE WASTE (LLRW) CONTAINER DATA SHEET	GARDNER	03/11/91	0	
SOP	20-C-700	NORCLEAN PORTABLE VACUUM OPERATION	GARDNER	05/30/91		
SOP	20-C-701	OPERATION OF SPENCER AND HOFFMAN PORTABLE DUST COLLECTORS	GARDNER	07/05/89	1	04/24/91
SOP	20-C-704	CHANGING HEPA FILTERS AND PREFILTERS	GARDNER	03/17/89	1	02/19/90
SOP	20-C-705	CHANGING DUST COLLECTOR MODULE AND SECONDARY SEPARATOR CARTRIDGE FILTERS	GARDNER	09/24/90	0	
SOP	20-C-707	DOP TESTING OF IN-PLACE HEPA FILTERS	GARDNER	05/07/90	0	
SOP	20-C-708	INSPECTING AND TROUBLESHOOTING BAGHOUSE TYPE DUST COLLECTORS AND PRECIPITRONS	GARDNER	02/16/90	1	04/22/91
SOP	20-C-709	BAGHOUSE TYPE DUST COLLECTOR REMOVAL/REPLACEMENT	GARDNER	02/16/90	0	
SOP	20-C-711	HAKO "MINUTE MAN" PORTABLE VACUUM CLEANER OPERATION	GARDNER	10/29/90	0	
SOP	20-C-801	STORAGE OF ENRICHED MATERIAL	GARDNER	06/02/90	1	05/15/91
SOP	20-C-902	LIQUID PROPANE GAS (LPG) POWERED HANDSTACKERS AND TUGGERS	GARDNER	05/29/90	0	
SOP	20-C-903	GUIDELINES FOR THE PREVENTION OF URANIUM METAL FIRES	GARDNER	03/10/88	0	
SOP	20-C-904	GENERAL NUCLEAR SAFETY REQUIREMENTS	GARDNER	11/17/88	0	
SOP	20-C-905	VENTILATION FLOW INDICATORS (VFI)	GARDNER	04/21/89	0	
SOP	20-C-908	RCRA WAREHOUSE PORTABLE CRANE OPERATION	GARDNER	07/09/90	0	
SOP	20-C-909	PORTABLE VENTILATION UNIT OPERATION	GARDNER	09/24/90	0	06/06/91
SOP	20-C-910	VENTING POTENTIALLY EXPLOSIVE DRUMS	GARDNER	03/15/91	2	03/15/91
SOP	46-C-101	LAUNDRY OPERATION	GARDNER	02/09/91	0	
SOP	65-C-105	PREPARATION OF SILO SAMPLES FOR LONG TERM STORAGE	GARDNER	11/08/89	1	12/03/90
SOP	65-C-106	SILO WASTE HANDLING	GARDNER	11/09/89	0	
SOP	65-C-201	K65 SILO NUMBERS 1 AND 2 AREA EMERGENCIES	GARDNER	09/10/90	1	05/13/91

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TYPE	DOCUMENT.NO	TITLE	DOC. OWNER	ISSUE DATE	REV. NO.	REVISION DATE
SOP	66-C-101	OPERATION OF K65 RADON TREATMENT SYSTEM	GARDNER	07/03/91	0	
SOP	66-C-909	RADON TREATMENT SYSTEM EMERGENCIES	GARDNER	09/11/90	0	05/13/91
MANUAL	ANL-M-100	LABORATORY BUILDING RADIATION CONTROL MANUAL	NEYER	10/31/90	0	
METH	1001	THE DETERMINATION OF OIL AND GREASE IN WATER AND WASTES USING THE PARTITION-GRAVIMETRIC METHOD	NEYER	07/21/87		
METH	1002	THE DETERMINATION OF HYDROGEN IN URANIUM AND URANIUM BASED ALLOYS USING A LECO RHIE HYDROGEN DETERMINATOR	NEYER	09/18/89		
METH	1003	DETERMINATION OF ASH CONTENT IN OILS USING THE GRAVIMETRIC METHOD	NEYER	09/23/86		
METH	1004	APPARENT DENSITY	NEYER	10/14/86		
METH	1005		NEYER	01/12/87		
METH	1006	DETERMINATION OF VISCOSITY, BROOKFIELD VISCOMETER METHOD	NEYER	06/22/88		
METH	1007	DETERMINATION OF TOTAL SUSPENDED SOLIDS, NON-EPA METHOD	NEYER	09/19/86		
METH	1008	DETERMINATION OF URANIUM IN URANIUM TETRAFLUORIDE-PYROHYDROLYTIC METHOD	NEYER	12/01/86		
METH	1010	THE SAMPLE PREPARATION PROCEDURE FOR THE DETERMINATION OF URANIUM IN WET RESIDUE TYPE SAMPLES	NEYER	09/25/89	1	06/18/91
METH	1011	THE PREPARATION OF URANIUM TETRAFLUORIDE SAMPLES FOR THE ANALYSIS OF IMPURITES, HEXAVALENT URANIUM, TETRAVALENT URANIUM, CARBON, AND EXPERIMENTAL AMMONIUM OXALATE INSOLUBLES	NEYER	12/19/86		
METH	1012	THE DETERMINATION OF IRON IN URANIUM METAL, 1,10-PHENANTHROLINE COLORIMETRIC METHOD	NEYER	09/01/87		
METH	1013	THE DETERMINATION OF IRON IN MAGNESIUM METAL, 1,10-PHENANTHROLINE COLORIMETRIC METHOD	NEYER	08/12/87		
METH	1014	THE DETERMINATION OF IRON IN URANIUM TRIOXIDE, 1,10-PHENANTHROLINE COLORIMETRIC METHOD	NEYER	09/27/88		
METH	1015	DETERMINATION OF TOTAL SUSPENDED SOLIDS, EPA METHOD	NEYER	01/26/87		
METH	1018	GENERAL METHOD FOR THE DETERMINATION OF AMMONIUM OXALATE INSOLUBLES, GRAVIMETRIC METHOD	NEYER	02/19/87		
METH	1019	THE DETERMINATION OF AMMONIUM OXALATE INSOLUBLES IN URANIUM TETRAFLUORIDE, CALCULATION METHOD	NEYER	02/09/88		
METH	1020	THE DETERMINATION OF CHLORIDE, TURBIDMETRIC METHOD	NEYER	06/22/88		
METH	1021	THE DETERMINATION OF FLUORIDE ION, TITANIUM TRICHLORIDE COLORIMETRIC METHOD	NEYER	05/02/88		
METH	1022	THE DETERMINATION OF PHOSPHOROUS IN URANIUM METAL AND AQUEOUS SOLUTIONS, MOLYBDENUM BLUE	NEYER	06/29/88		

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		COLORIMETRIC METHOD				
METH	1023	THE DETERMINATION OF SULFATE, BARIUM SULFATE PRECIPITATION-GRAVIMETRIC METHOD	NEYER	11/20/87		
METH	1024	THE VOLUMETRIC DETERMINATION OF TETRAVALENT URANIUM IN URANIUM TETRAFLUORIDE, POTENTIOMETRIC ENDPOINT METHOD	NEYER	12/01/87		
METH	1025	GRAPHITE FURNACE ATOMIC ABSORPTION METHOD FOR THE DETERMINATION OF TOTAL CHROMIUM IN NPDES WATER SAMPLES	NEYER	01/14/87	1	06/18/91
METH	1026	GRAPHITE FURNACE ATOMIC ABSORPTION METHOD FOR THE DETERMINATION OF HEXAVALENT CHROMIUM IN NPDES WATER SAMPLES	NEYER	04/16/87		
METH	1027	GRAPHITE FURNACE ATOMIC ABSORPTION METHOD FOR THE DETERMINATION OF IRON IN NPDES WATER SAMPLES	NEYER	05/10/87		
METH	1028	GRAPHITE FURNACE ATOMIC ABSORPTION METHOD FOR THE DETERMINATION OF NICKEL IN NPDES WATER SAMPLES	NEYER	05/17/87		
METH	1029	GRAPHITE FURNACE ATOMIC ABSORPTION METHOD FOR THE DETERMINATION OF COPPER IN NPDES WATER SAMPLES	NEYER	05/17/87		
METH	1030	THE DETERMINATION OF BULK DENSITY	NEYER	09/10/87		
METH	1031	PARTICLE SIZE DETERMINATION OF POWDERS UTILIZING A COMPUTER INTERFACED LASER DIFFRACTION PARTICLE SIZE ANALYZER	NEYER	08/14/87		
METH	1032	THE SPECTROPHOTOMETRIC DETERMINATION OF ALUMINUM IN MAGNESIUM METAL, 8-HYDROXY-QUINOLINOL EXTRACTION METHOD	NEYER	08/07/87		
METH	1033	DETERMINATION OF ALUMINUM IN URANIUM BASE MATERIALS, 8-HYDROXY-QUINOLINOL COLORIMETRIC METHOD	NEYER	05/11/87		
METH	1034	THE DETERMINATION OF IRON AND ALUMINUM IN URANIUM METAL: COLORIMETRIC METHOD UTILIZING AN AUTOANALYZER INTERFACED TO HP-85 PERSONAL COMPUTER	NEYER	05/21/85		
METH	1035	DECOMPOSITION OF REFRACTORY MATERIALS BY SODIUM PEROXIDE SINTERING	NEYER	02/20/87		
METH	1036	DETERMINATION OF COALESCENCE TIME OF TRIBUTYL PHOSPHATE-KEROSENE SOLVENT	NEYER	02/23/87		
METH	1037	SAMPLE PREPARATION OF ORGANIC LIQUIDS, PARR OXYGEN BOMB METHOD	NEYER	09/28/88		
METH	1038	COLORIMETRIC DETERMINATION OF TIN IN MAGNESIUM METAL WITH SENSITIZED PYROCATECHOL VIOLET	NEYER	03/04/87		
METH	1039	THE DETERMINATION OF URANIUM BY FERROUS REDUCTION, TITRIMETRIC, POTENTIOMETRIC ENDPOINT METHOD	NEYER	09/18/89		
METH	1040	THE SIMULTANEOUS DETERMINATION OF URANIUM AND WATER IN URANIUM TRIOXIDE, GRAVIMETRIC METHOD	NEYER	07/06/87		

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TYPE	DOCUMENT.NO	TITLE	DOC. OWNER	ISSUE DATE	REV. NO.	REVISION DATE
METH	1041	THE DETERMINATION OF MOISTURE IN POWDERS, GRAVIMETRIC METHOD	NEYER	01/11/88		
METH	1042	SAMPLE PREPARATION PROCEDURE FOR THE DETERMINATION OF URANIUM IN DRY RESIDUE TYPE SAMPLES	NEYER	07/23/87	1	06/18/91
METH	1046	THE DETERMINATION OF MAGNESIUM IN URANIUM FLAME ATOMIC ABSORPTION SPECTROPHOTOMETRIC METHOD	NEYER	04/21/87		
METH	1054	EXTRACTION PROCEDURE TOXICITY	NEYER	05/19/88		
METH	1055	GRAPHITE FURNACE ATOMIC ABSORPTION METHOD FOR THE DETERMINATION OF SILVER	NEYER	08/31/87		
METH	1056	GRAPHITE FURNACE ATOMIC ABSORPTION METHOD FOR THE DETERMINATION OF ARSENIC	NEYER	08/28/87		
METH	1057	GRAPHITE FURNACE ATOMIC ABSORPTION METHOD FOR THE DETERMINATION OF BARIUM	NEYER	08/31/87		
METH	1058	GRAPHITE FURNACE ATOMIC ABSORPTION METHOD FOR THE DETERMINATION OF CADMIUM	NEYER	08/31/87		
METH	1059	COLD VAPOR ATOMIC ABSORPTION TECHNIQUE FOR THE DETERMINATION OF MERCURY	NEYER	02/27/89		
METH	1060	GRAPHITE FURNACE ATOMIC ABSORPTION METHOD FOR THE DETERMINATION OF LEAD	NEYER	08/06/87		
METH	1061	GRAPHITE FURNACE ATOMIC ABSORPTION METHOD FOR THE DETERMINATION OF SELENIUM	NEYER	12/01/88		
METH	1062	THE DETERMINATION OF CHROMIUM, COPPER, IRON, AND NICKEL IN URANIUM TETRAFLUORIDE BY FLAME ATOMIC ABSORPTION SPECTROPHOTOMETRY	NEYER	08/08/88		
METH	1066	THE DETERMINATION OF CALCIUM, MAGNESIUM, AND SODIUM BY INDUCTIVELY COUPLED PLASMA-ATOMIC EMISSION SPECTROSCOPY	NEYER	08/01/88		
METH	1067	THE DETERMINATION OF CHLORIDE -GRAVIMETRIC METHOD	NEYER	08/08/88		
METH	1068	THE DETERMINATION OF CHROMIUM IN URANIUM MATRICES - COLORIMETRIC METHOD	NEYER	07/22/88		
METH	1069	THE DETERMINATION OF COPPER IN URANIUM, SPECTROPHOTOMETRIC NEOCUPROINE METHOD	NEYER	02/19/88		
METH	1071	THE DETERMINATION OF WET SCREEN FRACTIONS OF URANIUM TRIOXIDE	NEYER	12/16/87		
METH	1072	THE DETERMINATION OF LIGHT TRANSMITTANCE OF TRIBUTYL PHOSPATE-KEROSENE SOLVENT	NEYER	12/08/87		
METH	1073	THE DETERMINATION OF NICKEL IN URANIUM MATRICES, DIMETHYLGLYOXIME COLORIMETRIC METHOD	NEYER	09/11/87		
METH	1074	THE DETERMINATION OF NITRATE IN URANIUM TRIOXIDE, CALCULATION METHOD	NEYER	09/11/87		
METH	1075	THE DETERMINATION OF MOLYBDENUM IN URANIUM MATRICES - COLORIMETRIC TOLUENE - 3, 4 - DITHIOL METHOD	NEYER	05/17/88		
METH	1076	THE DETERMINATION OF SILICON IN MAGNESIUM METAL - MOLYBDENUM BLUE COLORIMETRIC METHOD	NEYER	07/22/88		
METH	1077	THE DETERMINATION OF SILICON IN URANIUM METAL, MOLYBDENUM BLUE COLORIMETRIC METHOD	NEYER	11/23/87		

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METH	1078	THE DETERMINATION OF ASH CONTENT OF GRAPHITE, GRAVIMETRIC METHOD	NEYER	08/18/87		
METH	1080	THE COLORIMETRIC DETERMINATION OF THORIUM IN URANIUM-BASE MATERIALS (TTA EXTRACTION-COLORIMETRIC THORIN METHOD)	NEYER	09/26/89		
METH	1081	THE DETERMINATION OF TAP DENSITY	NEYER	09/10/87		
METH	1083	THE SPECTROPHOTOMETRIC DETERMINATION OF TITANIUM IN MAGNESIUM METAL, HYDROGEN PEROXIDE METHOD	NEYER	08/12/87		
METH	1085	THE DETERMINATION OF LITHIUM IN LITHIUM CARBONATE SALT, FLAME ATOMIC ABSORPTION SPECTROPHOTOMETRIC METHOD	NEYER	05/02/88		
METH	1089	THE GRAVIMETRIC DETERMINATION OF URANIUM IN URANIUM HEXAFLUORIDE	NEYER	07/01/88		
METH	1096	PAINT FILTER LIQUIDS TEST	NEYER	10/16/89		
METH	1250	CLP/ACID DIGESTION OF SOIL AND SEDIMENT SAMPLES FOR METALS ANALYSES	NEYER	04/03/91	0	
METH	1251	CLP/ACID DIGESTION OF WATER SAMPLES FOR METAL ANALYSES	NEYER	04/03/91	0	
METH	2002	GAS CHROMATOGRAPHIC DETERMINATION OF METHANOL IN BIODENITRIFICATION PROCESS LIQUORS	NEYER	09/26/89		
METH	2050	ZERO-HEADSPACE EXTRACTION (ZHE) FOR VOLATILE ORGANIC COMPOUNDS	NEYER	02/11/91	0	
METH	3001	THE DETERMINATION OF AMMONIA-NITROGEN IN WASTEWATER USING THE POTENTIOMETRIC AMMONIA SENSING ELECTRODE METHOD	NEYER	10/20/86		
METH	3002	THE COLORIMETRIC (BR PADAP) DETERMINATION OF URANIUM USING AN AUTOANALYZER	NEYER	08/22/89	1	06/18/91
METH	3003	GRAVIMETRIC DETERMINATION OF NON-VOLATILE PARTICULATES ON STACK FILTERS (INCLUDING SAMPLE PREPARATION FOR A TOTAL URANIUM DETERMINATION)	NEYER	05/17/85	1	06/18/91
METH	3004	DETERMINATION OF NITRATE NITROGEN IN WATER BY ION SELECTIVE ELECTRODE POTENTIOMETRY	NEYER	06/25/87		
METH	3005	THE DETERMINATION OF TOTAL COPPER IN SUMP LIQUOR USING THE DIRECT ASPIRATION ATOMIC ABSORPTION TECHNIQUE	NEYER	11/19/86	1	06/18/91
METH	3007	THE DETERMINATION OF CARBON IN UF4 AND RESIDUE SAMPLES USING THE IR-112 LECO CARBON ANALYZER MODEL 781-800	NEYER	05/17/88		
METH	3008	THE DETERMINATION OF CARBON IN URANIUM METAL USING THE LECO IR-212 CARBON TERMINATOR, MODEL 784-400	NEYER	08/29/89		
METH	3010	METHOD FOR THE DETERMINATION OF SODIUM IN URANYL NITRATE SOLUTIONS FLAME PHOTOMETRIC METHOD	NEYER	01/19/88		
METH	3011	THE DETERMINATION OF ACID CONCENTRATION IN SOLUTIONS CONTAINING URANYL IONS USING THE FISHER COMPUTER-AIDED TITRIMETER METHOD	NEYER	01/16/87		
METH	3012	THE DETERMINATION OF URANIUM BY THE	NEYER	05/13/88		

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		VOLMETRIC FERROUS SULFATE REDUCTION METHOD				
METH	3014	THE DETERMINATION OF FREE METAL IN THE PRESENCE OF CARBONATES USING THE GASOMETRIC METHOD	NEYER	06/16/87		
METH	3015	THE VOLUMETRIC (KARL FISCHER) DETERMINATION OF WATER	NEYER	03/10/87		
METH	3017	DETERMINATION OF ACID CONCENTRATION IN SOLUTIONS CONTAINING URANYL IONS USING THE VOLUMETRIC METHOD	NEYER	09/17/86		
METH	3018	GENERAL METHOD FOR THE DETERMINATION OF ACID CONCENTRATION, VOLUMETRIC METHOD	NEYER	01/12/87		
METH	3020	GENERAL METHOD FOR THE DETERMINATION OF BOILING RANGE	NEYER	02/18/87		
METH	3021	METHOD FOR THE DETERMINATION OF CHLORIDE, COLORIMETRIC METHOD	NEYER	12/13/88		
METH	3022	COLORIMETRIC DETERMINATION OF COPPER IN DECOPPERING ACID AS CUPRIC PERCHLORATE	NEYER	02/23/87		
METH	3024	GENERAL METHOD FOR THE DETERMINATION OF ALKALI CONCENTRATION, VOLUMETRIC METHOD	NEYER	02/23/87		
METH	3025	DETERMINATION OF TRIBUTYL PHOSPATE (TBP), ACID SATURATION METHOD	NEYER	03/19/87		
METH	3026	THE DETERMINATION OF CRYSTALLIZATION TEMPERATURE IN AQUEOUS URANYL NITRATE, NITRIC ACID SYSTEMS	NEYER	12/05/88		
METH	3027	THE VOLUMETRIC METHOD FOR THE DETERMINATION OF NITRIDE NITROGEN IN URANIUM METAL	NEYER	04/16/87		
METH	3028	THE DETERMINATION OF URANIUM METAL DENSITY USING AN HP-85 COMPUTER AND SETRA 1000 ELECTRONIC BALANCE	NEYER	10/18/88		
METH	3029	DETERMINATION OF FLASH AND FIRE POINT BY THE CLEVELAND OPEN CUP PROCEDURE	NEYER	05/20/87		
METH	3030	DETERMINATION OF FLASH POINT BY THE TAG CLOSED CUP PROCEDURE	NEYER	12/04/53		08/22/89
METH	3031	THE DETERMINATION OF CARBON IN URANIUM METAL USING THE LECO CS-244 CARBON AND SULFUR DETERMINATOR, (MODEL 784-000)	NEYER	05/12/89		08/22/89
METH	3033	DETERMINATION OF PH USING AN ACCUMENT 915 PH METER	NEYER	08/22/89		
METH	3034	THE DETERMINATION OF ORGANIC MATERIAL IN URANIUM METAL AND RESIDUES	NEYER	06/25/87		
METH	3035	THE DETERMINATION OF CARBONATE IN SOLUTIONS USING THE VOLUMETRIC METHOD	NEYER	07/02/87		
METH	3036	THE MICRO-KJELDAHL VOLUMETRIC METHOD FOR THE DETERMINATION OF AMMONIA	NEYER	07/28/88		
METH	3038	THE COLORIMETRIC DETERMINATION OF HEXAVALENT CHROMIUM IN WASTEWATER SAMPLES	NEYER	08/11/87		
METH	3039	DETERMINATION OF FLUORIDE IN WASTEWATER USING POTENTIOMETRIC, ION-SELECTIVE ELECTRODE METHOD	NEYER	08/09/88		
METH	3041	COLORIMETRIC METHOD FOR THE DETERMINATION OF NITRATE	NEYER	09/02/87		

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METH	3042	COLORIMETRIC METHOD FOR THE DETERMINATION OF PHOSPHATE	NEYER	08/03/87		
METH	3043	THE DETERMINATION OF SPECIFIC GRAVITY USING A METTLER/PAAR DENSITY METER, MODEL DMA-46	NEYER	08/11/87		
METH	3045	URANIUM SATURATION METHOD FOR THE DETERMINATION OF TBP IN RAFFINATE SAMPLES	NEYER	02/17/88		
METH	3047	THE DETERMINATION OF WATER IN AMMONIA BY KARL FISCHER TITRATION	NEYER	08/20/87		
METH	3048	THE DETERMINATION OF SATURATED SPECIFIC GRAVITY AND SATURATED URANIUM CONCENTRATION IN URANYL NITRATE SATURATED SOLVENT MATERIAL	NEYER	08/16/88		
METH	3049	THE NOMOGRAPHIC METHOD FOR THE DETERMINATION OF URANIUM IN NITRIC ACID - ORGANIC SOLUTIONS	NEYER	05/20/88		
METH	3050	THE NOMOGRAPHIC METHOD FOR THE DETERMINATION OF URANIUM IN NITRIC ACID - AQUEOUS SOLUTIONS	NEYER	01/27/88		
METH	3051	THE SIMULTANEOUS DETERMINATION OF NITRATE, NITRITE, AND PHOSPHATE IN WATER BY AN AUTOMATED CONTINUOUS FLOW ANALYZER	NEYER	06/07/88		
METH	3052	DETERMINATION OF WATER IN ANHYDROUS HYDROFLUORIC ACID BY KARL FISCHER TITRATION	NEYER	03/10/88		
METH	3053	PREPARATION OF SUBSAMPLES OF ANHYDROUS HYDROGEN FLUORIDE	NEYER	07/07/88		
METH	3054	VOLUMETRIC DETERMINATION OF SULFUR DIOXIDE IN HYDROFLUORIC ACID	NEYER	03/10/88		
METH	3055	THE VOLUMETRIC DETERMINATION OF NON-VOLATILE ACIDITY IN HYDROFLUORIC ACID	NEYER	03/10/88		
METH	3056	SPECTROPHOTOMETRIC DETERMINATION OF FLUOSILICIC ACID IN HYDROFLUORIC ACID	NEYER	08/23/88		
METH	3057	DETERMINATION OF HYDROFLUORIC ACID CONTENT OF ANHYDROUS HYDROFLUORIC ACID	NEYER	05/16/88		
METH	3058	THE DETERMINATION OF WATER IN ANHYDROUS HYDROFLUORIC ACID BY CONDUCTIVITY	NEYER	06/08/88		
METH	3059	AUTOMATED COLORIMETRIC DETERMINATION OF THORIUM IN LIQUID AND SOLID WASTE	NEYER	04/06/89	1	06/18/91
METH	3060	CORROSIVITY TOWARD STEEL	NEYER	08/01/89		
METH	3062	DETERMINATION OF TRACE URANIUM BY KINETIC PHOSPHORESCENCE ANALYSIS	NEYER	08/30/89		
METH	3063	THE SEPARATION OF THORIUM FROM URANIUM USING TTA-XYLENE	NEYER	10/06/89		
METH	3064	DETERMINATION OF FLASH POINT BY PENSKY - MARTENS CLOSED TESTER	NEYER	12/12/89		
METH	4000	MANUAL DETERMINATION OF URANIUM-235 WT% IN A URANIUM MATRIX BY GAMMA SPECTROMETRY	NEYER	03/02/87		09/26/89
METH	4001	AUTOMATIC DETERMINATION OF U-235 WT% IN A URANIUM MATRIX BY GAMMA SPECTROMETRY	NEYER	03/03/87		09/26/89
METH	4002	THE RADIOMETRIC DETERMINATION OF RADIUM-226 AND RADIUM-228 IN VARIOUS MATRICES	NEYER	09/18/86		

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METH	4003	RADIOMETRIC PROCEDURE FOR THE DETERMINATION OF NEPTUNIUM-237	NEYER	12/16/86		09/26/89
METH	4004	ALPHA SPECTROMETER OPERATING PROCEDURE UTILIZING SILICON SURFACE BARRIER DETECTORS	NEYER	02/07/87		09/26/89
METH	4005	RADIOMETRIC PROCEDURE FOR THE DETERMINATION OF URANIUM-233 IN THORIUM	NEYER	01/14/87		
METH	4006	RADIOMETRIC PROCEDURE FOR THE DETERMINATION OF CESIUM-137	NEYER	09/25/89		
METH	4007	RADIOMETRIC PROCEDURE FOR THE DETERMINATION OF TECHNETIUM-99	NEYER	03/25/91	0	
METH	4008	THE RADIOMETRIC DETERMINATION OF TOTAL BETA ACTIVITY	NEYER	01/14/87		
METH	4009	THE RADIOMETRIC DETERMINATION OF PB-210 IN VARIOUS MATRICES	NEYER	09/26/89		
METH	4010	THE RADIOMETRIC DETERMINATION OF THORIUM-230 IN THORIUM MATRICES	NEYER	01/14/87		09/26/89
METH	4011	RADIOMETRIC DETERMINATION OF URANIUM-232 IN URANIUM BEARING MATERIALS	NEYER	01/14/87		09/26/89
METH	4012	OPERATING PROCEDURE FOR THE AUTOMATIC LOW BACKGROUND ALPHA/BETA PROPORTIONAL COUNTER	NEYER	09/26/89		
METH	4013	RADIOMETRIC SCREENING METHOD FOR DETERMINING	NEYER	06/10/91	0	
METH	4014	RADIOMETRIC METHOD FOR THE ANALYSIS OF TH-232 IN U METAL	NEYER	12/19/86		09/26/89
METH	4015	THE RADIOMETRIC DETERMINATION OF BETA ACTIVITY IN RECYCLED MATERIALS	NEYER	01/16/87		
METH	4016	THE RADIOMETRIC DETERMINATION OF GAMMA ACTIVITY IN RECYCLED MATERIALS	NEYER	01/16/87		
METH	4017	THE RADIOMETRIC NONDESTRUCTIVE ANALYSIS OF URANIUM-235 IN URANIUM TETRAFLUORIDE	NEYER	01/27/87		
METH	4018	URANIUM ISOLATION AND PURIFICATION FROM VARIOUS MATRICES FOR SUBSEQUENT URANIUM ISOTOPIC ANALYSIS	NEYER	02/26/87		09/26/87
METH	4019	RADIOMETRIC PROCEDURE FOR THE DETERMINATION OF PLUTONIUM	NEYER	05/28/89		09/25/89
METH	4020	OPERATING PROCEDURE FOR THE MANUAL LOW BACKGROUND ALPHA/BETA PROPORTIONAL COUNTERS	NEYER	03/09/87		
METH	4021	PHOTOMULTIPLIER TUBE TESTING	NEYER	04/28/87		
METH	4022	THE RADIOMETRIC DETERMINATION OF TH-234 AND PA-234M IN EFFLUENTS	NEYER	12/07/88		
METH	4023	QUALITATIVE & SEMI-QUANTITATIVE IDENTIFICATION OF ALPHA AND GAMMA RADIONUCLIDES EMITTING IN VARIOUS MATRICES	NEYER	03/11/91	0	
METH	4024	RADIOMETRIC ANALYSIS OF TH-232,TH-230, AND TH-228 IN VARIOUS MATRICES	NEYER	07/10/91	0	
METH	5001	PROCEDURE FOR THE ANION EXCHANGE SEPARATION OF RARE EARTH ELEMENTS FROM THORIUM DIOXIDE	NEYER	11/10/86		09/11/89
METH	5002	THE SPECTROGRAPHIC DETERMINATION OF RARE EARTH ELEMENTS SEPARATED FROM THORIUM DIOXIDE	NEYER	08/31/88		

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METH	5003	CALIBRATION OF THE PRODUCTION CONTROL QUANTOMETER FOR THE DETERMINATION OF IMPURITIES IN URANIUM	NEYER	05/13/87		
METH	5004	SPECTROGRAPHIC ANALYSIS OF MAGNESIUM METAL USING A SILVER CHLORIDE - LITHIUM FLUORIDE CARRIER TECHNIQUE	NEYER	10/31/86		
METH	5005	THE DETERMINATION OF IMPURITIES IN URANIUM USING THE PROCESS CONTROL QUANTOMETER WITH SILVER CHLORIDE LITHIUM FLUORIDE AS THE CARRIER	NEYER	04/13/88		
METH	5006	QUALITATIVE AND SEMI-QUANTITATIVE SPECTROGRAPHIC ANALYSIS OF MISCELLANEOUS MATERIALS, NOW URANIUM OR THORIUM MATRICES	NEYER	05/05/88		
METH	5007	METHOD FOR THE SPECTROGRAPHIC DETERMINATION OF RARE EARTH ELEMENTS SEPARATED FROM URANIUM	NEYER	10/01/87		
METH	5014	PROCEDURE FOR THE ANION EXCHANGE SEPARATION OF RARE EARTH ELEMENTS FROM URANIUM COMPOUNDS	NEYER	10/28/87		09/22/89
METH	6000	CONVERSION OF U308 TO UF6	NEYER	09/18/86		09/19/89
METH	6001	CONVERSION OF URANIUM TETRAFLUORIDE (UF4) TO TRIURANIUM OXTOXIDE (U308) USING THE PYROHYDROLYSIS TECHNIQUE	NEYER	06/16/86		09/19/89
METH	6002	DETERMINATION OF WT% U-236 IN DEPLETED URANIUM HEXAFLUORIDE (UF6)	NEYER	07/18/86		
METH	6003	DETERMINATION OF WT% U-235 IN URANIUM HEXAFLUORIDE (UF6) USING GAS MASS SPECTROMETRY	NEYER	02/09/87		
METH	6004	THE COMPOSITING OF URANIUM SAMPLES FOR MASS SPECTROMETRIC ISOTOPIC ANALYSES	NEYER	03/05/87		
METH	6005	THE DETERMINATION OF THE URANIUM ISOTOPES (WT%) BY THERMAL IONIZATION MASS SPECTROMETRY (TMS)	NEYER	04/06/87		04/06/89
METH	6006	THE THERMAL MASS SPECTROMETRIC ANALYSES OF ENVIRONMENTAL SAMPLES FOR URANIUM ISOTOPES	NEYER	11/20/90	0	
METH	7000	THE DETERMINATION OF FREE ACID IN URANYL NITRATE SOLUTIONS (SPOT TEST METHOD FOR IN PLANT USE)	NEYER	03/04/87		
METH	7004	QUANTITATIVE ANALYSIS OF URANIUM AND THORIUM IN CONCRETE SAMPLES BY ENERGY DISPERSIVE X-RAY FLUORESCENCE (EDXRF) SPECTROSCOPY	NEYER	11/30/90	0	
METH	9001	GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR SEMI-VOLATILE ORGANICS:CAPILLARY COLUMN TECHNIQUE	NEYER	02/25/91	0	
METH	9002	GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR VOLATILE ORGANICS:CAPILLARY COLUMN TECHNIQUE	NEYER	02/25/91	0	
METH	9011	QUANTITATIVE ANALYSIS OF URANIUM AND THORIUM IN SOIL SAMPLES BY ENERGY DISPERSIVE FLUORESCENCE (EDXRF) SPECTROSCOPY	NEYER	04/17/91	0	
METH	9012	TOXICITY CHARACTERISTICS LEACHING PROCEDURE	NEYER	04/03/91	0	

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		(TCLP) FOR METALLIC ANALYSES				
METH	9014	QUANTITATIVE ANALYSIS OF LOW LEVEL HYDROGEN IN GAS SAMPLES BY QUADRUPOLE MASS SPECTROMETRY	NEYER	05/09/91	0	
METH	9019	CLP:272.2/GFAA METHOD FOR THE DETERMINATION OF SILVER	NEYER	05/10/91	0	
METH	9020	CLP:239.2/GFAA METHOD FOR THE DETERMINATION OF LEAD	NEYER	05/15/91	0	
METH	9021	CLP:218.2/GFAA METHOD FOR THE DETERMINATION OF CHROMIUM	NEYER	05/14/91	0	
METH	9022	CLP/GFAA METHOD FOR THE DETERMINATION OF SELENIUM	NEYER	05/13/91	0	
METH	9024	CLP:213.2/GFAA METHOD FOR THE DETERMINATION OF CADMIUM	NEYER	06/27/91	0	
METH	9025	QUALITATIVE ANALYSIS OF SAMPLES BY ENERGY DISPERSIVE X-RAY FLUORESCENCE(EDXRF)	NEYER	05/03/91	0	
METH	9028	CLP:210.2 GFAA METHOD FOR THE DETERMINATION OF BERYLLIUM	NEYER	06/27/91		
METH	9033	CLP:245.5/COLD VAPOR ATOMIC ABSORPTION TECHNIQUE FOR THE DETERMINATION OF MERCURY IN SOIL AND SEDIMENT SAMPLES	NEYER	06/10/91	0	
METH	9036	CLP:245.1/COLD VAPOR ATOMIC ABSORPTION TECHNIQUE FOR THE DETERMINATION OF MERCURY IN WATER SAMPLES	NEYER	06/10/91	0	
METH	9038	CLP:206.2/GFAA METHOD FOR THE DETERMINATION OF ARSENIC	NEYER	06/27/91	0	
METH	9039	CLP/GFAA METHOD FOR THE DETERMINATION OF THALLIUM	NEYER	07/08/91	0	
METH	9040	CLP:204.2/GFAA METHOD FOR THE DETERMINATION OF ANTIMONY	NEYER	06/27/91	0	
METH	9044	THE DETERMINATION OF METALS BY INDUCTIVELY COUPLED PLASMA (ICP)	NEYER	06/03/91		
METH	9045	OPERATION OF THE PERKIN-ELMER 5100 ZEEMAN SERIES, FURNACE TECHNIQUE	NEYER	06/27/91	0	
METH	9059	DETERMINATION OF ASBESTOS TYPE IN BULK MATERIALS/POLARIZED LIGHT MICROSCOPY	NEYER	07/18/91	0	
METH	9060	PERCENT SOLIDS DETERMINATION	NEYER	07/18/91	0	
SECT	PO-S-08-001	ANALYTICAL DOCUMENT PROCESSING	NEYER	12/04/90	1	05/31/91
SOP	10-C-103	LABORATORY BUILDING NUCLEAR MATERIALS INVENTORY	NEYER	12/05/89	0	
SOP	10-C-701	LABORATORY EMERGENCIES	NEYER	03/02/90	0	
SOP	9000	OPERATION OF GAS THE CHROMATOGRAPH/MASS SPECTROMETER DETECTOR INSTRUMENT	NEYER	02/26/91	0	
SOP	9003	DISPOSAL OF RADIOACTIVE LABORATORY	NEYER	04/03/91	0	
SOP	9007	LOGKEEPING	NEYER	03/22/91	0	
SOP	9008	REFRIGERATION REQUIREMENTS FOR ENVIRONMENTAL SAMPLES AND STANDARDS	NEYER	04/03/91	0	

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SOP	9010	LOW LEVEL SEMIVOLATILE AND PESTICIDE/PCB SOIL EXTRACTION	NEYER	04/03/91	0	
SOP	9018	ORGANIC PREPARATION LAB PROCEDURE FOR CLEANING GLASSWARE	NEYER	05/15/91	0	
SOP	9026	INORGANIC GLASSWARE CLEANING REQUIREMENT	NEYER	05/13/91	0	
SOP	9034	SEMIVOLATILE WATER EXTRACTION	NEYER	06/10/91	0	
SOP	9035	MEDIUM LEVEL PESTICIDE/PCB SOIL EXTRACTION	NEYER	06/10/91	0	
SOP	9037	CLP PESTICIDE/PCB SOIL EXTRACTION	NEYER	06/13/91		
SOP	9046	CLP LOW LEVEL SEMIVOLATILE SOIL EXTRACTION	NEYER	07/18/91	0	
SOP	9047	PESTICIDE/PCB WATER EXTRACTION	NEYER	07/18/91	0	
SOP	9058	CLP PROTOCOL FOR INORGANIC ANALYSIS OF METALLIC ANALYTES	NEYER	07/18/91	0	
SOP	ANL-01-0015	DISPOSAL OF RADIOACTIVE LABORATORY LIQUID WASTES	NEYER	05/13/87		
SOP	ANL-01-0017	PREPARATION OF REAGENTS AND STANDARDS	NEYER	10/13/89		
SOP	ANL-01-0035	USING ANALIS	NEYER	06/30/88		
SOP	ANL-01-0038	HANDLING AND STORING CHEMICALS	NEYER	08/30/89		
SOP	ANL-01-0045	REMOVAL OF NON-RADIOACTIVE LABORATORY LIQUID AND SOLID WASTE CHEMICALS FROM INDIVIDUAL LABORATORIES FOR DISPOSAL	NEYER	12/17/90	0	
SOP	ANL-01-0049	CHAIN OF CUSTODY FOR ENVIRONMENTAL SAMPLES	NEYER	09/05/89		
SOP	ANL-01-0053	MANAGING HAZARDOUS WASTE SATELLITE ACCUMULATION AREAS IN ANALYTICAL LABORATORIES	NEYER	07/02/91	0	
SOP	ANL-01-0054	TRAINING AND QUALIFICATIONS OF ANALYSTS WITHIN THE WMCO ANALYTICAL LABORATORIES	NEYER	03/27/90	0	
SOP	ANL-01-0055	OPERATION OF LABCONOCO GLOVE BOX	NEYER	11/19/90	0	
SOP	ANL-01-0060	INSPECTION AND LABELING OF COMPRESSED GASES IN THE ANALYTICAL LABORATORIES	NEYER	01/22/91	0	
SOP	ANL-10-0001	STATISTICAL TEST FOR DETERMINING OUTLYING OBSERVATIONS	NEYER	09/15/86		
SOP	ANL-10-0016	RECEIVING AND DELIVERING NPDES SAMPLES	NEYER	01/26/88		09/18/89
SOP	ANL-10-0034	PREPARATION, DOCUMENTATION, AND DELIVERY OF QUALITY CONTROL SAMPLES	NEYER	01/26/88		09/21/89
SOP	ANL-15-0058	OPERATOR SCALE CHECKING IN THE LABORATORY	NEYER	03/26/90	0	
SOP	ANL-15-0062	LABORATORY BUILDING EMERGENCIES	NEYER	03/04/91	0	
SOP	ANL-21-0033	METHOD SELECTION FOR URANIUM TETRAFLUORIDE ANALYSES	NEYER	08/17/87		
SOP	ANL-22-0043	THE PREPARATION, STORAGE, AND DOCUMENTATION OF MONTHLY AND YEARLY STACK FILTER COMPOSITE SAMPLES	NEYER	10/13/89		
SOP	ANL-23-0029	MAINTENANCE OF DRY GAS PURGE FOURIER TRANSFORM INFRA RED (FTIR) SPECTROMETER	NEYER	07/13/87		
SOP	ANL-31-0002	SUBSAMPLING COF3 IN A GLOVE BOX	NEYER	10/29/86		
SOP	ANL-31-0013	ION SOURCE CLEANING AND MAINTENANCE	NEYER	04/24/87		
SOP	ANL-31-0023	URANIUM HEXAFLUORIDE MASS SPECTROMETER ANALYZER MAINTENANCE AND RELATED OPERATIONS	NEYER	07/08/87		09/26/89

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SOP	ANL-31-0032	OPERATION OF THE LIQUID NITROGEN WITHDRAWAL FACILITY	NEYER	08/12/87		
SOP	ANL-32-0004	PREVENTATIVE MAINTENANCE FOR THE PRODUCTION CONTROL QUANTOMETER	NEYER	12/22/86		09/19/89
SOP	ANL-32-0005	TESTING AND OPTICAL ALIGNMENT OF SLITS AND MIRRORS ON THE PRODUCTION CONTROL QUANTOMETER	NEYER	07/12/87		
SOP	ANL-33-0007	CO-60 RADIOGRAPHIC SOURCE REPLACEMENT	NEYER	11/17/86		
SOP	ANL-33-0008	RADIOGRAPHIC FACILITY OPERATION	NEYER	04/12/88		02/27/87
SOP	ANL-33-0009	NONDESTRUCTIVE URANIUM-235 ENRICHMENT MONITOR OPERATION	NEYER	03/02/87		
SOP	ANL-33-0022	VERIFICATION OF THE URANIUM-235 CONTENT OF FMPC RECEIPTS	NEYER	04/21/87		
SOP	ANL-33-0028	RADIOMETRIC RECORDS AND SAMPLE HANDLING	NEYER	06/10/91	0	
SOP	ANL-33-0036	ALPHA SPECTROMETER DATA TRANSFER PROCEDURE	NEYER	03/30/87		
SOP	ANL-33-0044	URANIUM ACTIVITY CALCULATIONS FOR VARIOUS MATRICES	NEYER	04/04/91	0	
SOP	ANL-33-0048	URANIUM AND THORIUM ACTIVITY CALCULATION FOR WATER SAMPLES	NEYER	09/19/89		
SOP	ANL-40-0006	FOR USING THE ANALYTICAL SAMPLE RECEIVING LABORATORY URANIUM INVENTORY COMPUTER PROGRAM	NEYER	12/20/86		
SOP	ANL-40-0011	RECEIVING URANIUM TETRAFLUORIDE, UF4, SAMPLES	NEYER	11/05/87		
SOP	ANL-40-0012	RECEIVING URANIUM TRIOXIDE, UO3, SAMPLES FROM OFF SITE	NEYER	10/13/87		
SOP	ANL-40-0015	RECEIVING URANIUM DERBY DRILLINGS SAMPLES	NEYER	04/08/87		10/06/89
SOP	ANL-40-0037	RECEIVING URANIUM METAL FLAT CASTINGS SAMPLES -- 2" AND 4" FLATS	NEYER	11/12/87		10/06/89
SOP	ANL-40-0040	RECEIVING MAGNESIUM METAL SAMPLES	NEYER	04/21/88		
SOP	ANL-40-0051	RECEIVING AND PREPARING SOIL SAMPLES	NEYER	09/18/89		
SOP	ANL-40-0052	PREPARATION OF GENERAL SUMP LIQUOR BIWEEKLY COMPOSITE SAMPLE FOR RADIUM-226 AND RADIUM-228	NEYER	09/05/89		
SOP	ANL-QAP	ANALYTICAL LABORATORIES QUALITY ASSURANCE PLAN	NEYER	10/01/87		
SOP	ESH-P-34-001	DETERMINATION OF PH VALUE OF WATER USING AN ORION MODEL 611 METER	NEYER	12/28/87	0	
SOP	ESH-P-34-004	DETERMINATION OF URANIUM IN WATER: FLUOROMETRIC FUSION METHOD	NEYER	12/23/87	0	
SOP	OSH-P-34-003	DETERMINATION OF URANIUM IN URINE: FLUOROMETRIC FUSION METHOD	NEYER	03/24/88	0	
SOP	OSH-P-34-006	OPERATION OF TENNELEC LB-1000 MANUAL ALPHA/BETA PROPORTIONAL COUNTER - CHEMISTRY LABORATORY APPLICATIONS	NEYER	01/11/89	0	
SOP	OSH-P-34-019	FISSION FOIL COUNTING PROCEDURES FOR NUCLEAR ACCIDENT DOSIMETERS AND PERSONNEL ACCIDENT DOSIMETERS	NEYER	04/27/89	0	
SOP	OSH-P-34-020	CALIBRATION AND OPERATIONAL VERIFICATION OF THE CANBERRA SERIES 35 PLUS MULTICHANNEL	NEYER	04/27/89	0	

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		ANALYZER - SODIUM IODIDE DETECTOR SYSTEM				
SOP	SAP-P-34-021	REUSE OF LABORATORY CHEMICAL CONTAINERS	NEYER	09/14/89	0	
METH	43-M-1000	BIOCHEMICAL OXYGEN DEMAND	PENNINGTON	11/28/90	0	
METH	43-M-1001	DISSOLVED OXYGEN (DO) AZIDE MODIFICATION OF WINKLER METHOD	PENNINGTON	12/17/90	0	
METH	43-M-1002	DISSOLVED OXYGEN (DO) MEMBRANE ELECTRODE METHOD	PENNINGTON	09/20/90	0	
METH	43-M-1003	DPD METHOD FOR FREE AND TOTAL CHLORINE TEST	PENNINGTON	11/28/90	0	
METH	43-M-1004	TOTAL COLIFORM TESTING BY MEMBRANE FILTER METHOD	PENNINGTON	03/18/91	0	
METH	43-M-1005	FECAL COLIFORM TESTING OF WATER BY MEMBRANE FILTER METHOD	PENNINGTON	05/01/91		
METH	43-M-1007	ALKALINITY (TOTAL AND PHENOLPHALEIN) TESTING OF WATER	PENNINGTON	04/10/91	0	
METH	43-M-1008	TOTAL HARDNESS TESTING OF WATER BY EDTA TITRIMETRIC METHOD	PENNINGTON	04/10/91	0	
METH	43-M-1010	STABILITY TEST OF WATER BY SATURATION WITH CALCIUM CARBONATE	PENNINGTON	06/04/91		
METH	43-M-1012	CONDUCTIVITY/RESISTIVITY TESTING OF WATER BY ELECTROMETRIC METHOD	PENNINGTON	07/22/91	0	
MS	43-BE-410-02	BIODENITRIFICATION FACILITY	PENNINGTON	08/08/90	0	
SOP	43-C-301	WATER TREATMENT PLANT OPERATION	PENNINGTON	06/17/91	0	
SOP	43-C-303	COOLING WATER TOWER	PENNINGTON	12/04/89	0	
SOP	43-C-304	GRAVER WATER SOFTENERS	PENNINGTON	04/01/77	0	
SOP	43-C-305	WATER PLANT LABORATORY PROCEDURES	PENNINGTON	03/18/87	0	
SOP	43-C-306	STORM SEWER LIFT STATION	PENNINGTON	03/06/91	0	
SOP	43-C-308	RESPONDING TO INDICATIONS OF OUT-OF-SPECIFICATION EXCURSIONS OF STORM SEWER WATER QUALITY	PENNINGTON	06/10/88	0	
SOP	43-C-310	SAMPLING DRINKING WATER FOR TOTAL COLIFORM DETERMINATION	PENNINGTON	05/03/91	0	
SOP	43-C-311	WATER PLANT BLOWDOWN OPERATION	PENNINGTON	02/13/90	0	
SOP	43-C-313	STORMWATER RETENTION/EMERGENCY SPILL CONTAINMENT BASIN SLUDGE REMOVAL	PENNINGTON	12/17/90	0	
SOP	43-C-314	STORMWATER RETENTION/EMERGENCY SPILL CONTAINMENT BASIN SAMPLING	PENNINGTON	08/13/90	0	
SOP	43-C-315	BIODENITRIFICATION FACILITY ROUTINE CHECKS	PENNINGTON	08/02/90	0	
SOP	43-C-316	BIODENITRIFICATION FACILITY CORRECTIVE RESPONSES	PENNINGTON	08/02/90	0	
SOP	43-C-318	SURGE LAGOON UNDERDRAIN SYSTEM	PENNINGTON	02/14/89		
SOP	43-C-319	SURGE LAGOON INSPECTION	PENNINGTON	08/06/90	0	
SOP	43-C-320	BIODENITRIFICATION FACILITY NORMAL OPERATIONS	PENNINGTON	08/01/90	0	
SOP	43-C-321	OPERATION OF CALCIUM REMOVAL SYSTEM	PENNINGTON	10/30/86		
SOP	43-C-322	FILLING METHANOL STORAGE TANK	PENNINGTON	08/02/90	0	
SOP	43-C-323	WATER PLANT TEMPORARY TANKS	PENNINGTON	04/07/89		
SOP	43-C-324	SAMPLING FMPC WATER SUPPLIES	PENNINGTON	06/26/89		
SOP	43-C-325	BIODENITRIFICATION HIGH NITRATE TANK	PENNINGTON	01/10/90	1	08/01/90
SOP	43-C-326	STORMWATER RETENTION BASIN CONTROL SYSTEM OPERATION	PENNINGTON	05/30/91	0	
SOP	43-C-327	EFFLUENT TREATMENT SYSTEM NORMAL	PENNINGTON	08/02/90	0	
SOP	43-C-329	BIODENITRIFICATION ETS EMERGENCIES	PENNINGTON	08/15/90	0	

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SOP	43-C-400	BOILER WATER AND FEED WATER TESTING	PENNINGTON	01/11/91	0	
SOP	43-C-401	COAL HANDLING SYSTEM	PENNINGTON	06/28/88		02/15/89
SOP	43-C-402	OPERATION OF STEAM GENERATING EQUIPMENT	PENNINGTON	04/24/91	1	06/21/91
SOP	43-C-403	BOILER COMBUSTION CONTROL	PENNINGTON	02/09/91	0	
SOP	43-C-404	DEAERATING FEEDWATER HEATER SYSTEM	PENNINGTON	01/08/91	0	
SOP	43-C-405	BLOWING SOOT ON RILEY BOILERS	PENNINGTON	05/29/90	0	
SOP	43-C-406	ASH HANDLING SYSTEM	PENNINGTON	01/07/91	0	
SOP	43-C-407	AIR COMPRESSORS	PENNINGTON	03/22/89	0	
SOP	43-C-408	BULLDOZER OPERATION	PENNINGTON	08/01/90	0	
SOP	43-C-409	OPERATION OF PORTABLE AIR COMPRESSORS	PENNINGTON	07/25/90	0	
SOP	43-C-410	RECEIPT, SAMPLING, AND STORING COAL	PENNINGTON	10/12/90	0	
SOP	43-C-411	POWER PLANT ELECTROSTATIC PRECIPITATOR	PENNINGTON	04/04/91	0	
SOP	43-C-501	SANITARY SEWAGE TREATMENT PLANT OPERATION	PENNINGTON	05/30/91	0	
SOP	43-C-601	CHEMICAL PITS	PENNINGTON	08/28/81		10/28/86
SOP	43-C-701	GENERAL SUMP	PENNINGTON	02/20/90	0	
SOP	43-C-702	BULK LIME HANDLING SYSTEM	PENNINGTON	03/04/91	0	
SOP	43-C-801	UTILITIES ENGINEER - GENERAL	PENNINGTON	04/01/77	1	09/01/89
SOP	43-C-802	EMERGENCY POWER SYSTEM	PENNINGTON	07/11/90	0	
SOP	43-C-804	NATURAL GAS METERING STATION AND DISTRIBUTION SYSTEM	PENNINGTON	03/08/91	0	
SOP	43-C-805	TESTING FIRE PUMPS	PENNINGTON	02/12/91	0	
SOP	43-C-806	WINTER OPERATION OF THE FIRE PROTECTION WATER	PENNINGTON	07/23/91	0	
SOP	43-C-901	POWER AND WATER PLANTS EMERGENCIES	PENNINGTON	09/25/78		04/07/87
SOP	43-C-902	OPERATION, INSPECTION, AND TEST OF THE EMERGENCY OPERATIONS CENTER GENERATOR	PENNINGTON	12/07/88		
SOP	43-C-910	UTILITIES HOISTS AND CRANES	PENNINGTON	06/06/88		
SOP	43-C-911	INVINCIBLE PORTABLE DUST COLLECTOR OPERATION	PENNINGTON	10/10/89	1	12/28/89
SOP	9029	CLP MEDIUM LEVEL SEMIVOLATILE SOIL EXTRACTION	PENNINGTON	06/10/91	0	
SOP	46-C-907	SERVICE BUILDING EMERGENCIES	TOWNSEND	03/27/90	0	
SECT	PO-S-06-001	MOVEMENT OF HAZARDOUS WASTE	WEDDLE	07/21/89	3	01/09/91
SECT	PO-S-06-002	PREPARING "UNIFORM HAZARDOUS WASTE MANIFEST"	WEDDLE	01/29/90	0	
SECT	PO-S-07-001	PROCESS, ISSUE, AND CONTROL OF PROCEDURES AND SPECIFICATIONS	WEDDLE	07/13/90	0	

D...	DOC.AFFECTED.....	TITLE.....	EFFECTIVE.DATE	EXPIRATION.DATE
C90-058	02-C-923	TRASH BALER OPERATION	02/06/91	08/06/91
C90-062	02-C-923	TRASH BALER OPERATION	02/06/91	08/06/91
C91-001	N/A	SEAPARATING INGOTS FROM TWO-INCH AND FOUR-INCH FLATS AND TEN-INCH ROUND MOLDS	03/25/91	09/25/91
C91-002	N/A	REMOVAL OF INGOTS FROM REMELT FURNACES	03/25/91	09/25/91
C91-003	4024	RADIOMETRIC ANALYSIS OF TH-232, TH-230, AND TH-228 IN VARIOUS MATRICES	07/10/91	01/10/92
C91-004	4024	RADIOMETRIC ANALYSIS OF TH-232, TH-230, AND TH-228 IN VARIOUS MATRICES	07/10/91	01/10/92
C91-005	4024	RADIOMETRIC ANALYSIS OF TH-232, TH-230, AND TH-228 IN VARIOUS MATRICES	07/10/91	01/10/92
C91-006	4024	RADIOMETRIC ANALYSIS OF TH-232, TH-230 AND TH-228 IN VARIOUS MATRICES	07/10/91	01/10/92
C91-017	43-C-407	AIR COMPRESSORS	05/24/91	11/25/91
C91-021	9010	LOW LEVEL SEMIVOLATILE AND PESTICIDE/PCB SOIL EXTRACTION	06/14/91	12/14/91
C91-022	9010	LOW LEVEL SEMIVOLATILE AND PESTICIDE/PCB SOIL EXTRACTION	06/14/91	12/14/91
C91-023	43-C-407	AIR COMPRESSORS	05/24/91	11/25/91

WESTINGHOUSE MATERIALS COMPANY OF OHIO SITE DOCUMENT PROGRAM		SITE STANDARD OPERATING PROCEDURE Page 1 of 21 4228
Title: DEVIATION AND CORRECTIVE ACTION REPORTING		DOCUMENT NO: SSOP-0023 REVISION NO. 0
Authorization: (SOF) W. H. Britton, President	Supersedes: None	Issue Date: 06-27-91

1.0 POLICY

Westinghouse Materials Company of Ohio (WMCO) shall document, disposition and, where appropriate, identify root cause and take action to prevent the recurrence of deviations discovered in materials, processes and related documentation at the Site or at supplier facilities.

2.0 SCOPE

This procedure identifies the assigned responsibilities and required actions for identifying, documenting, evaluating and providing dispositions and corrective action plans for deviations and corrective actions observed during audits, reviews, surveillances, inspections or tests performed at the Site both internal and external organizations, as well as the evaluation of supplier-proposed dispositions and corrective actions plans.

3.0 DEFINITIONS

3.1 Condition Adverse to Quality (CAQ) - An all-inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, defective items, violation of regulatory requirement or nonconformances.

3.2 Corrective Action - Measures taken to rectify significant conditions adverse to quality or violation of regulatory requirement and, where necessary, to preclude repetition.

3.3 Corrective Action Report (CAR) - A form used to document the corrective action process for significant conditions adverse to quality or violation of regulatory requirements discovered during audits, reviews, surveillances, inspections or tests performed by both internal and external organizations. This form can be either the CAR form shown in Attachment D or a computer generated form which contains the same information.

3.4 Deviation - As used in this procedure, "deviation" means a departure from a specified requirement discovered during an audit, review, surveillance, inspection or test. A deviation can be a condition in which characteristics of an item or service do not conform to prescribed limits; a required document is not available or is inadequate; a regulatory requirement was violated; or a procedure does not yield the desired results. These conditions can occur at any point in the fabrication, handling, shipment, storage, installation, operation of an item; the performance of a service; or the execution of quality assurance activities.

3.0 DEFINITIONS (cont.)

3.5 Deviation Report (DR) - A form used to document deviations, their disposition, verification and closure. This form can be either the DR form shown in Attachment A or a computer generated form which contains the same information.

3.6 Disposition - The action necessary to correct or resolve a specific deviation. Disposition involves the following:

3.6.1 Accept-as-is - item is acceptable for use when supported with technical justification.

3.6.2 Rework - item is processed further to conform to specified requirements.

3.6.3 Repair - item is processed to become acceptable for use but does not conform to specified requirements.

3.6.4 Reject - a decision that a nonconforming item cannot be accepted-as-is, reworked, or repaired. Rejected items shall be scrapped, identified and altered so as to be inapplicable for their original use, or returned to the supplier, as appropriate.

3.6.5 Other - describe in space provided on DR form the specific actions taken or to be taken such as revise procedure, develop procedure, provide training, etc.

3.7 External Corrective Action Report (XCAR) - A term used to signify the Corrective Action Report Form used to document findings discovered during external reviews by organizations other than WMCO and the corrective action process for addressing the findings.

3.8 Requisitioner - The individual who authorizes and/or initiates a purchase request.

3.9 Root Cause - The most basic reason for an effect, which, if corrected, will prevent recurrence of that effect. The correction must be achievable by WMCO and it cannot interfere with WMCO's goals and objectives. Most negative effects of interest will have a root cause that falls into one of three categories: Personnel Error, Procedural Error, or Equipment Failure.

3.10 Senior Management - Management reporting directly to the President of WMCO.

3.0 DEFINITIONS (cont.)

3.11 Significant Condition Adverse to Quality (SCAQ) - A condition which, if uncorrected, could have a impact on safety of employees and general public or operability, or violate a regulatory requirement.

4.0 RESPONSIBILITIES

4.1 WMCO Personnel/Preparer - Every WMCO employee is responsible for notifying Environmental Compliance/Quality Assurance of potential deviations by completing sections 1 and 2, as appropriate, of the Deviation Report (DR) form Attachment A.

4.2 Environmental Compliance and Quality Assurance - Is responsible for the following actions associated with deviations from reviews, surveillances, inspections and tests conducted at the Site and supplier facilities:

4.2.1 Identifying, documenting, issuing and requesting disposition of deviations on a DR form. Also assures clear description of deviation is provided.

4.2.2 Evaluating deviations and requesting root cause determination and corrective action where warranted.

4.2.3 Evaluating proposed disposition, root cause and corrective actions.

4.2.4 Verifying disposition/corrective actions are complete and acceptable, and closes DRs and CARs.

4.2.5 Retaining official records and files related to the documentation of deviations and their disposition and/or corrective action.

4.2.6 Tracking of the status of deviations.

4.3 Performance Assessment and Communications - Is responsible for the following actions associated with deviations from QA Program audits, trend analysis programs and external review findings:

4.3.1 Identifying, documenting, issuing and requesting disposition of deviations on a CAR form. Also assures clear description of deviation is provided.

4.3.2 Evaluating deviations and requesting root cause determination and corrective action where warranted.

4.0 RESPONSIBILITIES (cont.)

4.3.3 Evaluating proposed disposition, root cause and corrective actions.

4.3.4 Conducting actions to verify disposition/corrective actions are complete and acceptable.

4.3.5 Issuing final closure upon verification of corrective action.

4.3.6 Performing trend analysis of deviations.

4.3.7 Retaining official records and files related to the documentation of deviations and their disposition and/or corrective action.

4.3.8 Tracking of the status of deviations.

4.4 Senior Management/Activity Manager/Cognizant Engineer - Evaluates and determines root cause for the deviation. Proposes and accomplishes disposition/corrective actions. Approves Supplier Disposition Requests.

4.5 Procurement - Coordinates Supplier Disposition Requests for disposition/corrective action approval.

4.6 Evaluator - A person from Environmental Compliance and Quality Assurance or Performance Assessment and Communications, who is responsible to perform the following steps in processing a DR or CAR:

4.6.1 Determine whether a DR or CAR will be issued.

4.6.2 Accept the proposed disposition, root cause and corrective action.

4.6.3 Perform verification of disposition or corrective action.

4.6.4 Closeout the DR or CAR.

5.0 GENERAL

5.1 Deviations may or may not adversely affect the quality of the item or service involved, depending on the severity of the condition. Those deviations determined to be significant conditions adverse to quality require corrective action in accordance with this procedure. Deviations shall be evaluated for root cause determinations.

5.0 GENERAL (cont.)

5.2 Repetitive non-significant deviations of the same kind noted over a short period of time require corrective action in accordance with the requirements of this procedure.

5.3 A trend analysis of DRs, CARs and XCARs is performed by Performance Assessment to identify chronic problem areas. Results of this trend analysis are reported to responsible management, who review the data to determine root causes and develop corrective action(s) to prevent recurrence.

6.0 PROCEDURE

6.1 Deviation Reports

WMCO PERSONNEL/PREPARER

6.1.1 Identify and document potential deviations, as outlined in Attachment A, in Sections 1 and 2 of the Deviation Report (DR) form.

6.1.2 Verbally notify the responsible management of the potential deviation the same day it was discovered.

6.1.3 Sign and date the Prepared By block in section 2.

6.1.4 Forward the DR to Environmental Compliance/Quality Assurance for evaluation.

EVALUATOR

6.1.5 Evaluate the potential deviation for actual violation of requirements/specifications and assures clear description of deviation is provided. If an actual DR is not required notify preparer a DR is not required. If a DR is required proceed with step 6.1.6.

6.1.6 Obtain and enter a DR number from the computer DR data base or from the Administrator, Deviation and Corrective Action Control on the DR form . The unique number is composed of the current year and a three digit number (Example 89-001)

6.0 PROCEDURE (cont.)

6.1.7 When a nonconforming item (hardware or material) is discovered, ensure that a Quality Nonconformance Tag, Form FMPC-QA-2708 (Attachment B) is attached to it, where practical. If not practical to affix Nonconformance Tag, ensure other precautions are taken to preclude inadvertent use or further processing.

NOTE: Quality Nonconformance Tags shall be removed only after completion of the disposition action identified on the DR by the evaluator.

6.1.8 Evaluate deviations for Significant Conditions Adverse to Quality (SCAQ). See Attachment C for criteria and examples for determining the need for a Corrective Action Report. For those deviations determined to be SCAQ complete a Corrective Action Report in accordance with 6.2, if DR is no longer required close it out based upon the issue of a CAR.

6.1.9 Request disposition from the activity manager/cognizant engineer of the organization responsible for item or activity in which the deviation was discovered.

NOTE: When a deviation is identified at receiving inspection, the disposition shall be determined by the requisitioner/cognizant engineer.

ACTIVITY MANAGERS/COGNIZANT ENGINEER

6.1.10 Segregate hardware items in designated hold areas or implement other precautions to preclude inadvertent use, as appropriate.

6.1.11 Evaluate deviations for reportability under the occurrence reporting system. See PR-FMPC-4006, Occurrence Reports (OR). If an Occurrence Report is required, enter this as the proposed disposition and the DR will be closed out based upon the issue of an OR.

6.1.12 Enter the proposed disposition by checking the appropriate block in Section 3 of the DR. For non-hardware deviations check the "Other" block and enter the disposition in the space provided. Include the scheduled completion date for dispositioning action.

6.0 PROCEDURE (cont.)

6.1.13 Provide a technical justification for items which are dispositioned "Accept-As-Is" or "Repair". This justification must identify specific engineering calculations or higher tier documents which provide evidence that the item will function reliably and safely even though it does not conform to the original requirement. An unsupported belief, opinion, or recommendation is not an acceptable technical justification.

NOTE: When "accept-as-is" or "repair" are used for the disposition, configuration control records shall be updated to reflect changes.

6.1.14 Return the disposition for the DR to the Evaluator within the requested time frame.

EVALUATOR

6.1.15 Evaluate proposed disposition action(s) and notify the activity manager/cognizant engineer of the responsible organization of the results by signing the "Evaluation of Disposition" section of the DR form.

6.1.16 Obtain customer approval of proposed dispositions for deviations associated with accountability of nuclear materials and for products that do not conform to customer specification requirements.

ACTIVITY MANAGERS/COGNIZANT ENGINEER

6.1.17 Accomplish disposition action(s) as scheduled.

6.1.18 Notify the evaluator when disposition action(s) is completed by signing the "Verification of Disposition Action Completion" section of the DR form.

EVALUATOR

6.1.19 Monitor accomplishment of disposition action(s) and verify completeness and acceptability.

6.1.20 Close DR and notify the activity manager/cognizant engineer, of the organization responsible for disposition action, of closure.

6.1.21 Ensure Nonconformance tags are removed and release any hardware items involved from hold status.

6.0 PROCEDURE (cont.)

6.2 Corrective Action Reports

EVALUATOR

6.2.1 Evaluate deviations for Significant Conditions Adverse to Quality (SCAQ). See Attachment C for criteria and examples for determining the need for a Corrective Action Report (CAR).

6.2.2 Evaluate the need to issue the CAR to Senior Management in accordance with Attachment C. If a CAR is required obtain a CAR number from the computer CAR data base or from the Administrator, Deviation and Corrective Action Control. The unique number is composed of the current year and a three digit number (Example 89-001)

6.2.3 Verbally notify the responsible management the same day as identified.

6.2.4 Identify and document the request for corrective actions, as outlined in Attachment D, in sections 1 and 2 of the CAR form.

6.2.5 Obtain the concurrence of the Evaluator's manager.

6.2.6 Issue the Corrective Action Report to the senior management/activity manager of the organization responsible for the deviation.

ACTIVITY MANAGER

6.2.7 Evaluate deviations for reportability under the occurrences reporting system. See PR-FMPC-4006, Occurrence Report (OR).

6.2.8 Determine the underlying (root) cause of the problem and document it in Section 3A of the CAR form.

6.2.9 If necessary, perform an investigation to determine if any similar work is affected by the problem and, if so, identify the action taken/proposed and the schedule to correct it in Section 3B of the CAR form.

6.2.10 Describe the action taken/proposed to correct the root cause and to prevent recurrence of the problem in Section 3C of the DCAR form. Enter the scheduled completion date for corrective action in Section 3D.

6.0 PROCEDURE (cont.)

6.2.11 Provide response to the CAR to the Evaluator within the time frame requested.

EVALUATOR

6.2.12 Evaluate proposed corrective action(s), obtain the evaluating manager's approval, sign block 4 of CAR form and notify the activity manager of the responsible organization of the results.

ACTIVITY MANAGERS

6.2.13 Accomplish corrective action(s) as scheduled.

6.2.14 Notify the evaluator when corrective action(s) is completed.

EVALUATOR

6.2.15 Monitor accomplishment of corrective action(s) and verify completeness and acceptability.

6.2.16 Close CAR, by signing block 5 of the CAR form, and notify the activity manager of the organization responsible for disposition action of closure.

6.3 External Corrective Action Reports (XCARs)

PERFORMANCE ASSESSMENT

6.3.1 Receive external findings from external organization (such as Tiger Teams, Technical Safety Appraisal, Westinghouse Corporate, etc.).

6.3.2 Obtain and enter an XCAR number from the computer XCAR data base or from the Administrator, External Corrective Action Control on the CAR form. Enter the XCAR data into the Commitment System. The unique number is composed of an X, the current year and a three digit number (Example X89-001).

6.3.3 Process the finding in accordance with 6.2 except the use of an XCAR number instead of a CAR number.

6.0 PROCEDURE (cont.)

6.4 Responding to Supplier Request for Disposition/Corrective Action Approval

BUYER

6.4.1 Receive Supplier Disposition Requests (SDR), Attachment E, with proposed dispositions.

6.4.2 Forward the SDR with proposed disposition to requisitioning department and a copy to Environmental Compliance and Quality Assurance for review and concurrence.

REQUISITIONER

6.4.3 Evaluate the supplier's proposed disposition, obtain concurrence from Environmental Compliance and Quality Assurance concerning its acceptability and if appropriate, approve the disposition action in an approval memorandum.

NOTE: If disposition action is unacceptable, the Requisitioner initiates correspondence through the Buyer back to the supplier until resolution is reached.

REQUISITIONER

6.4.4 Forward the approval memorandum and supporting documentation to the Buyer.

BUYER

6.4.5 Issue disposition approval memorandum to supplier.

6.4.6 File a copy of disposition approval memorandum, completed SDR and supporting documentation in the purchase order file.

6.5 Trend Analysis

PERFORMANCE ASSESSMENT AND COMMUNICATIONS

6.5.1 Maintain a trend analysis program for the Deviation Reports, Corrective Action Reports and External Corrective Action Reports.

6.0 PROCEDURE (cont.)

6.6 Tracking of Deviations

ENVIRONMENTAL COMPLIANCE AND QUALITY ASSURANCE

6.6.1 Maintain a computer tracking/history system on open and closed Deviation Reports and Corrective Action Reports.

PERFORMANCE ASSESSMENT AND COMMUNICATIONS

6.6.2 Maintain a computer tracking/history system on open and closed External Corrective Action Reports.

6.7 Records

ENVIRONMENTAL COMPLIANCE AND QUALITY ASSURANCE

6.7.1 Maintain completed Deviation Reports and Corrective Action Reports as Quality Records.

PERFORMANCE ASSESSMENT AND COMMUNICATIONS

6.7.2 Maintain completed External Corrective Action Reports as Quality Records.

7.0 APPLICABLE DOCUMENTS

7.1 PR-FMPC-4006, Occurrence Reports (OR)

8.0 APPLICABLE FORMS

8.1 Form FMPC-EC&QA-2909 Deviation Report (DR)

8.2 Form FMPC-Q-2708, Quality Nonconformance Tag

8.3 Form FMPC-EC&QA-2909-1, Corrective Action Report (CAR)

8.4 Form FMPC-QA-2642, Supplier Disposition Request

4228

9.0 ATTACHMENTS

9.1 Attachment A - Deviation Report (DR).

9.2 Attachment B - Quality Nonconformance Tag.

9.3 Attachment C - Criteria for Determining If a Corrective Action Report Is Required - Criteria for Determining If a Corrective Action Report Is Required To Be Issued To Senior Management

9.4 Attachment D - Corrective Action Report Form (CAR)

9.5 Attachment E - Supplier Disposition Request (SDR)

Attachment A
Page 1 of 2

DR NO.:	DEVIATION REPORT	REVISION:

1 Date of Discovery: _____ Responsible Organization: _____

Responsible Organization Representative: _____

Activity: _____ Location: _____

2 Requirements: _____

Deviation: _____

Verbally Notified Management: _____ (DATE) Prepared By: _____ Date: _____

Is Corrective Action Report Required? ☐ YES ☐ NO Provide Disposition by: _____

Evaluator: _____ Date: _____

3 Is Deviation Reportable Under OR? ☐ *Yes (UOR No. ____) ☐ No
*If yes, proceed in accordance with PR-FMPC-4006 and close this DR.

Disposition: ☐ Accept-As-Is ☐ Rework ☐ Repair ☐ Reject ☐ Other

Accept-As-Is/Repair Justification: _____

Scheduled Completion Date: _____

Responsible Organization's Representative: _____ Date: _____

4 Evaluation of Disposition:

Evaluator: _____ Date: _____

5 Verification of Disposition Action Completion:

Evaluator: _____ Date: _____

Attachment A
Page 2 of 2

Preparer

Complete Section 1 and 2 as follows:

- Date of Discovery - Enter date the deviation was discovered.
- Responsible Organization - Enter the organization responsible for the item or activity in which a deviation is discovered.
- Responsible Organizations Representative - Enter name of the representative responsible for disposition/corrective action.
- Activity - Enter activity performed. (Example Audit 199-1)
- Location - Location of the activity. (Example Plant 6)
- Requirements - Identify the procedure, instruction, standard, or code which establishes the acceptance criteria for the activity or item being evaluated.
- Deviation - Fully describe the deviation as it relates to the requirements.
- Verbally Notified Management - List the date that the responsible organizations management was verbally notified of the potential deviation.
- Prepared By - The preparer signs and dates for Sections 2.

Evaluator

- Is Corrective Action Report Required - Evaluate deviation for issue of a Corrective Action Request. Check "Yes" if required or "No" if not required.
- DR No. - Obtain and enter on the DR Form a DR Number from the Computer DR Data Base or from the Administrator, Deviation Control and Corrective Action.
- Revision - Enter the current revision number 0, 1, etc.
- Provide Disposition By Date - Request the organization deemed responsible to provide dispositioning action by a certain date outlining steps taken or planned to correct immediate problem
- Evaluator - Sign & date Section 2 of the DR form.

Responsible Organization Representative

Completion of Disposition Action Section 3

- Is Deviation Reportable Under OR - Evaluate the deviation in accordance with PR-FMPC-4006 for Occurrence Reporting and check the appropriate block. If an OR is required sign off section as complete and forward back to Evaluator.
- Disposition - for DR's not reportable as an OR, check the appropriate block for Accept-as-is, Rework, Repair, Reject or Other and indicate the appropriate disposition in the space provid disposition is Accept-as-is or Repair provide a technical justification

Evaluator

Completion of the Receipt & Evaluation of Proposed Dispositions Section 4

- Receive and evaluate the proposed disposition to determine its adequacy for solving the specific problem identified in the deviation report, which includes verification that a decision has been by the Manager of the organization responsible, as to whether the deviation is reportable in accordance with PR-FMPC-4006 for Occurrence Report (OR). If the "Yes" box is checked, the resp organization proceeds with the reportability process in accordance with PR-FMPC-4006 and the DR can be closed based upon the issue of a OR.
- Document acceptance of the proposed disposition in Block 4 by signature and date.
- Notify the organization responsible for disposition action of the rejection of the proposed disposition action and coordinate with the organization to obtain a revised response.

Completion of the Verification and Closure of Disposition Action Section 5

- Monitor the disposition and verify that the actions taken to correct the deviation have been completed satisfactorily.
- Approve acceptance of verified disposition in section 5 by signature and date.
- Ensure the removal of nonconforming item tag(s) only after verifying satisfactory completion of all dispositioning actions.
- Forward the closed out deviation report (DR) to the Administrator, Deviation Control and Corrective Action with a copy to responsible organization management.

Attachment B

QUALITY NONCONFORMANCE

P.O./SHIPMENT/LOT/PACKAGE/CONTAINER I.D. No. _____

RECEIVING REPORT NO.: _____ INSPECTION REPORT NO.: _____

DESCRIPTION OF NONCONFORMANCE: _____

_____

_____

NAME: _____ BADGE No _____ PHONE No _____

TO BE REMOVED BY AUTHORIZED PERSONNEL ONLY

FMPC-O-2708 (REV 8-29-90)

Westinghouse Materials Company of Ohio

DCAR No.: _____

DATE: _____

QUALITY NONCONFORMANCE

TO BE REMOVED BY AUTHORIZED PERSONNEL ONLY

FMPC-O-2708 (REV 8-29-90)

TAG IS WHITE WITH RED LETTERS

Attachment C

CRITERIA FOR DETERMINING IF A CORRECTIVE ACTION REPORT IS REQUIRED

A Corrective Action Report shall be issued for deviations with:

- o Significance - Deviations which have, or may have, serious effect on safety, health, operability, environment or reliability.
- o Quantity/Frequency - Repetitive deviations or similar deviations resulting from activities or conditions which are common to the deviations.
- o Ineffective Implementation of Dispositions - Deviations which have not been properly or promptly dispositioned or resolved and which if uncorrected could result in other deviations or significant conditions adverse to quality.

The following are examples of significant conditions adverse to quality and shall be processed in accordance with this procedure:

- o Approved and released documents such as design documents, procurement documents, procedures, instructions, reports, and data found to contain significant errors or to be inadequate for their intended function.
- o In-process checks that indicate process or test limits may be exceeded and may have serious effect on safety, operability, or reliability.
- o Out-of-calibration standards or instruments used to verify process limits and may have serious effect on safety, operability, or reliability.
- o Significant Adverse trend analysis results.

CRITERIA FOR DETERMINING IF A CORRECTIVE ACTION REPORT IS REQUIRED TO BE ISSUED TO SENIOR MANAGEMENT

An evaluation shall be performed of each CAR for issue to Senior Management. If the CAR meets the following criteria, it shall be issued to Senior Management:

a) Significant and repetitive trends in deviation documents, audit/surveillance findings, and other inspections for which corrective action measures have proven ineffective or inadequate.

b) Delinquent Corrective Action that cannot be resolved at a lower level of Management.

c) Significant conditions adverse to quality which require more than a routine evaluation, analysis and corrective action.

Attachment D
Page 1 of 2

CAR NO.:	CORRECTIVE ACTION REPORT	REVISION:

1 Date of Discovery: _____ Responsible Organization: _____
Responsible Organization Representative: _____
Activity: _____ Location: _____

2 Requirements: _____

Deviation: _____

Verbally Notified Management: _____ Evaluator: _____ Date: _____

Provide Disposition by: _____ Evaluating Manager: _____ Date: _____

3 Response to the Request for Corrective Action:

Is Deviation Reportable Under OR? ☐ *Yes (OR No. ____) ☐ No
*If yes, proceed in accordance with PR-FMPC-4006 and close this CAR.

A. Reason for the Deviation (Root Cause): _____

B. Action Taken/Proposed to Investigate and Correct Similar Work: _____

C. Action Taken to Prevent Recurrence: _____

D. Date(s) Action(s) will be Complete: _____

Responsible Organization's Representative: _____ Date: _____

4 Evaluation of Corrective Action Response:

Evaluator: _____ Date: _____

Evaluating Manager: _____ Date: _____

5 Verification of Corrective Action Completion:

Evaluator: _____ Date: _____

Evaluator

Complete Section 1 and 2 as follows:

- Date of Discovery - Enter date that corrective action was discovered to be required.
- Responsible Organization - Enter the organization responsible for the item or activity in which a corrective action is required.
- Responsible Organizational Representative - Enter name of the representative responsible for corrective action.
- Activity - Enter activity performed. (Example Audit 189-1)
- Location - Location of the activity. (Example Plant 6)
- Requirements - Identify the procedure, instruction, standard, or code which establishes the acceptance criteria for the activity or item being evaluated.
- Deviation - Fully describe the deviation as it relates to the requirements.
- Verbally Notified Management - List the date that the responsible organizations management was verbally notified of the potential deviation.
- CAR No. - Obtain and enter on the CAR Form a CAR Number from the Computer CAR Data Base or from the Administrator, Deviation Control and Corrective Action.
- Revision - Enter the current revision number 0, 1, etc.
- Provide Disposition By Date - Request the organization deemed responsible to provide disposition action by a certain date outlining steps taken or planned to correct immediate problem.
- Evaluator - Sign & date Section 2 of the DR form.
- Evaluating Manager - Obtain the concurrence of the Evaluator's Manager.

Responsible Organization Representative

Completion of Disposition Action Section 3

- Evaluate deviations for reportability under the occurrences reporting system. See PR-FMPC-4006, Occurrence Reporting (ORI).
- A. Reason for the Deviation (Root Cause) - Determine the underlying (root) cause of the problem and document it in Section 3A of the CAR form.
- B. Action Taken/Proposed to Investigate and Correct Similar Work - If necessary, perform an investigation to determine if any similar work is affected by the problem and, if so, identify the action taken/proposed and the schedule to correct it in Section 3B of the CAR form.
- C. Action Taken to Prevent Recurrence - Describe action taken/proposed to correct the root cause and to prevent recurrence of the problem in Section 3C of the CAR form.
- D. Date(s) Action(s) will be Complete - Enter the scheduled completion date for corrective action in Section 3D.

Evaluator

Completion of the Evaluation of Corrective Action Response Section 4

- Receive and evaluate the proposed corrective action to determine its adequacy for solving the specific problem identified in the deviation report, which includes verification that a decision has been made, by the Manager of the organization responsible, as to whether the deviation is reportable in accordance with PR-FMPC-4006 for Occurrence Report (ORI). If the "Yes" box is checked, the responsible organization proceeds with the reportability process in accordance with PR-FMPC-4006 and the CAR can be closed based upon the issue of a OR.
- Document acceptance of the proposed disposition in Block 4 by signature and date.
- Notify the organization responsible for disposition action of the rejection of the proposed disposition action and coordinate with the organization to obtain a revised response.

Completion of the Verification and Closure of Disposition Action Section 5

- Monitor the disposition and verify that the actions taken to correct the deviation have been completed satisfactorily.
- Approve acceptance of verified disposition in Section 5 by signature and date.
- Ensure the removal of nonconforming item tag(s) only after verifying satisfactory completion of all disposition actions.
- Forward the closed out corrective action report (CAR) to the Administrator, Deviation Control and Corrective Action with a copy to responsible organization management.

Attachment E
Page 1 of 2

Westinghouse Materials Company of Ohio

SUPPLIER DISPOSITION REQUEST

SDR SERIAL NUMBER

SUBCONTRACT NUMBER

TO BE COMPLETED BY SUPPLIER

1 Waiver ☐ (W)
Non Conformance ☐ (N)

Attn _____ SUBCONTRACT ADMINISTRATOR

2 FROM (SUPPLIER NAME & ADDRESS)

3 DRAWING NUMBER & REVISION

4 COMPONENT AND SERIAL NUMBER

5 PART NAME AND SERIAL NUMBER

6 DESCRIPTION OF SPECIFICATION OR DRAWING REQUIREMENT TO BE WAIVED, OR INTERPRETATION REQUIRED. (W) OR DEFICIENT CONDITION (N)

7 SDR'S PREVIOUSLY ISSUED ON THIS PART

8 OTHER PARTS AFFECTED
☐ YES ☐ SDR NO _____ (W)
☐ NO ☐ Quantity _____ (N)

9 (A) SUPPLIER'S RECOMMENDED DISPOSITION (WAIVER) (B) JUSTIFICATION FOR WAIVER (W)
(A) SUPPLIER'S RECOMMENDED DISPOSITION (B) JUSTIFICATION (C) CORRECTIVE ACTION BEING TAKEN TO PREVENT RECURRENCE (N)

10 THIS DISPOSITION WOULD AFFECT
INTERCHANGEABILITY ☐ YES ☐ NO OPERATION ☐ YES ☐ NO REPAIR PARTS ☐ YES ☐ NO

11 LIST ATTACHMENTS

12 SIGNATURE OF SUPPLIER'S AUTHORIZED REPRESENTATIVE DATE

TO BE COMPLETED BY WMCO

13 BASELINE ENG'R. DOCUMENTS AFFECTED (ECR REQUIRED):
☐ YES ☐ NO ☐ MAJOR SCOPE CHANGE ☐ CLASS I CHANGE ☐ CLASS II CHANGE ECR NO. _____

14 DISPOSITION ACTION
APPROVED AS RECOMMENDED ☐ DISAPPROVED ☐ OP AS BELOW ☐

15 THIS REQUEST AFFECTS INSPECTION OR INSTALLATION AT SITE
☐ YES ☐ NO

16 SIGNATURES & APPROVALS

ENGINEERING APPROVAL DATE

QUALITY ASSURANCE DATE

SUBCONTRACT ADMINISTRATOR BUYER DATE Subcontract Consideration Required ☐ YES ☐ NO

DOE (AS REQUIRED) DATE

17 DISTRIBUTION

The supplier accepts full responsibility for the accuracy and completeness of the information above. The issuance and acceptance of this request in no way limits or affects the warranty provisions of the order. This request shall not establish a precedent or obligation to accept similar conditions in the future.

INSTRUCTIONS FOR PREPARATION OF SUPPLIER DISPOSITION REQUEST

GENERAL

It shall be the responsibility of the Supplier to initiate an SDR (Form FMPC QA 2642) for each waiver or nonconforming condition and submit it to WMCO for approval prior to implementing the supplier's recommended disposition. Attach all supplemental sheets as necessary to provide detailed explanations for those factors that cannot be fully explained in the space provided on the SDR form. Reports and dispositions via telephone or TWX are not prohibited, however, the supplier is responsible to execute an SDR on ALL deviations from drawing, specifications, or contract requirements. Any work done before receipt of written approval of the recommended disposition shall be at supplier's risk. Items shall not be released for shipment before approval of the recommended disposition.

The supplier shall maintain an SDR log and record a sequential numerical identification number on each SDR submitted. The subcontract or purchase order number, and the serial number shall be entered on the top of each SDR submitted.

PROCEDURE

Supplier Responsibility

Box 1 — Record the name of the cognizant Subcontract Administrator and check Box W or Box N.
Box W (Waiver) shall be used to identify a design change which will produce a better or less expensive product or improve the delivery schedule but requires waiving one or more requirements of the procurement document.
Box W shall also be checked if a clarification of specified requirements is requested.
Box N (Nonconformance) shall be used to identify a deviation from procurement document requirements which has occurred unintentionally during fabrication.

Box 2 — Record the mailing address as stated on the purchase order.

Box 3 — Record the drawing number and revision for the affected parts.

Box 4 — Record name of article as described in purchase order including serial number if applicable.

Box 5 — Record name of the affected part as shown on the drawing recorded in block 3, including serial number if applicable.

Box 6 — (W) For waiver or clarification request. Describe the problem or question identifying specification section for which the waiver is requested.
(N) For nonconformance. Record the condition including specification section violated.
(Both) Include sufficient detail to allow complete evaluation. Describe in detail those conditions not characterized by numerical variable.

Box 7 — List by serial number all previous SDR's submitted on the material defined by the information in blocks 5 and 6.

Box 8 — Evaluate and record whether other parts are influenced by the condition in block 6.
(W) For waiver or clarification request. Enter number of associated SDR.
(N) For nonconformance. Record the quantity of parts which are part of the same lot having the same attributes as described in block 6 for which disposition has not been requested.

Box 9 — Record the recommended disposition, the justification for such disposition and the corrective action to be taken to prevent recurrence (if applicable).

Box 10 — Record what effect the recommended disposition would have on interchangeability, operation and repair parts insofar as the Supplier can determine. Attach supplemental sheets explaining in detail what the effects are, if any of the blocks are checked "yes".

Box 12 — Signature and title of the Supplier's authorized representative.

Mail to the cognizant Subcontract Administrator.

WMCO Responsibility

Box 13 — Responsible WMCO Engineer shall indicate if Baseline Engineering Documents are affected. If an ECR is required, process and obtain required review and approvals prior to obtaining the required signatures in Box 16.

Box 14 — The WMCO Engineer shall record the disposition action after coordination with Quality and Procurement. Reason for disapproval shall be stated.

Box 15 — The WMCO Engineer shall check the appropriate box after coordination with Quality. The affected superintendent or manager shall be notified immediately.

Box 16 — The Representatives of Engineering, Quality, and Subcontracts will endorse the disposition by their signature.

Box 17 — Distribute copies of completed form to Supplier, Receiving Inspection and QA Records.

NOTE: *The Subcontract Administrator will record in the SDR log the date of transmittal of the disposition to the supplier.*

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
06-27-91	0	Issued to identify the assigned responsibilities and required actions for identifying, documenting, and providing dispositions for deviations and corrective actions observed during audits, reviews, initiated by M. A. Malone per Request No. P91-220.

THORIUM OVERPACKING PROJECT

SPECIFIC HEALTH AND SAFETY PLAN

BUILDINGS 67, 68, AND THE MIDDLE BAY OF 64

(Revision 1)

Prepared by

J. G. ROWE

APPROVALS:

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Vice President, IRS&T

S. W. Coyle
Manager, Environmental Management

August 2, 1991

WESTINGHOUSE MATERIALS COMPANY OF OHIO

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1.0 HISTORY & DESCRIPTION OF BUILDINGS 64, 67 & 68

1.1 History

1.1.1 Thorium Metal

The FMPC produced thorium metals during two production periods, in the early fifties and from the mid-sixties to the mid-seventies. Most of the metal from the early production period was sent to Hanford or Savannah River as metal rods to be used as target material for irradiation and subsequent recovery of fissionable materials. The bulk of the metal from the late production period was sent to Oak Ridge (Y-12) as derbies to be cut up and arc melted to form ingots.

During both production periods small quantities of materials were sent offsite to special projects or laboratories for testing or analysis. Many of these materials were returned to the FMPC following the test program. Similarly, some of the offspec and leftover materials were returned to the FMPC from the Oak Ridge and Hanford/Savannah River projects.

1.1.2 Thorium Oxide, Oxalate, and Hydroxide Streams

The FMPC produced thorium oxide for use in various projects. The majority of the materials were made for the Light Water Breeder Reactor (LWBR) program from the mid-sixties to the early seventies. The FMPC process precipitated thorium oxalate from a thorium nitrate solution. This thorium oxalate was sent to General Electric in Evendale, Ohio where the material was calcined to thorium oxide or thoria or to Bettis Labs in West Mifflin, PA where the material was used to produced clad target elements for the LWBR. The current inventory of these materials is offspec materials, byproducts or excess materials returned to the FMPC when the materials were no longer required for the offsite programs.

1.1.3 Miscellaneous Thorium Materials

The FMPC produced thorium materials for various DOE projects during both production periods. This material was recalled to the FMPC for storage.

1.1.4 Current Thorium Inventory

In the early seventies, the DOE recalled all thorium materials to the FMPC which currently serves as the DOE repository for thorium materials. Thorium materials currently inventoried at the FMPC can be grouped into four different source categories: excess FMPC products and byproducts, offsite laboratories (which received small quantities), manufacturing facilities (which received larger quantities) and offsite storage facilities.

1.2 Thorium Warehouse Characterization

The current thorium inventory is stored in five warehouses. This plan is for the overpacking of the containers in three of these warehouses (Figure 1, attached). Table 1 is a characteristic summary of the three warehouses covered by this plan and their contents.

1.2.1 Building 64

1.2.1.1 Description

Building 64 was erected between 1953 and 1954. The structure is a prefabricated (Butler Mfg. Co.) open frame steel construction covered with 24 gauge galvanized corrugated steel. The structure was erected on a 9 inch concrete pad. Building 64 provides approximately 16,000 square feet of storage space. This storage space is divided into three separate storage areas or bays. The north and middle bays each provide approximately 1,000 square feet of storage space. The south bay provides approximately 14,000 square feet of storage space.

1.2.1.2 Activities Conducted in Building 64

Building 64 was erected to provide storage for Plant 9 raw materials, in-process, and finished products. The material stored there included uranium metal, orange oxide, green salt and process equipment stored for decommissioning. Uranium metal is currently stored in the south bay of building 64. The north end of the south bay (approximately 3,400 square feet) was dedicated to the overpacking operation for the drums stored on the pad west of building 65. These overpacked containers of thorium are currently stored in the north bay of building 64. The middle bay is currently used to store 181 containers of thorium materials to be overpacked. These materials were received for storage at the FMPC over a twelve year period (12/1963 - 11/1975).

TABLE 1 WAREHOUSE CHARACTERISTICS

Warehouse/Size	Contents	Radiological Contents	Hazardous Materials/Wastes	
			Organics/ HSL Semivolatiles	HSL Inorganics
Building 64 (middle bay) 1,000 ft²	181 containers of thorium metals, oxides, and miscellaneous materials	Thorium-232 6 Ci Thorium-230 1 Ci Thorium-228 6 Ci	None suspected	Trace amounts
Building 67 4,000 ft²	6,027 containers of thorium oxides and miscellaneous materials	Thorium-232 16 Ci Thorium-230 3 Ci Thorium-228 16 Ci Uranium-233 0.2 Ci	None suspected	35 containers are suspect RCRA hazardous for reactivity, corrosivity, and EP toxic for lead and chrome 136 containers need further evaluation actions, 2 of these containers are potentially pyrophoric
Building 68 5,000 ft²	1,314 containers of thorium oxides and miscellaneous materials	Thorium-232 36 Ci Thorium-230 4 Ci Thorium-228 36 Ci Uranium-233 41 Ci	None suspected	Trace amounts 42 containers require further evaluation actions

1.2.2 Building 67

1.2.2.1 Description

Building 67 was erected between 1954 and 1955. This structure is a prefabricated (Butler type) steel construction covered with 24 gauge galvanized corrugated steel erected on a 6 inch concrete pad. There is approximately 4,000 square feet of storage space in this building. The 6,027 containers of thorium are stored in a variety of arrangements, palletized for the most part.

1.2.2.2 Activities Conducted in Building 67

Building 67 was originally erected to provide storage for Plant 1. Building 67 has been used to store thorium and thorium compounds since the early seventies.

1.2.3 Building 68

1.2.3.1 Description

Building 68 was erected between 1955 and 1956. This structure is a prefabricated (Butler type) steel construction erected on a 6 inch concrete pad covered with transite panels. There is approximately 5,000 square feet of storage space in this building. For the most part, the 1,370 containers of thorium are stacked three high with 4' X 8' X 1/2" sheets of plywood separating the layers of drums.

1.2.3.2 Activities Conducted in Building 68

Building 68 was originally erected to provide storage for the Pilot Plant. The majority of the inventory of thorium drums has been stored in building 68 since it was processed in the pilot plant. A row of triple stacked drums of Magnesium Fluoride on pallets has been placed in the building as a shield wall between the thorium drums and the northwest corner of the building. The shield wall is arranged in an "L" shape from the east side of the north roll-up door to the center of the building to the center of the west wall. The northwest corner of building 68 contains drums of RCRA hazardous waste and K-65 debris (contaminated clothing, etc.)

2.0 WORK AREA DESCRIPTION, ORGANIZATION AND CONTROL

2.1 Work Area Description

The work area will comprise of buildings 67, 68, the middle bay of 64 and an interim storage facility. The interim storage facility will be an existing facility or a temporary tension support structure to be erected on the pad west of building 65.

An overpacking area will be established just outside of each warehouse (Figures 2, 3, & 4, attached). This area will be large enough to accommodate two overpacking stations.

2.2 Organization and Control

Access to potentially high radiation areas, the thorium warehouses, interim storage facility and overpacking areas will be controlled by posting the areas with signs ("Radiation Work Permit (RWP) required for entry"). Entry into these areas will be controlled and limited to those employees trained to work on this project. Signs will be posted at all entrances to the work areas prohibiting entry of personnel without proper protective clothing and equipment. The supervisor will maintain a list of trained (approved) personnel and provide the list to the Radiological Safety Technicians to verify training before granting permission to enter the work area.

The overpacking area will be maintained as a work area during overpacking operations when thorium materials are present. Contamination will be controlled by posting the area and requiring equipment and personnel monitoring prior to exiting the area.

Rev Each warehouse will remain a high radiation area until all containers of thorium have been removed, the floor has been cleaned, and a radiological survey demonstrates activity below action levels.

2.3 ALARA Controls

The dose to workers shall be maintained As Low As Reasonably Achievable (ALARA) through the use of time, distance and Shielding. All workers are responsible for minimizing exposure to themselves and other's. This effort will be supported by Radiological Safety Technicians who will assist in using the above techniques.

The forecast exposure for this job is 28.7 man-rem based on exposure from the thorium overpacking project for the 212 drums on the pad west of building 65. The ALARA target for this project is to achieve a 10% reduction in actual exposure versus forecast exposure.

3.0 JOB ACTIVITIES/WORK PLAN

3.1 Objective

The objective of this project is to remove and overpack the thorium containers from the three warehouses (buildings 67, 68 and the middle bay of building 64), per SOP 20-C-600 and move them to the an interim storage facility, per SOP 20-C-101 and FMPC 2089. Prior to being overpacked, each individual container will be identified and weighed. An inventory of overpacked drums will be maintained by MC&A personnel. The MC&A personnel will assign each overpack (six-pack) a unique number. Six-packs will be moved to the interim storage facility only after a smear survey determines loose surface contamination on the outside of the six-pack to be less than 200 dpm/100 cm^2 Alpha and 1,000 dpm/100 cm^2 Beta/gamma. Six-pack overpacks will be tight packed (no aisle space) and stacked three or four high in the interim storage facility after Quality Assurance (QA) personnel certify the container.

The containers in the middle bay of building 64 will be overpacked first. All containers that require further RCRA actions are in buildings 67 and 68. Containers that require further RCRA actions will be transported to the middle bay of building 64, per FMPC 2089, until the determinations are complete. Thirty-five (35) containers in building 67 which have been declared RCRA will be moved to an approved RCRA storage warehouse, per FMPC 2089.

4.0 HAZARD RISK ASSESSMENT

4.1 Types of Hazards

The primary hazard, other than physical hazards associated with material handling, encountered in this project is radiological exposure. The most likely routes of entry are inhalation and ingestion. The engineering design and administrative controls discussed in section 2.0 and summarized in Table 2 will maintain hazards levels As Low As Reasonably Achievable (ALARA).

Table 3 presents an assessment of the anticipated hazards that may be encountered during this project.

Table 4 lists the hazards that are not unique to this project which are controlled by established procedures taught in general plant worker training or project specific training. This table includes the two containers in building 67 which are considered to be potentially pyrophoric (PP). These containers represent less than 1% of the total containers to be handled in this project. Once the PP containers are located they will be isolated and overpacked according to SOP 1-C-918 after all other thorium containers in building 67 have been overpacked. After they are overpacked under an argon blanket, the PP containers will be transported to building 64 and stored with the PP drums previously overpacked until final treatment and disposition is determined .

TABLE 2: Administrative and engineering controls.

	HAZARD				
	PHYSICAL	AIRBORNE RADIATION	AIRBORNE CHEMICAL	DIRECT RADIATION	DIRECT CHEMICAL
The supervisor maintains access control to the exclusion area. During idle periods, the personnel will retreat to the decontamination zone	*	*	*	*	*
Eating, drinking, and smoking are prohibited in the overpacking area	*	*	*	*	*
Shielded forklift will be used to retrieve containers from the warehouses		*	*	*	*
No containers will be opened during the overpacking operation, reducing airborne emissions		*	*		
Concrete shield walls will be installed on the outside of each warehouse to reduce direct penetrating radiation exposure to overpacking personnel				*	
Overpacking stations will be equipped with shield walls to protect the crane operator and the spotter from direct penetrating radiation from the containers being overpacked				*	

Table 3: Anticipated Hazards for the Overpacking Project

Contaminant/Hazard	Route of Entry	Exposure Limit[1]	Action Level	Assessment
Radiological Airborne				
Long-Lived	inhalation			
thorium 228		4×10^{-12} µCi/ml	4×10^{-13} µCi/ml	Airborne activity levels at 10% of Exposure Limit will require posting as "Airborne Radioactivity Area" posting.
thorium 230		3×10^{-12} µCi/ml	3×10^{-13} µCi/ml	
thorium 232		5×10^{-11} µCi/ml	5×10^{-14} µCi/ml	"Respirator Area" posting will be required if average activity levels exceed 25% of the Exposure Limit.
uranium 233		2×10^{-11} µCi/ml	2×10^{-12} µCi/ml	
Bld 64 Total Long-Lived		9.4×10^{-11} µCi/ml	9.4×10^{-14} µCi/ml	Action levels for respiratory protection are not expected to be approached because containers are in good condition and will not be opened during the overpacking operation. Loose surface contamination exceeding 10,000 DPM/100cm² will require "wipe down" to maintain respiratory protection action levels below limits in Table 7.
Bld 67 Total Long-Lived		9.4×10^{-11} µCi/ml	9.4×10^{-14} µCi/ml	
Bld 68 Total Long-Lived		1.4×10^{-12} µCi/ml	1.4×10^{-13} µCi/ml	
Short-Lived	inhalation			
Radon (Rn-222)		1/3 Working Level	.033 Working Lev.	
Thoron (Rn-220)		1 Working Level	.1 Working Level	
External exposure Whole body	penetrating	3 rem/year	150 mrem/wk	Radiation work permits will control exposure at or below the action levels to maintain exposure below the established limits. The highest penetrating dose rates in each of the warehouses are: Building 64 - 120 mrem/hr; Building 67 - 70 mrem/hr; Building 68 - 190 mrem/hr
Contamination Loose surface	inhalation ingestion		200 dpm/100 cm²	Action level is the limit for removable contamination both for materials being freely released from the area and for posting as "Contamination Area".

1 = Exposure limits determined using DOE Derived Air Concentrations from the source terms for each warehouse using the following formula:

$$DAC^{total} = \frac{1}{\%X/(DAC^{X}) + \%Y/(DAC^{Y}) + \%Z/(DAC^{Z})}$$

Table 4: Anticipated Hazards for the Overpacking Project

Contaminant/Hazard	Route of Entry	Exposure Limit	Action Level	Assessment
Inorganics				
Lead, inorganic	inhalation	.05 mg/m³	0.03 mg/m³	The action level will not be approached because containers are in good condition and will not be opened during the overpacking operation. These containers comprise < 1% of the total containers to be overpacked.
Chromium[1,2]	inhalation	0.5 mg/m³	0.3 mg/m³	
Magnesium Fluoride[1]	inhalation/skin	2.5 mg(F⁻)/m³	1.3 mg(F⁻)/m³	
Physical				
Potentially Pyrophoric Metal	NA		> 3% free metal	2[2] Containers of potentially pyrophoric thorium metal will be overpacked in 85 gal. drums under an argon blanket.
Heat stress	NA		80°F Dry bulb	Work will be accomplished during late summer and early fall seasons. Additional rest periods may be required.
Cold stress	NA		20° F	Work will be performed in late summer and early fall.
Noise	NA	90 dba, 8hr TWA	85 dba	Hearing protection is required when noise levels exceed 85 dba.
Crane Operation/Electrical Shock	NA		NA	General crane procedures will be followed. All electrical equipment will be GFI protected.
Slips/Trips and Falls	NA		NA	All spills will be cleaned up immediately. General housekeeping will maintain a trip free work space.

1 = Building 68 only.
2 = Less than 1% of the containers to be overpacked in this project.

5.0 STANDARD OPERATING PROCEDURES (SOPs)

Every task of this operation will be controlled by existing SOPs. The applicable Standard Operating Procedures are as follows:

1-C-918	"THORIUM OVERPACKING"
20-C-101	"MOVING AND STORING NUCLEAR MATERIALS ON SITE"
1-C-904	"OPERATOR SCALE CHECKING IN PLANT 1"
20-C-600	"OVERPACKING DETERIORATED CONTAINERS"
20-C-601	"PACKAGING LOW-LEVEL RADIOACTIVE WASTE (LLRW) FOR OFFSITE DISPOSAL"
20-C-602	"INSPECTION AND OPERATION OF NILFISK PORTABLE VACUUM UNITS"
20-C-603	"REMOVAL AND REPLACEMENT OF NILFISK PORTABLE VACUUM UNIT FILTERS AND DUST BAGS"
20-C-606	"HAZARDOUS MATERIAL SPILL CLEAN-UP"
20-C-904	"GENERAL NUCLEAR SAFETY REQUIREMENTS"
FMPC-2089	"THE ONSITE TRANSPORTATION OF RADIOACTIVE AND NONRADIOACTIVE HAZARDOUS MATERIALS"

6.0 EDUCATION AND TRAINING

All training is to be documented, including demonstrated understanding (i.e. tests, checklists, task demonstration, etc.) for all WMCO personnel assigned to work on this operation. As a minimum, all personnel will meet the following training requirements:

- Review of this health and safety plan including site specified hazards and procedures
- WMCO radiation safety training
- WMCO annual respirator training and quantitative fit test
- 40-hour OSHA training
- 8-hour annual refresher training
- WMCO annual Fire Extinguisher Training
- 8-hour supervisor training (supervisors only)
- 24-hour supervised field experience
- Review of MSDSs for all chemicals involved (attached)
- Review of all pertinent SOPs and MSs for the plan (section 5.0)

Start of shift briefings will be conducted each shift and documented. The meeting topics should address one of the following subjects:

task assignment	personnel protective equipment
daily work plan	monitoring tests and results
decontamination	hazard communications
physical stress	emergency procedures
general safety	housekeeping
equipment check	SOPs and MSDSs

7.0 MEDICAL SURVEILLANCE

7.1 Occupational Medicine Program

In accordance with 29 CFR 1910.120 OSHA requirements, all site personnel are required to participate in a occupational medicine program which includes:

7.1.1 Surveillance

7.1.1.1 Pre-employment or baseline medical examination

7.1.1.2 Periotic (routine) and follow up medical examinations when appropriate

7.1.1.3 Termination medical examination

7.1.2 Treatment

7.1.2.1 Emergency

7.1.2.2 Non-emergency

7.1.3 Record Keeping

7.1.4 Program review

7.2 Individual Identification

Prior to the start of work, individuals involved in this project shall be identified by name and badge number. Each individual shall be subject to a medical surveillance approval by the Director of Medical Services. The approval statement shall certify that each individual is medically qualified to perform the work and is physically fit to wear personal protective equipment (PPE).

8.0 MONITORING

Rev Radioactive contamination monitoring/surveillance will be provided daily by Radiological Safety, at the warehouse, overpacking station and as needed at the interim storage facility. Radiological conditions will be monitored during the overpacking operation by continuous air sampling for particulates, loose surface contamination surveys and penetrating radiation surveys for gamma emissions as summarized in Table 5.

Rev Personnel entering the high radiation area shall wear regular TLD, project specific TLD and direct reading dosimeters.

Rev Smear surveys shall be required before any equipment is moved from the contamination control area. Loose surface contamination surveys of the containers will be conducted at each warehouse prior to overpacking and continued as needed thereafter to confirm adequate respiratory protection.

The shielded forklift operator shall perform a whole body frisk prior to entering the cab each time to preclude contaminating the forklift during the operation. All personnel will frisk when exiting the contamination control area.

TABLE 5: Monitoring summary chart.

Hazard Monitored	Sampling Method	Analysis	Frequency
Long-lived Airborne Radiological contaminants	Filter samples and Alpha Spectroscopy	Gross/Alpha Spectroscopy	Continuous
Short-lived Airborne Radiological contaminants	Working level monitor or grab samples for radon and thoron	Single count working level techniques	Continuous or working level grab samples
External/Penetrating Radiation	Direct Reading Dosimeter, TLD [1]	Direct	Continuous
Internal Radiation	In-Vivo, Fecal Samples for thorium and Urinalysis	Thorium	Baseline, or event[2]
External/Loose Surface Contamination	"Frisking"	Direct scintillation	Initially at each warehouse[3], exiting[4]
Temperature	Call Control 6295	Thermometer	Prior to start and as needed.
Lead, inorganic	Dust monitoring	Total particulates by MIE MiniRAM	As specified in Addendum 1 to the plan
Chromium[3]	Dust monitoring	Total particulates by MIE MiniRAM	As specified in Addendum 1 of the plan
Magnesium fluoride	Dust monitoring	Total particulates by MIE MiniRAM	As specified in Addendum 1 of the plan

1 = Project specific TLD required.
2 = Required in the event of incidents with potential for ingestion or when exposure exceeds 40 DAC hours per week.
3 = continued as needed
4 = contamination control area

9.0 LEVELS OF PROTECTION

9.1 Description of Protection

Rev

It is WMCO's philosophy to prevent the spread of contamination, protect workers and the environment with engineering controls and work practices (where feasible) before resorting to the use of personal protective equipment (PPE). Administrative controls will be established for primary contamination control and worker protection. The protective equipment required for this project is determined by the task being performed. The levels of protection required for this project are summarized in Table 6 and expanded below. Table 7 summarizes the respirator requirements based on airborne concentrations of the possible radiological contaminants. Action levels requiring respiratory protection and anti-C clothing are not expected to be approached because the containers being overpacked are in good condition and will not be opened during the overpacking project. Surveys of loose surface contamination will be conducted initially at each warehouse and continued as needed to maintain airborne concentrations below the action levels.

9.1.1 High Radiation Area

Rev

Personnel entering this area to work or observe the overpacking operation shall be required to wear company issued clothes (or smock and shoe covers -- for observers only), TLD badge, project specific TLD badge, direct reading dosimeter and safety glasses.

9.1.2 Contamination Control Area/ Airborne Radioactivity Area

Rev

In addition to the requirements for entering the High Radiation Area, personnel entering the overpacking area to work or observe the overpacking process will be required to wear company issued clothes (smock and shoe covers for observers are acceptable only when no overpacking is being performed).

While overpacking is in process, inner and outer gloves, anti-C coveralls (taped at the wrist and cuff), and respirator selection will be determined by monitoring and required when radiological activities exceed action levels.

9.1.3 Thorium Warehouses

Rev

In addition to the requirements for entering the High Radiation Area, personnel entering the warehouses for work or inspections shall be required to wear company issued clothes, anti-C coveralls (taped at the wrist and cuff), inner and outer gloves, shoe covers, and fullface respirator. The shielded forklift operator will wear the same PPE as required to enter the high radiation area except a PAPR with an ELSA unit will be required.

TABLE 6: Personal Protective Equipment

	Chemical Operators	Supervisor	Shielded Forklift Operator	Forklift Operator	Inspection Personnel
Body	Company issued clothes[1], Anti-C with taped cuffs[2]	Company issued clothes[1], Anti-C with taped cuffs[2]	Company issued clothes[1], Anti-C[2]	Company issued clothes[1]	Company issued clothes[1], Anti-C[2]
Hands	outer glove[1] with inner glove[2]	outer glove[1] with inner glove[2]	outer glove[1] with inner glove[2]	outer glove[1]	outer glove[1] with inner glove[2]
Feet	safety shoes[1]	safety shoes[1]	safety shoes[1]	safety shoes[1]	safety shoes[1]
Head	safety glasses[1] hearing protection[4]	safety glasses[1] hearing protection[4]	safety glasses[1] hearing protection[4]	Safety glasses[1] hearing protection[4]	safety glasses[1] hearing protection[4]
Respiratory	fullface[3]	fullface[3]	fullface[3]	fullface[3]	fullface[3]

1 = minimum requirement
2 = as indicated on radiological work permit
3 = as per Table 7, as determined by monitoring
4 = as required in Table 4

TABLE 7: Respiratory protection summary chart.

MEASUREMENT	ACTION LEVEL RANGES	RESPIRATORY PROTECTION
Radioactivity Buildings 64, 67 and 68	> 2.0×10^{-13} µci/ml to ≤ 5.0×10^{-12} µci/ml or ≤ 5 mg/m^3 total dust	Full-face[1], (APR)
Radioactivity Buildings 64, 67 and 68	> 5.0×10^{-12} µci/ml to ≤ 9.0×10^{-11} µci/ml or ≤ 5 mg/m^3 total dust	Powered Air Purifying Respirator (PAPR)[1] or Air Supplied Half-face Respirator
Radioactivity Buildings 64, 67 and 68	> 9.0×10^{-11} µci/ml to ≤ 2.0×10^{-10} µci/ml or > 5 mg/m^3 total dust	Air Supplied Full-face Respirator

1 = Combination cartridge, organic vapors, and particulate HEPA filter.
2 = Assuming lead content in 35 containers in building 67 is ≤ 10 percent by weight of total and using protection factors from OSHA lead standard (29 CFR 1910.1025)

10.0 SAFETY EQUIPMENT

10.1 Personal Protection Equipment (PPE) as specified under section 9.0.

10.2 Spill clean-up equipment to include drums, shovels, and HEPA filtered vacuum units will be available and maintained in the overpacking area.

10.3 All electrical equipment will be protected by Ground Fault Circuit Interrupters (GFI).

11.0 DECONTAMINATION

11.1 The primary method to be employed to ensure that equipment and personnel are free of contamination will be direct alpha scintillation monitoring in lieu of decontamination. If contamination is found, one of three actions will occur.

11.1.1 Disposable items will be packaged and disposed of as LLW.

11.1.2 Non-disposable items will be containerized or wrapped with herculite and sent to the Decontamination Facility.

11.1.3 Personnel contamination:

11.1.3.1 The affected area will be covered.

11.1.3.2 Radiological Safety and the AEDO shall be notified.

11.1.3.3 The individual will be transported to the infirmary.

11.1.3.4 Radiation Safety shall decontaminate the affected areas in accordance with SPP-35-017, "Personnel Decontamination."

12.0 CONTINGENCY PLANS

12.1 Spill Procedures

12.1.2 In the event of a spill, the workers shall immediately notify (by radio, if possible) the AEDO of the spill. Clean-up shall be done in accordance with Standard Operating Procedure (SOP) 20-C-606, "Hazardous Material Spill Clean-up," and under the direction of the AEDO. Clean-up of spilled material shall be undertaken only after consultation with the Radiation and Industrial Safety representatives to determine any other requirements. It is not anticipated that any spills will require action beyond normal reporting and clean-up under the direction of the AEDO. A Minor Event Report shall be submitted for any spill incident.

12.2 Incidents or Injuries

Rev 12.2.1 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to IRS&T Radiological Safety Section and the AEDO for evaluation. Nasal smears shall be taken by the accompanying RST and analyzed immediately following the incident, or as soon as possible. The involved employees shall report to the Invivo Examination Center (IVEC) at the end of their shift, or as directed, to complete an Incident Investigation Report (IRR) and obtain a fecal sample kit and sample submittal instructions. Fecal samples will be required prior to project start and if exposure exceeds 40 DAC hours as a result of the incident. The dosimetry subsection will analyze the results and may require additional bioassay monitoring as necessary. The involved employees shall also report to the Urine Sampling Station at the end of their shift and start of their next shift to submit a samples. Employees are responsible for complying with additional requirements as specified by the Radiological Safety Section. The supervisor shall consider the circumstance to be a minor event and shall immediately complete a "Minor Event Report" per FMPC-704.

12.3 Pre-emergency Planning

12.3.1 During the training and pre-work safety meetings, all employees involved in this task shall be trained and reminded of the provisions of the plant emergency procedure, alarm signals and communications, evacuation routes, and emergency reporting.

12.4 Lines of Authority

12.4.1 The supervisor-in-charge has the primary responsibility for the prevention of emergency conditions. In the event that an emergency does occur, the individual involved in or observing the situation shall immediately notify the supervisor, the communication center, or the AEDO. The AEDO is responsible for ensuring that corrective actions have been implemented, the appropriate individuals notified, and reports completed as required.

12.5 Evacuation

Rev 12.5.1 In the event of an emergency which necessitates an evacuation of the high radiation area, a supervisory alert alarm (3-3 alarm) will be sounded over the plant alarm system. Then a voice message will follow over the Emergency Message System (and radio) instructing individuals to go to their designated Rally Point (see Figure 1, attached). Individuals shall immediately proceed to the Rally Point and participate in the accountability process. Assistants will follow relay instructions given by the Rally Point Coordinator. When an "all-clear" condition has been achieved, individuals will be released from the Rally Point.

12.6 Emergency Notification

12.6.1 In the event of any emergency, leaks, spills, or fires, personnel will evacuate the area and immediately report the emergency. Emergencies can be reported over the telephone by dialing 6511, by pulling a manual fire alarm or over the radio by calling "Control." The communication center operator will activate the emergency response team and dispatch them to the affected location.

12.7 Additional Information

12.7.1 Hospitals

12.7.1.1 The FMPC Medical Facility (building 53) is the primary initial treatment facility for onsite injuries. Figure 5, (attached) indicates the route from each warehouse to the Medical Facility. The FMPC ambulance will transport the injured to the nearest hospital if necessary. FMPC maintains an emergency response capability which includes an ambulance and Emergency Medical Technicians.

12.7.2 Emergency Telephone Numbers

12.7.2.1 Ambulance: 6511
Hospital: 6511
Fire: 6511

Name	Work	Radio
EMERGENCY RESPONSE	6511	Control
Industrial Hygiene	6207	357
Radiation Safety	6889	355
Fire and Safety	6235	303
Assistant Emergency Duty Officer (AEDO)	6431, or 6295	202

13.0 AMENDMENTS

13.1 This Health and Safety Plan is based on information available at the time of preparation. Unexpected conditions may arise that require reassessment of the safety procedures. Unplanned activities and/or changes in the hazard status shall require a review of and may necessitate changes in this plan.

Changes in the anticipated hazard status or unplanned activities are to be submitted as an amendment to this plan. Amendments must be approved by the Operable Unit 3 manager/project engineer and the appropriate IRS&T representative (e.g., Industrial Hygiene or Radiation Safety representative, depending on change) prior to implementation of the amendment.

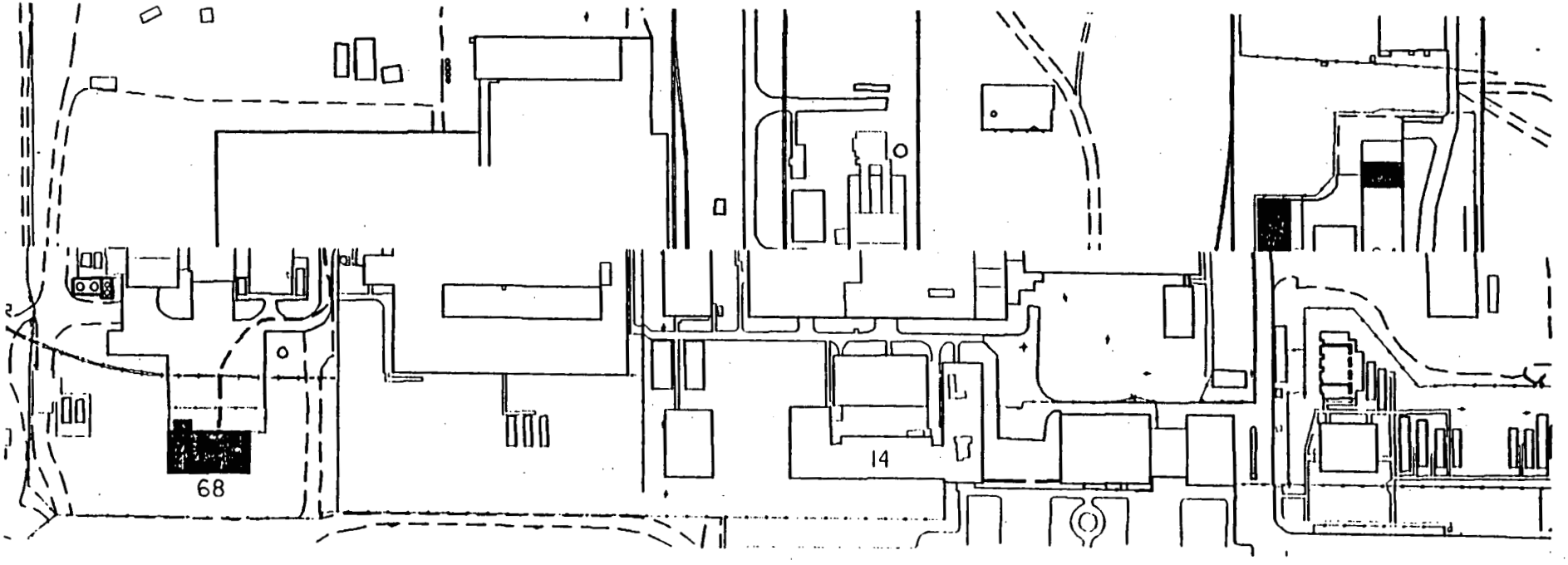


FIGURE #1.
THORIUM OVERPACKING
WORK AREAS
AND
RALLEY POINT ROUTES

LEGEND

(8) — RALLEY POINTS

— THORIUM STORAGE

NBBOO.DGN
TIME 09:40:52
DATE May. 22, 1991

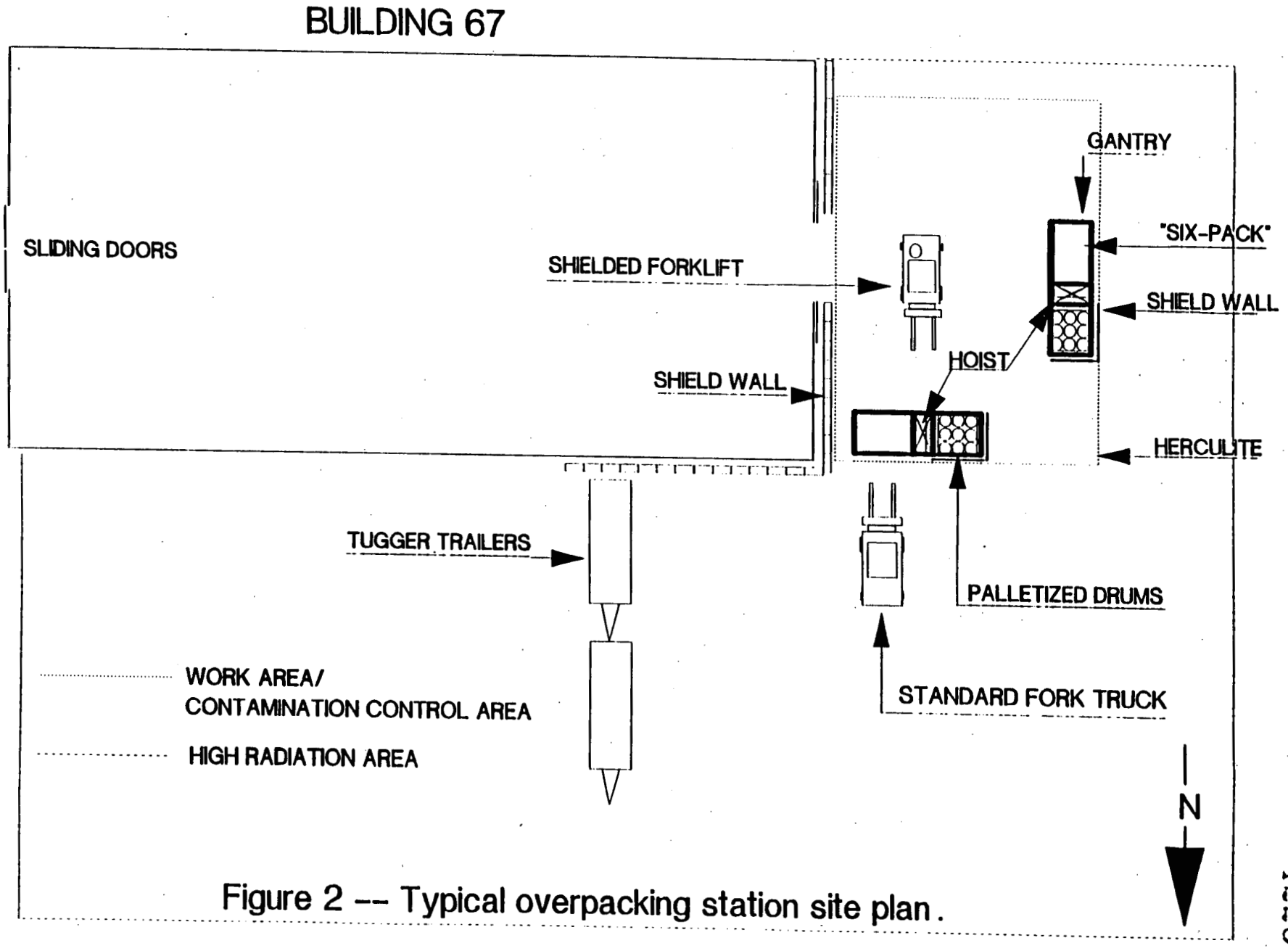


Figure 2 -- Typical overpacking station site plan.

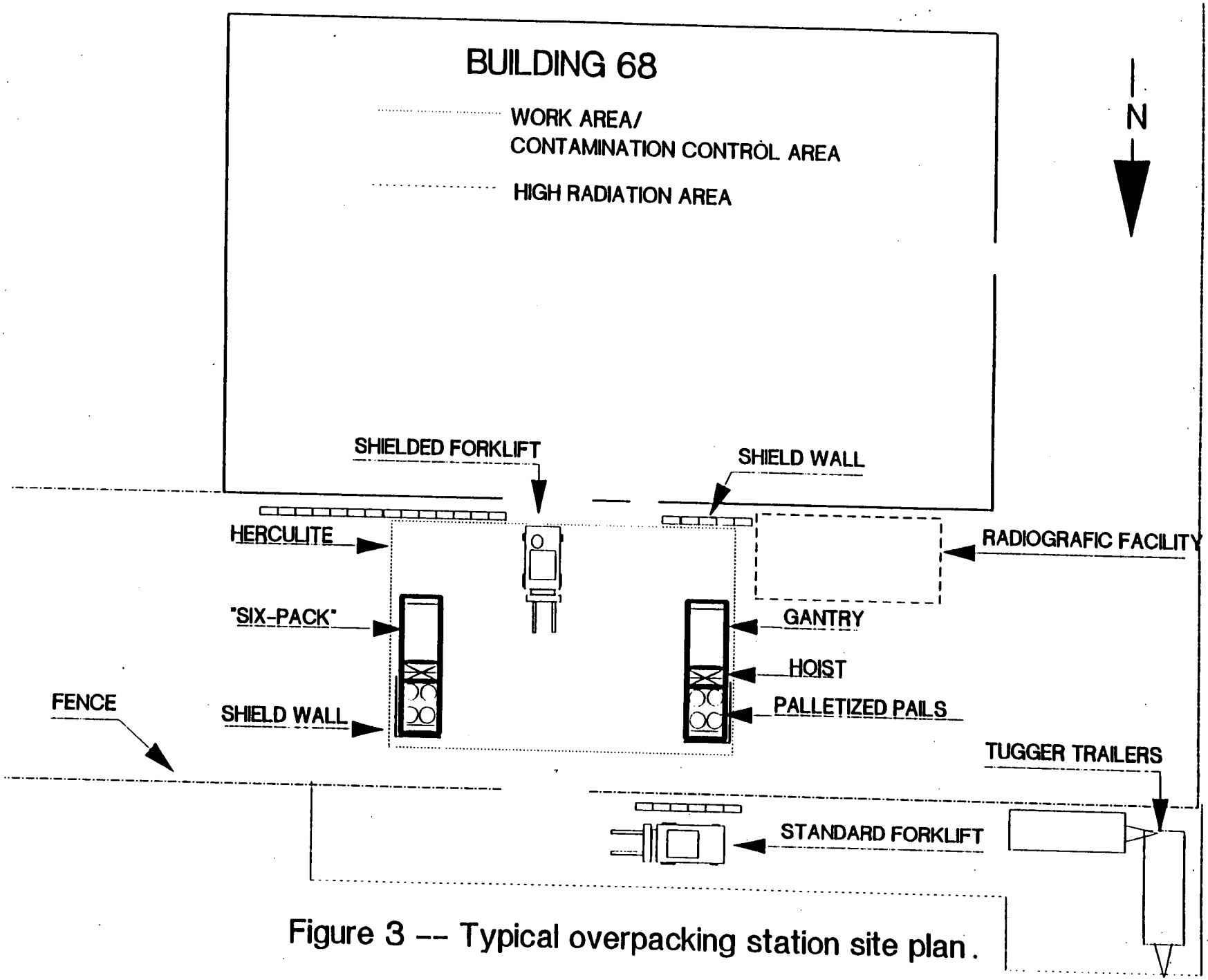


Figure 3 -- Typical overpacking station site plan.

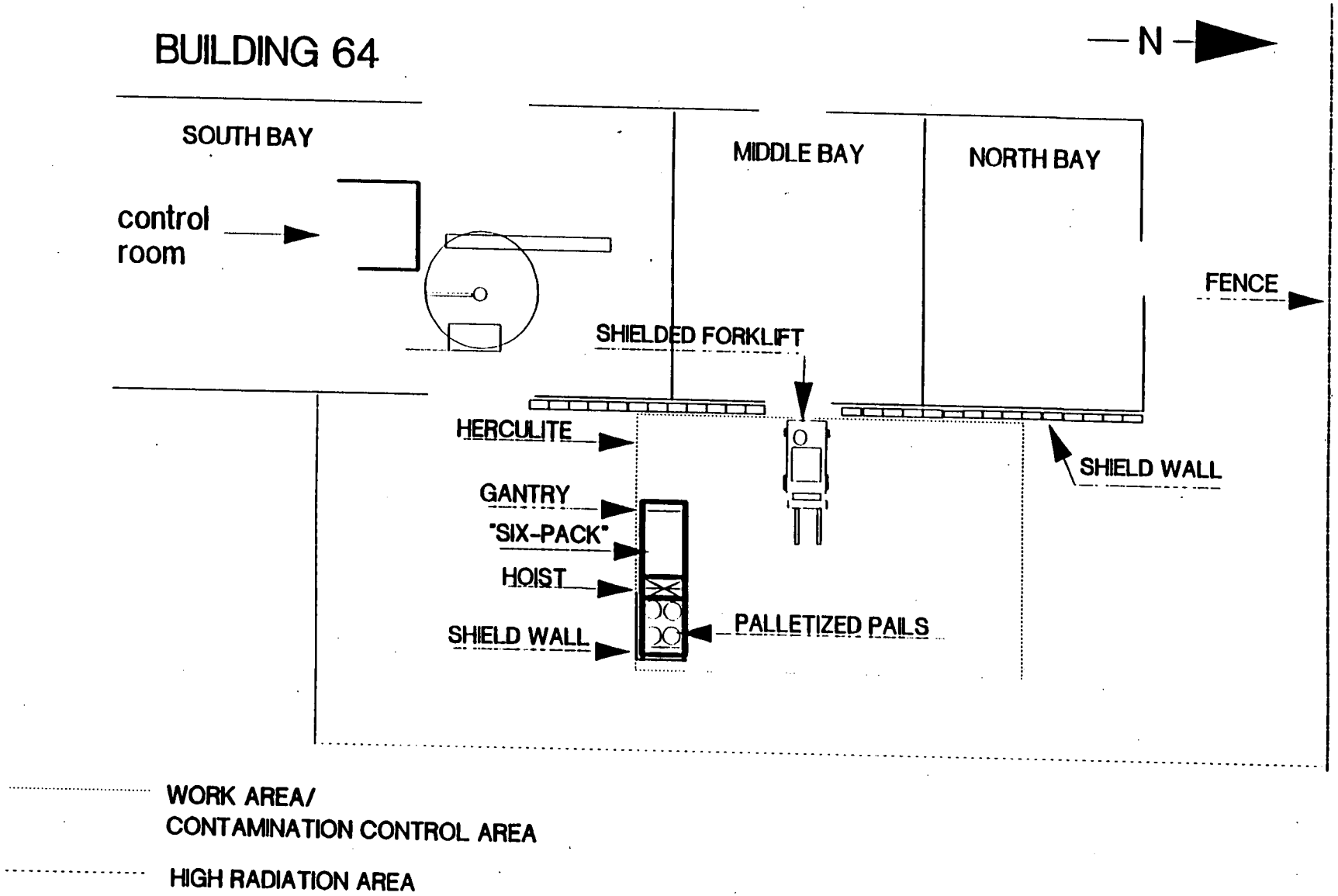


Figure 4 -- Typical overpacking station site plan.

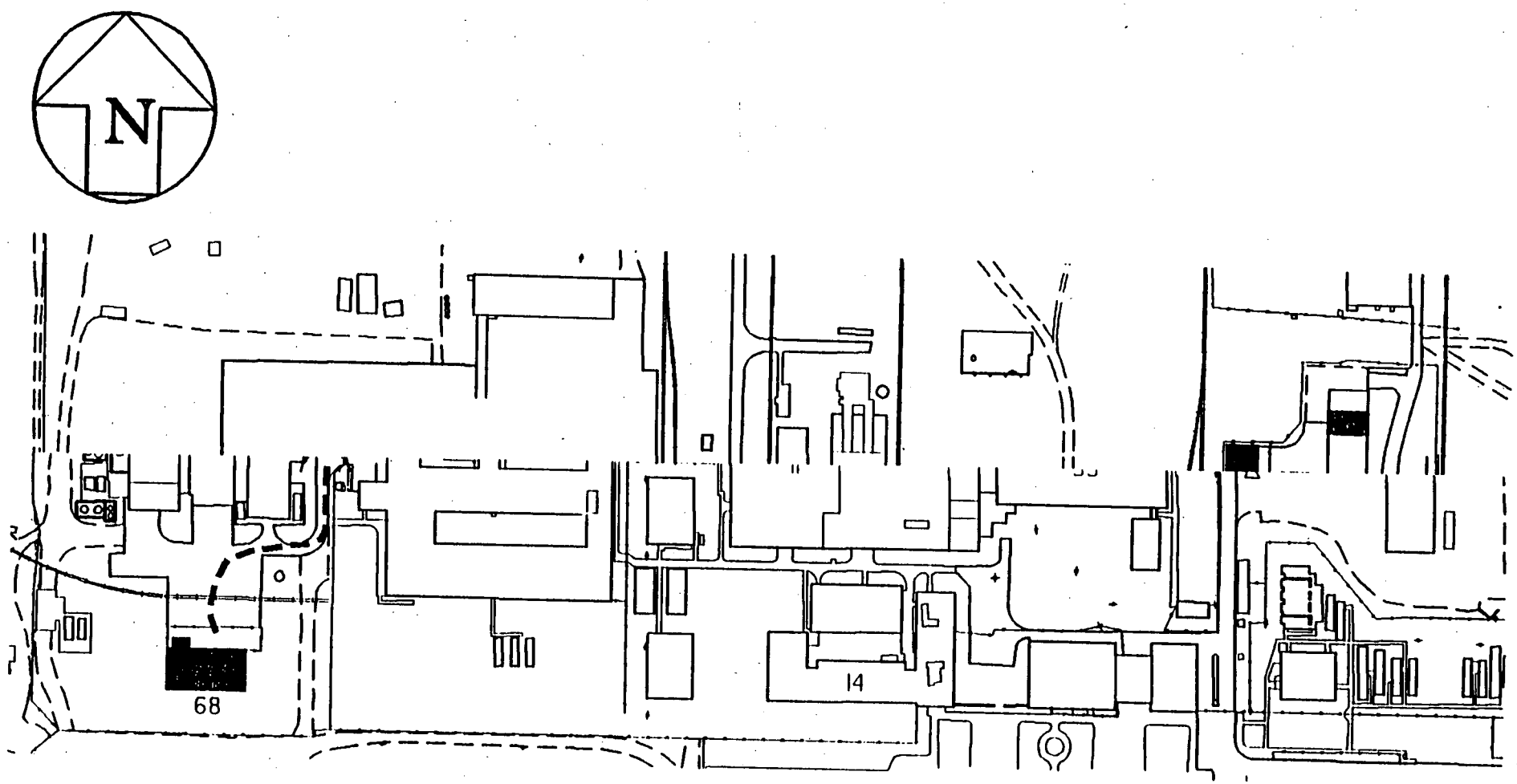


FIGURE #5.
THORIUM OVERPACKING
EVACUATION ROUTES TO
MEDICAL FACILITY (BLDG. #53)

MBBOO.DGN
TIME-09:41:02
DATE-May. 22, 1991

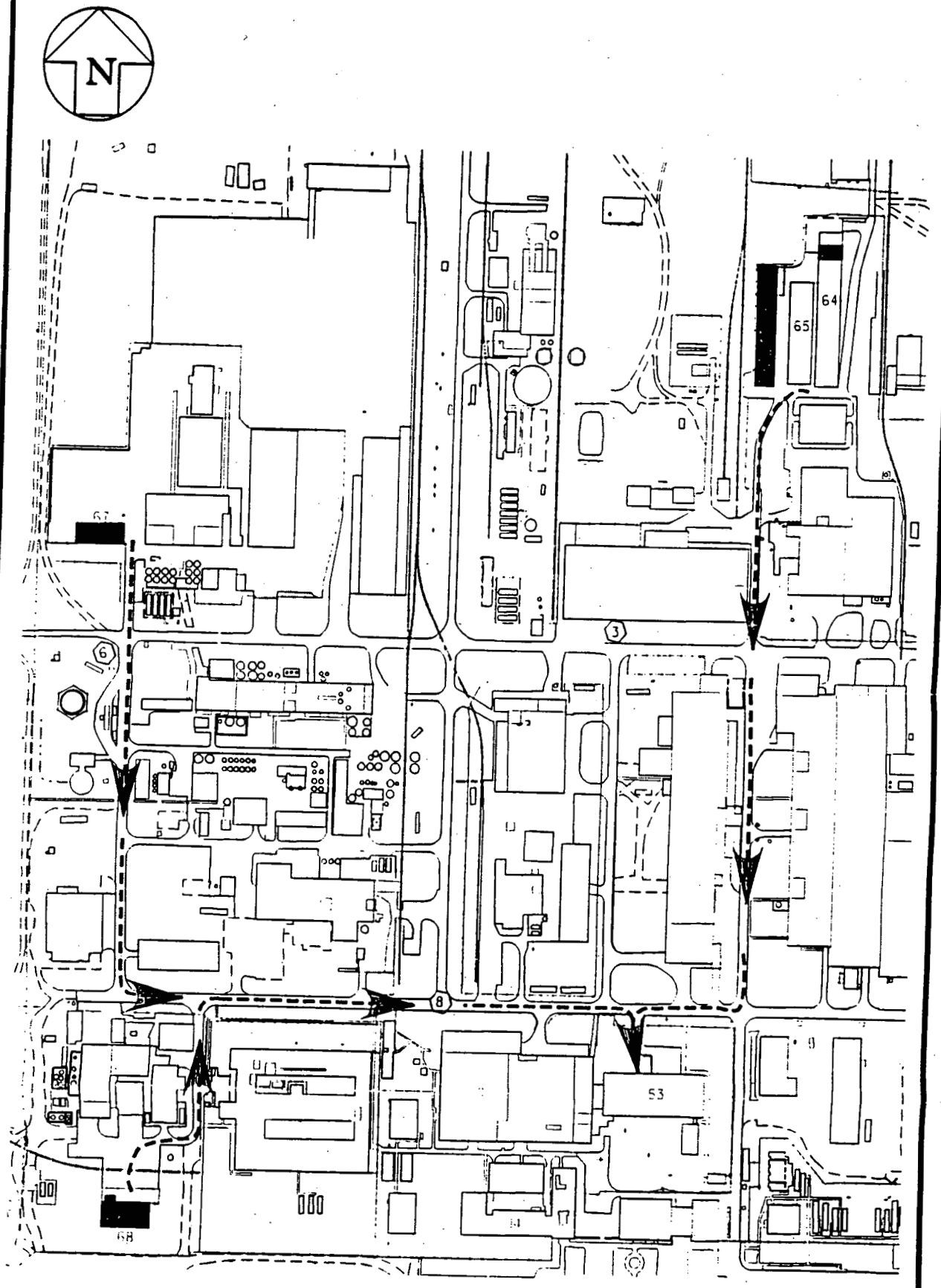


FIGURE #5.
THORIUM OVERPACKING
EVACUATION ROUTES TO

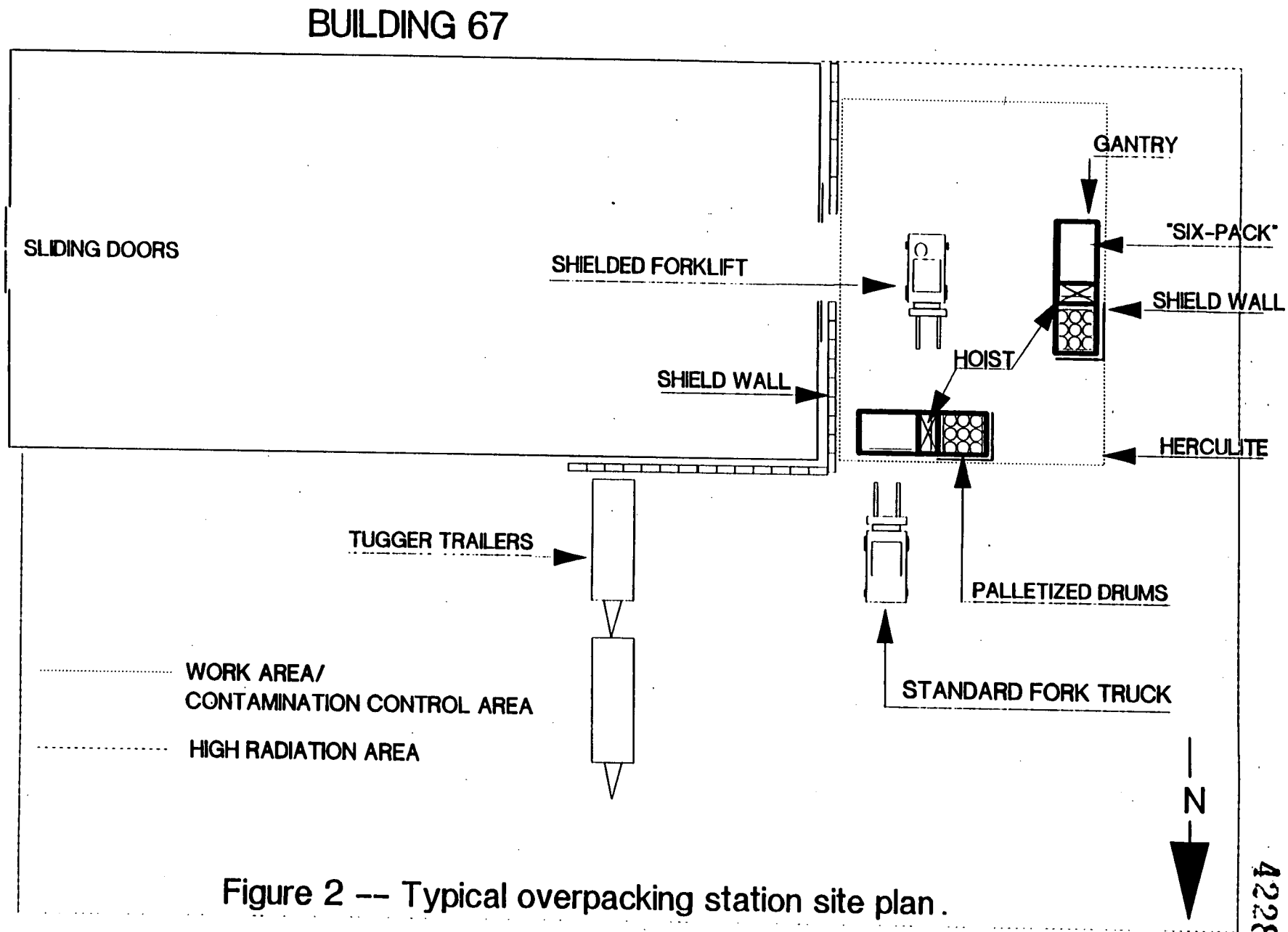


Figure 2 -- Typical overpacking station site plan.

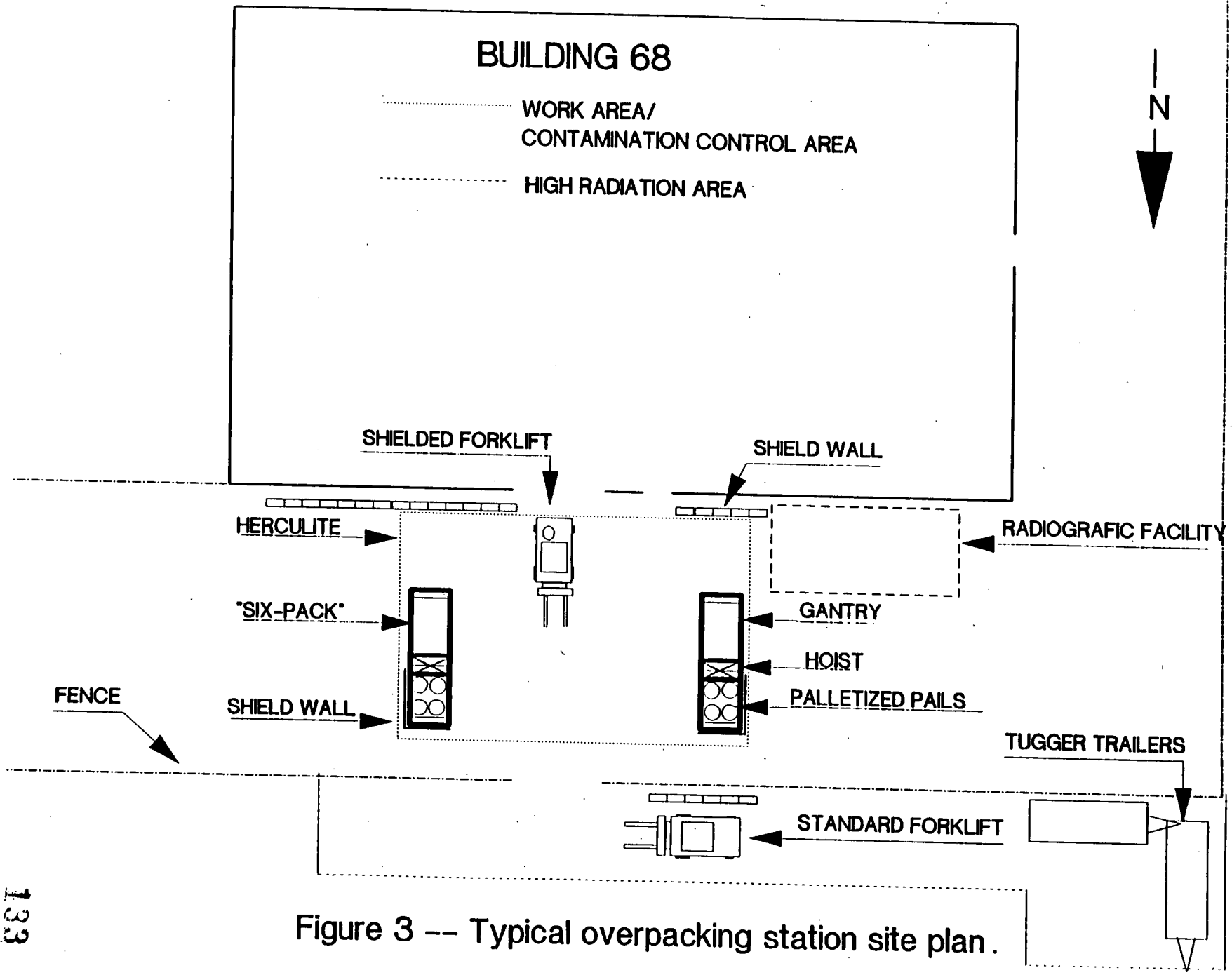
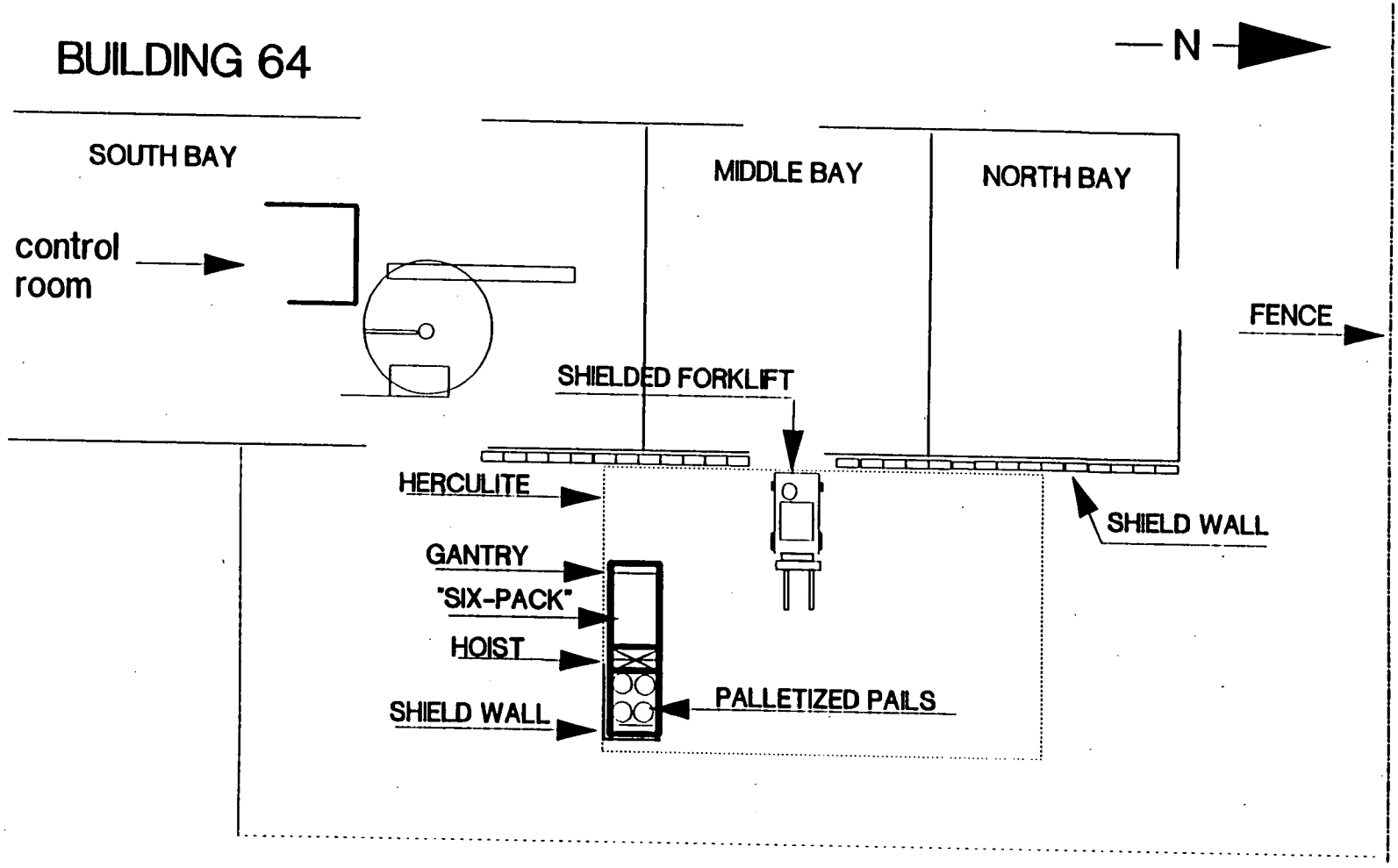


Figure 3 -- Typical overpacking station site plan.



WORK AREA/
CONTAMINATION CONTROL AREA

HIGH RADIATION AREA

Figure 4 -- Typical overpacking station site plan.

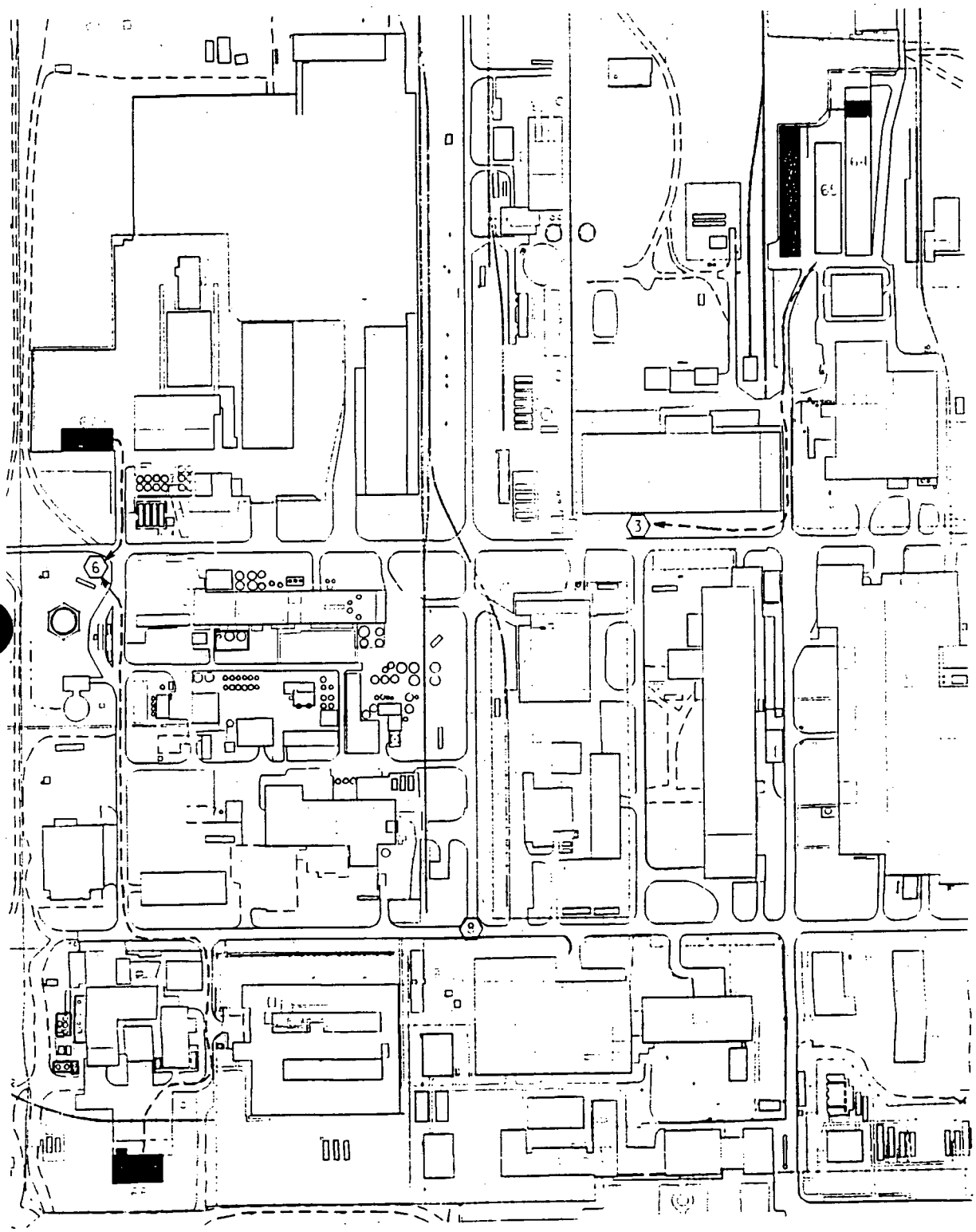


FIGURE #1.
THORIUM OVERPACKING
WORK AREAS
AND
RALLEY POINT ROUTES

LEGEND

(8) — RALLEY POINTS

— THORIUM STORAGE

ADDENDUM 1
TO
THORIUM OVERPACKING PROJECT SPECIFIC HEALTH AND SAFETY PLAN
FOR THE CONTAINERS IN BUILDINGS 67, 68, AND THE MIDDLE BAY OF 64.
AUGUST 24, 1991

The Thorium Overpacking Project Specific Health and Safety Plan for the Containers in Buildings 67, 68, and the Middle Bay of 64 (herein referred to as the" plan") was developed on the premise that every task performed in the operation is controlled by existing procedures. The plan was developed to provide information on the safety concerns of thorium.

This addendum is provided to list the limiting conditions in the existing procedures that apply to the Thorium Overpacking Project but are not adequately discussed in the health and safety plan. The specific limiting conditions from these SOPs that will apply to the overpacking project for the thorium containers in buildings 67, 68, and the middle bay of 64 are listed below.

Materials Control and Accountability:

Identification:

Tare weight of white metal box will be marked on the outside of the container prior to filling.

The FMPC lot code and weight of each item added to the white metal box will be recorded on the form provided by MC&A. This weight is determined by subtracting the total weight of the container before the item was added from the total weight of the container after the item was added.

No containers will be overpacked until its FMPC lot code is checked against the list provided and verified by MC&A. Every effort should be made to overpack containers from the same lot code together in the same white metal box (boxes). Containers that cannot be identified will be put back in the warehouse until all other containers have been overpacked. Unidentified containers will be transported to the middle bay of building 64 as a containers needing further RCRA action.

Onsite movement of completed overpacks from the overpacking area to the interim storage location will be controlled by MC&A using 65 cards in lieu of the SOPs listed in the plan (20-C-101 and FMPC 2089).

Physical Limits:

Capacities:

The forks on the shielded forktruck is limited to 3,000 pounds. Heavier loads will be moved using standard forktrucks with capacity rated for the load to be moved.

The gantry crane is designed to lift the heaviest individual container in the thorium inventory. A one and one-half ton (3,000 pound) chain hoist is suspended from the gantry for this operation.

White metal boxes have a maximum gross weight of 6,000 pounds when full. Boxes will be filled efficiently to minimize the number of white metal boxes to dispose (eight 30 gallon containers, six 55 gallon containers, or any combination of containers are acceptable).

The drum grabber used to lift 30 and 55 gallon containers is certified to lift 1,300 pounds. Heavier containers and crates will be lifted into white metal boxes using slings.

The platform scales used for this project have a capacity of 10,000 pounds.

Records of daily equipment checks prior to using the shielded forktruck, gantry cranes, and scales will be maintained on daily record sheets.

Radiological:

All work will be controlled by Radiation Work Permits (RWP). RWPs will control who can enter the work area and what personal protective equipment will be required in the work area based on the monitoring data from the work area.

An ALARA dose estimate for the entire job is 28.7 manrems. Any personnel approaching 150 mrems per week will be assigned to other projects. Time, distance and shielding practices will be utilized to work toward a total exposure goal of 25.8 manrems or less for the job. Personnel will remain behind shield walls to perform the drum handling, identification, overpacking tasks. Thorium containers will be lifted and immediately placed inside the white metal box. Thorium containers will not be suspended above the shield wall longer than necessary to move it to the overpack. Work beyond the shield walls must be limited to simple tasks that can be quickly accomplished. If complex or time consuming work is required, the work will not be conducted until all containers of thorium are removed from the work area or, if possible, the work is performed in an area with lower dose rates.

In the event that the shielded forktruck is unavailable, a standard forktruck may be used as approved by Radiological Safety on a case by case basis.

In the event of a spill, all personnel will immediately evacuate the area, follow the emergency plan (FMPC-2046), wait for Radiological Safety Technicians to survey the area, determine the proper personal protective equipment required to enter the area, and clean up the spill as directed by the AEDO.

Respiratory Protection:

Respiratory protection will be determined by the Radiological Technicians and indicated on the Radiological Work Permit based on airborne radiological concentrations as indicated in Table 7 of the plan. The airborne concentration of radioactive contaminants is used for respirator selection because they are more restrictive than the limits for the HSL contaminants or magnesium fluoride listed below and are present at much higher levels in drummed materials.

Industrial Hygiene will maintain the Powered Air Purifying Respirators (PAPR) and Emergency Life Support Apparatus (ELSA) units and supply clean units with charged batteries to the shielded forktruck driver(s) daily.

Industrial Hygiene Technicians will be contacted to perform the air monitoring for inorganic lead, chromium^{+3} and magnesium fluoride as specified in Table 5 of the plan. Table 5 has been revised to clarify the method of monitoring and analysis for potential HSL contaminants (attached). This support will only be required for 35 containers in building 67 which have been identified as hazardous for the contaminants listed above. Only building 68 contains magnesium fluoride, the handling of which is not in the scope of this project.

Fire Safety:

Two containers in building 67 a potentially pyrophoric. These containers will be overpacked after all the other thorium containers in building 67 have been overpacked and/or moved to an interim storage location. The two potentially pyrophoric containers will be overpacked and stored in accordance with the conditions listed in the existing OSR for storage of potentially pyrophoric thorium.

Housekeeping:

At the end of each overpacking episode, the Radiological Safety Technicians will survey the area for contamination that if found will be cleaned up immediately. Equipment will be secured and all containers of thorium returned to the warehouse or overpacked and moved to the interim storage location before operations are discontinued for the day. No partial overpacks will be left in the work area after operations discontinue.

General clutter (debris, used personal protective equipment, etc.) will be removed from the work area immediately to reduce the risk of slips, trips, and falls.

Tears in the herculite liner will be repaired (patched) before any additional thorium containers are removed from the warehouse to be overpacked.

Environmental Conditions:

Rain/Snow:

Overpacking will be suspended when precipitation is sufficient enough to cause puddling on the herculite contamination control pad. Thorium overpacking operations will be curtailed during severe weather alerts.

Heat/Cold:

More frequent or extended breaks may be necessary to maintain worker safety as covered in OSHA 1910.120 worker training.

This addendum to the Thorium Overpacking Project Specific Health and Safety Plan for the Containers in Buildings 67, 68, and the Middle Bay of 64 was prepared to address specific concerns realized during the Operational Readiness Review for the project. Additional changes in the anticipated hazards or other unplanned activities will be submitted as additional addenda to the plan.

APPROVALS:

Plan Author: Jeff Rowe Date: 8/30/91

Manager, Environmental Management: [illegible] Date: 8/30/91

IRS&T: [illegible] Date: [illegible]

Westinghouse Materials Company of Ohio — FMPC

NUMBER:	REVISION:	ISSUE DATE:
FMPC-307	3	05-28-91

TITLE: CONTROL AND ACCOUNTABILITY OF NUCLEAR MATERIALS

SITE POLICY AND PROCEDURE

APPROVED BY: W. H. Britton, President

1.0 POLICY

Westinghouse Materials Company of Ohio (WMCO) shall maintain control and accountability of nuclear materials at the Feed Materials Production Center (FMPC) in accordance with DOE orders.

2.0 SCOPE

This site policy implements the responsibilities and requirements for nuclear materials control and accountability program planning and management as contained in Materials Control and Accountability (MC&A)
R Manuals, FMPC-2083 and PL-FMPC-3006.

3.0 DEFINITIONS

3.1 Accountability - The functions of nuclear materials management which pertain to the measurement, recording and reporting system of transfers and inventories which provides current and accurate information as to the chemical and physical form, disposition,
R quantity and availability of nuclear materials.

3.2 Book Inventory - The quantity of nuclear material shown in the accounting records to be present at a given time.

R 3.3 Depleted Uranium - Uranium having less than 0.711 percent by weight
R of the isotope U-235.

R 3.4 Economic Discard Limit - The value of U-235 and uranium assay at
R which a uranium residue may be declared a waste material.

R 3.5 Enriched Uranium - Uranium containing greater than 0.711 percent by
R weight of the isotope U-235.

3.6 Isotopic Crossover - Any accidental or intended mixing of uranium materials having different percentages of U-235 with the result of downgrading the material having the higher enrichment.

3.7 Lot Marking and Color Coding System - The method used at the FMPC
R for nuclear material identification by assigning a 15 digit alphanumeric code number (11 digits for thorium) and using colors to assure complete separation of depleted, normal and enriched uranium or thorium materials, see FMPC-2178.

3.0 DEFINITIONS (cont.)

3.8 Low-Level Radioactive Waste - A term applied to nuclear materials which have been evaluated and determined to be uneconomical to recover. This term also applies to such materials as trash, construction rubble, and soil that is contaminated with nuclear materials. Materials designated for shipment off-site must meet criteria in "Waste Certification Program Plan", QA 87001.

3.9 Material Balance Account (MBA) - A subsidiary account of the facility for a specific process to establish accountability and to localize inventory differences.

3.10 Normal Operating Losses (NOL) - Measured or estimated loss of nuclear material (whether in the form of a solid, liquid or gas) from a process stream which includes operating losses, measured discards and accidental losses. These losses must be categorized, reported to DOE, and removed from the nuclear materials inventory.

R 3.11 Normal Uranium - Uranium containing 0.711 percent by weight of
R U-235, which is that isotopic content which occurs in nature.

3.12 Nuclear Material Discard - Nuclear material removed intentionally from process inventory and disposed of as waste by approved methods.

3.13 Nuclear Materials Management and Safeguards System (NMMSS) - The national database and information support system for nuclear materials controlled by the U. S. Government.

3.14 Nuclear Material (NM) - Collective term including all such materials designated by the DOE. A listing of designated nuclear materials can be found in DOE Order 5633.3; however, at the FMPC,
R nuclear materials shall mean depleted, normal and enriched (less
R than 20% U-235 by weight) uranium and thorium.

3.15 Physical Inventory - Quantity of nuclear material determined to be on hand by counting or measuring it, usually sampling, weighing and analyzing samples taken; also by calculations, outage measurements and pressure-volume-temperature relationships.

3.16 Reporting Units - Unit of measurement, for a given type of nuclear material, used for reporting transactions or inventory information to the DOE-ORO and to the NMMSS.

3.17 Safeguards - Measures mandated by DOE orders designed to prevent theft or diversion of nuclear materials. At the FMPC, these requirements are satisfied by the implementation of physical and administrative controls over the location and movement of nuclear materials. A set of graded safeguards requirements entails less stringent physical controls over the types of nuclear materials found at the FMPC, compared to requirements for weapons-grade materials located at other sites.

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4.0 RESPONSIBILITIES

4.1 Materials Control and Accountability (MC&A) - Responsible for the nuclear materials control and accountability program at the FMPC. To achieve this objective, MC&A must formulate plans, procedures, control systems, performance criteria, provide training, oversee physical inventories, conduct surveys, maintain an accounting of all nuclear material and report regularly to DOE and WMCO management regarding the physical and book inventories.

MC&A is responsible for reporting measured discards and process
R emissions in accordance with DOE Directives, and for declaring
R nuclear materials below the economic discard limit as waste.

MC&A is responsible for maintaining the FMPC Lot Marking and Color Coding System, FMPC-2178, the MC&A Manual, FMPC-2083, and MC&A Plan,
R PL-FMPC-3006.

R 4.2 Site Services - Responsible for sampling, handling, weighing, loading, processing, storing, inventorying, and avoiding unnecessary isotopic crossover of nuclear materials at the FMPC. Also responsible for maintenance of NM scales and water treatment operations which control NM discards. Documents that track the
R movements of nuclear materials onsite are originated by Facility
R Operations supervisors/managers, but must be approved by MC&A. Assists Environmental Compliance in providing calculated stack and scrubber loss data in a timely manner to allow MC&A to meet normal operating loss reporting deadlines to the DOE.

4.3 Analytical Laboratory - Responsible for determining and reporting uranium assay and isotopic analysis of all uranium-bearing materials for nuclear materials control and accountability. The analytical laboratory is also responsible for maintaining nuclear materials inventory records for the proper and safe storage of all nuclear materials in their jurisdiction.

R 4.4 Environmental Compliance and Quality Assurance - Environmental
R Compliance must provide calculated stack and scrubber loss data in a
R timely manner to allow MC&A to meet normal operating loss reporting
R deadlines to the DOE. Quality Assurance is responsible for the
R handling, weighing, loading, and storing of uranium metal products
R during final inspection for off-site shipment to the customer.
R Sitewide Quality Assurance is responsible for providing assistance
R for the inventorying of uranium metal products. Responsible for
R the maintenance of their nuclear materials scales used for weighing
R uranium products. Documents as required for transfer of unclear
R materials within the FMPC and shipments from the FMPC are
R originated by Sitewide Quality Assurance, but must be approved
R by MC&A.

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4.0 RESPONSIBILITIES (cont.)

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4.5 Safeguards and Security Section - Responsible for safeguarding the FMPC's nuclear materials inventory against theft or diversion and for preparing the Site Safeguards and Security Plan.

R 4.6 Traffic Section - Responsible for the safe transport of nuclear materials in accordance with DOT, DOE and EPA regulations as well as FMPC internal procedures, including MC&A requirements.

4.7 Information Systems - Responsible for the actual electronic data processing (EDP) for the nuclear materials accounting system.

4.8 Cost Accounting - Responsible for calculating and assigning monetary values applicable to all nuclear materials inventories in each material balance account. Prepares Product Cost Transfer Vouchers to transfer the value of material shipped off-site.

4.9 Shippers of Nuclear Material from the FMPC - The off-site shipment of all nuclear materials (including samples) must be via a
R "Shipping Order for Nuclear Material" (Form FMPC-CONT-558), see
R Figure 2.

5.0 GENERAL

5.1 DOE Order 5633 Series establishes the requirements, responsibilities and authorities for nuclear materials control and accountability under Department of Energy jurisdiction. WMCO, a DOE contractor, is subject to all applicable parts of these regulations.

5.2 DOE directives, particularly DOE Order 5633.3, require facilities possessing nuclear materials to prepare a materials control and
R accountability plan and procedures.

R The "Materials Control and Accountability Plan" (PL-FMPC-3006) and "Materials Control and Accountability Manual" (FMPC-2083), supplemented by the MC&A Internal Procedures Manual, satisfy these requirements. These documents identify the responsibilities and requirements for nuclear materials control and accountability program management, threat considerations, performance criteria, the accounting system, physical inventories, measurements and measurement control, control limits, loss detection elements, nuclear material alarms, access control, containment and surveillance.

5.3 A DOE issued inspection guide, referred to as the "Inspection and Evaluation (I&E) Standards and Criteria-Material Control and Accountability," where applicable, serves as the basis for evaluation of MC&A. This guide stipulates training requirements for all MC&A personnel, as well as other facility personnel involved in making nuclear material measurements, weighing, sampling and analysis.

5.0 GENERAL (cont.)

5.4 No Category I, II or III nuclear material (plutonium, U-233, or
R enriched uranium containing 20 or more percent U-235) is stored at the FMPC. Only certain Category IV nuclear material (enriched uranium containing less than 20 percent by weight of the isotope
R U-235, normal, and depleted uranium, and thorium plus an exempt
R quantity of laboratory standards greater than 20% U-235) is
R authorized at the FMPC.

5.5 The requirements for handling nuclear materials at the FMPC are included in the departmental standard operating procedures.

5.6 All nuclear materials are to be lot marked and color coded as outlined in FMPC-2178, "Lot Marking and Color Coding System."

5.7 All nuclear material shipments to the FMPC must be authorized by Form FMPC-ES&H-1987, "Authorization to Ship Nuclear Materials" (See Figure 1). All shipments from the FMPC must be authorized by
R Form FMPC-CONT-558, "Shipping Order for Nuclear Material"
R (See Figure 2).

5.8 All nuclear material data that is to be released outside the WMCO organization, including estimates or calculations of possible process losses, must be submitted to MC&A for review and comment before release to the public or the news media.

6.0 PROCEDURE

Detailed procedures and instructions for implementing this site policy and procedure are provided in WMCO FMPC-2083, "Materials Control and
R Accountability Manual" and PL-FMPC-3006, "Materials Control and Accountability Plan."

7.0 APPLICABLE DOCUMENTS

7.1 Drivers

7.1.1 DOE Guide, "Inspection and Evaluation (I&E) Standards and Criteria for Nuclear Materials Control and Accountability"

7.1.2 DOE Order 5633.2, "Control and Accountability of Nuclear Materials: Responsibilities and Authorities"

7.1.3 DOE Order 5633.3, "Control and Accountability of Nuclear Material"

7.1.4 DOE Order 5633.4, "Nuclear Materials Transactions: Documentation and Reporting"

7.1.5 DOE Order 5633.5, "Nuclear Materials Reporting and Data Submission Procedures"

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7.0 APPLICABLE DOCUMENTS (cont.)

7.2 References

7.2.1 FMPC-519, "Management of Hazardous Waste"

7.2.2 FMPC-720, "Control of Construction Waste"

7.2.3 FMPC-2083, "Materials Control and Accountability Manual"

R 7.2.4 PL-FMPC-3006, "Materials Control and Accountability Plan"

7.2.5 FMPC-2178, "FMPC Lot Marking and Color Coding System"

7.2.6 QA 87001, "Waste Certification Program Plan"

8.0 FORMS USED

8.1 FMPC-ES&H-1987, "Authorization to Ship Nuclear Materials"

R 8.2 FMPC-CONT-558, "Shipping Order for Nuclear Material"

Additional forms are dispersed throughout the MC&A Manual and are referenced in Section XIV of the MC&A Manual and Section 14 of the Plan.

9.0 FIGURES

9.1 Figure 1 - FMPC-ES&H-1987, "Authorization to Ship Nuclear Material"

9.2 Figure 2 - FMPC-CONT-558, "Shipping Order for Nuclear Material"

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Westinghouse Materials Company of Ohio

AUTHORIZATION TO SHIP NUCLEAR MATERIALS

WMT No.: _____

TO: C. W. Lower, Nuclear Materials Representative
Westinghouse Materials Company of Ohio
P. O. Box 398704
Cincinnati, Ohio 45239

Authorization is requested to ship the following nuclear materials to WMCO (Station FVC):

Type: ☐ Normal ☐ Enriched ☐ Depleted ☐ Thorium

Note: Weights listed are in: ☐ Lbs. ☐ Kgs. ☐ Gms.

SCRAP CLASS	QUANTITY & TYPE CONTAINER	PHYSICAL OR CHEMICAL DESCRIPTION	NET WEIGHT	ELEMENT WEIGHT	U-235

ADDITIONAL DESCRIPTION

1. % U-235 RANGE
2. ALLOYING OR ADDITIVE ELEMENTS
3. MAX NET WT OF CONTAINERS (NOT UNIFORMLY PACKED)
4. CRITICALITY CONTROL EMPLOYED: ☐ SLAB ☐ MASS ☐ VOLUME ☐ CONCENTRATION ☐ CYLINDER

☐ OTHER (Specify) _____ State Maximum Value _____

5. SHIPPER'S COLOR CODING OR SPECIAL IDENTIFICATION
6. PACKAGE DESCRIPTION (IF NOT IN STANDARD CONTAINER)
7. SPECIAL PRECAUTIONS

Nuclear materials are to be identified, packaged and shipped in accordance with all provisions of the latest DOE Manual Order. Notification and DOE Form - 741 must include this authorization number

REQUESTED BY

STATION LOCATION RIS

REQUESTED SHIPPING DATE

DATE OF REQUEST

SIGNATURE (NUCLEAR MATERIALS REPRESENTATIVE)

APPROVAL (For FVC Use Only)

Scheduled Date of Delivery _____ (DATE)

Approved By _____ (NUCLEAR MATERIALS REPRESENTATIVE) _____ (DATE)

REMARKS

NO.	DISTRIBUTION OF COPIES
1	To FVC for Approval and Return to Shipper
2	FVC - MC&A (RECORD COPY)
3	Originator
4	
5	

FMPC ES&H-1987 REV. 1 (1-88)

AUTHORIZATION TO SHIP NUCLEAR MATERIAL
FMPC-ES&H-1987
Figure 1

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Westinghouse Materials Company of Ohio

SHIPPING ORDER FOR NUCLEAR MATERIAL

A

Date Prepared _____

SHIP TO	ROUTING			SHIPPERS AUTHORIZATION NO	SHIPPING ORDER NO
STREET	PREPAID	CAR OR TRAILER NO	SEAL NO	SHIPPED FROM PLANT	ORIGINATOR NO
CITY / STATE	COLLECT	BILL OF LADING NO	QUALITY CONTROL APPROVAL		DATE SHIPPED
SPECIAL INSTRUCTIONS		COUNTRY CONTROL NO.	PROJECT NO		TIME SHIPPED

Type of Material _____ FMPC Production Order No _____ Originator's Signature _____

Station RIS _____ DOE 741 No _____ Shipment Authorized By _____

NMC DATA			ORIGINATOR'S DATA						MATERIAL CONTROL DATA							
FROM MBA	COST CODE	741 NO	P.O. NO	LOT NUMBER	QUANTITY	WEIGHT LBS. GROSS	TARE	NET	ANAL CODE	ELE ANAL	ELE LBS	ELE GRAMS OR KGS	LIMIT ERROR ELE	ISO ANAL	U235 GRAMS OR KGS	LIMIT ERROR ISO

DISTRIBUTION OF COPIES	
1 NMA RECORD COPY	5 Cost Accounting
2 Shipping Group	6 Originator of Shipping Order
3 Quality Control	
4 Production Control	

FMPC CONT 558 (REV 6 8 91)

I _____ certify that this shipment was made on the above date after complying with all security regulations

A

Audited by _____ Date _____

A

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SHIPPING ORDER FOR NUCLEAR MATERIAL
FMPC-CONT-558
Figure 2

1.0 PURPOSE

The purpose of this procedure is to provide the steps for the inspection and sampling of containerized waste residues and refuse material.

2.0 APPLICABILITY

This procedure shall apply to containerized waste residues and refuse material located on the Plant 1 pad or designated for the Plant 1 sampling line.

3.0 RESPONSIBILITIES

3.1 The Waste Management Supervisor shall be responsible for the following:

3.1.1 Designating the material to be inspected or sampled.

3.1.2 Supplying the packaging materials.

3.1.3 Coordinating and notifying supporting organizations of assistance as required per this SOP.

3.1.4 Labeling packaged material in accordance with the FMPC Lot Marking and Color-Coding System.

3.1.5 Designating holding areas as specified by this SOP.

3.1.6 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection for the processing performed.

3.1.7 Providing operators with the required respiratory protection.

3.2 Materials Control and Accountability shall be responsible for reconciling and maintaining the inventory records of Plant 1 nuclear waste materials.

3.3 Operators shall be responsible for inspecting and sampling containerized waste residues and refuse material per this SOP.

4.0 DEFINITIONS

4.1 Overpack - Container placed over another container.

4.2 Net Weight - Gross weight minus the tare weight of the container.

4.3 Respirable Material - Small particles capable of being inhaled.

R - MATERIAL REVISED, ADDED, OR DELETED.

5.0 REFERENCES

5.1 SOP 20-C-902, "Liquid Propane Gas (LPG) Powered Handstackers and Tuggers"

5.2 SOP 1-C-916, "Plant 1 Hoists and Cranes"

5.3 SOP 1-C-904, "Operator Scale Checking in Plant 1"

5.4 SOP 1-C-101, "Sampling Residue and Waste Materials"

5.5 SOP 1-C-804, "Overpacking Deteriorated Containers"

5.6 SOP 20-C-602, "Inspection and Operation of Nilfisk Portable Vacuum Units"

5.7 SOP 20-C-603, "Removal and Replacement of Nilfisk Portable Vacuum Unit Filters and Dust Bag"

5.8 SOP 1-C-602, "Low Level Radioactive Waste (L-LRW) Shipment Preparation"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 Safety glasses with side shields shall be worn unless other eye protection is specified.

6.3 Respiratory protection shall be worn when provided by the supervisor.

6.4 Leather-palm gloves shall be worn while handling drums/containers, operating equipment, and when handling rough, sharp-edged, or contaminated material.

6.5 HEPA type filter vacuum cleaners or a vacuum system approved by Q&S shall be used.

6.6 Face shields shall be worn when removing lids or bungs on containers filled with liquids or during operations where a liquid splash could occur.

6.7 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to Radiological Safety for evaluation. The involved employees shall report to Medical Services at the end of their shift to submit a urine sample and again report at the start of their next shift to submit another urine sample.

7.0 PROCEDURE

7.1 Inspecting Drummed Waste Residues

7.1.1 Check drum for deterioration. If drum is deteriorated, place drum in an overpack per SOP 1-C-804 or position a Griflon bag, or equivalent, over drum and fasten.

7.1.2 Move designated drums to a staging area near Plant 1 sample line.

7.1.3 Perform a scale check per SOP 1-C-904.

NOTE: The supervisor shall specify the scale to be used.

7.1.4 Inspect the barrel grab for damage.

7.1.4.1 If the barrel grab is damaged, notify supervisor of damage.

CAUTION: **DO NOT USE DAMAGED BARREL GRAB.**

NOTE: The supervisor shall specify the barrel grab/lifting device to be used.

7.1.5 Inspect forklift (used with barrel grab) per SOP 20-C-902.

7.1.6 Using barrel grab attached to forklift, move the drum onto the scale.

7.1.7 Obtain the gross weight of the drum.

> WARNING: **MAXIMUM WEIGHT OF DRUMS SHALL BE 700 POUNDS FOR A 30 GALLON OVERPACK; 1,200 POUNDS FOR 55 GALLON OVERPACKS, 55 GALLON SINGLEPACK, AND 85 GALLON OVERPACKS. MAXIMUM WEIGHT OF 85 GALLON SINGLEPACKS SHALL BE 1,000 POUNDS.**

7.1.8 Complete the "Item Production/Certification/Identification" XX card, Form FMPC-CONT-1945-XX (See Figure 1) except "Package Physical Certification" section of form, if one does not exist.

7.0 PROCEDURE (cont.)

7.1.9 Check to ensure that the drum information on the "Item Production/Certification/Identification XX Card is the same as the information marked on the drum. If the card and drum information are not the same, notify supervisor.

NOTE: MC&A shall verify the information is accurate according to inventory records.

7.1.10 Using the barrel grab, move drum from scale to a ventilated sampling station.

WARNING: ENSURE SAMPLING STATION VENTILATION SYSTEM IS IN OPERATION BY CHECKING THE VENTILATION FLOW INDICATOR.

7.1.11 Remove lock ring and lid from the drum.

WARNING: SLOWLY REMOVE BUNG(S) AND LID(S) TO RELEASE POSSIBLE PRESSURE.

7.1.12 Visually inspect drum per items listed in the Package Physical Certification section of the "Item Production/Certification/ Identification XX card, Form FMPC-CONT-1945-XX. Indicate inspection condition on card.

7.1.12.1 If oil is present, notify supervisor.

NOTE: Supervisor shall have drum sampled for waste type determination. Move drum to area specified by supervisor.

NOTE: Do not continue drum inspection process until notified by supervisor.

7.1.12.2 If 1/2 inch or more of free standing liquid is present on the top of the material, move the drum to the designated holding area for additional processing.

7.1.12.3 If less than 1/2 inch of free standing liquid is present on the top of the material, add uncalcined diatomaceous earth to absorb the liquid.

7.1.12.4 If material is dry, loose and respirable, notify supervisor for disposition per SOP 20-C-601.

7.0 PROCEDURE (cont.)

7.1.12.5 If material does not apply to the designated FMPC Lot Code description, sample material per SOP 1-C-101. Notify the supervisor for placement of drum in designated holding area.

7.1.13 Install lock ring and lid on drum.

7.1.14 Install seal on lever ring and record seal number on the "Item Production/Certification/Identification" XX card, Form FMPC-CONT-1945-XX (See Figure 1).

7.1.15 Using the barrel grab, move drum to the end of the sample line.

7.1.16 Place drum in a designated overpack per SOP 1-C-804.

7.2 Inspecting Containerized Refuse Material

7.2.1 Place container in designated inspection area.

7.2.2 Remove container lid.

7.2.3 Visually inspect container per items listed in the Package Physical Certification Section of the "Item Production/Certification/Identification" XX card, Form FMPC-CONT-1945-XX (See Figure 1). Indicate inspection condition on card.

7.2.3.1 If oil is present, follow Step 7.1.12.1.

7.2.3.2 If moisture is found on container, follow Steps 7.1.12.2 and 7.1.12.3.

7.2.3.3 If respirable material is present, follow Step 7.1.12.4.

7.2.3.4 If material present does not apply to FMPC Lot Code description, follow Step 7.1.12.5.

7.2.3.5 If an excessive void space is found, add refuse material per SOP 20-C-601.

7.2.4 Replace lid on container per SOP 1-C-602.

7.2.5 Complete the remaining items on the "Item Production/Certification/Identification" XX card.

7.2.6 Using the barrel grab, move container to a designated holding area for shipment preparation.

8.0 APPLICABLE FORMS

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

R - MATERIAL REVISED, ADDED, OR DELETED.

CARD XX ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

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

SEAL NUMBER	SEAL DATE MONTH	SEAL DATE DAY	SEAL DATE 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)

ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION
FMPC-CONT-1945-XX
Figure 1

R - MATERIAL REVISED, ADDED, OR DELETED.

RESTORATION PROCEDURE	INSPECTION OF CONTAINERIZED REFUSE MATERIAL AND DRUMMED RESIDUES	SOP 1-C-604
		SECTION: Waste Management AREA: Plant 1
Authorization: J. T. Grumski per CIO C88-175	Supersedes: NONE	Issue Date: 09-07-89

RECORD OF ISSUE/REVISIONS

PAGE	DATE	REV.NO.	DESCRIPTION AND AUTHORITY
1 thru 8	09-07-89	0	Procedure required to replace CIO C88-175 per Request No. P89-097.

1.0 PURPOSE

The purpose of this document is to establish the procedure for taking representative samples of residues and waste at Plant 1 and Resource Conservation and Recovery Act (RCRA) Storage facilities.

2.0 APPLICABILITY

This procedure is applicable to the methods and equipment for preparing and taking samples of dry, moist, and liquid materials by Waste Management.

3.0 RESPONSIBILITIES

3.1 Supervisors shall be responsible for the following:

3.1.1 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection for the process being performed.

3.1.2 Providing operators with the required respiratory protection.

3.1.3 Ensuring that only trained personnel take samples.

3.1.4 Reporting exceptional circumstances not addressed by this SOP in a Minor Event Report (refer to FMPC-704) and notifying the AEDO of the circumstances.

3.2 Operators shall be responsible for complying with this procedure and reporting any unusual occurrences to the supervisor or, in the supervisor's absence, the Assistant Emergency Duty Officer (AEDO).

3.3 Radiological Safety shall be responsible for furnishing a copy of P-35-013 with a "Radiation Work Permit" when sampling Plutonium Out of Specification (POOS) material.

3.4 Waste Technology shall be responsible for the preparation of RCRA or suspect RCRA sampling plans, hazardous waste determination, and homogeneous determinations on an individual basis in accordance with required EPA sampling test methods.

3.5 Solid Waste Compliance shall be responsible for hazardous waste determination.

4.0 DEFINITIONS

4.1 DELETED

R - MATERIAL REVISED, ADDED, OR DELETED.

4.0 DEFINITIONS (cont.)

4.2 DELETED

4.3 DELETED

4.4 DELETED

5.0 REFERENCES

5.1 1-C-701, "Plant 1 Dust Collectors"

5.2 1-C-904, "Operator Scale Checking in Plant 1"

5.3 20-C-601, "Packaging Low Level Waste for Offsite Disposal"

5.4 20-C-605, "Hazardous Waste Satellite Accumulation Areas"

5.5 20-C-905, "Ventilation Flow Indicators (VFI)"

5.6 FMPC-2178, "FMPC Lot Marking and Color-Coding System"

5.7 DELETED.

5.8 SOP 20-C-101, "Moving and Storing Nuclear Materials on Site at the FMPC"

5.9 SOP 20-C-102, "Nuclear Safety for Receiving, Storing, Repackaging, and Moving Enriched Uranium Materials <20% ^{235}U from Offsite"

5.10 SOP 20-C-904, "General Nuclear Safety Requirements"

R 5.11 SOP 20-C-606, "Hazardous Material Spill Clean-Up"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 Operators shall wear respiratory protection provided by the supervisor when dusty conditions exist.

6.3 Leather-palm gloves shall be worn when handling drums, locking rings, lids, sharp or abrasive material, or when using tools.

6.4 Face shields and neoprene gloves and aprons shall be worn when taking sam of caustic material, acid slurries, or liquids.

R - MATERIAL REVISED, ADDED, OR DELETED.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.5 Drums with noticeable bulging shall be opened under the direction of the supervisor and Safety and Fire Protection Engineering.

6.6 Protective equipment as directed by IS&H shall be worn when handling or sampling drums that are corroded, rusted, bulging, or deformed.

6.7 Material in damaged drums shall be placed in another correctly identified container.

R 6.8 Any release of hazardous waste shall be reported and handled immediately per
R SOP 20-C-606.

6.9 Dust Collector G2-172 shall be turned on during the sampling operation at the Plant 1 sample line.

6.10 If POOS material is to be sampled, contact Radiological Safety.

6.11 Material shall be handled per the requirements of SOP 20-C-101, 20-C-102, and 20-C-904.

6.12 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to Radiological Safety for evaluation. The involved employees shall report to Medical Services at the end of their shift or as directed to submit a urine sample and again report at the start of their next shift to submit another urine sample. The supervisor shall consider the circumstances to be a minor event and shall immediately complete a minor Event Report per FMPC-704 and notify the AEDO of the circumstance.

6.13 Gloves shall be leak-checked prior to use.

6.14 A Radiation Work Permit shall be obtained prior to performing any sampling operation.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE

NOTE: A sampling plan, as required by EPA Document EPA SW-846, shall be prepared prior to sampling a hazardous waste or suspect hazardous waste stream.

NOTE: Any sample collected for hazardous waste or residue material taken for verification of hazardous waste determination shall follow strict chain of custody guidelines in accordance with 7.12.

NOTE: Any deviation from procedure shall be documented on a "Sampling Deviation/Special Handling Requirements", Form FMPC-PRO-3130 (See Figure 1).

NOTE: DELETED.

NOTE: When sampling a material for hazardous waste determination, a "clean" sampler must be used (Refer to Section 7.9).

7.1 Preparation for Sampling

7.1.1 At the start of the operating shift, check the scales to be used per SOP 1-C-904.

7.1.2 Move skids of material into the sampling area.

7.1.3 Prepare a composite sample drum.

7.1.3.1 Tare weigh an empty, clean, color-coded 30-gallon drum. Stencil the tare weight and the lot marking number on the drum (Refer to "FMPC Lot Marking and Color-Coding System").

NOTE: The composite sample container shall be large enough to hold the entire composite sample. Use a larger container if necessary.

7.1.4 If the drum to be sampled was received from offsite, printweigh the drum per Item 7.2.

7.1.5 Remove the locking ring and drum lid from the drum to be sampled.

NOTE: To prevent contamination of the sample, only one drum at a time shall be open.

7.1.6 Visually inspect the waste material to be sampled to determine the physi characteristics (liquid, solid, dry, moist).

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.1.7 Select and obtain a clean sampler for the type of material to be sampled per recommendation of Table 1.

7.1.7.1 If assistance is required in determining the physical characteristics of the waste or the type of sampler to be used, contact Waste Technology.

NOTE: Clean samplers shall have a completed "Clean Equipment" tag affixed to the sampler and be sealed in plastic bags or tubes.

7.1.8 Sample the material using the procedure for the type sampler (Refer to Table 1).

NOTE: The supervisor will supply sampling requirements for nuclear materials and for suspected RCRA material based on published sampling plans. Sampling may also be specified using an approved "Sampling Deviation/Special Handling Requirements", Form FMPC-PRO-3130 (See Figure 1).

7.1.9 Replace the drum lid and lock ring following sampling.

7.1.9.1 If the drum lid and lock ring are damaged, replace with a new lid and ring.

7.1.10 Repeat Steps 7.1.4, 7.1.5, 7.1.8, and 7.1.9 for each drum in the lot.

7.1.11 After the lot has been sampled, weigh the 30-gallon composite sample drum. Record the weight on a "Sample Weight Ticket", Form FMPC-PRO-1579 (See Figure 3).

7.1.12 Take a secondary sample from the composite sample drum (Refer to Item 7.7 and 7.8).

7.1.13 Place a clean lid and locking ring on the 30-gallon composite sample drum.

7.1.14 Using a forklift, load the sampled drums and the composite sample drum onto skids.

7.1.15 Move the skids to the storage area designated by the supervisor.

7.1.16 Clean and store the sampling instrument per Items 7.9 and 7.10.

7.1.17 Complete the "Sample Weight Ticket", Form FMPC-PRO-1579 (See Figure 3).

7.0 PROCEDURE (cont.)

7.1.18 Send the documentation as completed in Item 7.11 and the secondary sample to the laboratory.

7.1.18.1 If the Chain of Custody form is being used, deliver listed samples directly to the Laboratory.

NOTE: The operator obtaining the samples shall deliver the samples to the Laboratory without the use of Transportation personnel.

7.2 Completing the Container Printweigh Card

7.2.1 If the drum to be sampled contains material from offsite, printweigh the drum on a "Container Printweigh Card", Form FMPC-PRO-1342 (See Figure 2).

7.2.2 Check that the gross weight is printed in the "WEIGHT" column.

7.2.3 Enter the drum tare weight in the column marked "CODE".

NOTE: Tare weight is stencilled on the drum.

7.2.4 After lot sampling has been completed, printweigh the composite sample drum.

7.2.5 Calculate the net weight of the composite sample drum.

NOTE: The net weight is the difference between the weight after sampling and the tare weight.

7.2.6 For each composite sample container, complete a "Container Printweigh Card" as follows:

7.2.6.1 Enter the gross and net weight of the composite sample container.

7.2.6.2 In Box #1, enter the type of material sampled.

7.2.6.3 In Box #2, enter the 15-digit lot number.

7.2.6.4 In Box #3, enter the specific sampling method.

7.2.6.5 In Box #4, enter the tare weight.

7.2.6.6 In Box #5, enter the vendor lot marking number, if available.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.2.6.7 In Box #6, enter the date and gross and net weights.

7.2.6.8 In Box #7, enter the date the sample was prepared.

7.2.6.9 In Box #10, enter the scale number.

7.2.6.10 In Box #13, enter the total number of containers (including the composite sample container).

7.2.6.11 In Box #15, enter when the sample was weighed.

7.2.6.12 In Box #16, enter the operator's name and badge number.

7.2.7 Affix the "Container Printweigh Card" to the composite sample drum.

7.2.8 DELETED.

7.2.9 DELETED.

7.2.10 DELETED.

7.3 Using the Automatic Closed Auger Sampler

7.3.1 After skids of material have been moved into the sampling area, place the drums on the Sampling Conveyor using a forklift.

7.3.2 Ensure Dust Collector G2-172 is in operation, and if not, start-up and operate per SOP 1-C-701.

NOTE: DELETED.

7.3.3 Check the Ventilation Flow Indicator (VFI) located on the auger enclosure. Notify supervisor and discontinue sampling if the VFI reads less than 2.2 inches differential (Refer to 20-C-905, "Ventilation Flow Indicators").

7.3.4 After the drum lid is removed, manually move the drum along the conveyor into the Auger Sampling Chamber.

7.3.5 Place the composite sample drum under the Sample Discharge Chute.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.3.6 Insert the auger sampler in the drum. Run the auger to the bottom of the drum.

NOTE: Vary the sampling location for each drum. Samples shall be taken from the center and off center points.

NOTE: Do not tilt the drum during sampling.

7.3.6.1 If the material type is different from that previously sampled (different lot, different material), take two samples from the first drum. Discard the samples to avoid cross contamination of samples.

NOTE: Use a separate container to collect the discarded samples. Discard samples can be returned to the drum after the drum has been sampled.

7.3.7 Withdraw the auger sampler.

NOTE: The auger sampler will automatically deposit the sample in the 30-gallon composite sample drum. Drum shall not be more than half filled to permit blending.

7.3.8 Check to ensure that the entire content of the auger was deposited in the sample container.

7.3.9 If specified by supervision, repeat Steps 7.3.9 thru 7.3.11 to take additional samples from other points in the drum.

7.3.10 When sampling is complete, move the drum along the conveyor to the lidding station.

7.3.11 Repeats steps 7.3.4 through 7.3.10 until all drums have been sampled.

7.4 Using the Grain Sampler

7.4.1 Ensure that the grain sampler is in the closed position with the slots in the outer tube face up.

7.4.2 Insert the sampler into the material being sampled.

NOTE: Insert the sampler at a point near the side of the container, through the center of the container, to a point opposite the ent point.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.4.3 Rotate the inner tube of the sampler to the open position.

7.4.4 Wiggle the sampler a few times to ensure that material enters the open slots.

7.4.5 Rotate the inner tube of the sampler to the closed position.

7.4.6 Withdraw the sampler from the drum of material.

7.4.7 Place the sampler in a horizontal position with the slots in the outer tube facing up.

7.4.8 Rotate the inner tube to the open position.

7.4.9 Slide the inner tube out of the outer tube.

7.4.10 Place the sample in the appropriate sample container as specified in Table 2 for residues and Table 3 for RCRA or suspect RCRA material.

7.4.11 Lid the sample container while obtaining the next sample.

7.4.12 If specified by supervision, repeat Steps 7.4.1 thru 7.4.11 to take additional samples from other points in the drum.

7.4.13 After adequate samples have been taken, sample the next drum.

7.4.14 Repeat steps 7.4.1 thru 7.4.13 until all drums in the lot have been sampled.

7.5 Using the Pipe Sampler

NOTE: The pipe sampler shall be long enough to reach the bottom of the container being sampled.

7.5.1 Insert the pipe sampler diagonally through the contents of the drum.

7.5.2 Rotate the pipe sampler once or twice to cut a core of material.

7.5.3 Ensure that the slot is face up and slowly withdraw the pipe sampler.

7.5.4 Check to ensure that the entire length of pipe contains material. If not, repeat Steps 7.5.1 thru 7.5.3.

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7.0 PROCEDURE (cont.)

7.5.5 Using a clean stainless steel spatula, push the material out of the sampler into the appropriate sample container as specified in Table 2 for residues and Table 3 for RCRA or suspect RCRA material.

7.5.5.1 If an organic analysis is required, refer to Table 4 for the appropriate sample container.

7.5.6 Lid the sample container while obtaining the next sample.

7.5.7 If specified by supervision, repeat Steps 7.5.1 thru 7.5.6 to collect samples from other points in the drum.

7.5.8 Repeat Steps 7.5.1 thru 7.5.7 until all the drums in the lot have been sampled.

7.6 Using the Composite Liquid Waste Sampler (COLIWASA)

7.6.1 Using the Disposable COLIWASA

7.6.1.1 Adjust the locking mechanism, if necessary, to ensure that the neoprene rubber stopper provides a tight closure.

7.6.1.2 Place the stopper rod handle in the T-position.

7.6.1.3 Push the rod down until the handle is against the locking block.

7.6.1.4 Slowly lower the COLIWASA vertically into the drum.

NOTE: Lower the COLIWASA so that the levels of liquid inside and outside the sampler tube remain even. If the liquid level in the sampler tube is lower than the level outside the sampler, the rate is too fast and will result in a nonrepresentative sample.

7.6.1.5 When the stopper hits the bottom of the drum, push the sampler tube downward against the stopper to close the sampler.

7.6.1.6 Turn the T-handle upright with one end tight on the locking block to lock the sampler closed.

7.6.1.7 Slowly withdraw the sampler with one hand while wiping the outside of the sampler with a clean disposable cloth.

7.6.1.7.1 Dispose of absorbent cloths and trash bags which have not come in contact with RCRA, or suspected RCRA, waste per SOP 20-C-601.

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7.0 PROCEDURE (cont.)

7.6.1.7.2 Dispose of absorbent cloths and trash bags which have come in contact with RCRA, or suspected RCRA, waste per SOP 20-C-605.

7.6.1.8 Place the end of the COLIWASA into the appropriate composite sample container (Refer to Table 3).

7.6.1.8.1 If an organic analysis is required, complete Step 7.13.1 through Step 7.13.3 (Refer to Table 4 for appropriate sample container).

NOTE: Waste Technology shall determine if an organic analysis is required per the Sampling Plan.

7.6.1.9 Empty the sampler by slowly pulling the lower end of the T-handle away from the locking block.

7.6.1.10 If specified by supervision, repeat Steps 7.6.1.2 through 7.6.1.9 to collect samples from other points in the drum.

7.6.1.11 After changing drums, repeat Steps 7.6.1.2 through 7.6.1.10 until all the drums in the lot have been sampled.

7.6.2 Using the Glass COLIWASA

7.6.2.1 Check to ensure that the inner tubing and the outer sheath are not cracked.

7.6.2.2 Insert the inner tubing inside the sheath.

7.6.2.3 Raise the ground glass and the tubing several inches above the hole in the bottom of the sheath.

7.6.2.4 Slowly lower the COLIWASA vertically into the drum, keeping the ground glass end away from the hole in the bottom of the sheath.

NOTE: Lower the COLIWASA so that the levels of liquid inside and outside the sampler tube remain even. If the liquid level in the sampler tube is lower than the level outside the sampler, the rate is too fast and will result in a nonrepresentative sample.

7.0 PROCEDURE (cont.)

7.6.2.5 When the sheath hits the bottom of the drum, push the inner tube downward so that the ground glass end seals the end of the sheath.

7.6.2.6 Slowly withdraw the COLIWASA sampler with one hand ensuring the ground glass end is sealed against the tube bottom while wiping the outside of the sampler with a clean disposable cloth.

7.6.2.6.1 Dispose of absorbent cloths and trash bags which have not come in contact with RCRA, or suspected RCRA, waste per SOP 20-C-601.

7.6.2.6.2 Dispose of absorbent cloths and trash bags which have come in contact with RCRA, or suspected RCRA, waste per SOP 20-C-605.

7.6.2.7 Place the end of the COLIWASA into the appropriate composite sample container (Refer to Table 3).

7.6.2.7.1 If an organic analysis is required, complete steps 7.13.1 through 7.13.3 (refer to Table 4 for appropriate sample container).

NOTE: Waste Technology shall determine if an organic analysis is required per the Sampling Plan.

7.6.2.8 Empty the sampler by pulling the inner tube upward causing the ground glass end to separate from the outer tube bottom.

7.6.2.9 If specified by supervision, repeat Steps 7.6.2.2 through 7.6.2.8 to collect samples from other points in the drum.

7.6.2.10 After changing drums, repeat Steps 7.6.2.2 through 7.6.2.9 until all the drums in the lot have been sampled.

7.7 Collecting Secondary Samples of Dry Materials

7.7.1 Place the composite sample container on its side on the drum roller.

7.7.2 Set the drum roller timer for five minutes.

7.7.3 Turn on the drum roller.

7.7.4 Mix for five minutes and turn off the drum roller.

7.7.5 Place the drum in an upright position for five minutes to allow dust to settle.

7.0 PROCEDURE (cont.)

7.7.6 Tare weigh a clean sample jar on the scale.

7.7.7 Remove the locking ring and lid from the composite sample container.

7.7.8 Using a clean grain sampler (Refer to Item 7.4), take a sample from the container.

7.7.9 Place the sample in the appropriate sample container (Refer to Table 2 or Table 3).

7.7.10 Repeat Steps 7.7.8 and 7.7.9 to collect samples from other points in the drum until an amount specified by supervision is collected.

NOTE: A minimum of two sample points is required.

7.7.11 Cap the sample jar after obtaining the secondary sample.

NOTE: No preservatives or other substances shall be added to the sample without the prior consent of the Analytical Laboratory.

7.7.12 Weigh the sample jar.

7.7.13 Complete the required records (Refer to Item 7.11).

7.7.14 Deliver the sample and completed documents to the Analytical Laboratory sample receiving room.

NOTE: All RCRA or suspected RCRA samples shall be delivered during the same shift in which they were collected.

7.7.14.1 If the Chain of Custody form is being used, deliver listed samples directly to the Laboratory.

NOTE: The operator obtaining the samples shall deliver the samples to the Laboratory without the use of Transportation personnel.

7.8 Collecting Secondary Samples - Moist or Sticky Materials

7.8.1 Tare weigh an appropriate sample jar (Refer to Table 2 or Table 3).

7.8.2 Open the composite sample container.

7.8.3 Using a pipe sampler, take a sample from the container per Steps 7.5.3 thru 7.5.5.

7.0 PROCEDURE (cont.)

7.8.4 Using a stainless steel spatula, push the sample out of the pipe into a clean five gallon can.

7.8.5 Repeat Steps 7.8.3 and 7.8.4 to collect four more samples.

NOTE: For the remaining samples, insert the pipe sampler at different points at the side of the container.

7.8.6 Blend the five core samples using the stainless steel spatula.

7.8.7 Using the stainless steel spatula, take five equal portions from different areas of the blend and place the portions in the appropriate sample container (Refer to Table 2 or Table 3).

NOTE: Sampling shall continue until an amount specified by supervision is collected.

NOTE: No preservatives or other substances shall be added to the samples without the prior consent of the Analytical Laboratory.

7.8.8 Place the unused secondary sample in the primary composite sample container and return the container to the lot.

7.8.9 Complete the required records (Refer to Item 7.11).

7.8.10 Deliver the sample and completed documents to the Analytical Laboratory sample receiving room.

NOTE: All samples shall be delivered during the same shift in which they were collected.

7.8.10.1 If the Chain of Custody form is being used, deliver listed samples directly to the Laboratory.

NOTE: The operator obtaining the samples shall deliver the samples to the Laboratory without the use of Transportation personnel.

7.0 PROCEDURE (cont.)

7.9 Cleaning Sampling Equipment

NOTE: This cleaning procedure is not applicable to the automatic closed auger sampler.

NOTE: Cleaning shall be performed over a container marked with the appropriate 15-digit FMPC Lot Markings.

7.9.1 Using a warm detergent solution, wash sampling equipment thoroughly. Use a bottle brush to remove particulate matter, films, or other dirt as necessary.

CAUTION: THE LID SHALL BE KEPT ON THE DRUM CONTAINING THE USED RINSE SOLUTION WHEN NOT IN USE.

NOTE: Alquinox or Liquinox may be used as the cleaning detergent.

NOTE: Only non wire-wrapped brushes shall be used.

7.9.2 Rinse the sampler several times with tap water to remove detergent residues.

7.9.2.1 When the rinse container is full, process the contents as RCRA waste per SOP 20-C-605.

NOTE: The solution accumulated from rinsing the sampling equipment shall not be mixed except when directed by the supervisor.

7.9.3 Rinse the sampler with distilled water.

7.9.4 Drain excess water off the sampler.

7.9.5 Rinse the sampler with pesticide grade purity isopropanol and, if necessary, dry with clean dry cloth.

NOTE: Pesticide grade purity isopropanol is isopropanol that is below laboratory grade purity isopropanol.

7.9.6 Place the clean sampler into a clean plastic bag or wrap with aluminum foil.

7.9.7 Dispose of absorbent cloths and trash bags which have not come in contact with RCRA waste or suspected RCRA waste per SOP 20-C-601.

7.0 PROCEDURE (cont.)

7.9.8 Dispose of absorbent cloths and trash bags which have come in contact with RCRA waste or suspected RCRA waste per SOP 20-C-605.

7.9.9 Fill out and attach a "Clean Equipment" tag to sampler, Form No. FMPC-PRO-3128, (See Figure 4).

7.9.10 Store the sampler per item 7.10 unless the sampler is to be used immediately.

7.9.11 If directed by the supervisor, obtain a sample of the rinsate and forward to the Laboratory for analysis.

7.9.11.1 When an analysis is required, store rinsate container in a satellite accumulation container/area until the analysis results are received and disposition determined.

7.10 Storing Sampling Equipment

7.10.1 Place the clean samplers (except closed auger) in a clean polyethylene plastic bag or wrap with aluminum foil.

7.10.2 Seal the plastic bag with tape.

7.10.3 Place the samplers in a clean, protected area.

7.11 Record Requirements

NOTE: The following record requirements apply to all secondary samples collected by Plant 1 personnel.

NOTE: All data for RCRA or suspect RCRA materials shall be recorded in waterproof ink.

7.11.1 Record the following information on the "Enrichment Label", Form No. FMPC-PRO-306 M-145 (See Figure 6). Affix the completed label to the secondary sample container.

7.11.1.1 Sampling location.

7.11.1.2 Collector signature.

7.11.1.3 Type of material.

7.11.1.4 Type of sample.

7.0 PROCEDURE (cont.)

7.11.1.5 Lot number of material sampled.

7.11.1.6 Date sampled.

7.11.1.7 Time sampled (AM/PM or military time).

7.11.1.8 Net weight of the secondary sample.

7.11.1.9 Isotopic range (enriched, depleted).

7.11.2 DELETED.

7.11.2.1 DELETED.

7.11.2.2 DELETED.

7.11.2.3 DELETED.

7.11.2.4 DELETED.

7.11.2.5 DELETED.

7.11.2.6 DELETED.

7.11.2 Complete a "Report of Chemical Analyses", Form FMPC-T-200 (See Figure 8).

NOTE: Supervision shall specify analyses required.

7.11.2.1 If a sampling plan is in effect, do not complete Form FMPC-T-200 for RCRA Sampling.

7.12 Chain of Custody For Hazardous Determination Samples

NOTE: Plant 1 personnel shall be notified of all lots requiring Chain of Custody documentation.

7.12.1 Fill out an "Analytical Laboratory Sample Seal," Form No. FMPC-ES&H-2774 (See Figure 9) with the sample collector's name and badge number, date and time the sample was collected, and the drum and lot numbers.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.12.2 Place the sample seal over the lid of the sample container.

NOTE: Tamper guard tape may be used if a sample seal is not available.

NOTE: The sample seal (or tamper guard tape) shall be attached so that the seal will break when the sample container is opened.

NOTE: Each container must be sealed immediately after sample is collected and labeled using waterproof ink.

7.12.3 Ensure that record requirements (Refer to Item 7.11) are complete.

7.12.4 Complete the "Chain of Custody" sheet, Form No. FMPC-PRO-3112 (See Figure 10).

7.12.4.1 If the material is being sampled according to a sampling plan, write "See Sampling Plan No. XXXX" under "Analyses Requested" on the form.

NOTE: The "Chain of Custody" sheet shall be signed each time physical control of the samples is transferred.

NOTE: More than one sample can be included on the custody form. When more than one form is required for a large shipment, each form shall be completed entirely.

7.12.5 DELETED.

7.12.6 Record the following information in the "Field Log Book".

NOTE: Log entries shall be recorded using waterproof ink in a written manner which can be easily read and understood.

NOTE: The log book shall be protected and kept in a safe place.

7.12.6.1 Purpose of sampling (RCRA determination, MC&A sampling).

7.12.6.2 Location of sampling.

7.12.6.3 Name of field contact (person responsible for answering questions concerning the sample).

7.12.6.4 Generator of waste and address (if different from location).

7.12.6.5 Type of process producing waste (if known).

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7.0 PROCEDURE (cont.)

7.12.6.6 Type of waste.

7.12.6.7 Declared/suspected waste components and concentrations.

7.12.6.8 Number and volume of sample taken.

7.12.6.9 Description of sampling point.

7.12.6.10 Date and time of collection.

7.12.6.11 Sample collector sample identification number(s).

7.12.6.12 Type of container the sample was taken from.

7.12.6.13 Drum inventory number (if available) as specified by MC&A (unique 4-digit number stenciled in white on the side of the waste drum).

7.12.6.14 FMPC lot marking system number.

7.12.6.15 Drum number (if available)

7.12.6.16 All other numbers on the drum(s).

7.12.6.17 Any written information on the drum describing the material contained in the drum.

7.12.6.18 Sampling method used.

7.12.6.19 Material description as observed by the collector.

7.12.6.20 Preservatives used.

NOTE: No preservatives or other substances shall be added to the samples without the prior consent of the Analytical Laboratory.

7.12.6.21 Any field measurements made, such as pH.

7.12.6.22 Signature of person recording the data.

7.12.7 Deliver the sample and completed documents to the Analytical Laboratory sample receiving room.

NOTE: All samples shall be delivered to the lab for analysis during the same shift in which the samples were collected.

7.0 PROCEDURE (cont.)

7.13 Liquid Organic Analysis

7.13.1 Carefully fill the septum bottle with the sample liquid.

NOTE: The liquid must reach the lip of the bottle.

7.13.2 Slide the teflon septum across the lip of the bottle covering the opening and then screw the plastic lid on the bottle.

7.13.3 Check the septum bottle for air bubbles by turning the bottle upside down.

NOTE: Organic analysis requires that no air bubbles be present in the septum bottle.

7.13.3.1 If air bubbles are present, empty the bottle and repeat steps 7.13.1 through 7.13.3 until the air bubbles are not present.

8.0 APPLICABLE FORMS

8.1 FMPC-PRO-3130, "Sampling Deviation/Special Handling Requirements"

8.2 FMPC-PRO-1342, "Container Printweigh Card"

8.3 FMPC-PRO-1579, "Sample Weight Ticket"

8.4 FMPC-PRO-3128, "Clean Equipment"

8.5 DELETED.

8.6 FMPC-PRO-306 M-145, "Enrichment Label"

8.7 DELETED.

8.8 FMPC-T-200, "Report of Chemical Analyses"

8.9 FMPC-OS&H-2774, "Sample Seal"

8.10 FMPC-PRO-3112, "Chain of Custody"

8.11 DELETED.

TABLE 1

SAMPLERS

MATERIAL	SAMPLER	PROCEDURE ITEM NUMBER
Dry, compacted solids	Auger	7.3
Dry, fluffy, solids	Grain	7.4
Moist solids	Pipe	7.5
Liquids, sludges	COLIWASA	7.6

TABLE 2

SAMPLE CONTAINERS FOR RESIDUE SAMPLING

SAMPLER	TYPE OF SAMPLE CONTAINER
Auger	Glass or plastic
Grain	Glass or plastic
Pipe	Glass or plastic

R - MATERIAL REVISED, ADDED, OR DELETED.

TABLE 3

SAMPLE CONTAINERS FOR RCRA OR RCRA SUSPECT SAMPLING

SAMPLER	TYPE OF SAMPLE CONTAINER
Grain	Shatterproof glass bottle with teflon cap liner
Pipe	Shatterproof glass bottle with teflon cap liner
Coliwasa	Shatterproof glass bottle with teflon cap liner

TABLE 4

SPECIAL SAMPLE CONTAINERS FOR ORGANIC ANALYSIS

SAMPLER	ANALYSIS	TYPE OF SAMPLE CONTAINER
Coliwasa	volatile	Septum Bottle (40 ml.)
Coliwasa	semi-volatile	Septum Bottle (40 ml.)
Pipe	volatile	Septum Bottle (40 ml.)
Pipe	semi-volatile	Septum Bottle (40 ml.)

R - MATERIAL REVISED, ADDED, OR DELETED.

SAMPLING DEVIATION/SPECIAL HANDLING REQUIREMENTS

SAMPLING LOCATION: _____ DATE: _____

MATERIAL TYPE: _____ CONTAINER TYPE: _____

REASON FOR SAMPLING DEVIATION/SPECIAL HANDLING:

_____
_____
_____
_____
_____
_____

OUTLINE OF SPECIAL REQUIREMENTS:

_____
_____
_____
_____
_____
_____
_____

APPROVALS:

_____ MC&A Representative

_____ Solid Waste Compliance Representative

_____ Waste Operations Supervisor

_____ Cognizant Engineer

SAMPLING DEVIATION/SPECIAL HANDLING REQUIREMENTS
FMPC-PRO-3130
Figure 1

R - MATERIAL REVISED, ADDED, OR DELETED.

FMPC-PRO-1342 (REV. 2/5/87)

PRODUCTION RECORDS - PLANT 1

CONTAINER PRINTWEIGH CARD

WO	CODE	WEIGHT	CONTR. NO.
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

1. MATERIAL TYPE:

2. FMPC LOT NO.:

3. SAMPLING METHOD (CHECK ONE): (P) ☐ PIPE (A) ☐ Auger (S) ☐ System

4. TARE WEIGHT SOURCE (CHECK ONE): (V) ☐ Vendor (F) ☐ FMPC (X) ☐ Stat. Sample ____ -lbs.

TEST 11 12 13 14 15 16 17 18 19 20

5. VENDOR LOT NO.:

WEIGHED: Date: ____ Gross ____ Tare ____

6. DATE OF MOISTURE DETERMINATION

7. DATE SAMPLE PREPARED:

8. SAMPLE AMOUNT TO VENDOR

9. MOISTURE CONTENT: — H_2O

10. SCALE NO.:

11. PLANT RPT. NO.:

12. POS. GUIDES TEST SW 1 2 3 4 5 6 7 8 9 10

13. TOTAL NO. CONTRS.:

14. REPORT COPIES REQ.: ☐ 6 ☐ 12

15. WEIGHING INST.: ☐ Before Sample ☐ After Sample

16. OPERATOR'S NAME:

17. DATA VERIFIED BY:

NO.	DISTRIBUTION OF COPIES
1	Tabulating Section
2	Production Records - Plant 1 (RECORD COPY)

Card No. ____ of ____

WO	CODE	WEIGHT	CONTR. NO.
SAMPLE WEIGHT			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

CODES:
TD - Test Drum
SA - Scale Adjusted
CS - Changed Scales
R-SA - Reweigh-Scale Adjusted

CONTAINER PRINTWEIGH CARD
FMPC-PRO-1342
Figure 2

R - MATERIAL REVISED, ADDED, OR DELETED.

SAMPLING PLANT

SAMPLE WEIGHT TICKET

VENDOR:

LOT NO.: DATE:

CHECK (√) ☐ Partial ☐ Complete ☐ Sample Reject

WEIGHT	Gross	
	Tare	
	Net	

RETURNED DRUM NO.:

PRO-1579 (9/4/59)

GROSS

TARE

NET

SAMPLE WEIGHT TICKET
FMPC-PRO-1579
Figure 3

R - MATERIAL REVISED, ADDED, OR DELETED.

CLEANED BY: _____

DATE: _____

Cleaned according to sop : _____

FMPC-OPR-3128 (6/22/89)

CLEAN EQUIPMENT
FMPC-PRO-3128
Figure 4

R - MATERIAL REVISED, ADDED, OR DELETED.

DELETED

DELETED
DELETED
Figure 5

R - MATERIAL REVISED, ADDED, OR DELETED.

FMPC-SAMPLE LABEL/RCRA MATERIAL-ENRICHED

SAMPLING LOCATION	PB NO ENRICHMENT
COLLECTOR	
TYPE OF MATERIAL	
TYPE OF SAMPLE	
LOT NUMBER OR IDENT	
DATE / TIME / NET WT	

FMPC FORM 306 M-145 (REV 11-29-88)

ENRICHMENT LABEL
FMPC-PRO-306 M-145
Figure 6

R - MATERIAL REVISED, ADDED, OR DELETED.

DELETED

DELETED
DELETED
Figure 7

R - MATERIAL REVISED, ADDED, OR DELETED.

PC

PORT OF CHEMICAL ANALYSES

E: Write Firmly — Part 4 must be legible.)

FMPC-T-200 (REV 5/8/86)

Lab. Nos. _____

Lot No. _____

alyses Requested _____

ERIAL

NO:

PLED:

MITTED BY:

MARKS

LAB. NO.	IDENTIFICATION	ANALYTICAL DATA					

DISTRIBUTION OF COPIES
Originator
Extra Copy
Quality Assurance
Analytical (RECORD COPY)

Approved By _____ Date of Report _____

REPORT OF CHEMICAL ANALYSES
FMPC-T-200
Figure 8

R - MATERIAL REVISED, ADDED, OR DELETED.

Collector: _____ (SIGNATURE)	ANALYTICAL LABORATORY SAMPLE SEAL
Date Collected: _____	Lot No.: _____
Time Collected: _____ ☐ AM ☐ PM	Drum No.: _____
	FMPC-ES&H-2774 (3/16/87)

SAMPLE SEAL
FMPC-OS&H-2774
Figure 9

R - MATERIAL REVISED, ADDED, OR DELETED.

FMPC
PRODUCTION OPERATIONS
CHAIN-OF-CUSTODY RECORD

Request No. _____

Company's Name and Address: _____ Phone No.: _____ Carrier Way Bill No.: _____ Lab Destination: _____

Name of Sampler(s): _____ Phone No.: _____ Badge No.: _____

SAMPLE NUMBER	SAMPLE LOCATION AND DESCRIPTION (Waste Type)	SAMPLED		SAMPLE TYPE	CONTAINER TYPE	ANALYSES REQUESTED (please refer to last column)						SAMPLE COND ON RECEIPT
		DATE	TIME									

TYPES OF ANALYSES
1 Composite Analyses
2 Total U
3 Total Th
4 EP Toxicity
5 Isotopic
6 Th-228
7 Th-232
8 Ra-226
9 UpCuvg Sa (U Calcul
10 ThoCuvg Sa (Th Calculat
11 _____
12 _____
13 _____
14 _____
15 _____

Field Information: _____

Possible Sample Hazards: _____

SIGNATURES:

1. Relinquished By: _____ (SIGNATURE / TITLE / COMPANY / INCLUSIVE DATES) Received By: _____
2. Relinquished By: _____ (SIGNATURE / TITLE / COMPANY / INCLUSIVE DATES) Received By: _____
3. Relinquished By: _____ (SIGNATURE / TITLE / COMPANY / INCLUSIVE DATES) Received By: _____
4. Relinquished By: _____ (SIGNATURE / TITLE / COMPANY / INCLUSIVE DATES) Received By: _____

NO.	DISTRIBUTION OF COPIES
1	To Accompany Samples
2	Field Copy

CHAIN OF CUSTODY
FMPC-PRO-3112
Figure 10

R - MATERIAL REVISED, ADDED, OR DELETED.

DELETED

DELETED
DELETED
Figure 11

R - MATERIAL REVISED, ADDED, OR DELETED.

RESTORATION PROCEDURE	SAMPLING RESIDUE AND WASTE MATERIALS	SOP 1-C-101 AREA: Plant 1
Authorization: (Signature on File) J. T. Grumski, Waste Management	Supersedes: 1-C-101, 06-29-72	Issue Date: 6-16-89

RECORD OF ISSUE/REVISIONS

DATE	REV NO.	DESCRIPTION AND AUTHORITY
06-29-72	N/A	SOP has been revised to detail secondary sampling of both dry and wet materials as well as primary sampling.
10-30-84	N/A	Corrections in format made to Industrial Health and Safety and Environmental paragraphs, no text change. Changes made by Quality Control Department.
10-30-84	N/A	Quality Control Department replacement pages. List of Effective Pages added.
10-14-85	N/A	General update of SOP to reflect current operations per SOP Change Request No. 1009, initiated by R. C. Dicken.
04-23-87	N/A	Revised to implement Chain of Custody requirements for hazardous waste sampling of stored inventories to meet EPA requirements. Section 3 added per Request No. P87-092, initiated by D. J. Carr.
06-16-89	N/A	Reissued to update and reformat per Request No. P89-320, initiated by B. L. Krupa.
07-11-90	1	Revised to update RCRA requirements and incorporate references to SOP 20-C-101, 20-C-102, and 20-C-904 per Request No. P90-017, initiated by B. Krupa/J. Angert and Request P90-162, initiated by J. Angert.
03-11-91	2	Revised to incorporate CIOs C90-056 and C90-057 per Request Nos. P90-340 and P90-342.

R - MATERIAL REVISED, ADDED, OR DELETED.

Westinghouse Materials Company of Ohio — FMPC	NUMBER: FMPC-314	REVISION: 2	ISSUE DATE: 12-31-90
SITE POLICY AND PROCEDURE	TITLE: PACKAGING, ON-SITE MOVEMENT AND OFF-SITE SHIPMENT OF MATERIAL		
	APPROVED BY: W. H. Britton, President		

1.0 POLICY

Westinghouse Materials Company of Ohio (WMCO) shall establish and implement procedures to be followed by WMCO and their subcontractors to control the packaging and safe transport of materials and equipment, both on-site and off-site, in compliance with Federal, State, and Local transportation regulations, as well as Department of Energy (DOE) Orders and Directives.

2.0 SCOPE

This procedure delineates the requirements and assigns the responsibilities for ensuring that materials, including uranium products, waste and nonhazardous miscellaneous items, are properly packaged, marked, labeled, loaded, and secured for transportation both on-site and off-site.

3.0 DEFINITIONS

3.1 Material - For purpose of this procedure, includes radioactive, nonradioactive hazardous, and nonhazardous items or substances.

3.2 Hazardous Material - Substance or material, including a hazardous substance, which has been determined by the Secretary of Transportation to be capable of posing a risk to health, safety and property when transported in commerce, and which has been so designated in 49 CFR 100-199.

3.3 Hazardous Waste - (Resource Conservation and Recovery Act [RCRA] Waste) Waste material exhibiting a characteristic of ignitability, corrosiveness, reactivity, or toxicity, or any material that is subject to the Waste Manifest Requirements of the U.S. EPA as specified in 40 CFR 261 or in applicable state regulations.

3.4 Radioactive Material - Material having a specific activity greater than 0.002 microcuries per gram, which has been so designated in 49 CFR 100-199. Radioactive materials include, but are not limited to, depleted, normal and enriched uranium materials, thorium and radioactive sources used on site.

3.5 Radioactive Waste - Materials that have reached their economic discard limit (EDL), or radionuclide sources which have been declared waste. These materials are packaged in the same manner as radioactive materials in compliance with all applicable regulations.

3.6 Radioactive Mixed Waste - A hazardous waste combined or contaminated with a radioactive material. It is handled consistent with both hazardous waste regulations and regulations covering radioactive materials.

3.0 DEFINITIONS (cont.)

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3.7 Low Level Waste - Objects of nonradioactive, material externally contaminated with radioactive material, that is not readily dispersible and the surface contamination when averaged over an area of one (1) square meter, does not exceed 0.0001 millicurie (220,000 dpm) per square centimeter of radionuclides. These objects include, but are not limited to, scrap pallets, boxes or construction rubble and bulk material.

3.8 Nonhazardous Miscellaneous Material - Any item that has not been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety and property when transported in commerce, and which has not been so designated in 49 CFR 100-199.

3.9 Nonradioactive Hazardous Material - A hazardous material that does not have a specific activity greater than 0.002 microcuries per gram. Refer to FMPC-2086, "Hazard Communication Standard Written Program," for a list of nonradioactive hazardous materials on site.

3.10 Hazardous Substance - A material, including its mixtures and solutions, that is listed in the appendix of the current issue of 49 CFR 172.101 of this subchapter and is in a quantity, in one package, which equals or exceeds the reportable quantity listed in the appendix.

3.11 PCB/PCB'S - Toxic substances that are regulated (Toxic Substance Control Act) and include, but are not limited to, dielectric fluids, contaminated solvents, oils, waste oils, heat transfer fluids, hydraulic fluids, paints, capacitors, light ballasts, sludges, slurries, dredge spoils, a soil materials contaminated as a result of spills and other chemical substances, and being a concentration of 50 parts per million (PPM) or above.

3.12 Radioactive Source - Any encapsulated material which emits alpha, beta, gamma, or neutron radiation.

4.0 RESPONSIBILITIES

4.1 Traffic - Provides guidance on packaging, markings and labeling to be used, assuring that it conforms to Federal, State and Local regulations. Collects and prepares shipping documents including hazardous waste manifests and applicable supplier notification. Selects DOT and PUCO hazardous materials certified carriers, and coordinates scheduling of the shipments with the Facilities Services. Traffic is responsible for preparing and implementing this procedure.

4.2 Performance Assessment - Conducts internal independent annual audits of the packaging and transportation of hazardous commodities in accordance with acceptance criteria per DOE Orders 1540.1 and 1540.2.

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4.0 RESPONSIBILITIES (cont.)

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4.3 Site Quality Engineering - Conducts surveillances of the packaging and transportation of materials and commodities for compliance with applicable procedures and DOE orders. Routinely verifies the acceptability of packaging of hazardous materials in accordance with Quality Assurance procedures. Certifies that hazardous waste shipments comply with waste acceptance criteria of the destination site.

4.4 Industrial Radiological Safety and Training - Radiologically monitors radioactive and hazardous materials and wastes for compliance with Federal, State and Local requirements during packaging and handling. Also monitors/surveys vehicles before and after loading and prior to release.

4.5 Materials Control & Accountability - Documents all movements of nuclear materials from one plant facility to another, and off-site shipments and receipts. Prepares "Shipping Order for Nuclear Material", Form FMPC-CONT-558 (See Figure 1).

4.6 Facilities Services - Provides personnel and equipment for receipt of materials, on-site movement of materials, and loading of off-site shipments of waste and product. (For hazardous materials see applicable Operations and Environmental Management Standard Operating Procedures.)

4.7 Warehousing - Verifies shipments and inspects for damages.

4.8 Safeguards and Security - Provides directions to drivers of off-site carrier vehicles from the main gate to the Process Area. Assures that the proper tamper-proof seals are installed on trailer door locks and that the seal numbers match the seal numbers listed on the outbound Bill of Lading prior to the vehicle leaving the FMPC.

4.9 Quality Operations - Prepares depleted, normal and enriched uranium materials, thorium and radioactive sources for on-site movement and packages radioactive FMPC final products for shipment, which include, but are not limited to, ingots, billets, derbies, and flats.

4.10 Waste Operations - Develops and implements controls and procedures for packaging of radioactive waste to conform to Nevada Test Site burial criteria. Packages hazardous and radioactive waste materials.

4.11 Waste Generator - For the purpose of this procedure, waste generators are WMCO employees and subcontractors who generate and package waste materials in specified containers for disposal and ensure that the packaged material meets waste criteria guidelines.

4.12 Analytical Laboratories - Provides analytical data on FMPC materials that qualify as RCRA waste and the hazard content of mixed wastes.

4.13 Shipment Originator - For the purpose of this procedure, shipment originators are WMCO employees who require nonhazardous miscellaneous materials to be sent off site by any form of conveyance.

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4.0 RESPONSIBILITIES (cont.)

4.14 Procurement - Reviews and approves miscellaneous shipping orders for o site shipment of nonhazardous miscellaneous materials.

4.15 Radioactive Source Custodian - For the purpose of this procedure, prepares Miscellaneous Shipping Order. Notifies Traffic and the Radioactive Source Controller of need for off-site shipment of radioactive source. Applies applicable label(s) per direction from Traffic.

5.0 GENERAL

5.1 WMCO shall respond to incoming emergency calls concerning an accident involving hazardous materials shipped from the FMPC or in transit in the area, supporting the agency with authority, as requested per FMPC-125, "Emergency Management."

5.2 When shipping radioactive material, the following packaging must be used:

TABLE I

DOT PACKAGING SPECIFICATIONS

Package Description	Material Description	Authorized Gross Weight Per Pkg.
DOT Spec 17C metal 5-gal. drum (DOT 7A Type A)	samples, bulk type radioactive material	100 pounds
DOT Spec 17H metal 30-gal. drum (DOT 7A Type A)	samples, bulk type radioactive material	500 pounds
DOT Spec 17H metal 55-gal. drum (DOT 7A Type A)	samples, bulk type radioactive material	900 pounds
FMPC Family of Wooden Boxes DOT 7A Type A:		
Model No. 4214	uranium metal products	1,805 pounds
Model No. 4245	uranium metal products	250 pounds
Model No. 4255	uranium metal products	1,500 pounds
Model No. 4273	uranium metal products	3,250 pounds
Model No. 4292	uranium metal products	852 pounds

5.3 No special packaging provisions are required for the on-site movement and off-site movement of nonhazardous miscellaneous materials.

5.4 PCB substances which are regulated by the Toxic Substances Control Act (TSCA) shall be controlled the same as RCRA waste material as described in Section 6.4, "Off-Site Movement of Hazardous Waste" (of this policy).

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6.0 PROCEDURE

6.1 Packaging of Radioactive Material and/or Low Level Waste

RESPONSIBILITY		ACTION
WASTE OPERATIONS	A.	Responds to FMPC requests for direction or disposal of materials.
WASTE GENERATOR	B.	Packages low-level waste per applicable department procedure(s).

NOTE: All RCRA waste shall be properly labeled at its generating point. Refer to applicable Environmental Management Standard Operating Procedure for hazardous waste satellite accumulation areas.

FACILITIES SERVICES	C.	Supplies Waste Generator with proper containers. Refer to applicable Operations Standard Operating Procedure for movement of hazardous waste.
	D.	Provides support for loading and shipping of waste and product.
QUALITY OPERATIONS	E.	Packages the uranium products in accordance with department procedures.
INDUSTRIAL RADIOLOGICAL SAFETY AND TRAINING	F.	Specifies protective equipment to be used by personnel if not addressed in existing procedures.
	G.	Surveys packages to determine dose rate and contamination levels per applicable procedures.

NOTE: Packaging of radioactive and nonradioactive hazardous material shall be accomplished in accordance with the requirements and instructions contained in Topical Manual FMPC-2089, "On-site Transportation of Radioactive and Nonradioactive Hazardous Materials."

6.2 On-Site Movement of Packaged Radioactive Materials and Low Level Waste

NOTE: Detailed requirements for loading, marking, labeling, and transporting radioactive and nonradioactive hazardous materials are contained in DOE Order 5480.3, "Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances, and Hazardous Wastes;" Topical Manual FMPC-2089, "On-Site Transportation of Radioactive and Nonradioactive Hazardous Materials;" applicable Operations Standard Operating Procedure for movement of hazardous waste; and 49 CFR 100-199. Specific requirements for lot marking and color coding are contained in FMPC-2178, "Lot Marking and Color Coding System." Specific requirements for handling drums and containers are contained in 29 CFR 1910:120(J) and applicable Environmental Management Standard Operating Procedure for hazardous waste shipment preparation.

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6.0 PROCEDURE (cont.)

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RESPONSIBILITY		ACTION
WASTE OPERATIONS WASTE GENERATOR	A.	Notifies Facilities Services of need for on-site movement of prepared FMPC final product or low level waste.
MATERIALS CONTROL & ACCOUNTABILITY	B.	Checks drums for identification and weight accuracy. Initiates and completes form "Nuclear Materials Transfer Record," FMPC-CONT-1990, FMPC-CONT-2220, and FMPC-CONT-2221.
QUALITY ASSURANCE CERTIFICATION	C.	Provides an independent overview of all operations to assure all applicable procedures for shipments have been followed and documented.
INDUSTRIAL RADIOLOGICAL SAFETY AND TRAINING	D.	Monitors materials and vehicles per applicable IRS&T procedures prior to loading to assure they are free of loose radioactive material and that no contamination is present.
FACILITIES SERVICES	E.	Loads the shipment onto the transport vehicle. Assures the vehicle is loaded correctly and the load is properly secured.
	F.	Assures a copy of the applicable transfer documents is available and in hand before the load is moved.
SAFEGUARDS AND SECURITY	G.	Assures all traffic rules on site are observed.

NOTE: All personnel shall be responsible for reporting spills/leaks of radioactive and nonradioactive hazardous materials in accordance with the requirements of the Site Policy & Procedure: FMPC-503, "FMPC Spill Incident Reporting and Cleanup;" FMPC-2182, "Emergency and Nonroutine Event Notification and Reporting;" and applicable Operations Standard Operating Procedures for hazardous material spill cleanup.

6.3 Off-Site Movement of Packaged Radioactive Materials and Low Level Waste

NOTE: Detailed requirements for loading, marking and labeling are contained in 49 CFR 100 through 199. Specific requirements for lot marking and color coding are contained in FMPC-2178, "Lot Marking and Color Coding System." Shipments of bulk low level waste shall be processed per applicable Operations Standard Operating Procedures.

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6.0 PROCEDURE (cont.)

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RESPONSIBILITY		ACTION
WASTE OPERATIONS	A.	Marks and labels containers.
	B.	Stages material on the main truck dock located south of Building 71.
MATERIALS CONTROL & ACCOUNTABILITY	C.	Initiates and completes Form FMPC-CONT-558, "Shipping Order for Nuclear Material" (See Figure 1).
WAREHOUSING	D.	Verifies shipment and inspects containers for damage.
INDUSTRIAL RADIOLOGICAL SAFETY AND TRAINING	E.	Surveys packages to determine acceptability of radiation levels and contamination levels per applicable departmental procedures.
WASTE PACKAGING QUALITY ASSURANCE	F.	Verifies the roadworthiness of the trailer and that all markings and applicable labels are displayed on each container and the condition of the container is acceptable.
QUALITY ASSURANCE CERTIFICATION	G.	Provides an independent overview of all operations to assure that all applicable procedures for shipments have been followed and documented.
INDUSTRIAL RADIOLOGICAL SAFETY AND TRAINING	H.	Monitors vehicle per applicable departmental procedures prior to loading, to assure it is not contaminated.
FACILITIES SERVICES	I.	Inspects vehicle for roadworthiness and applicable documents. Ensures that vehicles with significant defects are rejected and repaired or returned to the carrier unused.
	J.	Loads the shipment onto the transport vehicle. Assures the vehicle is loaded correctly, the load is properly secured, and the vehicle is scale weighed to confirm legal overall gross and axle weight limits.
FACILITIES SERVICES	K.	Assures a copy of the applicable paperwork is made available to the Traffic.
	L.	Closes the trailer doors, fastens a numbered tamper-proof seal to the locking mechanism.
WAREHOUSING	M.	Applies Radioactive Placards when required.

6.0 PROCEDURE (cont.)

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RESPONSIBILITY		ACTION
INDUSTRIAL RADIOLOGICAL SAFETY AND TRAINING	N.	Monitors loaded trailer per applicable departmental procedures to assure radiation and contamination levels are within acceptable limits.
TRAFFIC	O.	Collects and reviews all completed forms and check sheets related to the shipment and vehicle. Prepares shipping documents per applicable Traffic procedures and issues instructions to carrier's driver.
	P.	Notifies consignee of impending shipments.
WASTE PACKAGING QUALITY ASSURANCE	Q.	Reviews and verifies data on the shipping papers as an independent overview.
	R.	Makes a safety inspection of waste shipment vehicle.
QUALITY ASSURANCE CERTIFICATION	S.	Provides a final overview to ensure that all required checks have been made to verify compliance with requirements. Issues a signed certification statement as required by the destination site, and signs the quality section of "FMPC Shipping Order for Nuclear Material", Form FMPC-CONT-558 (See Figure 1) to signify that a quality release has been made for that shipment.
SAFEGUARDS AND SECURITY	T.	Verifies numbers on tamper-proof seal against Bill of Lading and releases vehicle.

NOTE: The tractor, after connection to a loaded trailer, must be monitored prior to departing the FMPC.

6.4 Off-Site Movement of Hazardous Waste

RESPONSIBILITY		ACTION
WASTE OPERATIONS	A.	Coordinates waste sampling with Analytical Laboratories.
ANALYTICAL LABORATORIES	B.	Provides analytical data on FMPC materials that qualify as RCRA waste and the hazard content of mixed wastes to the Nuclear Material Accountability and Traffic Section.
TRAFFIC	C.	Provides information on the type of containers required to package waste material.

6.0 PROCEDURE (cont.)

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RESPONSIBILITY		ACTION
MATERIALS CONTROL AND ACCOUNTABILITY	D.	Verifies that the lot number and weights on each container are correct. Initiates and completes form FMPC-CONT-558, "Shipping Order for Nuclear Material" (See Figure 1).
INDUSTRIAL RADIOLOGICAL SAFETY AND TRAINING	E.	Surveys packages and records results using department procedures.
WASTE OPERATIONS	F.	Marks and labels containers.
TRAFFIC	G.	Prepares shipping manifest and documents per applicable traffic procedure.

NOTE: Refer to Section 6.3 for loading requirements. While PCB waste activities are similar to hazardous waste, detailed requirements for loading, marking, labeling, notification, and manifesting for PCB waste activities are contained in Regulatory Compliance Guide SW:1, "TSCA Record Keeping," and 40 CFR 761.

6.5 Off-Site Movement of Nonhazardous Miscellaneous Items

RESPONSIBILITY		ACTION
SHIPMENT ORIGINATOR	A.	Initiates "Miscellaneous Shipping Order", Form FMPC-ADMS-871 (See Figure 2).
QUALITY ASSURANCE CERTIFICATION	B.	Reviews shipping order if Quality Level 3 or above is specified.
PROCUREMENT	C.	Completes and approves "Miscellaneous Shipping Order" Form FMPC-ADMS-871 (See Figure 2).
INDUSTRIAL RADIOLOGICAL SAFETY AND TRAINING	D.	Surveys packages to determine radiation levels and contamination levels per applicable departmental procedures.
WAREHOUSING	E.	Determines packaging necessary to protect material with Traffic Section assistance as necessary.
	F.	Packages material.

6.6 Off-Site Movement of Packaged Radioactive Sources

RESPONSIBILITY		ACTION
RADIOACTIVE SOURCE CUSTODIAN	A.	Initiates Miscellaneous Shipping Order" Form FMPC-ADMS-871 (See Figure 2).

6.0 PROCEDURE (cont.)

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RESPONSIBILITY		ACTION
RADIOACTIVE SOURCE CUSTODIAN (cont.)	B.	Notifies Traffic and Radioactive Source Controller of need for off-site shipment of radioactive source.
	C.	Applies applicable label(s) per direction from Traffic.
QUALITY ASSURANCE CERTIFICATION	D.	Reviews shipping order per applicable departmental procedures.
PROCUREMENT	E.	Approves Miscellaneous Shipping Order and forwards to Traffic.
WAREHOUSING	F.	Verifies shipment and inspects container for damage.
INDUSTRIAL RADIOLOGICAL SAFETY AND TRAINING	G.	Surveys packages to determine acceptability of radiation levels and contamination levels per applicable departmental procedures.
TRAFFIC	H.	Schedules radioactive source to be shipped.
	I.	Collects and reviews all completed forms and check sheets related to the shipment. Prepares shipping documents per applicable departmental procedures.
	J.	Notifies Facilities Services upon arrival of carrier.
INDUSTRIAL RADIOLOGICAL SAFETY AND TRAINING	K.	Monitors vehicle per applicable departmental procedures prior to loading, to assure it is not contaminated.
FACILITIES SERVICES	L.	Inspects vehicle for roadworthiness and generates applicable documents. Ensures that vehicles with defects are repaired or returned to the carrier unused.
	M.	Assures copies of applicable transfer documents from Traffic are in hand prior to radioactive source being moved from point of origin.
	N.	Assures applicable labels have been properly placed on container.
	O.	Loads and transports radioactive source from point of origin to predetermined on-site shipping point per Topical Manual FMPC-2089

6.0 PROCEDURE (cont.)

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RESPONSIBILITY		ACTION
FACILITIES SERVICES (cont.)	P.	Loads shipment onto the carrier's transport vehicle. Assures radioactive source is loaded correctly and properly secured.
	Q.	Completes applicable paperwork and returns all documentation to the Traffic.
	R.	Closes trailer doors and assures locking mechanism is properly secured.
WAREHOUSING	S.	Applies Radioactive placards when required.
INDUSTRIAL RADIOLOGICAL SAFETY AND TRAINING	T.	Monitors loaded trailer per applicable departmental procedures to assure radiation and contamination levels are within acceptable limits.
TRAFFIC	U.	Collects and reviews all completed forms and check sheets related to shipment and vehicle. Signs shipping documents and issues instructions to carrier's driver.
	V.	Notifies consignee of impending shipment(s).
SAFEGUARDS AND SECURITY	W.	Verifies carrier's driver has copy of signed bill of lading and releases vehicle.

NOTE: The tractor must be monitored prior to departing the FMPC.

6.7 Off-Site Movement of Packaged Radioactive Samples

RESPONSIBILITY		ACTION
MATERIALS CONTROL & ACCOUNTABILITY	A.	Completes Form FMPC-CONT-558, "Shipping Order for Nuclear Material" (See Figure 1).
INDUSTRIAL RADIOLOGICAL SAFETY AND TRAINING	B.	Surveys packages to determine acceptability of radiation and contamination levels per applicable department procedures.
FACILITIES SERVICES	C.	Moves packaged material to Receiving.
WAREHOUSING	D.	Verifies shipment and inspects containers for damage.
TRAFFIC	E.	Collects and reviews all completed forms related to shipment. Prepares shipping documents per applicable Traffic procedures and issues instructions to carrier's drivers.

7.0 APPLICABLE DOCUMENTS

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FMPC-125, "Emergency Management"

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

FMPC-2089, "On-Site Transportation of Radioactive and Nonradioactive Hazardous Materials"

FMPC-2115 Revision 1, "Materials Control & Accountability Plan"

FMPC-2086, "Hazard Communication Standard Written Program," (list of nonradioactive hazard materials on site)

FMPC-2178, "Lot Marking and Color Coding System"

FMPC-2182, "Emergency and Nonroutine Event Notification and Reporting"

FMPC-2084, "Radiation control Manual"

FMPC, "Transportation Manual"

DOE Order 5480.3, "Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances and Hazardous Waste"

DOE Order 1540.1, "Material Transportation and Traffic Management"

DOE Order 1540.2, "Hazardous Material Packing and Transport"

10 CFR 1900.1200, "Hazard Communication"

29 CFR 1910.120(J), "Hazardous Waste Operations and Emergency Response"

40 CFR Parts 260-265, "Protection of Environment"

40 CFR 761, "Polychlorinated Biphenyls (PCB) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions"

49 CFR 100-199, "Transportation"

OAC 3745-53, "Transporters of Hazardous Waste"

OAC 4901, "Ohio Public Utilities Commission"

OAC 5501, "Ohio Department of Transportation"

Regulatory Compliance S.W:1 "Guide TSCA Record Keeping"

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8.0 APPLICABLE FORMS

8.1 FMPC-CONT-588, "Shipping order for Nuclear Material"

8.2 FMPC-ADMS-871, "Miscellaneous Shipping Order"

9.0 FIGURES

9.1 Figure 1 - FMPC-CONT-588 - "Shipping Order for Nuclear Material"

9.2 Figure 2 - FMPC-ADMS-871 - "Miscellaneous Shipping Order"

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NOTE: Spaces marked A are for use of classification stamps when required

Westinghouse Materials Company of Ohio

SHIPPING ORDER FOR NUCLEAR MATERIAL

A

Date Prepared: _____

SHIP TO:	ROUTING:			SHIPPERS AUTHORIZATION NO.:	SHIPPING ORDER NO.:
STREET:	PREPAID:	CAR OR TRAILER NO.:	SEAL NO.:	SHIPPED FROM PLANT:	ORIGINATOR NO.:
CITY: / STATE:	COLLECT:	BILL OF LADING NO.:	QUALITY CONTROL APPROVAL:		DATE SHIPPED:
SPECIAL INSTRUCTIONS:		COUNTER CONTROL NO.:	PROJECT NO.:		TIME SHIPPED:

Type of Material _____ FMPC Production Order No _____ Originator's Signature _____

Station RIS _____ DOE 741 No _____ Shipment Authorized By _____ (NUCLEAR MATERIAL SUPERVISOR REPRESENTATIVE)

NMC DATA			ORIGINATOR'S DATA						MATERIAL CONTROL DATA							
FROM MBA	COST CODE	741 NO	PO NO	LOT NUMBER	QUANTITY	WEIGHT (LBS) GROSS	TARE	NET	ANAL CODE	ELE ANAL	ELE LBS	ELE GRAMS OR KGS	LIMIT ERROR ELE	ISO ANAL	ISO GRAMS OR KGS	LIMIT ERROR ISO

DISTRIBUTION OF COPIES			
1	NMA (RECORD COPY)	5	Cost Accounting
2	Shipping Group	6	Originator of Shipping Order
3	Quality Control		
4	Production Control		

FMPC-CONT 566 (REV 6/89)

I, _____ certify that this shipment was made on the above date after complying with all security regulations.

A

Audited by _____ Date _____

A

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SHIPPING ORDER FOR NUCLEAR MATERIAL
Figure 1

FMPC-T 2657-1 (REV 5 12 87)

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Westinghouse Materials Company of Ohio
BOX 398704, CINCINNATI, OHIO 45239-8704
PHONE 513-738-6200

MISCELLANEOUS SHIPPING ORDER

MSO No. _____

Date _____

SHIP TO	STREET	CITY & STATE

VIA

GROSS	TARE	NET	PREPAID	COLLECT

Requested By _____ (ORIGINATOR)

QUANTITY	FULL DESCRIPTION

REASON FOR SHIPMENT

GIVE LOCATION IF NOT DELIVERED TO SHIPPING

REFERENCE OR PURCHASE ORDER NO	CHARGE

Approved By _____ (PURCHASING)

(TO BE FILLED IN BY TRANSPORTATION)

Date Shipped _____ Bill of Lading No. _____

Received in Good Order By _____

DISTRIBUTION OF COPIES	
1 (White) Transportation (RECORD COPY)	5 (Salmon) Stores (RECORD COPY)
2 (Pink) Accounting - Accounts Payable (RECORD COPY)	6 (Canary) Receiving
3 (Blue) Purchasing	7 (Green) Originator
4 (Goldenrod) Consignee	

FMPC-SAML-671 (REV 7-16-88)

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Miscellaneous Shipping Order
Figure 2

FMPC-2657-1 (REV 5 12 87)

OPER.TIONS PROCEDURE	OVERPACKING DEFECTIVE CONTAINERS	SOP 20-C-600
Authorization: R. L. Gardner Operations Facilities/Waste Mgt.	Supersedes: 1-C-804, 6-10-88	AREA: As Applicable Issue Date: 03-06-91

1.0 PURPOSE

The purpose of this document is to establish the procedure for overpacking defective containers.

2.0 APPLICABILITY

This procedure shall apply to material containers which are defective or unacceptable for storage.

3.0 RESPONSIBILITY

3.1 The supervisor shall be responsible for the following:

3.1.1 Ensuring that personnel are qualified per the existing training requirements identified by the Department/Staff Manager.

3.1.2 Final determination to overpack a container.

3.1.3 If multiple containers are to be overpacked into a single overpack drum, ensuring that defective containers contain compatible materials.

3.1.4 Designating appropriate lifting device.

3.1.5 Supplying the Materials Control and Accountability (MC&A) Specialist with recorded information taken from container(s) including Forms FMPC-PRO-2987 and FMPC-CONT-367.

3.1.6 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection for the process being performed.

3.1.7 Providing operators with the required respiratory protection.

3.1.8 Immediately notifying the Assistant Emergency Duty Officer (AEDO) and submitting a Minor Event Report (MER) in the event of a hazardous material spill or abnormal event.

3.2 Materials Control & Accountability (MC&A) shall be responsible for reconciling and maintaining the inventory records of materials at the applicable location.

3.3 Operators shall be responsible for complying with this procedure.

R - MATERIAL REVISED, ADDED, OR DELETED.

4.0 DEFINITIONS

4.1 Overpack Drum - A drum into which one or more smaller defective containers are placed.

4.2 Defective Container - A container with holes, dents, bulges and/or corrosion which is unacceptable for storage of material.

4.3 Overpack Tare Weight - The sum of the tare weight(s) from the defective container(s) plus the tare weight of the overpack drum.

4.4 Overpack Net Weight - The overpack gross weight minus the overpack tare weight.

4.5 Overpack Gross Weight - The weight of the completed overpack; defective container(s) plus overpack drum.

5.0 REFERENCES

5.1 SOP 20-C-602, "Inspection and Operation of Nilfisk Portable Vacuum Units"

5.2 SOP 20-C-904, "General Nuclear Safety Requirements"

5.3 FMPC-2178, "Lot Marking and Color Coding System"

5.4 SOP 20-C-606, "Hazardous Material Spill Cleanup"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 Safety glasses with side shields shall be worn unless other eye protection is specified.

6.3 Respiratory protection provided by the supervisor shall be worn when required.

6.4 Leather-palm gloves shall be worn to protect the hands from rough or sharp edged material and possible contamination.

6.5 A NILFISK HEPA type filter vacuum cleaner shall be used in accordance with SOP 20-C-602, or a vacuum system approved by IRS&T, when cleanup is requir

6.6 As applicable, nuclear safety requirements of SOP 20-C-904 shall be followed in the handling of depleted, normal, and/or enriched material.

R - MATERIAL REVISED, ADDED, OR DELETED.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont,)

6.7 Any release of hazardous material shall be reported immediately per SOP 20-C-606.

6.8 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to Environmental and Radiation Monitoring for evaluation. The involved employees shall report to Medical Services at the end of their shift to submit a urine sample and again report at the start of their next shift to submit another urine sample.

7.0 PROCEDURE

NOTE: "Cautions" and "Warnings" precede the step to which they apply.

7.1 Overpacking into Drums

7.1.1 Prepare loading area by laying down a tarpaulin, plastic sheet, or other equivalent material on ground.

7.1.2 Select defective containers to be overpacked.

NOTE: If multiple containers are to be overpacked into a single overpack drum, supervisor shall ensure that defective containers contain compatible materials.

NOTE: If defective containers are vented, supervisor shall ensure overpack drums are vented.

7.1.3 Inspect the area around the defective container(s). If material is visible around the container(s), notify the supervisor.

NOTE: Leaking container(s) shall be overpacked within 24 hours from time of discovery.

NOTE: The supervisor shall report the spill and direct spill cleanup per SOP 20-C-606.

NOTE: HEPA filtered vacuum systems shall not be used if the HEPA test has expired or test sticker is broken.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

CAUTION

CAREFULLY MOVE THE DEFECTIVE CONTAINERS(S) TO PREVENT FURTHER DAMAGE.

7.1.4 Move defective containers to loading area.

NOTE: Containers loaded on a pallet for transport shall be strapped.

7.1.5 Complete "Container Overpack Information" sheet, Form FMPC-PRO-2987 (See Figure 1) with data from defective container(s).

7.1.5.1 If the information which appears on the defective drum(s) is illegible and/or non-existent, contact supervisor.

NOTE: Supervisor shall contact IRS&T, SWC, Transportation or MC&A as applicable for assistance in identifying material/container markings.

7.1.6 Prepare new markings/labels for the overpack drum identification by using the markings/labels on the defective container(s).

7.1.7 Transmit Form FMPC-PRO-2987 to MC&A Specialist's Office for verification.

7.1.7.1 If the form is acceptable, proceed to step 7.1.8.

7.1.7.2 If the form is not acceptable, correct any discrepancies with assistance from MC&A. Notify supervisor as necessary.

7.1.8 Obtain required overpack drum according to material compatibility and defective container size.

7.1.9 Inspect overpack drum to ensure no dents, holes, or corrosion is present.

7.1.9.1 If damage/corrosion is present, notify supervisor.

7.1.10 Ensure scale to be used has been inspected and calibrated per the applicable SOP for the scale to be used.

7.1.11 Tare weigh the empty overpack drum and record the overpack drum tare weight on Form FMPC-PRO-2987.

7.1.12 Move the empty overpack drum to the loading area.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.1.13 Remove the gasket, locking ring, and lid.

7.1.14 Ensure that the forklift/or hoist and lifting device specified by supervisor has been checked per the applicable SOP.

CAUTION

KEEP FINGERS OUT OF PINCH POINTS WHILE LOWERING DEFECTIVE CONTAINER(S) INTO OVERPACK.

7.1.15 Using the specified forklift/or hoist and lifting device, place defective container(s) into the overpack drum (See Figure 2 for the primary equipment utilized for this task).

NOTE: Other lifting equipment may be utilized with the approval of the immediate supervisor and IRS&T.

7.1.16 Check condition of gasket, lock ring, and drum lid. Replace damaged items.

7.1.17 Seat lid and gasket evenly on overpack drum.

7.1.18 Place locking bolt ring around lid of overpack drum ensuring the flanges point downward from the lock ring.

NOTE: Locking bolt shall be positioned no more than six inches from the seam of the drum.

7.1.19 Install locking bolt shaft through the unthreaded flange, locking nut, and threaded flange (See Figure 3) so that the locking bolt head rests against unthreaded flange.

7.1.20 Tighten the locking bolt or latch lever lock.

7.1.21 Manually tighten the locking nut against the threaded flange.

7.1.22 Using a wrench, tighten the locking nut against the threaded flange an additional 1/4 turn.

7.1.23 Weigh the completed overpack and record the overpack gross weight on Form FMPC-PRO-2987 (See Figure 1).

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.1.24 Calculate overpack tare and net weights.

NOTE: Overpack Tare Weight is the sum of the tare weight(s) from the defective container(s) plus the tare weight of the overpack drum.

NOTE: Overpack Net Weight is the overpack gross weight (Step 7.1.23) minus the Overpack Tare Weight.

7.1.25 Record the overpack tare weight and the overpack net weight on Form FMPC-PRO-2987.

7.1.26 Using information from Form FMPC-PRO-2987, stencil/paint the required identification per Figure 4, using applicable section number.

NOTE: Paint sticks may be used until proper stenciling can be perform

NOTE: Stencil or marking shall be legible block letters, 1-1/2 inches in height (minimum).

NOTE: The drum labeling arrangement in Figure 4 is effective upon date of issue of this procedure. Drums labeled prior to this date shall not require relabeling.

7.1.26.1 If the overpack drum contains non-RCRA material or uncharacterized material, stencil/paint the FMPC Lot Marking Code followed by the drum number using two lines as shown in Figure 4, Section 1.

7.1.26.2 If the overpack drum contains RCRA material, stencil/paint the FMPC Lot Marking Code followed by the drum number using one line as shown in Figure 4, Section 2.

7.1.27 Affix all markings/labels previously prepared (See step 7.1.6) to the overpack drum in accordance with Figure 4 per the applicable section number.

7.1.28 Transmit Form FMPC-PRO-2987 to the supervisor or the applicable MC&A Specialist.

P - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.1.29 Move the overpack as instructed by the supervisor and record location on the "Permanent Inventory Record", Form FMPC-CONT-367 (See Figure 5) and transmit to MC&A.

NOTE: Containers loaded on a pallet for transport shall be strapped.

7.2 Overpacking into Double Lid Drums

7.2.1 Complete steps 7.1.1 thru 7.1.12.

7.2.2 Stencil "TOP" on side of the overpack drum, left of center, and near top bolt ring. Stencil "BOTTOM" on side of the overpack drum, left of center, and near the bottom bolt ring (See Figure 4, Section 6).

7.2.3 Remove the bolt ring, gasket, and lid from drum end marked "BOTTOM".

7.2.4 Place a pallet in the loading area.

7.2.5 Place a 24 inch x 1-1/2 inch plywood disk on top of the pallet.

7.2.6 Check condition of gasket, bolt ring and drum lid. Replace damaged items.

7.2.7 Place the overpack drum bottom lid on top of the plywood disk with the inside of the lid facing up.

7.2.8 Place locking bolt ring around the lid of the overpack drum ensuring the flanges point upward from the lock ring (See Figure 4).

NOTE: Locking bolt shall be positioned no more than six inches from the seam of the drum.

CAUTION

CAREFULLY MOVE THE DEFECTIVE CONTAINER(S) TO PREVENT FURTHER DAMAGE.

7.2.9 Using the specified forklift/or hoist and lifting device, center the defective container(s) on the disk/lid.

7.2.10 Using the lifting device, place the overpack drum with a lid assembly on the end of the drum marked "TOP", over the defective container(s).

7.2.10.1 Seat overpack drum evenly on lid and gasket.

7.0 PROCEDURE (cont.)

7.2.11 Complete steps 7.1.19 thru 7.1.22.

7.2.12 Remove the bolt ring, gasket, and lid from drum end marked "TOP".

7.2.13 Complete steps 7.1.16 thru 7.1.29.

7.3 Overpacking into Vented Single Lidded Drums

NOTE: Supervisor shall specify the method used to make the vent holes in the overpack drum.

7.3.1 Complete step 7.1.1 thru 7.1.13.

7.3.2 Using the method specified by supervisor, make two 1/4 inch to 1 inch holes (180 degrees apart) in the side of the drum approximately 1 foot below the top rim of the overpack drum ensuring vent holes do not interfere with the lock ring (See Figure 4, Section 3).

7.3.4 Using a stencil and white paint, mark the side of the drum with the word "Vent" to indicate the drum has been vented.

NOTE: The word "Vent" shall be 1-1/2 to 2 inches high and located under the bottom chime at the drum seam (drum centerline). (See Figure 4, Section 3.)

7.3.5 Record the required data on the "Drum Venting Record", Form FMPC-OPR-3228 (See Figure 6).

7.3.6 Complete steps 7.1.14 thru 7.1.29.

7.4 Overpacking into Vented, Double Lidded Drums

7.4.1 Complete steps 7.1.1 thru 7.1.12.

7.4.2 Stencil "TOP" on one side of the overpack drum, near bolt rings and "BOTTOM" on the other side of drum near bolt rings.

7.4.3 Position drum with "TOP" end up (See Figure 4).

7.4.4 Remove the bolt ring, gasket, and lid from drum end marked "TOP".

7.4.5 Complete steps 7.3.2 thru 7.3.5.

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7.0 PROCEDURE (cont.)

7.4.6 Complete steps 7.2.4 thru 7.2.11.

7.4.7 Complete steps 7.1.16 thru 7.1.29.

8.0 APPLICABLE FORMS

8.1 FMPC-PRO-2987, "Container Overpack Information"

8.2 FMPC-CONT-367, "Permanent Inventory Record"

8.3 FMPC-OPR-3228, "Drum Venting Record"

R - MATERIAL REVISED, ADDED, OR DELETED.

CONTAINER OVERPACK INFORMATION

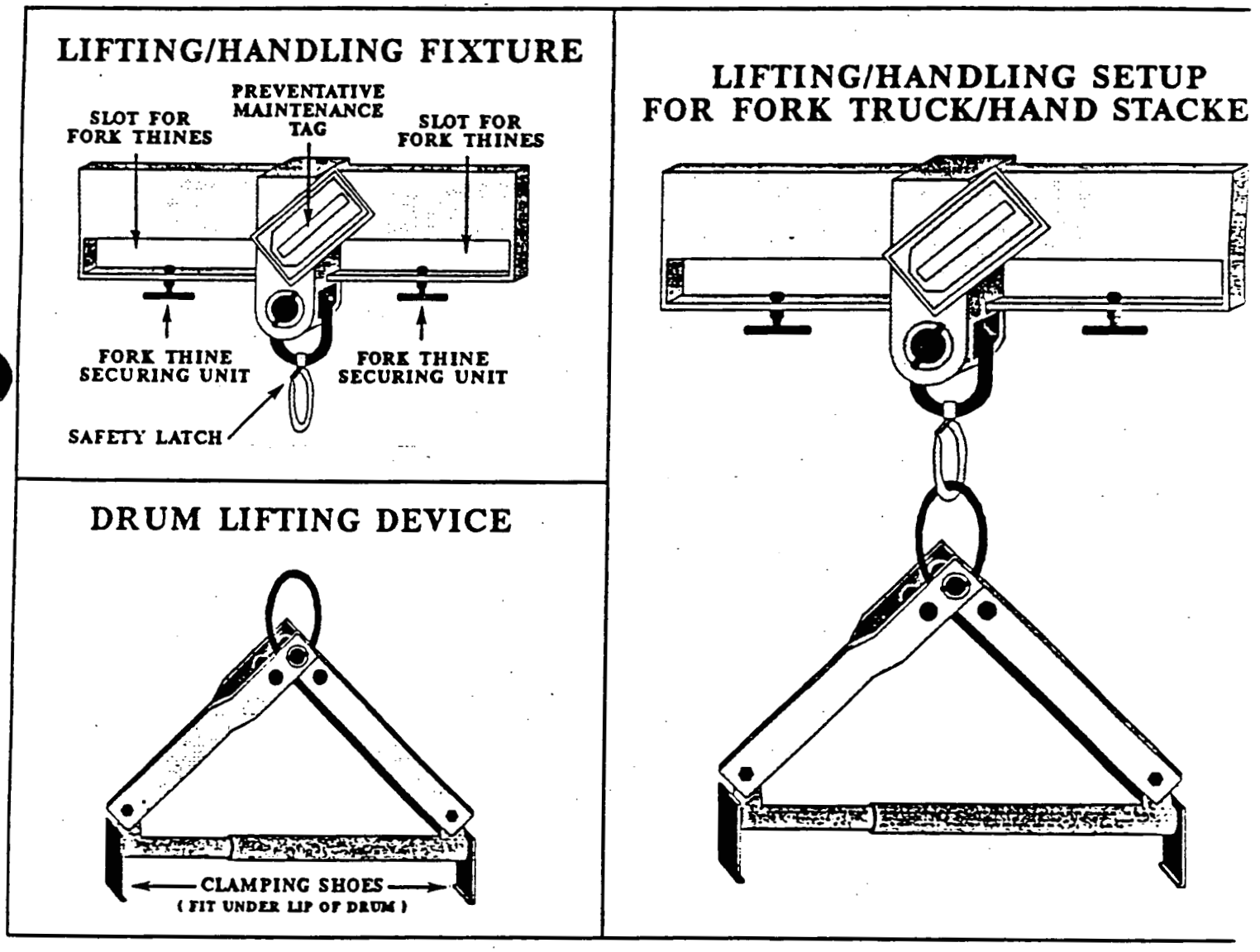
DATE:_____ BADGE:_____

LOT NUMBER	DEFECTIVE WEIGHTS				OVERPACK WEIGHTS				ADDED INFORMATION				LOCATION			OVER-PACK SIZE	VISUAL LOSS OF MATERIAL		LIQUID
	DR. NO.	GROSS	TARE	NET	DR. NO.	GROSS	TARE	NET	GAIN	LOSS	WET	DRY	AREA	ROW	STACK		YES	NO	SOLID
TOTALS																			

FMPC-PRO-2987

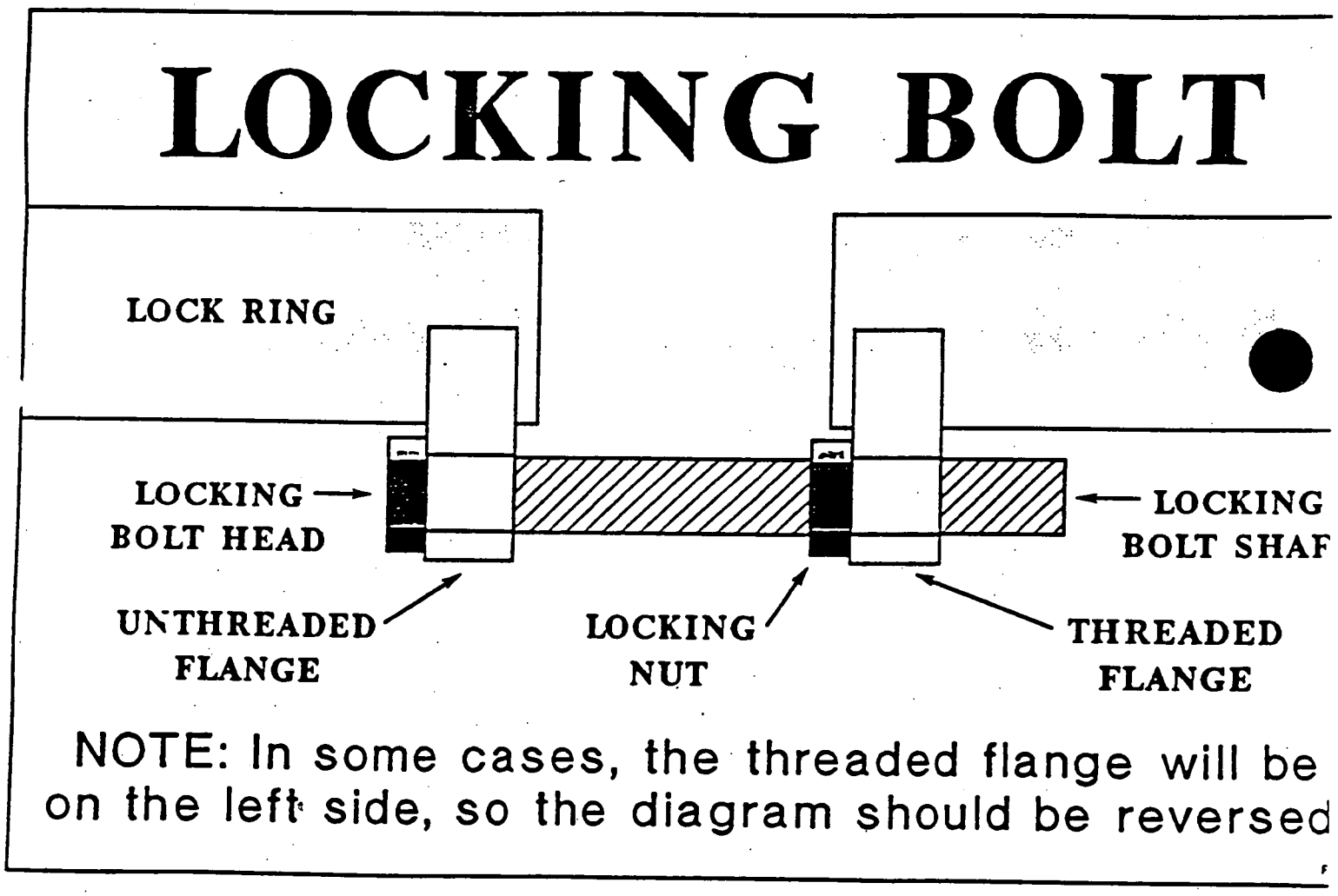
CONTAINER OVERPACK INFORMATION
FORM FMPC-PRO-2987
Figure 1

R - MATERIAL REVISED, ADDED, OR DELETED.



TYPICAL LIFTING/HANDLING EQUIPMENT
Figure 2

R - MATERIAL REVISED, ADDED, OR DELETED.



INSTALLATION OF BOLT-TYPE LOCKING RING
Figure 3

R - MATERIAL REVISED, ADDED, OR DELETED.

FMPC WESTINGHOUSE MATERIALS COMPANY OF OHIO OPERATIONS DOCUMENT PROGRAM	Page 13 of 16 Revision No. 0	
OPERATIONS PROCEDURE	OVERPACKING DEFECTIVE CONTAINERS	SOP 20-C-600 AREA: As Applicable
Authorization: R. L. Gardner Operations Facilities/Waste Mgt.	Supersedes: 1-C-804, 6-10-88	Issue Date: 03-06-91

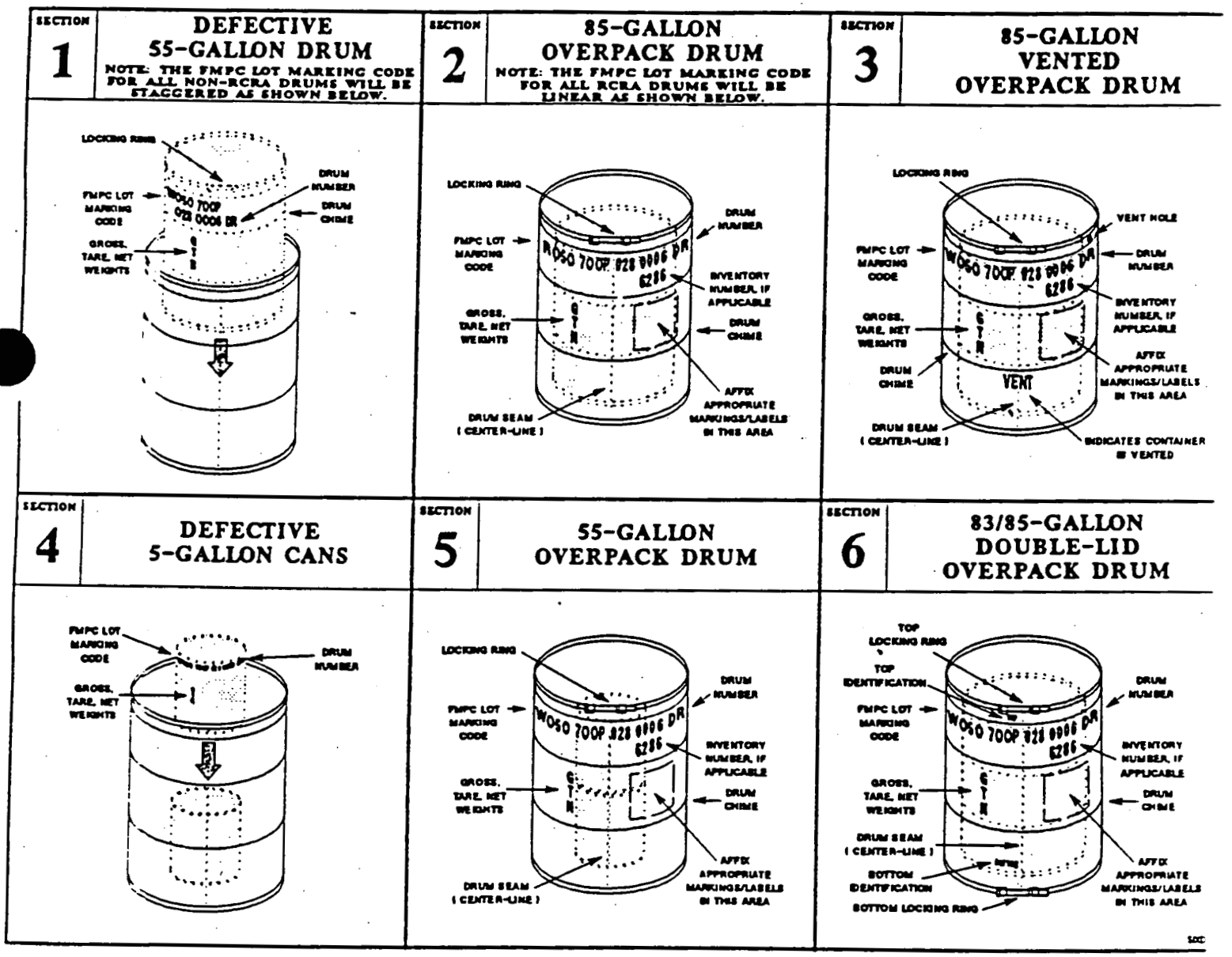


DIAGRAM OF OVERPACK/DEFECTIVE CONTAINER IDENTIFICATION
Figure 4

R - MATERIAL REVISED, ADDED, OR DELETED.

FMPC
CONTROLLER'S ORGANIZATION - MATERIALS CONTROL AND ACCOUNTABILITY
PERMANENT INVENTORY RECORD

DATE	INVENTORY SHEET NUMBER
PLANT	AREA	NUCLEAR MATERIAL

LINE NO	BADGE NUMBER	INVENTORY NUMBER	LOT NUMBER					DRUM NO	GROSS WEIGHT POUNDS	TARE WEIGHT POUNDS	NET WEIGHT POUNDS	MBA	LOCATION			DRUM SIZE	1 - YES	
			P O NUMBER	SOURCE	CLASS	MATERIAL	SEQUENCE						ROW	STACK	LEVEL		OP	POOS
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
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16																		
17																		
18																		
19																		
20																		

PERMANENT INVENTORY RECORD
FORM FMPC-CONT-367
Figure 5

R - MATERIAL REVISED, ADDED, OR DELETED.

FMPC
DRUM VENTING RECORD

Plant _____

DRUM NUMBER	LOT NUMBER	WTC/SRC	DAMAGED/DEPOSITED YES	DAMAGED/DEPOSITED NO	DRUM VENTED YES	DRUM VENTED NO	DATE	OPERATOR NAME AND BADGE NUMBER	OVERPACK YES	OVERPACK NO

REMARKS: _____

DRUM VENTING RECORD
FORM FMPC-OPR-3228
Figure 6

R - MATERIAL REVISED, ADDED, OR DELETED.

RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
03-06-91	0	Requirement for a new procedure for overpacking defective containers per Request No. P91-058 initiated by J. W. Ogg.

R - MATERIAL REVISED, ADDED, OR DELETED.

FMPC-2178
INTERNAL SPECIAL

FMPC LOT MARKING AND COLOR CODING SYSTEM

by

THE STAFF OF THE MC&A SECTION

Revised July 1, 1989

FEED MATERIALS PRODUCTION CENTER
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Prepared for the
U.S. Department of Energy
OAK RIDGE OPERATIONS OFFICE
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NOTICE

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INTRODUCTION

The United States Department of Energy (DOE) requires WMCO to maintain rigid control of nuclear materials through the preparation of detailed material balances showing the receipt, consumption, production, shipment and inventory of all nuclear materials consigned to the Feed Materials Production Center for processing for the DOE defense programs or for recovery.

The keystone of effective nuclear materials control is accurate and complete identification and segregation of each distinct material so that an appropriate uranium or thorium content and isotopic level may be determined and applied toward the construction of material balances. A highly developed system of nuclear materials identification is essential for the maintenance of product quality and nuclear safety.

In order to adapt the handling of plant operational data to electronic data processing, this identification must be translated from words to "alphanumeric" (containing numbers or letters or both) codes which are used in computer programming.

A key feature of the coding system is the assignment of the same material description code to similar materials regardless of their source or special nature, whether it be normal uranium, enriched uranium, depleted uranium or thorium.

Rev. 7/1/89

This booklet has been prepared to describe and illustrate the use of the lot marking and color coding system employed at the FMPC. Deviations from procedures outlined herein could result in costly interruption of plant production, unnecessary expenditures for clean-up of contaminated equipment, or injury to personnel due to faulty identification of material. Furthermore, the application of incorrect codes to accurately weighed and segregated materials could result in improper material balances which can reflect unfavorably on our ability to control nuclear materials. For all of these reasons, it is vital to our operations that this booklet be widely distributed and kept readily available for reference by all those concerned with material identification.

* * * * *

REVISION

The periodic review and updating of this coding system will be performed by the Materials Control and Accountability Section. Requests for revision should be submitted in writing to the Materials Control and Accountability Section on Form No. FMPC-2077.

CHAPTER 1 Lot Marking System

The FMPC lot mark will consist of five basic elements as follows:

Element	Thorium	Enriched; Depleted; and Normal Uranium
I Production Order Number	None	4 digits
II Origin or Source Code	3 digits	3 digits
III Class or Enrichment Code combined with	1 digit.	1 digit
IV Material Description Code	3 digits	3 digits
V Lot or Sequence Number	4 digits	4 digits
Total Digits	11 digits	15 digits

Elements I, II, III, and V are alpha-numeric (contain numbers or letters or both).

Element IV is numbers only.

Elements III and IV will be combined into a four-character material type code.

Elements II, III and V will be separated from their predecessors by hyphens or dashes.

A detailed description of the composition of each element follows:

I Production Order Number

This designation is assigned by the Production Scheduling Section to identify certain key production activities. It usually consists of one letter followed by three digits, e.g. A500. In the lot marking system, it is always used in identification of enriched, depleted and normal materials. Waste packaged specifically for shipment to NTS may be marked with the PO Number N003.

When enriched uranium materials of irregular percent U^{235} content, for which no Production Order is applicable, are received or generated, special designations are assigned as outlined in the following paragraphs:

1. "S", followed by three digits indicating the shipper's percent U^{235} to two decimal places, is used to identify receipts of unusual U^{235} levels.

"S", followed by three digits, indicates the on-site producing plant's best estimate of the highest isotopic processed over a particular campaign. It is used to identify residue materials generated from the processing of materials of irregular U^{235} levels in FMPC operations. Materials containing up to 9.99 percent U^{235} will be coded as S plus the 3 digit isotopic value. Materials containing 10.00 to 19.99 percent U^{235} will be coded with only the isotopic value (4 digits).

2. "W", followed by three digits indicates the on-site generating plant's best estimate of the highest isotopic associated with nonrecoverable contaminated waste material.

3. "X", followed by three digits, as indicated in the summary below, designating a range of percent U^{235}, will be used to identify certain residues produced from the mixing of materials of regular production but differing U^{235} levels (all numbers are inclusive):

a. X948 for 0.148 to 0.193 & 0.207 to 0.709
b. X110, X111, X118 & X119 for 0.710 to 0.712
c. X008 for 0.713 to 0.756
d. X884 for 0.757 to 0.853
e. X500 for 0.867 to 0.940
f. X888 for 0.954 to 1.243
g. X767 for 1.257 to 1.593
h. X911 for 1.607 to 2.093

4. "P" followed by three digits, indicates the on-site producing plant's estimate of the highest isotopic associated with uranium products or residues containing trace quantities of plutonium requiring special handling.

5. "R", followed by three digits, indicates the on-site producing plant's estimate of the highest isotopic associated with uranium products or residues containing RCRA mixed hazardous materials requiring special handling.

II Origin or Source Code

This is three-digit code with a block of 100 numbers assigned to each plant, as indicated in the following table. The plants are divided into sub-areas with subordinate blocks of numbers assigned to each.

FMPC Origin or Source Codes			
000 - 099	Reserved for future needs	500 - 599	Plant 5
		600 - 699	Plant 6
100 - 199	Plant 1	700 - 799	Miscellaneous facilities
200 - 299	Plants 2 & 3		
300 - 399	Pilot Plant	800 - 899	Plant 8
400 - 499	Plant 4	900 - 999	Plant 9

For example, Plant 5 is assigned 500-599 and the Reduction Area in Plant 5 is assigned 510 to 529. Within the area, each operation or piece of equipment which may generate a material for coding is assigned a source number. In the Plant 5 Metal Reduction Area, the Rockwell furnaces are assigned 516 and the breakout area dust collectors 520. The intention is to provide a flexible system which can be used to identify a particular item of equipment as a source, if this is desirable, or to allow coding by general area or by plant if this is all that is required.

A complete list describing all FMPC Source or Origin codes currently assigned will be found in Chapter 4 of this booklet.

Off-site origin codes used in processing receipts from other nuclear facilities are alphabetically designated using the three-letter Reporting Identification Symbol (RIS) of the shipper. See discussion on special handling of external receipts on page 1.11.

III Class or Enrichment Code

This code consists of one digit or letter designating the general class or enrichment into which the material falls. Those categories currently most important in our operations have been assigned a number or letter as indicated.

Class or Enrichment Codes — Alphabetic

Code	Category	Detail	% U^{235}	Additive or Alloy Level
A	Normal	Alloy	—	Alloy
B	Enriched	Alloy	Various	Alloy
C	Enriched		2.10	[1]Other
D	Depleted		—	Standard
E				
F				
G	Normal		—	Alloy 601
H	Enriched		0.947	Alloy 601
J				
K				
L	Enriched		0.947	[1]Other
M	Enriched		1.25	Alloy 601
N	Normal	Waste	0.710 to 0.712	None
P	Depleted	Waste	<0.710	None
Q				
R				
T	Thorium		—	None
U				
V	Enriched	Waste	>0.712	None
W				
X	Enriched		[1]Other	[1]Other
Y				
Z				

NOTE: Letters I, O, and S will not be used.

[1]Not specified. Refer to P.O. for U^{235} or additive level.

Class or Enrichment Codes — Numeric

Code	Category	Detail	% U^{235}	Additive or Alloy Level
1	Normal		0.710 to 0.712	Std
2	Enriched	Recycle Tails	Various	None
3	Enriched		1.10	Std
4	Enriched		1.25	Std
5	Enriched		0.947	Std
6				
7	Enriched	Sweetener	Various	None
8	Enriched		0.86	Std
9	Enriched		2.10	Alloy 601
0	Enriched		[1]Other	Std

[1]Not specified. Refer to P.O. for U^{235} or additive level.

The use of this code in combination with the Material Description Code makes it possible to assign the same material description code to similar materials regardless of their class, enrichment or special nature.

For ready reference, a table of class codes arranged by material categories, % U^{235} and additive or alloy levels is also included below.

Class Codes by Material Categories

Category	Detail	% U^{235}	Additive or Alloy Level				
			None	Std	601 2	Other 2 3	Alloy 4
Depleted				D	—	—	—
Depleted	Waste	<0.710	P	—	—	—	—
Normal	Waste	0.710 to 0.712	N	—	—		—
Enriched	Waste	>0.712	V	—	—		—
Enriched		0.86	—	8	—		—
Enriched		0.947	—	5	H	L	—
Enriched		1.10	—	3	—		—
Enriched		1.250	—	4	M		—
Enriched		2.10	—		9	C	—
Enriched	Alloy	[1]Other	—	0		X	B
Enriched	Recycle Tails	Various	2	—	—	—	—
Enriched	Sweetener	Various	7	—	—	—	—
Thorium		—	T	—	—	—	—

[1]Not specified. Refer to P.O. for U^{235} or additive level.

[2] Properly applied only to material which has actually achieved this additive level; not appropriate for UO_3, UF_4 or derbies.

[3] Any additive level other than "Standard" or Alloy 601; refer to P.O. or I.P.O. for details.

[4] Materials, ordinarily from offsite, containing a concentration of alloying materials usually far above additive (ppm) levels.

IV Material Description Code

This is a three digit code, subdivided into residue and product categories as follows:

Low Grade Residues	000-099
High Grade Residues	100-149
Refinery Feeds	150-188
Intermediate Products for Cascades	189-194
Products for Cascades	195-199

Intermediate Products	200 - 299
Remelt Feeds	300 - 399
Casting Products	400 - 449
Rolling and Extrusion Products	450 - 499
Machining Products	500 - 599

The intent in setting up the material descriptions was to make them general whenever possible, with the Class and Source Codes aiding in the specific indentification of the material.

The low grade residue category (000-099) is intended to include all low uranium or thorium content residues and some higher grade uranium or thorium content residues which require extensive handling and processing before use as oxidation or refinery feed. In general, the low grade residues have been arranged in order of increasing quality. In other words, the lowest uranium or thorium content and lowest quality materials are designated by lower numbers and the high quality materials by higher numbers.

High grade residues (100-149) are, in general, high uranium or thorium residues which require some processing such as screening or oxidation. They correspond in many cases to the feed for Plant 8.

Refinery feeds (150-199) are materials which are suitable for introduction into the refinery without further processing.

The intermediate product category (200-299) includes products from the various processes involved in converting refinery feed to metal. It also includes recycle metal which requires some pretreatment such as sawing or pickling before remelting.

Remelt feeds (300-399) are materials ready for remelt without further treatment.

Casting products (400-449), rolling and extrusion products (450-499), and machining products (500-510) are the products from these operations.

A complete list of all Material Description Codes currently assigned will be found in Chapter 3 of this booklet.

The one-digit or letter Class or Enrichment Code and the three-digit Material Description Code are combined into a four-character Material Type Code which is the basic unit of the FMPC Lot Marking system.

V Lot or Sequence Number

This is a four-digit number which is used to identify consecutive lots of specific material in sequence where more than one lot is produced per month. Where not more than one lot is produced per month, the lot sequence number indicates the consecutive month of production starting with January 1962 as lot 0001. May 1989 is lot 0329.

To identify the category of trash, the lot or sequence number should include the product month number (May 1989 = 329), preceded by a numeric code that represents the category of 003 material. These categories are:

1 - Glass
2 - Rubber Hose
3 - Plastic
4 - Metal
5 - Concrete, Ceramics, Soil
6 - Contaminated Burnables
7 - Oily Rags, Air Filters and Gaskets
8 - Floor Sweepings
9 - Miscellaneous Trash

EXAMPLES OF LOT MARKING OF FMPC PRODUCTION

The preceding sections of this discussion have been generalized to explain the intent of the system. The following examples are offered to illustrate the application of the general system structure in developing lot markings to identify specific material produced at the FMPC. Marking of material received from off site is discussed in subsequent paragraphs.

Example ! (Normal) H110 - 263 - 1200 - 0418

H110	Applicable to P.O. H110
2	Plants 2 and 3 (Refinery)
63	Produced in North Side Packaging
1	"Normal" uranium
200	UO_3, orange oxide
0418	Lot sequence number

Example 2 (Enriched) A500 - 965 - 5069 - 0541

A500 Applicable to P.O. A500
9 Produced in Plant 9
65 Produced in sump liquor processing area
5 0.947% U^{235} enriched uranium
069 Wet sump cake, non-oily, non-halide
0541 Lot sequence number

Example 3 (Thorium) 380 - T069 - 0126

3 Pilot Plant
80 Produced in sump area
T Thorium
069 Wet sump cake, non-oily, non-halide
0126 Lot sequence (indicates June 1972)

Example 4 (Depleted) A948 - 951 - D110 - 0329

A948 Applicable to P.O. A948
[redacted]9 Produced in Plant 9
51 LeBlond Rapid Borer
D Depleted uranium
110 Non-briquettable chips and turnings for oxidation
0329 Lot sequence (indicates May 1989)

Example 5 (Depleted) W020 - 501 - P003 - 6329

W020 Applicable to Waste (0.20% U^{235})
501 Plant 5 Maintenance
P003 Depleted non-recoverable trash
6 Contaminated burnables
329 May 1989

LOT MARKING OF EXTERNAL RECEIPTS

Lot marking of material received from off site by WMCO will conform in general to the format

described in previous sections of this booklet. There are, however, certain exceptions which should be noted:

1. The Source code will be the three-letter Reporting Identification Symbol (RIS) as illustrated in the table below.

2. The Lot Sequence Number will be the DOE Form 741 number assigned by the shipper in all cases except:

FTA Extrusions — use 0000

EXTERNAL SOURCE OR ORIGIN CODES

Codes

* FVC	WMCO

Off-Site Codes

ARF	Rockwell International Aerospace Operations, Rocky Flats Plant, Golden, Colorado
CBJ	New Brunswick Laboratory, Argonne, Illinois
CZA	Argonne National Laboratory, Argonne, Illinois
DZA	Westinghouse Savannah River Plant, Aiken, South Carolina
FAA	USDOE Oak Ridge Operations Office, Oak Ridge, Tennessee
FTA	RMI Company, Inc., Ashtabula, Ohio
FXA (and BXA)	Martin Marietta Energy Systems, Inc., Piketon, Ohio

* *Included for information only. The designation FVC is not used for coding containers of off-site receipts or shipments.*

FYC (and BYC)	Martin Marietta Energy Systems (GDP), Paducah, Kentucky
FZE	Martin Marietta Energy Systems (K-25) Oak Ridge, Tennessee
FZF	Martin Marietta Energy Systems (Y-12) Oak Ridge, Tennessee
FZG	Martin Marietta Energy Systems (ORNL) Oak Ridge, Tennessee
HUE	Westinghouse Hanford Company, Richland, Washington
HYA	Battelle, Pacific N. W. Laboratory, Richland, Washington
PZA	Westinghouse Electric Corporation, BAPL West Mifflin, Pennsylvania
VAB	Reynolds Electrical and Engineering Company, Mercury, Nevada

Example 6 (Depleted Receipt)

H082 - FTA - D455 - 0000

H082	Applicable to P. O. H082
FTA	RMI Company, Inc. (Shipper)
D	Depleted Uranium
455	Mark 31 extruded tubes - inner
0000	Indeterminate lot sequence number

CHAPTER 2 — Color Coding System

In addition to the lot marking system described for identifying nuclear materials, color coding is applied as a secondary method of designating depleted, normal, and enriched uranium and thorium.

Three basic colors, black, red and white, are used for painting the body of containers in service at the FMPC.

Black drums are used for depleted uranium, normal uranium, unrestricted (for Nuclear Safety) enriched uranium compounds and residues and thorium.

All-red drums are used for enriched, restricted uranium (e.g., mass, geometry, or concentration).

White drums are used for low-level waste materials suitable for off-site shipment.

Container identification markings required for long-term storage such as lot marks, weights, drum numbers, alloying chemical symbols and percent U^{235} are routinely applied by stencil over the basic paint colors as specified in Table I. "Markal" or equivalent type white or black paint sticks are used for applying temporary identification markings to residue and waste containers and to other specific materials in the production areas, including some off-site receipts and the reidentification of materials on the storage pad. Pre-printed identification labels that contain barcodes may also be used.

Color coding of black drums will be further

implemented by application of a narrow stripe around the circumference above the gross, tare and net weight information on each container. The colors to be used for this stripe are as follows:

Material in Black Drums	$\%U^{235}$	Stripe Color
(a) Depleted uranium	<0.710	green
(b) Normal uranium	0.710 to 0.712	yellow
(c) Enriched uranium — unrestricted compounds and residues		red
(d) Thorium	—	blue

An exception to the container body painting and stencilling requirement is permitted for enriched oxides packaged in 6" diameter by 15" high metal cans. A narrow red-tape stripe around the periphery of the can and a printed label are applied.

It will not be necessary to apply a stripe to all-red drums.

Red targets or red-white cards, or yellow-white or green-white cards and pressure-sensitive tape are used to color code enriched, normal and depleted uranium metal on skids, hoppers, dollies, metal pieces not in containers, or boxes and major components of process equipment such as vessels, sumps, machinery, dust collectors, etc. An explanation of their use is detailed in procedures 20-C-101 (latest revision), "SOP-Moving and Storing Nuclear Materials On-Site at the FMPC," 20-C-102, "SOP-For Receiving, Storing, Repackaging and Moving Enriched Uranium Materials $\leq$20.% U^{235} From Off-Site," and 20-C-904, "SOP-Nuclear Safety General Requirements."

Old identification markings will be obliterated with paint immediately upon emptying containers.

Off-site receipts which do not comply with FMPC color coding requirements are color coded with a band of paint around the periphery of the containers—yellow for normal, red for enriched, green for depleted, and blue for thorium, as a substitute for painting the entire container. The proper color coding is applied as soon as the analytical results are received from the Laboratory.

Summary of FMPC Color Coding System

Normal Uranium

Identification markings painted in white on an all- black container. Yellow stripe applied.

Enriched, unrestricted uranium compounds and residues

Identification markings painted in white on an all-black ontainer. Red stripe applied.

Enriched, restricted uranium (e.g., mass, geometry, or concentration)

Identification markings painted in white on an all- red container. No stripe applied.

Depleted Uranium

Identification markings are painted in white on an all-black container. Green stripe applied.

Thorium

Identification markings are painted in white on an all-black container. Blue stripe applied.

Thorium Waste

Identification markings are painted in black on an all-white container. Blue stripe applied.

Uranium Waste Shipments

Identification markings are painted in black on an all-white container. No stripe applied.

TABLE I

FMPC Color Code Specification for Basic Container Paints and Identification Markings

Type of Material	Basic Container Paint Color	Identification Markings Paint Color	Stripe Paint Color
Normal	black	white	yellow
Enriched unrestricted	black	white	red
Enriched mass, geometry or concentration restricted	red	white	none
Depleted	black	white	green
Thorium	black	white	blue
Thorium Waste	white	black	blue
Uranium Waste Shipments	white	black	none

MATERIAL DESCRIPTION CODES

LOW-GRADE RESIDUES

001	DISCARD PROCESS RESIDUES, TRAILER CAKES, WASTE SLURRIES, RAFFINATES, ETC.
002	SUMP CAKE - COPPER CONTAMINATED, LOW URANIUM
003	NON-RECOVERABLE TRASH - FOR STORAGE OR SHIPMENT FOR OFF-SITE BURIAL
004	CONTAMINATED STEEL AFTER WASHING AND/OR CLEANING
005	CONTAMINATED ZIRCONIUM
006	CONTAMINATED LEATHER GLOVES FOR LAUNDRY
007	TRAILER CAKES, WASTE SLURRIES, RAFFINATES NOT MEETING DISCARD SPECIFICATION
008	GRIT BLAST RESIDUE
009	CONTAMINATED OIL - SOLUBLE; COOLANT
010	CONTAMINATED WATER, CONTAINING CHLORIDES
011	CONTAMINATED SOIL, ROCKS, SAND, BRICKS AND CERAMICS
012	CONTAMINATED WATER OR SUMP LIQUOR, NON-CHLORIDE
013	CONTAMINATED SOLVENT - TRICHLOR, PERCHLOR, ETC. (STENCIL TYPE OF SOLVENT ON CONTAINER)
014	GLASS AND SAMPLE BOTTLES
015	CONTAMINATED OIL, INSOLUBLE
016	CONTAMINATED COPPER - FOR DISCARD
017	CONTAMINATED GRAPHITE - UNCRUSHED BUT BROKEN INTO LARGE PIECES

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018 CONTAMINATED ALUMINA-SODA LIME (HIGH Cl^-)

019 CONTAMINATED MAGNESIUM

020 CONTAMINATED MERCO-DRI AND HILCO CAKE

021 DRUM DECONTAMINATION RESIDUES: WET MGF_2

022 CONTAMINATED TBP AND/OR KEROSENE MIXTURES AND SLUDGES

023 OILY MGF_2

024 CONTAMINATED GRAPHITE - CRUSHED

025 CONTAMINATED FILTER ELEMENTS AND CARTRIDGES

026

027 CONTAMINATED RAGS, PAPER AND POLYETHYLENE

028 CONTAMINATED ASBESTOS MATERIALS

029 DUST COLLECTOR BAGS

030 MAGNESIUM OXIDE AND MAGNESIUM ZIRCONATE FROM CRUCIBLE CLEANOUT

031 ROASTED MGF_2 (BLENDED WITH OTHER MATERIALS)

032 INCINERATOR ASHES - MATERIAL PASSING THROUGH GRATE OR SCREEN

033 INCINERATOR CINDERS - MATERIAL NOT PASSING THROUGH GRATE OR SCREEN

034 MGF_2 FOR MILLING OR DISCARD

035 MGF_2 or CAF_2, GOOD LINER MATERIAL

036 MGF_2, -20 MESH, HIGH FREE METAL FOR PLANT 8 ROASTING (ENRICHED ONLY)

037 MGF_2, GROUND

038 MGF_2, +20 MESH, LOW U CONTENT, TO BE CRUSHED

039 SLUDGES, OILY

040 SLUDGES, FOR BLENDING AND SCREENING

041 SLUDGES, OILY, FOR OXIDATION, HIGH FREE METAL

042 SLUDGES, CLEANOUT, NON-OILY, FOR ROASTING

043 SLUDGES, SOLVENT - TRICHLOR, PERCHLOR, ETC. (STENCIL TYPE OF SOLVENT ON CONTAINER)

044 SLUDGES, SALT, SOFT, CHLORIDE (FOR PLANT 8 RECOVERY)

045 SLUDGES, SALT, SOFT, NON-CHLORIDE

046 SLUDGES, NON-OILY, FOR OXIDATION, INCLUDING HIGH OR LOW FREE METAL

047 SAMPLES, NON-METALLIC, MISCELLANEOUS

048 OIL BURNER ASH

049

050 PCB MATERIALS, BALLAST, PCB-CONTAMINATED RAGS

051 MERCURY-CONTAMINATED MATERIALS, MERCURY BATTERIES

052

053 NON-BURNABLE METAL WITH URANIUM CONTENT

054

055 DEPLETED U METAL - NOT SUITABLE FOR REACTOR PRODUCT STREAMS (NOT TOP CROPS)

056 DEPLETED U INGOT CROPS (TOP CROPS) FROM PRIMARY INGOTS

057 WET CRUSHED SLAG FROM FURNACE POT BLOW-OUTS

058 CONTAMINATED CaF_2 - MgO

059 ASH FROM BURNING DUST COLLECTOR BAGS

060 FURNACE SALT, SOLIDIFIED, CHLORIDE (FOR PLANT 8 RECOVERY)

061 FURNACE SALT, SOLIDIFIED, NON-CHLORIDE

062 DUST COLLECTOR RESIDUES - HIGH FLUORIDE

063 KOH REVERSION CAKE

064 DUST COLLECTOR RESIDUES, PYROPHORIC, HIGH FLUORIDE

065 SCRAP SALTS, HIGH FLUORIDE, INCLUDING FLOOR SWEEPINGS

066 SCRAP SALTS, LOW FLUORIDE, INCLUDING FLOOR SWEEPINGS

067 WET SUMP OR FILTER CAKE, HALIDE CONTD

068 WET SUMP OR FILTER CAKE, OIL CONTD

069 WET SUMP OR FILTER CAKE, NON-OILY AND NON-HALIDE

070 ROCKWELL SPILLS

071 ROCKWELL CLEANINGS

072 U OR TH NITRATE SOLUTIONS, HIGH IMPURITY SUCH AS ZIRNLO DECOPPERING SOLUTIONS -FOR REFINERY PROCESSING

073 U OR TH CHLORIDE OR FLUORIDE SOLUTIONS, HIGH IMPURITY - SUCH AS PLANT 8 METAL DISSOLVER PRODUCT - NOT FOR REFINERY FEED

074 U OR TH SULPHATE SOLUTIONS

075 CLAD METAL FOR HNO_3 DISSOLVER

076 ZIRNLO ENDS - TO BE CLASSIFIED FOR RECOVERY

077 DRY CRUSHED SLAG FROM FURNACE POT BLOW-OUTS

078 OFF-SPEC TH OXALATE, FRENCH SOURCE

079 UNFIRED REDUCTION CHARGES PLUS MGF_2 FROM LINER CAVE-INS

080 PARTIALLY OXIDIZED METAL FOR SORTING CONTAINING METL-X

081 PARTIALLY OXIDIZED METAL FOR SORTING CONTAINING NO METL-X

082 OFF-SPEC UF_4 OR THF_4

083 U OR TH CHLORIDE SALTS, REJECT

084 BAD REDUCTION (NO DERBY)

085 U_3O_8 - ROTEXED - OTHER THAN PLANT 8'S OWN PRODUCT

086

087 ROASTED SUMP CAKE - HIGH FLUORIDE - FOR MILLING

088 UNROASTED BUT MILLED MGF_2 (BLENDED WITH OTHER MATERIALS)

089 U_3O_8 ROTEXED - FROM CONCRETED CHIPS - CALCIUM

090

091

092

093

094

095 COLD METAL OXIDES - NON RADIUM-BEARING

096 AUSTRALIAN RADIUM CAKE

097 RADIUM-BEARING MATERIALS - SAMPLES, K-65, INCLUDING Q-11 CONTAMINATED MATERIALS

098 MATERIAL HELD FOR HISTORICAL PURPOSES

099

HIGH-GRADE RESIDUES

100 SCRAP U_3O_8 OR THO_2, LOW FLUORIDE

101 SCRAP U_3O_8 OR THO_2, HIGH FLUORIDE

102 SCRAP UO_2

103 INGOT CROPS (TOP CROPS) FROM PRIMARY INGOTS

104 METAL SPILLS AND EXTRUSION ENDS: METAL HIGH IN IMPURITIES AND SPILLS

105 THO_2 PRODUCED FROM UNPURIFIED HANFORD THORIUM NITRATE VIA THORIA GEL PROCESS

106 CHIPS EMBEDDED IN CONCRETE - HIGH CALCIUM

107 CHIPS AND TURNINGS CONTAMINATED WITH NON-U MATERIALS - FOR OXIDATION

108 WET PHOSPHATE CAKE

109 SAWDUST FOR OXIDATION

110 NON-BRIQUETTABLE CHIPS AND TURNINGS FOR OXIDATION

111 BRIQUETTABLE CHIPS AND TURNINGS FROM STANDARD METAL

112 BRIQUETTABLE CHIPS AND TURNINGS, HIGH IMPURITIES, FOR BRIQUETTING AND DOUBLE MELTING

113 ZIRCONIUM CLAD METAL, FROM OFF-SITE, TO BE DECLAD BY ZIRNLO SYSTEM

114 ZIRNLO FEED, CLASSIFIED AND SAWED

115 WET THORIUM OXALATE CAKE

116 WET THORIUM HYDROXIDE

117 WET AMMONIUM DIURANATE CAKE

118 HOLLOW CORES WITH BROKEN DRILLS - ALL TYPES - BITS TO BE REMOVED AND CORES PICKLED PRIOR TO REMELT

119 SOLID METAL, OTHER THAN CORES, WITH EMBEDDED STEEL

120 CHEMICAL REJECT PRIMARY INGOTS

121 U_3O_8, +8 MESH - HIGH FLUORIDE

122 U_3O_8, +8 MESH - LOW FLUORIDE

123 CALCIUM URANATE

124 ZIRNLO: PARTIALLY DECLAD FUEL ELEMENTS

125 UNRECYCLED SLAG +20 MESH, BALL MILL PRODUCT

126 OXIDES MIXED WITH ZIRCONIUM BUT CLAD WITH OTHER ELEMENTS

127

128 CLAD URANIUM METAL: DECLAD BY MACHINING OR CHEMICAL TREATMENT

129 DIRTY PRILL, CODE 5 DERBIES, AND PLANT 1 TITAN MILL CLEAN - OUT, HIGH U CONTENT

130 PARTIALLY OXIDIZED METAL FOR DISSOLVER

131 PARTIALLY OXIDIZED METAL OXIDATION FEED

132 DUST COLLECTOR RESIDUES, LOW FLUORIDE

133 OXIDES CLAD OR MIXED WITH ALUMINUM

134 U308 FOR REOXIDATION

135 DUST COLLECTOR RESIDUE, HIGH FLUORIDE, GREATER THAN 20% ASSAY

136 METAL TO BE OXIDIZED

137 MISCELLANEOUS MATERIAL - RECOVERY METHOD TO BE DETERMINED (NOT FOR USE BY INDIVIDUAL PLANTS)

138 OXIDES CLAD OR MIXED WITH ANY METALLIC ELEMENT OTHER THAN ALUMINUM, ZIRCONIUM OR STAINLESS STEEL

139 URANIUM ALLOYED OR CANNED WITH ELEMENTS OTHER THAN ALUMINUM, MOLYBDENUM OR ZIRCONIUM

140 OXIDES CLAD OR MIXED WITH ZIRCONIUM

141 CLAD METAL FOR ACID DISSOLUTION - NOT FOR ZIRNLO PROCESSING

142 OXIDES CLAD OR MIXED WITH STAINLESS STEEL

143 ROASTED CALCIUM-PRECIPITATED SUMP AND FILTER CAKES

144 OFF-SITE SUMP AND FILTER CAKES AFTER ROASTING AT FMPC

145 ROASTED AMMONIUM-PRECIPITATED SUMP AND FILTER CAKES

146 ROASTED MAGNESIUM-PRECIPATATED SUMP AND FILTER CAKES

147

148

149

REFINERY FEEDS

150 URANYL OR THORIUM NITRATE SOLUTION

151 OFF-SPEC THO_2; FRENCH SOURCE

152

153 -8 MESH PRODUCT FROM OXIDIZING +8 MATERIAL

154 U_3O_8 ROTEXED PLANT 8 FURNACE PRODUCT

155 U_3O_8 -8 MESH FROM ROTEXING OF OTHER THAN PLANT 8'S OWN PRODUCTS - LOW FLUORIDE

156 MILLED UO_2

157 REJECT UO_3

158 PHOSPHATE ASH

159 ROASTED, MILLED AND/OR SCREENED CALCIUM—PRECIPITATED SUMP AND FILTER CAKES

160 IMPURE URANYL OR THORIUM NITRATE - SOLID

161 URANIUM CARBIDE, UC

162 OFFSITE SUMP AND FILTER CAKES AFTER ROASTING, MILLING, AND/OR SCREENING AT FMPC

163 ROASTED, MILLED AND/OR SCREENED AMMONIUM-PRECIPITATED SUMP AND FILTER CAKES

164 ROASTED, MILLED AND/OR SCREENED MAGNESIUM-PRECIPITATED SUMP AND FILTER CAKES

165 U_3O_8 — NOT REQUIRING RE-OXIDATION

166 UO_2 (OR THO_2) PELLETS - REFINERY FEED

167 UO_2 (OR THO_2) POWDER - REFINERY FEED

168 CRUSHED FURNACE SALTS AND SLUDGES NON-CHLORINE

169 ROASTED FURNACE SALTS AND SLUDGES NON-CHLORINE

170 ORE CONCENTRATES - MISCELLANEOUS

171

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190 ENRICHED CALCINER U308 FOR REOXIDATION

191 REOXIDIZED ENRICHED CALCINER U308 FOR SCREENING AND MILLING

192 OXIDE FOR SCREENING AND MILLING

193

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200 UO_3 PRODUCT

201 UO_3 REACTOR RECYCLE TAILS

202 UO_2 OR THO_2 PRODUCT

203 UF_6, URANIUM HEXAFLUORIDE

204 PURIFIED URANYL OR THORIUM NITRATE SOLUTION

205 THO_2 PRODUCED FROM SOL-GEL PROCESS

206 BLENDED UF_4 OR THF_4 CHARGE

207 PURIFIED URANYL OR THORIUM NITRATE SOLID

208

209 URANIUM OR THORIUM TETRACHLORIDE

210 UF_4 OR THF_4

211 UF_4 FROM PILOT PLANT UF_6

212 UF_4 FROM HANFORD UO_3

213

214 U_3O_8 FROM RECYCLE UO_3 (ROR PROCESS)

215 THORIUM HYDROXIDE, DRY

216 CHARGED UF_4 POTS, WIP

217

218 CLEAN PRILL FOR DOUBLE MELTING

219 METAL FROM SPILLS FOR DOUBLE MELTING

220 CODE 2 DERBIES FOR DOUBLE MELTING OR SHOT CLEANING

221 SOLID METAL FOR PICKLING PRIOR TO REMELT DOES NOT REQUIRE BLENDING (<12")

222 SOLID METAL - INCLUDES PHYSICAL BUT NOT CHEMICAL REJECT INGOTS; TO BE SAWED OR CRUSHED AND PICKLED PRIOR TO REMELT ($\geq$ 12")

223 SOLID METAL TO BE SAWED, SHEARED OR CRUSHED, BUT NOT PICKLED PRIOR TO REMELT

224 SOLID METAL, NOT PICKLED, OTHER THAN SPILLS AND TOP CROPS, FOR DOUBLE MELT

225 S R STANDARD METAL TO BE SAWED AND PICKLED PRIOR TO REMELT

226

227 METAL SAMPLES FOR DOUBLE MELTING

228 SOLID METAL TO BE PICKLED

229 FIRST GENERATION TOP CROPS FROM PRODUCT INGOTS - FOR PRIMARY INGOT REMELT CHARGES

230 SAWED SECTIONS, REQUIRING PICKLING, FROM PRIMARY INGOTS CONTAINING FIRST GENERATION TOP CROPS

231 SAWED SECTIONS, REQUIRING PICKLING, FROM PRIMARY INGOTS CONTAINING NO TOP CROP METAL

232 PICKLED METAL FOR DOUBLE MELTING - OTHER THAN FIRST GENERATION TOP CROPS

233 CLASSIFIED SHAPES FOR DOUBLE MELTING

234 PHYSICAL REJECT BILLETS TO BE SAWED PRIOR TO REMELT

235 TUBULAR ELEMENTS TO BE CRUSHED

236 EXTRUSION BUTTS TO BE PICKLED

237 PARTIALLY DECLAD METAL, OTHER THAN ZIRNLO, FOR DOUBLE MELTING

238 SOLID METAL FOR PICKLING AND DOUBLE MELTING, OTHER THAN FIRST GENERATION TOP CROPS

239 CHEMICAL REJECT SAWED REMELT METAL - TO BE CAUSTIC LEACHED AND PICKLED

240 DOUBLE MELT INGOTS TO BE SAWED AND PICKLED PRIOR TO REMELT

241 DOUBLE MELT INGOTS TO BE SAWED, BUT NOT PICKLED, PRIOR TO REMELT

242 CHEMICAL REJECT INGOTS (AND OTHER CHEMICAL REJECT MATERIAL) TO BE SAWED AND PICKLED, OR TO BE ROLLED, SHEARED AND PICKLED, PRIOR TO REMELT

243 CHEMICAL REJECT SOLID METAL TO BE SAWED, BUT NOT PICKLED PRIOR TO REMELT

244 CHEMICAL REJECT DOUBLE MELT INGOTS FROM DOUBLE MELTING TO BE SAWED AND PICKLED

245 CHEMICAL REJECT DOUBLE MELT SOLID METAL TO BE SAWED, BUT NOT PICKLED, PRIOR TO REMELT

246 INGOTS FROM OFF-SITE TO BE REWORKED

247

248

249

250

251 CHEMICAL REJECT SOLID METAL FOR PICKLING PRIOR TO REMELT

252 BRIQUETTES HIGH IN IMPURITIES FOR DOUBLE MELTING

253

254 CODE 4 OR BOTTOM BURNOUT DERBIES FOR DOUBLE MELTING

255

256

257

258

259

260 TOP CROP FROM PRODUCT 4A FLAT BILLETS (SECOND GENERATION)

261 PHYSICAL SCRAP FROM RECYCLE 4A FLAT BILLETS (SECOND GENERATION)

262 CHEMICAL SCRAP FROM RECYCLE 4A FLAT BILLETS (SECOND GENERATION

263 OFF-SITE 4A SCRAP RETURNS (SECOND GENERATION)

REMELT FEEDS

300	DERBIES, CODE 1 AND CODE 3
301	
302	BRIQUETTES
303	CHIPS - CLEANED NON-BRIQUETTABLE - SUITABLE FOR CASTING
304	SOLID REMELT METAL - LOW IMPURITIES - DOES NOT REQUIRE BLENDING OR PICKLING - NOT FROM DOUBLE MELTS
305	PICKLED ARF REMELT METAL
306	EXPERIMENTAL SHAPES - INCLUDING CLASSIFIED SHAPES NOT TO BE CRUSHED
307	ZIRNLO PRODUCT
308	INGOT CROPS AND DUDS
309	
310	PICKLED CROPS FROM SR METAL
311	SR STANDARD SOLID METAL - FOR REMELT
312	
313	PICKLED CROPS FROM HW METAL
314	PICKLED PRIMARY INGOT SECTIONS CONTAINING FIRST GENERATION TOP CROPS
315	PICKLED PRIMARY INGOT SECTIONS CONTAINING NO TOP CROP METAL
316	PICKLED TI ALLOY REMELT SCRAP - DOES NOT REQUIRE BLENDING (NOT DERIVED FROM PRIMARY INGOTS)
317	
318	
319	

320

321

322 CHEMICAL REJECT SOLID REMELT METAL - DOES NOT REQUIRE PICKLING

323 REJECT ELEMENTS - OUTER

324 REJECT ELEMENTS - INNER

325 REJECT CORES

326 REJECT BILLETS, INCLUDING SAWED BILLET SECTIONS

327 PICKLED REJECT BILLETS OR BILLET SECTIONS

328

329

330 PRIMARY INGOT SECTIONS, NOT PICKLED, CONTAINING FIRST GENERATION TOP CROPS

331 PRIMARY INGOT SECTIONS, NOT PICKLED, CONTAINING NO TOP CROP METAL

332

333 PICKLED CHEMICAL REJECT CROPS

334 PICKLED CHEMICAL REJECT CROPS FROM DOUBLE MELT INGOTS

335 CRUSHED TUBULAR ELEMENTS

336 PICKLED EXTRUSION BUTTS

337 DECLAD METAL, OTHER THAN ZIRNLO

338

339

340 SECTIONS FROM CHEMICAL REJECT PRIMARY INGOTS, NOT PICKLED

CASTING PRODUCTS

400	
401	SPECIAL SOLID INGOTS OR SLABS
402	SPECIAL HOLLOW INGOTS
403	SPECIAL CASTINGS, INCLUDING STATIC AND CENTRIFUGAL
404	N REACTOR INGOTS - RAW
405	N REACTOR INGOTS - DIRECT CASTINGS FOR FINISHED BILLET MACHINING
406	MARK 31 CASTINGS - RAW - INNER
407	MARK 31 CASTINGS - RAW - OUTER
408	MARK 31 CASTINGS - FINISHED - INNER
409	MARK 31 CASTINGS - FINISHED - OUTER
410	N REACTOR INGOTS - FINISHED
411	URANIUM SHOT
412	MARK 15 CASTINGS — RAW - INNER
413	MARK 15 CASTINGS — RAW - OUTER
414	MARK 15 CASTINGS — FINISHED - INNER
415	MARK 15 CASTINGS — FINISHED - OUTER
416	MARK 25 CASTINGS - RAW - INNER
417	MARK 25 CASTINGS - RAW - OUTER
418	MARK 25 CASTINGS - FINISHED - INNER
419	MARK 25 CASTINGS - FINISHED - OUTER

ROLLING AND EXTRUSION PRODUCTS

450 BILLETS, ROLLING MILL

451 MARK 15 EXTRUDED TUBES - INNER

452 MARK 15 EXTRUDED TUBES - OUTER

453 N REACTOR EXTRUDED TUBES

454 N REACTOR RAW BILLETS - SAWED EXTRUSIONS

455 MARK 31 EXTRUDED TUBES - INNER

456 MARK 31 EXTRUDED TUBES - OUTER

457 SPECIAL RODS AND/OR TUBES

458

459 N REACTOR RAW BILLETS - UPSET FORGED

460

461 MARK 25 EXTRUDED TUBES - INNER

462 MARK 25 EXTRUDED TUBES - OUTER

463

464

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470

MACHINING PRODUCTS

500	MARK 31 ELEMENTS - INNER
501	MARK 31 ELEMENTS - OUTER
502	
503	N REACTOR FINISHED BILLETS FROM EXTRUSIONS
504	
505	N REACTOR FINISHED BILLETS FROM DIRECT CASTINGS
506	SPECIAL MACHINED SHAPES
507	MARK 15 ELEMENTS - INNER
508	MARK 15 ELEMENTS - OUTER
509	MARK 25 ELEMENTS - INNER
510	MARK 25 ELEMENTS - OUTER
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518	
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520	

NOTES

SOURCE OR ORIGIN CODES

PLANT 1 CODES

100 **PLANT 1 GENERAL**

101 PLANT 1 MAINTENANCE

102 MAINTENANCE SHOP (RCRA MATERIALS)

103 OIL STORAGE AREA (RCRA & TSCA)

104

105

106

107 Source unknown

108

109

110 **PLANT 1 MILLING**

111 DRUM DUMPER

112 TITAN MILL

113 DUST COLLECTOR NUMBER 64

114 DUST COLLECTOR NUMBER 76

115 THREE PHASE GALIGHER SAMPLER

116 HOPPER OR DRUM FILLING STATION

117 HOFFMAN VACUUM

118

119 FITZ MILL

120 **PLANT 1 STILL**

121 DRUM SIPHON
122 STILL TANK
123 WATER DRUMMING
124 RECLAIMED FLUID DRUMMING
125
126
127
128
129
130 **PLANT 1 DRUM RECONDITIONING**
131 SHOT SCREEN
132 WHEELABRATOR SHOT BLAST UNIT
133 DRUM REROLLER
134 PANGBORN DUST COLLECTOR
135 DRUM PAINTING BOOTH
136 DRUM DRYER
137 DRUM BALER
138
139
140 **PLANT 1 SAMPLING**
141 SMALL SHEATHED AUGER
142 WHEELABRATOR DUST COLLECTOR
143 LARGE SHEATHED AUGER

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144 PIPE SAMPLER

145 SLY DUST COLLECTOR

146

147

148

149

150 COPPER SHREDDER

PLANTS 2 AND 3 CODES

200	**PLANTS 2 AND 3 GENERAL**
201	PLANTS 2 AND 3 MAINTENANCE
202	MAINTENANCE SHOP (RCRA MATERIALS)
203	OIL STORAGE AREA (RCRA & TSCA)
204	
205	
206	
207	
208	
209	
210	**PLANT 2 DIGESTION**
211	SOUTH SIDE DIGESTORS
212	NORTH SIDE DIGESTORS
213	TURNER-HAWES DUST COLLECTOR
214	DAY-HOFFMAN DUST COLLECTOR
215	
216	
217	
218	
219	
220	**METAL DISSOLVER**
221	OLIVER FILTER

222 METAL DISSOLVER GRATE

223

224

225 **EXTRACTION**

226 SOUTH SIDE EXTRACTION COLUMN LINE

227 NORTH SIDE EXTRACTION COLUMN LINE

228 MIXER-SETTLER

229

230 **SOLVENT TREATMENT**

231

232

233

234

235 **HOT RAFFINATE BUILDING**

236 FILTERS

237

238

239

240 TRASH BALER

241

242

243

244

245 **REFINERY SUMP SYSTEM**

246 DORR THICKENERS

247 FILTERS

248

249

250 **RAFFINATE EVAPORATORS**

251

252

253

254

255 **ABSORBERS**

256 PLANT COLUMN ABSORBERS

257

258

259

260 **DENITRATION SYSTEM**

261 SCRUBBER SYSTEM

262 SOUTH SIDE PACKAGING

263 NORTH SIDE PACKAGING

264

265

266

FMPC Lot Marking System (Rev. 5/20/80) **4.07**

267 **SAFE GEOMETRY EVAPORATOR CALCINER**

268 **PULLMAN VACMOBILE**

269

270 **DRUM DIGESTOR**

271 CARTRIDGE FILTER

272 PLATE AND FRAME FILTER

PILOT PLANT CODES

300	**PILOT PLANT GENERAL**
301	PILOT PLANT MAINTENANCE
302	MAINTENANCE SHOP (RCRA MATERIALS)
303	OIL STORAGE AREA (RCRA & TSCA)
304	
305	
306	
307	
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310	**GREEN SALT PRODUCTION**
311	REACTOR NUMBER 1
312	REACTOR NUMBER 2
313	DUST COLLECTORS
314	VACUUM - PORTABLE
315	AUTOCLAVE
316	COLD TRAP
317	
318	
319	
320	

321 SLY DUST COLLECTOR
322 HOFFMAN VACUUM
323
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332 SPENCER VACUUM
333 EAST WHEELABRATOR DUST COLLECTOR
334 DUOCLONE CYCLONE
335
336
337
338
339
340 **PILOT PLANT REMELT AND CASTING**
341 REMELT FURNACE
342
343 CRUCIBLE BURNOUT

344

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346 WEST WHEELABRATOR DUST COLLECTOR

347 HOFFMAN VACUUM

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375 **PILOT PLANT SOLVENT EXTRACTION**
376 SIX-INCH EXTRACTION COLUMN
377 BOILDOWN TANKS
378 PRODUCT TANK
379 TWO-INCH EXTRACTION COLUMN
380 **PILOT PLANT SUMP**
381 SUMP CATCH BASIN
382 PRECIPITATOR
383 UNCONTAMINATED SUMP
384
385

PLANT 4 CODES

400	**PLANT 4 GENERAL**
401	PLANT 4 MAINTENANCE
402	MAINTENANCE SHOP (RCRA MATERIALS)
403	OIL STORAGE AREA (RCRA & TSCA)
404	
405	
406	
407	BANK 7
408	BANK 8
409	BANK 9
410	
411	
412	
413	
414	
415	
416	
417	
418	
419	
420	**DUST COLLECTORS - GENERAL**
421	

PLANT 5 CODES

500	**PLANT 5 GENERAL**
501	PLANT 5 MAINTENANCE
502	MAINTENANCE SHOP (RCRA MATERIALS)
503	OIL STORAGE AREA (RCRA & TSCA)
504	
505	
506	
507	
508	
509	DRUM STORAGE PAD
510	**METAL REDUCTION AREA**
511	BLENDERS
512	BLENDING FILLING CAP AND LID AREA DUST COLLECTORS 251, 253
513	JOLTER AREA DUST COLLECTORS 247, 248
514	BOMB FILLING STATION
515	CAP AND LID
516	ROCKWELL FURNACES
517	COOLING TANKS
518	BREAKOUT STATIONS
519	EAST BREAKOUT AREA DUST COLLECTORS
520	WEST BREAKOUT AREA DUST COLLECTORS

422 DUST COLLECTOR G4 - 2
423 DUST COLLECTOR G4 - 15
424 DUST COLLECTOR G4 - 4
425 DUST COLLECTOR G4 - 5
426
427 DUST COLLECTOR G4 - 7
428
429 DUST COLLECTOR G4 - 9
430
431
432 DUST COLLECTOR G4 - 12
433 DUST COLLECTOR G4 - 13
434 DUST COLLECTOR G4 - 14
435 **PLANT 4 SUMP**
436
437
438
439
440 **PACKAGING STATION - GENERAL**
441 EAST (NO. 1) PACKAGING STATION
442 WEST (NO. 2) PACKAGING STATION
443 SOUTHWEST (NO. 3) PACKAGING STATION
444
445

521 DERBY QUENCH

522 SLAG CONVEYOR PIT

523 POT REAMING STATION

524

525

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530 **CASTING AREA**

531 REMELT FURNACES

532 SEPARATION BOOTH

533 REMELT
DUST COLLECTOR 260

534 CRUCIBLE BURNOUT

535 CRUCIBLE BURNOUT
DUST COLLECTOR 261

536 SLY DUST COLLECTOR 100

537 GRAPHITE LATHE

538 HILCO OIL FILTER

539 BURNOUT AND MOLD TANKS

540 GRAPHITE BREAKUP STATION

541

542

543

544

545 **SUMP TREATMENT AREA**

546

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550 **SAW AREA**

551 HACK SAW

552 NORTH CIRCULAR SAW

553 EAST CIRCULAR SAW

554 WEST CIRCULAR SAW

555

556

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558

559

560 **EAST SLAG PLANT**

561 CRUSHER

562 COARSE SEPARATOR

563 FINE SEPARATOR

564 BIN 4: -20 MESH MAGNESIUM FLUORIDE

565 BIN 3: +20 MESH MAGNESIUM FLUORIDE

566 BIN 5, 6, 7, 8: MAGNESIUM FLUORIDE

567

568

569

570 **WEST SLAG PLANT**

571 CRUSHER

572 COARSE SEPARATOR

573 FINE SEPARATOR

574 -20 MESH MAGNESIUM FLUORIDE

575 +20 MESH MAGNESIUM FLUORIDE

576 GOOD LINER SOURCE

PLANT 6 CODES

600	**PLANT 6 GENERAL**
601	PLANT 6 MAINTENANCE
602	MAINTENANCE SHOP (RCRA MATERIALS)
603	OIL STORAGE AREA (RCRA & TSCA)
604	
605	
606	
607	
608	
609	
610	**ROLLING**
611	INGOT FURNACE
612	BLOOMING MILL
613	CROP SHEAR OR GAG SHEAR
614	EQUALIZER FURNACE
615	CONTINUOUS MILL
616	FLYING SHEAR
617	COOLING BEDS
618	STRAIGHTENER
619	INSPECTION - ROD AREA
620	**MACHINING**
621	BLANKING ACMES

622 CROSS TRANSFERMATIC

623 CENTERLESS GRINDERS

624 DRILLING ACMES

625 SUNDSTRAND LATHES

626 HEALD BOREMATICS

627 TURRET LATHES

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631 BARDONS AND OLIVER CUTOFF LATHE

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640 **HEAT TREATING**

641

642 SALT-OIL FURNACE

643 NU SAL FURNACE

644

645 **BRIQUETTING**

646 CHIP CRUSHER

647 CHIP PICKLING TANKS

648 CHIP BRIQUETTING PRESS

649

650 **DUST COLLECTORS**

651

652 TURNER HAWES

653

654

655 **WATER TREATMENT AREA**

656 COLLECTION TANKS

657 PRECIPITATORS

658 FILTERS

659 HOFFMAN CLARIFIERS

660 **DEGREASING AND PICKLING**

661 DERBY PICKLING

662 CORE PICKLING

663 REMELT METAL PICKLING

664

665 **INSPECTION**

666

667

668

669

MISCELLANEOUS FACILITIES CODES

700	WASTE MANAGEMENT
701	
702	MAINTENANCE SHOP (RCRA MATERIALS)
703	OIL STORAGE AREA (RCRA & TSCA)
704	
705	
706	
707	
708	
709	
710	K-65 GENERAL
711	SILO #1 K-65
712	SILO #2 K-65
713	SILO #3 COLD-METAL OXIDE
714	SILO #4
715	
716	
717	
718	
719	
720	
721	CHEMICAL PITS

722
723
724
725
726
727
728
729
730 LABORATORY GENERAL
731 OPERATIONS & ENGINEERING SERVICES
732 ANALYTICAL
733 ANALYTICAL LABORATORY HAZARDOUS WASTE
734 BIO-CHEMISTRY
735 SERVICE BLDG. AND ADMINISTRATION BLDG.
736 LAUNDRY
737
738 GARAGE RCRA
739 GARAGE OIL
740 PROCUREMENT
741 GARAGE
742 DECONTAMINATION
743 STORES-RECEIVING

744 TRUCK DOCK

745 MAINTENANCE SECTION

746 MACHINE SHOP (RCRA)

747 MACHINE SHOP OIL STORAGE (RCRA & TSCA)

748 PAINT SHOP (RCRA)

749 INSTRUMENT SHOP (RCRA)

750

751

752

753

754

755 QUALITY & SAFETY DEPARTMENT

756 DOSIMETRY LABORATORY HAZARDOUS WASTE

757

758

759 BUILDING 45

760 ENGINEERING

761 GENERAL SUMP

762

763

764

765 WATER TREATMENT

766 SEWAGE TREATMENT

767 BOILER PLANT

768 BOILER PLANT RCRA

769 BOILER PLANT OIL STORAGE

770

771

772

773

774

775 LAB MAINTENANCE SHOP (RCRA)

776 LAB OIL STORAGE AREA (RCRA & TSCA)

PLANT 8 CODES

800	**PLANT 8 GENERAL**
801	PLANT 8 MAINTENANCE
802	MAINTENANCE SHOP (RCRA MATERIALS)
803	OIL STORAGE AREA (RCRA & TSCA)
804	
805	DRUM WASHER
806	DRUM RECONDITIONING
807	
809	
810	**WET-CHEMICAL SYSTEM**
811	PRIMARY CALCINER
812	PLANT 8 MILLING
813	SUMP
814	
815	EIMCO FILTERS
816	PRECIPITATION
817	OLIVER FILTER
818	
819	
820	**OXIDATION SYSTEM**
821	CRUSHER
822	ROTEX SCREENING

823

824 BOX FURNACE

825 OXIDATION FURNACE NUMBER 1

826 ROTARY KILN

827 OXIDATION FURNACE NUMBER 2

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852 BLENDING AND SCREENING OPERATION

853 OIL DECANTATION

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PLANT 9 CODES

900	**PLANT 9 GENERAL**
901	PLANT 9 MAINTENANCE
902	MAINTENANCE SHOP (RCRA MATERIALS)
903	OIL STORAGE AREA (RCRA & TSCA)
904	
905	
906	
907	
908	
909	
910	
911	
912	
913	ROCKWELL FURNACES - MOLTEN SALT CLEANING
914	
915	
916	COOLING TANK
917	SPENCER PORTABLE VACUUM
918	
919	
920	**CASTING**
921	N-R FURNACE

922
923
924
925 N-R BAG HOFFMAN VACUUM UNIT
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935 **EXTRUSION SAWING**
936
937
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939
940 **MACHINING**
941 GISHOLT TURRET LATHE
942 J+L AUTOMATIC LATHE
943
944

945 L+S DUOMATIC LATHE
946
947
948
949 J+L TURRET LATHE
950
951 LE BLOND RAPID BORER
952
953 WARNER AND SWASEY LATHE
954 MONARCH ENGINE LATHE
955
956
957
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959
960 **PICKLING**
961 REMELT PICKLING AND RINSING
962 CORE DEGREASING AND PICKLING
963
964
965 **SUMP LIQUOR PROCESSING**
966 COLLECTION TANKS
967 PRECIPITATORS

968 FILTERS

969

970 **HEAT TREATING**

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980 **ZIRNLO PROCESS - GENERAL**

981 HACKSAW

982 DEGREASER

983 DECOPPERING

984 DEZIRCING

985 ACID FILTRATION

986 NEUTRALIZATION

987 NITRIC ACID PICKLE

988 KOH PICKLE

989

990

OPERATIONS PROCEDURE	COMPLETING THE LOW LEVEL RADIOACTIVE WASTE (LLRW) CONTAINER DATA SHEET (Per CIO C90-036)	SOP 20-C-618 AREA: As Applicable
Authorization: R. L. Gardner, Operations Facilities/Waste Mgt.	Supersedes: None	Issue Date: 03-11-91

1.0 PURPOSE

The purpose of this document is to provide the procedure for completing the LLRW data sheet needed to certify packaged waste for disposal.

2.0 APPLICABILITY

This procedure shall apply to organizations generating and/or packaging low level radioactive waste designated for disposal.

3.0 RESPONSIBILITIES

3.1 The supervisor of the organization generating and/or packaging shall be responsible for the following:

3.1.1 Ensuring only trained personnel complete the applicable sections of the "LLRW Container Data Sheet" per this procedure.

3.1.2 Reviewing and signing for approval applicable sections of the data sheet in accordance with this procedure.

3.2 The waste generator/packager shall be responsible for completing the data sheet as specified per this procedure.

3.3 Quality Operations shall be responsible for signing Sections I and II of the data sheet to verify construction generated waste packages.

3.4 An authorized Waste Management operator shall be responsible for completing Section III of the data sheet.

3.5 The Waste Management Shipping Supervisor shall review the completed data sheet, resolve discrepancies, and distribute copies per this procedure.

4.0 DEFINITIONS

4.1 Waste Generator/Packager - An individual who fills the container and/or prepares the waste container for shipment and completes applicable sections of the "LLRW Container Data Sheet".

5.0 REFERENCES

5.1 SOP 20-C-601, "Packaging Low Level Radioactive Waste (L-LRW) for Offsite Disposal"

5.2 SOP 1-C-602, "Low Level Radioactive Waste (L-LRW) Shipment Preparation"

R - MATERIAL REVISED, ADDED, OR DELETED.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

None

7.0 PROCEDURE

NOTE: The "LLRW Container Data Sheet", Form FMPC-REST-3236 (See Figure 1) shall be filled out as the packaging is performed per the applicable procedure.

NOTE: Waterproof ink shall be used to complete the LLRW Container Data Sheet.

7.1 Empty Container Certification

7.1.1 Complete Section I of the "LLRW Container Data Sheet", Form FMPC-REST-3236 per Table 1.

7.1.1.1 If more than one item is listed per line on the data sheet, circle those items which are applicable.

7.1.2 Notify the supervisor of the waste generating/packaging area, or the Quality Operations Representative for construction generated waste, that Section I of the data sheet has been completed and requires an approval signature for Section I.

NOTE: Quality Operations or the supervisor shall designate the container is approved for filling and record date.

NOTE: Supervision shall follow construction generated waste guidelines per FMPC-720.

7.1.3 Fasten with wire (or an equivalent fastener) the "LLRW Container Data Sheet" on to the container.

7.1.4 When Section I of the data sheet is complete, proceed to Section 7.2.

7.2 Full Container Certification

7.2.1 Complete Section II of the data sheet per Table 2.

NOTE: Quality Operations or Waste Packaging Quality Assurance and Certification shall record the "DCAR number" and "Date Closed" as deemed necessary.

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7.0 PROCEDURE (cont.)

7.2.1.1 If more than one item is listed per line on the data sheet, circle those items which are applicable.

7.2.2 Notify the supervisor of the waste generating/packaging area, or the Quality Operations Representative for construction generated waste, that Section II of the data sheet has been completed and requires an approval signature for Section II.

7.3 Final Package Certification

NOTE: Section III of the "LLRW Container Data Sheet" shall be completed by an authorized Waste Management operator.

7.3.1 Complete Section III of the data sheet per Table 3.

NOTE: Quality Operations or Waste Packaging Quality Assurance and Certification shall record the "DCAR Number" and "Date Closed" as deemed necessary.

7.3.1.1 If more than one item is listed per line, circle those items which are applicable.

7.3.2 Check the data sheet to ensure completion of all items in Sections I, II, and III.

7.3.2.1 If the data sheet is complete, write "yes" in the space provided, sign name, and enter badge number and date.

7.3.2.2 If the data sheet is not complete, write "no" in the space provided.

7.0 PROCEDURE (cont.)

7.3.3 Submit the data sheet to the Waste Management Shipping Supervisor for review and approval signature. Notify the supervisor of any discrepancies or unusual circumstances.

NOTE: The Waste Management Shipping Supervisor shall review the data sheet and sign name with date indicating the package meets requirements for shipment.

NOTE: The Waste Management Shipping Supervisor shall distribute copies of the signed "LLRW Container Data Sheet" to MC&A and maintain the original data sheet on file until respective packages are submitted for certification and shipment. The original data sheet shall then be delivered to QA Certification for final verification and Certification files.

NOTE: Waste Management shall maintain a copy of the "LLRW Container Data Sheet" on file.

8.0 APPLICABLE FORMS

8.1 Form FMPC-REST-3236, "LLRW Container Data Sheet"

TABLE 1
"LLRW Container Data Sheet" Instructions for Empty Container Certification (Section I)

ITEM TITLE	INSTRUCTIONS	REFERENCE (1)
Serial No.	Record the serial number of the container or the serial number of the seal from the drum package.	N/A
Drum No.	Record drum number.	N/A
Container Type	Mark appropriate box indicating the container type as defined below: MB - metal box WB - wood box B - bale SL - sea/land D - drum or overpack	N/A
Empty Container	If container is empty, mark "YES". If container holds any amount of material, mark "NO".	SOP 20-C-601
Container Condition Acceptable	Indicate whether container condition is acceptable; free from damage by rust, holes, or dents which could jeopardize the integrity of the container.	SOP 20-C-601
Sealand Preparation Complete	Indicate whether sealand container preparation is complete.	SOP 20-C-601
Absorbent Added	Indicate whether absorbent has been added to container.	SOP 20-C-601

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TABLE 1 (cont.)

ITEM TITLE	INSTRUCTIONS	REFERENCE (1)
Liner Present	Indicate whether liner is present (applicable only to wood boxes).	SOP 20-C-601
Drain Plug Secure	Indicate whether drain plug is securely in place on bottom of metal box, if applicable.	SOP 20-C-601
Generator/Pkg Signature	Sign name, badge no., and date for completing the applicable Section 1 items.	N/A

(1) The procedure referenced provides the specific procedure steps corresponding to the items in Table 1.

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TABLE 2
"LLRW Container Data Sheet" Instructions for Full Container Certification (Section II)

ITEM TITLE	INSTRUCTIONS	REFERENCE (1)
Origin	Specify where the waste was generated including construction project number, building, plant, area, and production process.	N/A
Material Type	List specific type or type(s) of material placed inside the container.	N/A
Material Code	Designate whether the material placed in the container corresponds to the material description or the FMPC Lot Code material identification.	SOP 20-C-601
Prohibited Materials	Indicate whether prohibited materials were placed in the container.	SOP 20-C-601
Free Liquids in Container	Indicate whether free liquid is present inside container.	SOP 20-C-601
Interplant Transfer	Indicate whether the container lid has been secured for interplant transport, including date closed.	SOP 20-C-601
Generator/Pkg Signature	Sign name, badge no., and date for completing the applicable Section II items.	N/A

(1) The procedure referenced provides the specific procedure steps corresponding to the items in Table 2.

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TABLE 3
"LLRW Container Data Sheet" Instructions for Final Container Certification (Section III)

ITEM TITLE	INSTRUCTIONS	REFERENCE (1)
Volume/Weight Capacity	Indicate whether space inside container has been fully utilized and meets container content and weight requirements.	1-C-602
Moisture/Liquid Present	Indicate whether container interior/exterior visibly shows moisture/liquid.	1-C-602
Absorbent Added	Indicate whether absorbent is added to container.	1-C-602
Liner Closed	Indicate whether liner has been folded over in a "closed" position.	1-C-602
Banding	Indicate whether banding is present and secure on container.	1-C-602
Radiological Dose Rates	Indicate whether radiological survey has been completed.	1-C-602
LSA/LQ/RQ Sticker	Indicate whether the radiological DOT identification sticker is on the container.	1-C-602
Markings Acceptable	Indicate whether container markings are acceptable.	1-C-602
Bolt Ring	Indicate whether bolt ring on drum package is properly closed/torqued.	1-C-602
Gasket/Caulking in Place	Indicate whether gasket/caulking is in place.	

(1) The procedure referenced provides the specific procedure steps corresponding to the items in Table 3.

TABLE 3 (cont.)

ITEM TITLE	INSTRUCTIONS	REFERENCE (1)
Pins/Bolts Retainer Ring Secure	Indicate whether pins/bolts/retainer ring are secure on lid.	1-C-602
Drain Plug Check (Red/Black Dot)	Indicate whether appropriate dot is present on container and drain plug is securely closed on metal box.	1-C-602
Package Condition Acceptable	Indicate whether condition of container is acceptable.	1-C-602
Wood Box Lid in Place	Indicate lid is secure on wooden box.	1-C-602
Material Added	List specific material added to container to meet package weight requirement and/or fill void spaces and record date material added. If no material is added, mark N/A for this item.	20-C-601
Gross	Record gross weight from container or 65 card.	N/A
Tare	Record tare weight from container or 65 card.	N/A
Net	Record new weight from container or 65 card.	N/A
Package Dimensions	Indicate size of container.	N/A
Lot Number	Record material lot sequence number from container or 65 card.	N/A

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TABLE 3 (cont.)

ITEM TITLE	INSTRUCTIONS	REFERENCE (1)
Container Number	Record container number within the same lot sequence.	1-C-602
Percent Combustible by Volume	Request amount from supervisor.	N/A
Shipment Number	Record assigned shipment number.	1-C-602
Waste Stream Number	Record waste stream number.	1-C-602

(1) The procedure referenced provides the specific procedure steps corresponding to the items in Table 3.

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LLRW CONTAINER DATA SHEET

Section I — EMPTY CONTAINER CERTIFICATION DATA

Serial # _____

Container No. _____

Container Type:

MB ☐ SL ☐
WB ☐ D ☐
B ☐

	YES	NO	N/A
Empty at Start			
Acceptable Condition			
Sealand Prep Complete			
Absorbent Added			
Liner Present			
Drain Plug Secure			

Pkg. Generator _____ Badge # _____ Date _____

Supervisor/PQA Signature _____ Badge # _____ Date _____

Section II — FULL CONTAINER CERTIFICATION DATA

Origin: _____

DCAR # _____ Date Closed _____

Ready for Interplant Transfer: _____ Date _____

Material Type: _____

	YES	NO	N/A
Material is as Coded			
Prohibited Materials			
Free Liquids in Container			

Pkg. Generator _____ Badge # _____ Date _____

Supervisor/PQA _____ Badge # _____ Date _____

LLRW CONTAINER DATA SHEET (Sheet 1 of 2)
Form No. FMPC REST-3236
Figure 1

R - MATERIAL REVISED, ADDED, OR DELETED.

OPERATIONS PROCEDURE	COMPLETING THE LOW LEVEL RADIOACTIVE WASTE (LLRW) CONTAINER DATA SHEET (Per CIO C90-036)	SOP 20-C-618 AREA: As Applicable
Authorization: R. L. Gardner, Operations Facilities/Waste Mgt.	Supersedes: None	Issue Date: 03-11-91

Section III FINAL PACKAGE CERTIFICATION DATA

	YES	NO	N/A		YES	NO	N/A
Max. Volume Utilization to Wt. Capacity				Pins/Bolts/Retainer Ring Secure			
Liquids or Excessive Moisture Present				Required Banding in Place			
Absorbent Added				Wood Box Lid in Place			
Liner Closed				Radiological Dose Rates			
Drain Plug Check (Red/Black Dot)				LSA/LQ/RQ Present			
Gaskets/Caulking in Place				Markings Acceptable			
Bolt Ring in Place/Torqued				Package Condition Acceptable			

Container Condition upon receipt: ☐ Acceptable ☐ Damaged

DCAR # _____ Date Closed _____

Package Dimen

Material Added: _____ Date _____

Source _____
Description _____
Quantity _____

Prohibited Materials Inspection: Yes ☐ No ☐

Gross _____ lbs.
Tare _____ lbs.
Net _____ lbs.

Waste Stream No. ONLO-0000000 __ __

Lot Number: _____ - _____ - _____ - _____

Container No. _____

Percent Combustible by Volume: _____

Shipment No. WML __ __ __ __ __

Above Sections Complete _____

Final Pkg. Generator Signature _____ Badge # _____ Date _____

Waste Mgmt. Shipping Supervisor _____ Badge # _____ Date _____

LLRW CONTAINER DATA SHEET (Sheet 2 of 2)
FORM FMPC-REST-3236
Figure 1

R - MATERIAL REVISED, ADDED, OR DELETED.

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORITY
03-11-91	0	Issued in accordance with CIO C90-036 per Request No. P90-355.

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FEED MATERIALS PRODUCTION CENTER

DRUM MANAGEMENT PLAN

AUGUST 1990

RECORD OF REVISIONS

Revision No.	Date
0	8/90
1	4/91

List of Revisions

Figure 5.1
Page 10
Page 11
Figure 6.3

DRUM MANAGEMENT PLAN OUTLINE

1.0 Purpose of Plan

2.0 Objective of Plan

3.0 Summary of Amended Consent Decree Commitments for Drum Management

4.0 Physical Description of Plant 1 Pad Area and Activities

- 4.1 Aisle Spacing
- 4.2 Inspections

5.0 Plant 1 Pad Containment Staging Area Operation

6.0 Indoor Drum Storage

- 6.1 Scope
- 6.2 Criteria for Drum Movement
- 6.3 Aisle Spacing
- 6.4 Drum Inspections

7.0 Material Storage Evaluations

8.0 Spill Response Actions

APPENDIX I DRUM TYPES

ADDENDUM I HYDROGEN GENERATING MATERIAL (April 1991)

1.0 PURPOSE OF PLAN

The purpose of the Feed Materials Production Center (FMPC) Drum Management Plan is to set forth the program that is in place to minimize environmental impact of stored, drummed materials at the FMPC. The sections contained in this plan outline the aggressive operational actions and administrative controls which have been implemented to enhance FMPC drum storage.

2.0 OBJECTIVE OF PLAN

The objective of the FMPC Drum Management Plan is to document drum management activities consistent with the commitments contained in the Amended Consent Decree for Ohio Environmental Protection Agency (OEPA) concurrence. In addition, Section 5.0 of this plan is submitted to obtain Ohio Environmental Protection Agency approval.

3.0 SUMMARY OF AMENDED CONSENT DECREE COMMITMENTS FOR DRUM MANAGEMENT

Listed below are the commitments as stated in the Amended Consent Decree made by the FMPC relating to drum management during the evaluations:

Amended Consent Decree Reference	Commitment	Drum Management Plan Reference
Subsection 3.5.1 (f)	DOE shall, as soon as reasonably possible but in no event more than sixty (60) days from a determination that any drummed materials are hazardous or mixed waste, move such materials to units that are identified in the FMPC Part A Permit Application submitted September 1989, or subsequent revisions. If storage space which meets RCRA and Ohio hazardous waste storage requirements is not available, DOE shall store such wastes in a manner as protective of human health and the environment as possible, shall perform daily leakage inspections on all such containers that are not located under cover, and shall, within sixty (60) days of a determination that sufficient RCRA storage space is not available, submit a plan and	Section 7.0

Amended Consent Decree Reference	Commitment	Drum Management Plan Reference
Subsection 3.5.1 (f) (Continued)	schedule for OEPA approval for short-term storage of such wastes. DOE shall perform weekly inspection in accordance with 40 CFR 265.15 and 265.174, and OAC 3745-65-15 and 3745-66-74 on all such containers.	Section 7.0 (Continued)
Subsection 3.5.1 (f)	DOE shall store backlog material which is being evaluated for the potential to be hazardous or mixed waste, but for which such evaluations have not been completed, on the best available hard surfaced facilities at the FMPC in such a manner that any leakage can be readily detected, and no later than September 30, 1990, will maintain aisle space meeting the requirements of 40 CFR 265.35.	Section 4.1, 6.1
Section 3.8 (a)	On or before September 30, 1990, DOE shall ensure that sufficient aisle space is maintained on the Plant 1 Pad to meet the requirements of 40 CFR 265.35, except on the covered staging area.	Section 4.1
Section 3.8 (b)	Until such time as the approximate 16,000 drums identified on Attachment 1 are removed from the Plant 1 Pad, or such drums are determined not to be hazardous or mixed waste, DOE shall perform daily leakage inspections on all such drums, and shall perform weekly inspections in accordance with 40 CFR 265.15 and 265.174, and OAC 3745-65-15 and 3745-66-74.	Section 4.2

Amended Consent Decree Reference	Commitment	Drum Management Plan Reference
Section 3.8 (c)	Until such time as all containers evaluated under paragraph 3.5.1 above and all other containers of hazardous or mixed wastes are removed from the Plant 1 Pad, DOE shall maintain containment measures at the overpack covered staging area, such as the use of temporary dikes or liners, sufficient to ensure that any potential spillage or releases of material from drums are contained on the covered staging area of the pad and are not released into any drains, soil, storm sewers, or other areas outside of the covered staging area.	Section 5.0
Section 3.8 (c)	For any drums that are actually leaking in such a manner as to allow wastes to be released onto the pad DOE shall immediately contain the release or spill and shall manage the drum in accordance with OAC 3745-66-71 as soon as possible after detection, but in no event more than 24 hours after discovery.	Section 8.0
Section 3.8 (c)	Within thirty (30) days after entry of this Amendment, DOE shall submit to OEPA for its approval a plan describing the actions DOE will perform in order to comply with this subsection.	Sections 4.1, 4.2. 5.0, 8.0

4.0 PHYSICAL DESCRIPTION OF PLANT 1 PAD AREA AND ACTIVITIES

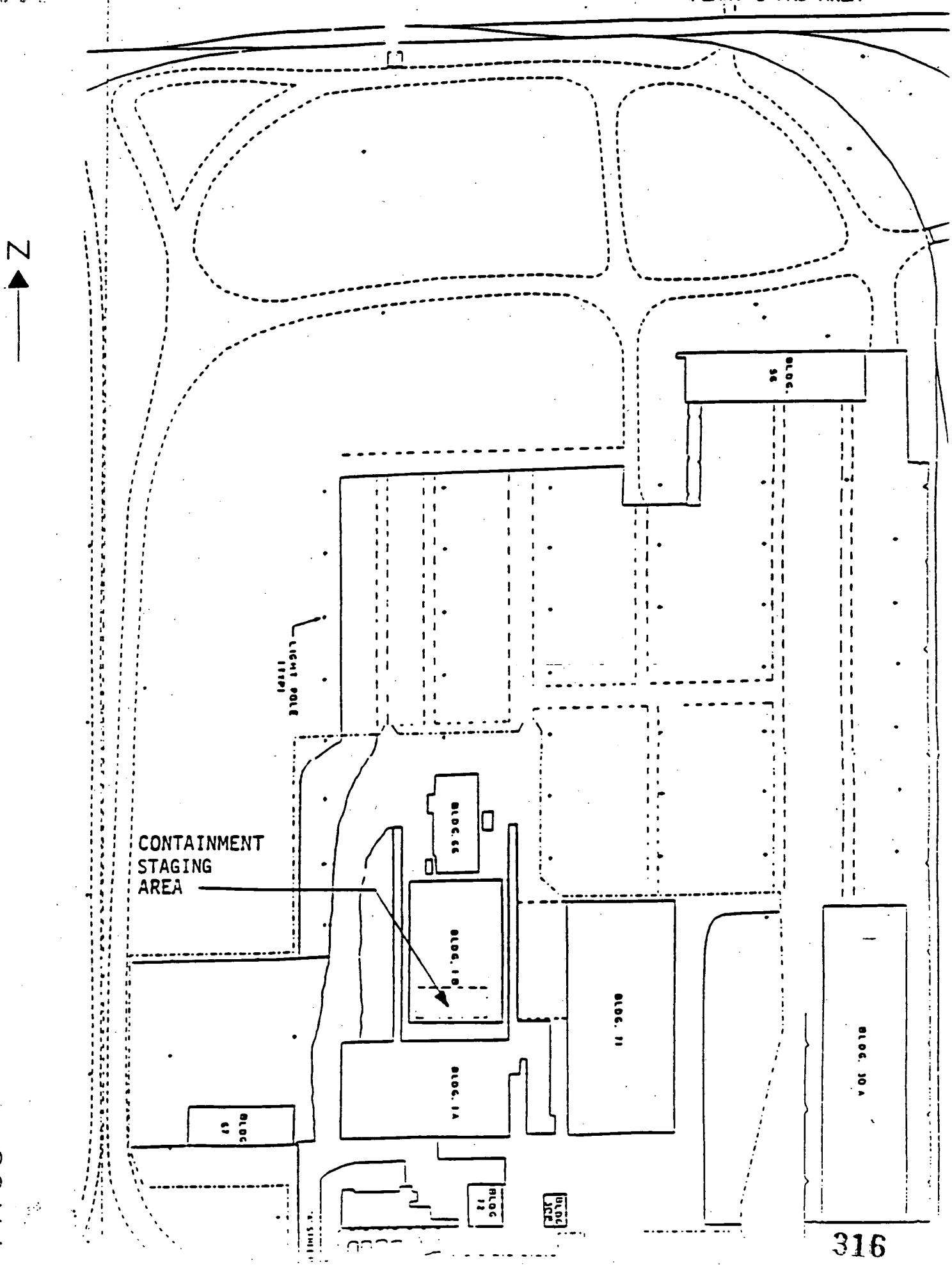
The Plant 1 Pad is a 375,000 square foot concrete storage area that is being used to store low level radioactive wastes, recoverable residues, and waste residues under Resource Conservation and Recovery Act (RCRA) evaluation. A sketch of the Plant 1 Pad, which is located in the northwest section of the FMPC production area is shown in Figure 4.0. The Containment Staging Area is located underneath the Building 1B weather shelter as noted on Figure 4.0.

Due to the deteriorated condition and environmental exposure of the approximately 45,000 drums stored on the pad, aggressive operational actions have been implemented to prevent spills/leaks from the drums. These actions include the following:

- Overpacking of deteriorated drums on the Plant 1 Pad.
- Daily drum leakage inspections.
- Weekly inspection consistent with 40 CFR 265.15 and 265.174 and OAC 3745-65-15 and 3745-66-74 by August 31, 1990.
- Operation of a lined staging area for deteriorated drums prior to overpacking.
- Relocation of 20,000 drums from the Plant 1 Pad to indoor storage within the FMPC production facilities by October 31, 1990.
- Rearrangement of remaining Plant 1 Pad drums to provide adequate aisle spacing for leakage inspections by September 30, 1990.
- Emergency repair of pad deterioration that would permit safe movement of the drums to achieve adequate aisle spacing. The repair consists of filling in deteriorated sections of the pad and cutting away severely cracked areas with subsequent replacement of the needed concrete. The emergency repair is being conducted in concert with the drum movements so that the September 30, 1990, date to achieve adequate aisle spacing is met. Controls are in place during the repair to minimize the spread of contamination and to drum the waste for subsequent evaluation.
- Special relocation of approximately 4,700 drums to the Plant 1 Pad containing uranium bearing materials that will require further action to alleviate a potential explosive hazard due to the possibility of hydrogen generation and ignition. A method for safe transport of the drums has been documented to allow development of the best method to mitigate the potential explosive hazard after the pad aisle spacing is achieved on September 30, 1990.

All of the above actions, as detailed in the remaining plan sections, are consistent with the Amended Consent Decree commitments and will result in a substantial environmental improvement at the FMPC.

FIGURE 4.0
PLANT 1 PAD AREA



4.1 AISLE SPACING

The aisle spacing that will be implemented by September 30, 1990, for the Plant 1 Pad (not including drums in the Containment Staging Area) and other outdoor drum storage areas is shown in Figure 4.1. The inspection aisles will be maintained at a minimum of 24 inches between each row of pallets. Fifty (50) inch fork truck access is provided on at least one side of the storage locations and when possible, on two sides. The maximum number of skids in any one row is 20. The exception is for the northeast ramp area of the Plant 1 Pad which has three rows that are 41 skids long due to the dimensions of the ramp area and the intent to maximize utilization of storage space on the pad. This storage arrangement was designed to maximize utilization of the hard surfaces found on the Plant 1 Pad Area and other outdoor storage locations; provide adequate aisle space for inspections; and allow sufficient room for immediate action to contain leaks/spills and allow a drum to be mitigated within 24 hours. This storage arrangement meets the requirements of 40 CFR 265.35.

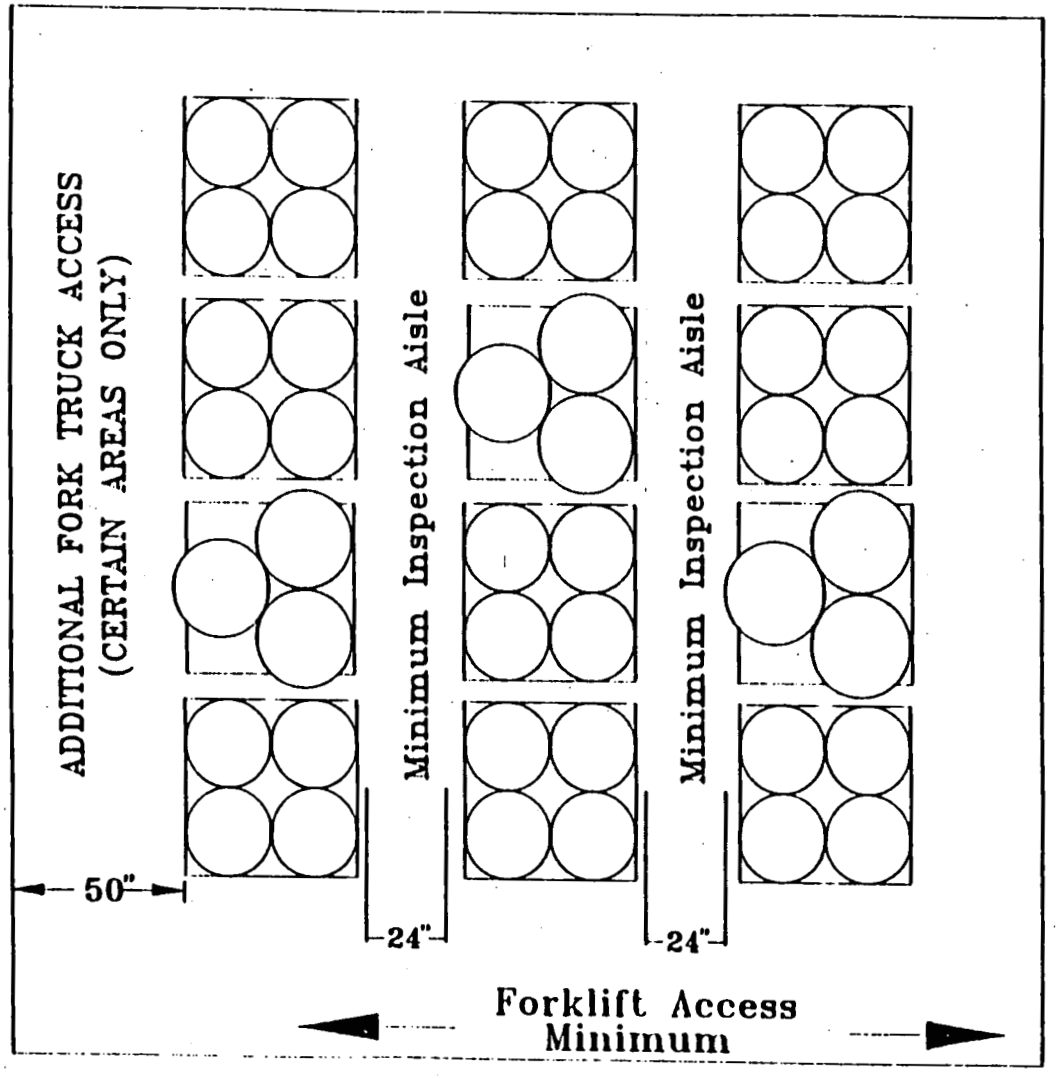
4.2 INSPECTIONS

Figure 4.2.0 is an example of a Plant 1 Pad daily leakage inspection sheet. The "RI" and "R" Areas marked at the top of the row columns in Figure 4.2.0 are examples of designated areas on the Plant 1 Pad for drum storage. Until September 30, 1990, the outdoor daily leakage inspections are performed to the extent that current aisle space allows due to the fact that not all of the drums stored outdoors have adequate aisle space. After September 30, 1990, the FMPC has committed to provide adequate aisles for all drums under evaluation. Ladders will be utilized during the daily leakage inspections to enhance observation of third tier drums. On this particular day, July 19, 1990, one drum was identified as leaking during the inspection contained in "R" Area, row number 4. Figure 4.2.1 is a comment page that is attached to an inspection sheet when a leaking drum is found and provides additional information on the drum, the corrective action, and the minor event report (MER) log number that the incident is recorded under.

Figures 4.2.2 and 4.2.3 illustrate the MER in which the documented corrective action states that the FMPC utility engineer, who is the on-shift assistant emergency duty officer (AEDO), was notified and the drum overpacked. The AEDO contacts the FMPC spill coordinator (as shown in Figure 4.2.4 under event number 90-07-261) to determine if a reportable quantity (RQ) was involved. In this case, an RQ was not spilled.

FIGURE 4.1 4228

Plant 1 Pad/Outdoor Drum Storage



NOTE: MAXIMUM ROW LENGTH
IS 20 PALLETS

P.C. Moralee,8-18-90,JTR,Plt1-01.dwg

PLANT 1 EAST PAD DRUM INSPECTION

"RI" AREA		"R" AREA
ROW 1 OK	ROW 26 NON RCRA STORAGE	ROW 1 OK
ROW 2 OK	ROW 27 MT	ROW 2 OK
ROW 3 OK	ROW 28 MT	ROW 3 OK
ROW 4 OK	ROW 29 MT	ROW 4 Leaker ST/O S
ROW 5 OK	ROW 30 NON RCRA STORAGE	ROW 5 OK
ROW 6 OK	ROW 31 " " "	ROW 6 OK
ROW 7 OK	ROW 32 " " "	ROW 7 OK
ROW 8 OK	ROW 33 " " "	ROW 8 OK
ROW 9 OK		ROW 9 OK
ROW 10 OK		ROW 10 OK
ROW 11 OK		ROW 11 OK
ROW 12 OK		ROW 12 OK
ROW 13 OK		ROW 13 OK
ROW 14 OK		ROW 14 OK
ROW 15 OK		ROW 15 OK
ROW 16 OK		ROW 16 OK
ROW 17 OK		ROW 17 OK
ROW 18 OK		ROW 18 OK
ROW 19 OK		ROW 19 OK
ROW 20 OK		ROW 20 NON RCRA STO
ROW 21 MT		ROW 21 " "
ROW 22 MT		ROW 22 " "
ROW 23 MT		ROW 23 " "
ROW 24 MT		ROW 24 " "
ROW 25 MT		ROW 25 " "
		ROW 26 " "

INSPECTOR NAME: Richard L. Keever

DATE: 7-19-90

319

TIME: 0936 AM

PLANT 1 PAD DRUM INSPECTION COMMENT PAGE

4228

LIST LOT AND DRUM NUMBER: H093-658-D069-0300 DR. 38

LIST DRUM WEIGHTS: 471-48-423

LIST TIME SUPERVISOR OR U.E. NOTIFIED: A. ELAM 0900AM

ACTIONS TAKEN AND TIMES: Drum plugged + overpacked 0945

MER REPORT NUMBER: 90-07-261

LIST LOT AND DRUM NUMBER:

LIST DRUM WEIGHTS:

LIST TIME SUPERVISOR OR U.E. NOTIFIED:

ACTIONS TAKEN AND TIMES:

MER REPORT NUMBER

LIST LOT AND DRUM NUMBER:

LIST DRUM WEIGHTS:

LIST TIME SUPERVISOR OR U.E. NOTIFIED:

ACTIONS TAKEN AND TIMES:

MER REPORT NUMBER:

LIST LOT AND DRUM NUMBER:

LIST DRUM WEIGHTS:

LIST TIME SUPERVISOR OR U.E. NOTIFIED:

ACTIONS TAKEN AND TIMES:

MER REPORT NUMBER:

LIST LOT AND DRUM NUMBER:

LIST DRUM WEIGHTS:

LIST TIME SUPERVISOR OR U.E. NOTIFIED:

ACTIONS TAKEN AND TIMES:

FIGURE 4.2.2

Westinghouse Materials Company of Ohio
MINOR EVENT REPORT

4228

EVENT LOG NO.: 90-07-26

DEPARTMENT REPORT NO.: MER:R:(WM):90-

PAGE: 1 2

UOR EVALUATION:	This MER was reviewed for UOR criteria in accordance with Site Procedure FMPC-703. UOR is required: ☒ NO ☐ YES UOR NUMBER:

18. STAFF MANAGER:	DATE:
J P Hopper	7/20/90

NO.	DISTRIBUTION OF [illegible]S
1	Staff Manager (ORIGINAL)
2	Vice President, Quality & Safety
3	Performance Assessment Department Mar
4	Section Manager
5	Area Supervisor/Group Manager
6	Central Files
7	Assistant Emergency Duty Officer/Utility E

This report is to be completed in accordance with Site Procedure FMPC-704 during the shift which the event took place. Notify the Manager, Environmental Compliance immediately if the event represents a threat to the environment, on or off site.

ACTUAL EVENT

1. EVENT SUBJECT:
LEAKING DRUM.

2. DATE OF EVENT:	3. TIME:	4. SHIFT:
7-19-90	0930	1
5. LOCATION:	**6. RESPONSIBLE DEPARTMENT:**	**7. SECTION:**
PLANT 1 EAST PAD	WASTE OPERATIONS	W/O.

8. EQUIPMENT/PROCESS/AREA:
PLANT 1 EAST PAD.

9. DESCRIBE THE EVENT IN DETAIL:
☐ See attached sheets (if required).

DURING ROUTINE EAST PAD INSPECTION A DRUM [illegible] H093-658-D069-0300 DRUM 38 WAS FOUND LEAKING. APPROX 2 OZ LEAKED OUT.

10. CORRECTIVE ACTION TAKEN:
☐ See attached sheets (if required).

THE LEAK WAS CONTAINED WITH ABSORBANT PADS
U.E WAS NOTIFIED.
THE DRUM WAS TAKEN TO A OVERPACK STATION
& OVERPACKED. NO LIQUIDS LEAKED ONTO THE FL

11. HAS THIS EVENT OCCURED PREVIOUSLY?
☐ NO
☒ YES WHEN? 7/15/90
WHERE? PLANT 1 PAD

12. WAS EVACUATION ALARM SOUNDED?
☒ NO
☐ YES WHEN?

13. WAS BUILDING/AREA EVACUATED?
☒ NO
☐ YES WHEN?

14. WHEN WAS THE BUILDING/AREA REENTERED?

AUTHORIZED BY:

15. PERSONNEL INVO[redacted] WITNESSES:
☐ See attached sheets for additional information.

	BADGE	TITLE	DEPARTMENT	SENT TO M: YES OR
[redacted]	2571	CHEM OPR.	W/O	N

16. ADDITIONAL INFORMATION:
☐ See attached sheets (if required).

NAME OF INDIVIDUAL FILING REPORT, TITLE, AND DATE:

EVENT LOG NUMBER (YR - MO - N[redacted]	TIME AND DATE	DESCR[redacted]I	AEDO'S BADGE NUMBER	HE	L[redacted]	[redacted]OTIFIED SPILL ADVISOR	DIR[redacted] A[redacted] MONI[redacted]
90-07-261 4220	0930 7-19-90	PLT. 1 PERSONNEL FOUND LEAKING DRUM ON PLT 1 PRD DURING ROUTINE INSPECTION - APPROX 2 OZ DRUM WAS OVERPACKED - LOT # H093-658-D069-0308 DR # 38	[redacted] 116		✓	✓ 3 3	
~~90-07-258~~	~~7-19-90~~						
90-07-258	1100 7-19-90	THE PROBLEMS WITH THE OFFSITE EMERG. WARNING SYSTEM AT BOSS FIRE HOUSE AND NEW BALTIMORE HAS BEEN CORRECTED - CONFIRMED AT 1100 HRS ON 7-19-90	[redacted] 116	CLOSE OUT OF EVENT		NA	✓
90-07-262	1230 7-19-90	EMPLOYEE FOR CLEVELAND WRECKING CO. (BOB VALINES # 50-1887) RECEIVED LACERATIONS ON RIGHT THUMB WHILE WORKING AT LAB, WAS TRANSPORTED TO FRANCISCAN MEDICAL CENTER AT HARRISON IN PRIVATE VEHICLE - NOT REPORTABLE TO ORDC - PER HRASER	[redacted] 116	✓		NA	✓

COPIES OF THIS LOG MUST BE DELIVERED TO THE EOC DAILY.

NO.	DISTRIBUTION
1	*EOC
2	Originator

* EOC TO MAKE DISTRIBUTION: 1. EDOs: (9) 2. DOE Site Office 3. Manager Public Affairs and Communications 4. Manager Environmental Compliance 5. Manager Industrial Hygiene & Safety 6. Manager Performance Assessment

8. Facility Owner: GRUNSK

The following criteria was developed to prioritize mitigation activities such that the most deteriorated drums are addressed first. This criteria will be implemented during the daily leakage inspections by August 31, 1990:

TYPE I - Obvious observation of material flowing or having accumulated on pallet or pad.

- Notify supervisor.
- Immediately stop or contain the leak.
- Supervisor notifies AEDO.
- Note drum on inspection form as requiring mitigation within 24 hours.
- Complete additional cleanup as necessary.
- Supervisor generates a MER.
- AEDO notifies FMPC spill coordinator.

TYPE II - Localized evidence of material on exterior of drum but no material contact with pallet or pad.

- Note on inspection form.
- Supervisor generates a MER.
- Supervisor reviews completed inspection sheets to prioritized drum for movement to Overpack Staging Area and subsequent mitigation.

TYPE III - Evidence of exterior contamination/discoloration without evidence of active release.

- Note on inspection form.
- Supervisor to schedule for overpacking when Type I and II drums are all overpacked.
- Supervisor generates a MER.

Appendix I contains example photographs of Type I, II, and III drums.

Table 4.2.1 illustrates the frequency of inspections for drums that are under evaluation with respect to the FMPC storage location.

TABLE 4.2.1
FMPC DRUM INSPECTION FREQUENCY*

TYPE OF INSPECTION	PLANT 1 PAD	ALL OTHER OUT-DOOR DRUM STORAGE AREAS	INDOOR PLANT	RCRA WAREHOUSES
Daily Leakage	X	X		
Weekly Leakage			X	
Weekly RCRA	X			X

*DOES NOT INCLUDE INTERMEDIATE PRODUCTS/PRODUCTS OR THORIUM

In addition to the daily leakage inspections performed on the Plant 1 Pad, weekly RCRA inspections will be performed as of August 30, 1990, to meet the requirements of 40 CFR 265.15 and 265.174 and OAC 3745-65-15 and 3745-66-74. The criteria used for the weekly Plant 1 Pad inspections is shown in Table 4.2.2.

TABLE 4.2.2
WEEKLY INSPECTION CRITERIA FOR PLANT 1 PAD*

1. Communications Device (Supervisors Office)
2. Spill Response Equipment (on Pad)
   - 2.A. Recovery drums (10)
   - 2.B. Absorbent Pad (6)
   - 2.C. Hazardous Material Pig (6)
   - 2.D. Leather Palm Gloves (3)
   - 2.E. Rubber Boots (3)
   - 2.F. Disposable Coveralls (3)
   - 2.G. Shovels (2)
   - 2.H. Brooms (1)
   - 2.I. Granular Absorbent (3 bags)
3. Respirators and Cartridges (3) (Building 66 and Plant 1)
4. Emergency Eyewash (outside Plant 1/Building 66)
5. Green Light for Eyewash Stations
6. Signs (pad perimeter)
   - 6.A. Authorized Personnel Signs
   - 6.B. No Smoking Signs
   - 6.C. Emergency Call
7. Fire Extinguisher (Outside Plant 1/Building 66/Building 71)
8. Containment Area
   - 8.A. Curb Condition
   - 8.B. Liner Condition
   - 8.C. Free Liquids
9. Security Maintained by FMPC Security System
10. Container Inspections-Reference Daily Leakage Inspection Forms.
11. Pad Inspection-Not applicable, Pad Integrity to be Addressed During Operational Improvement Project.

*This is the minimum inspection criteria and subject to revision.

The approximately "16,000" suspect drums as referenced in the Amended Consent Decree are located on the Plant 1 Pad, except for one material type representing approximately 5,539 drums located in Plant 6. The specific material stream, which is a sump cake that had previously been processed through the FMPC rotary kiln, was moved to Plant 6 because in February 1990, WMCO had concluded sampling/analysis of the material and evaluated it to be nonRCRA. Since the criteria for moving drums into the Plant 6 "dense pack" storage array (as outlined in Section 6.0) is that the material be dry as determined by process knowledge and unlikely to be evaluated RCRA, the dried sump cake stream was one of the materials selected for Plant 6 storage. The movement of the dried sump cake stream was initiated the week of June 18, 1990, and completed the week of July 16, 1990. The drum material contained in Plant 6, including the dried sump cake, has a weekly leakage inspection performed as shown in Table 4.2.1 which is sufficient based on the material type, drum conditions, and enhanced storage area location.

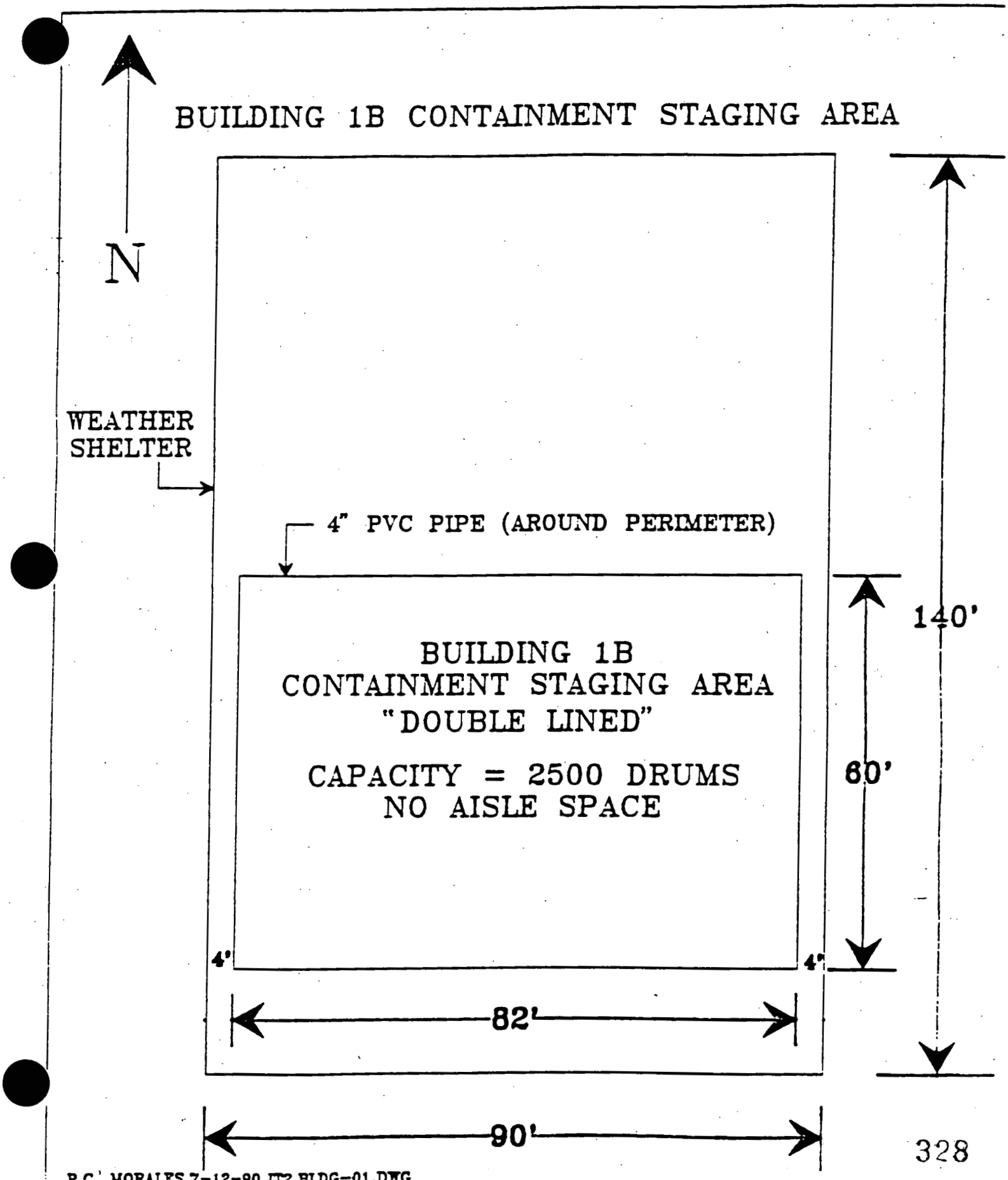
5.0 PLANT 1 PAD CONTAINMENT STAGING AREA OPERATION

The Plant 1 Pad Containment Staging Area is approximately 4,920 square foot area constructed of a layer of impermeable, vinyl-nylon plastic surrounded by 4 inch plastic pipe. The area is covered by a metal roof structure which is open on the sides. The capacity of the Containment Staging Area is approximately 2,000 drums without aisle spacing. Figure 5.0 contains a sketch of the Containment Staging Area.

The Plant 1 Pad Containment Staging Area is used to store deteriorated drums that require overpacking. Drums are overpacked for one of two reasons: (1) to correct a leak (Type I drums) or (2) to improve the integrity of the container due to a general or local deterioration so as to preclude future leaks (Type II/III drums).

As space permits, Type II/III drums are transported by fork truck from the Plant 1 Pad Area to the Containment Staging Area. From the Containment Staging Area, the drums are scheduled for overpacking at one of three locations (two inside Plant 1 and one inside Building 71 located on the pad). Additional overpacking areas may be set up on the Plant 1 Pad or alternate locations depending on the overpacking requirements. Figure 5.1 shows the number of drums overpacked to date during FY-1990.

When a Type I drum is identified, immediate action is taken to contain the drum/material using a patch, absorbent materials, or other appropriate methods. Once contained and direction has been given by the AEDO, as detailed in Section 8.0, the drum is transported to an overpacking area and mitigated within 24 hours after the drum was identified.



P.C. MORALES.7-12-90.JT2.BLDG-01.DWG

WASTE MANAGEMENT PERFORMANCE MEASURE

1990 GOAL

OVERPACK 10,000 DRUMS ON THE PLANT 1 PAD

STATUS: OVERPACKED 13,151 FOR FY 1990

1991 GOAL

OVERPACK 18,000 DETERIORATED DRUMS IN OPERATIONS FACILITIES

STATUS: OVERPACKED 13,437 FY 1991 TO DATE

	Monthly Accumulation	Year-To-Date
October	2,315	2,315
November	1,891	4,206
December	1,538	5,744
January	2,494	8,238
February	3,009	11,247
March	2,109	13,437

6.0 INDOOR DRUM STORAGE

6.1 Scope

The scope of the indoor drum storage activity involves relocating drums from outdoor storage locations to the inside areas of idle production plants. In some plants, machinery/equipment is being moved to make available the maximum amount of floor space to accommodate drums. The goal is to relocate 20,000 drums of residues into indoor storage by October 31, 1990. The movement and storage of drum residues inside FMPC facilities on lined and contained surfaces represents a significant environmental enhancement until evaluation, treatment/disposal of the residues is completed.

6.2 Criteria for Drum Movement

The criteria for selecting which materials are moved into indoor storage primarily depends on two factors. The first factor concerns the relative certainty that the material will be evaluated to be nonRCRA. Process knowledge combined with past analytical data indicates that certain process residues, such as the dried sump cake discussed in Section 4.2 or magnesium fluoride have a very unlikely probability of being evaluated hazardous. The final determination of many of the residues, however, cannot be finalized until the identification of all FMPC hazardous waste management units is complete in June 1991. Therefore, the FMPC will not knowingly create new hazardous waste storage units by relocating residues under evaluation that have a potential to be later determined hazardous. The second criteria is the use of process knowledge to verify the material contains no free liquids. The reason for this criteria is that in order to relocate as many drums indoors to reduce environmental deterioration of the drums, the FMPC is utilizing a "dense pack" arrangement as described in Section 6.3. The determination by process knowledge of a dry material allows the "dense pack" of the drums, yet still provides adequate room for inspection and spill response activities based on the relative immobility of the stored material.

R 6.3 Aisle Spacing

Figure 6.3 illustrates the "dense pack" arrangement for storage of dry materials (as determined by process knowledge) in FMPC Plant 6. All drums stored indoors are placed on an impermeable laminated vinyl/nylon and surrounded completely by 4 inch curbing to form a containment in the storage areas. This current storage arrangement in Plant 6 will not be used for storage of other waste subject to the decree or the hazardous waste rules. If any of the drummed material in Plant 6 is determined to be hazardous waste, the waste will be handled and stored consistent with the requirements of the Amended Consent Decree. Storage in other locations for drums under evaluation which contain hazardous waste must be conducted consistent with the arrangements specified for the Plant 1 Pad or the arrangements currently in use in the FMPC permitted storage areas. The latter storage arrangement meets the requirements of 40 CFR 265.35.

6.3 Aisle Spacing (Continued)

The inspection aisles are currently 22 inches between each two rows of pallets with a 50 inch fork truck access provided on at least one side of the storage locations and when possible on two sides. The 22 inch aisle spacing was based upon leakage inspection capability, spill response actions, and maximizing the number of drums stored indoors.

6.4 Drum Inspections

The inspection criteria for indoor drum storage is the same as described for outdoor drum storage in Section 4.2. The three levels of drum deterioration are applicable with the requirement of immediate spill response actions for Type I drums. The leakage inspections for indoor drum storage are conducted on a weekly basis as indicated in Table 4.2.1.

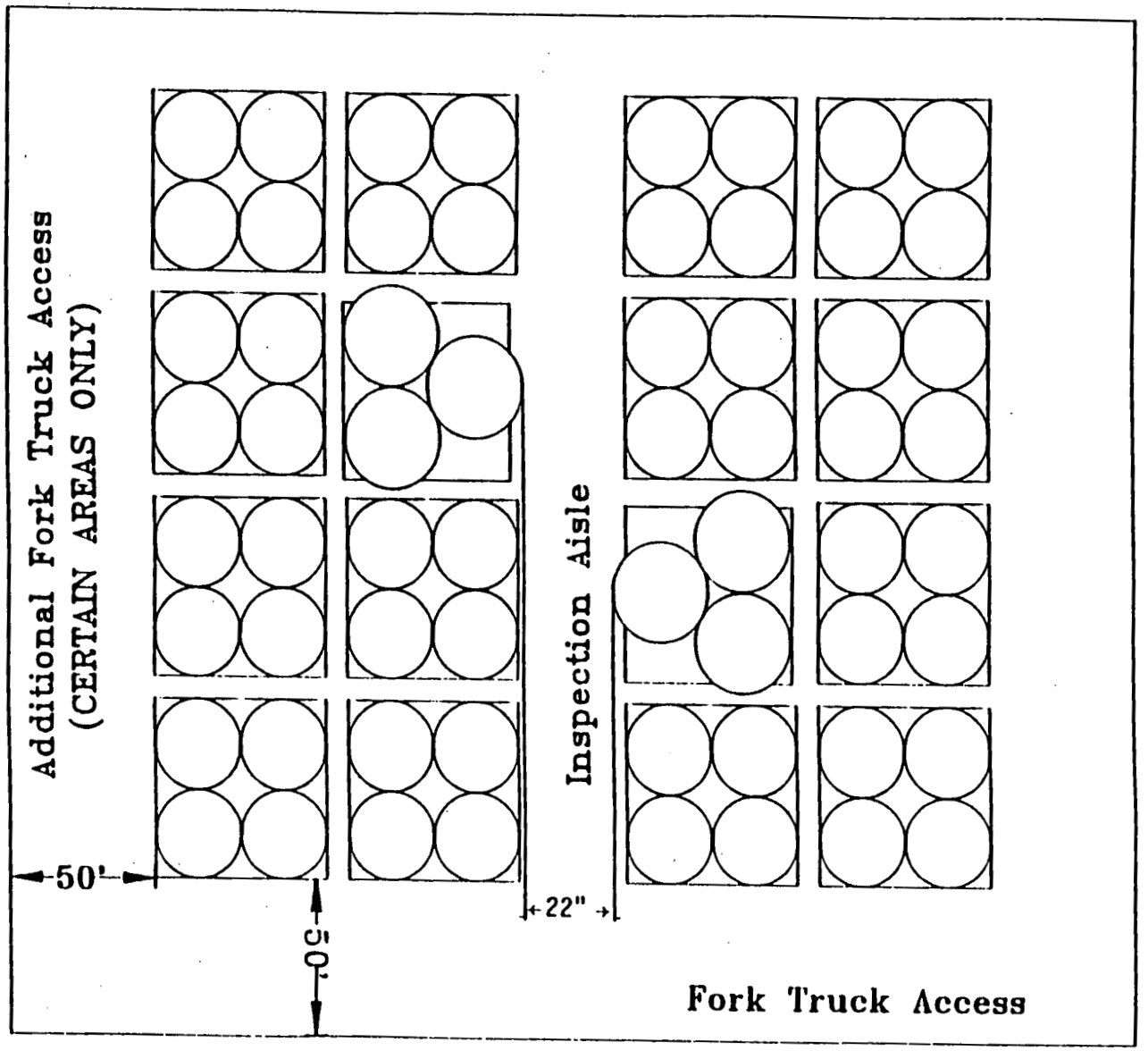
To enhance the inspection process inside plants where the lighting is not as bright during the daytime hours as in outdoor storage areas and the dense pack array requires more extensive examination, high intensity flashlights and rolling ladders are utilized. Each operator inspecting drums indoors is required to use a high intensity flashlight to shine between the double stack of pallets to perform the inspection. In addition, a rolling ladder is used to gain greater visibility to drums located within the interior of the third stack.

7.0 MATERIAL STORAGE EVALUATION

Determination of hazardous waste is defined by the FMPC when notification is made to OEPA in the form of the quarterly technical progress reports. Sixty days (60) from a determination that any drummed materials are hazardous or mixed waste, DOE will move such materials to units that are identified in the FMPC Part A permit Application submitted September 1989, or subsequent revisions. If storage space is not available, DOE will perform daily leakage inspections on all such containers as outlined in Section 4.2 of this plan, and shall, within 60 days of a determination that sufficient RCRA storage space is not available, submit a plan and schedule for OEPA approval for short-term storage of such wastes. DOE will perform weekly inspections in accordance with 40 CFR 265.15 and 265.174 and OAC 3745-65-15 and 3745-66-74 on all such containers.

Indoor Drum Storage

(For Plant 6 Only)



NOTES: 1. MAXIMUM ROW LENGTH IS 20 PALLETS.

MORALES,6-16-90,JR2,PLT1-02.DWG

8.0 SPILL RESPONSE ACTIONS

Based upon the inspection criteria listed in Section 4.2.0, the FMPC spill response actions for Type I identified drums are as follows:

1. Operator inspects drum and makes an obvious observation of material flowing from the drum or an accumulation of material on pallet or pad.

2. Operator notifies supervisor.

3. Immediate actions are taken utilizing the spill response equipment as identified in Table 4.2.2. Typically absorbents are used on wet spills and dry spills are covered and vacuumed or scooped up. The immediate actions are taken to contain the spill without normally moving the drums. the aisle spacing as outlined for the various FMPC storage area is adequate to perform these actions based on past operating experience.

4. Supervisor notifies the AEDO.

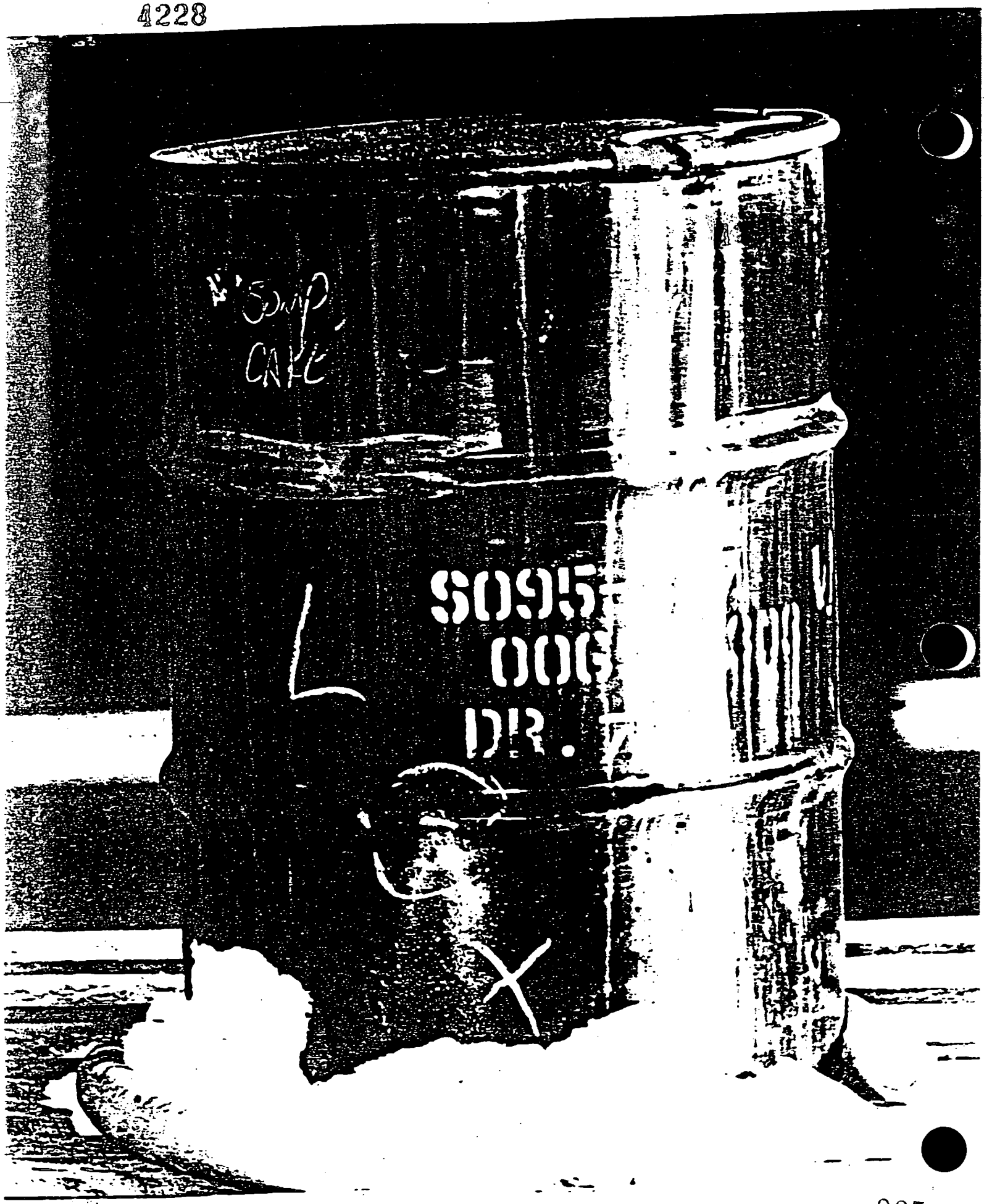
5. Notation is made on inspection form so that drum will be mitigated within 24 hours (for Type I drum only).

6. Supervisor generates a MER and AEDO notifies spill coordinator to determine if a RQ was spilled.

7. After the initial leak is contained or stopped, a fork truck is used to stage the pallets into the 50 inch fork truck aisle to retrieve the drum for overpacking and additional cleanup of the spill area if necessary.

APPENDIX I

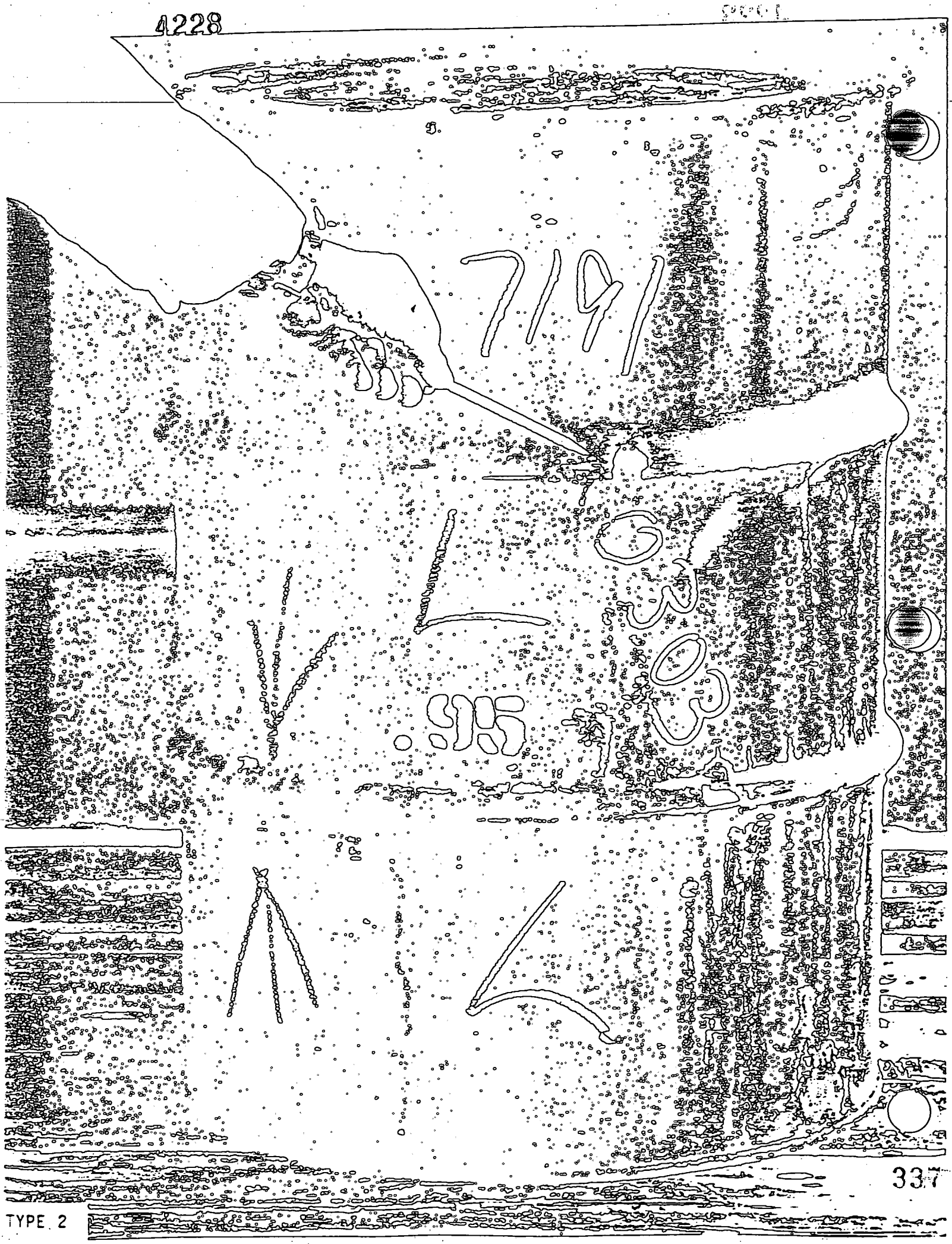
DRUM TYPES



TYPE 1

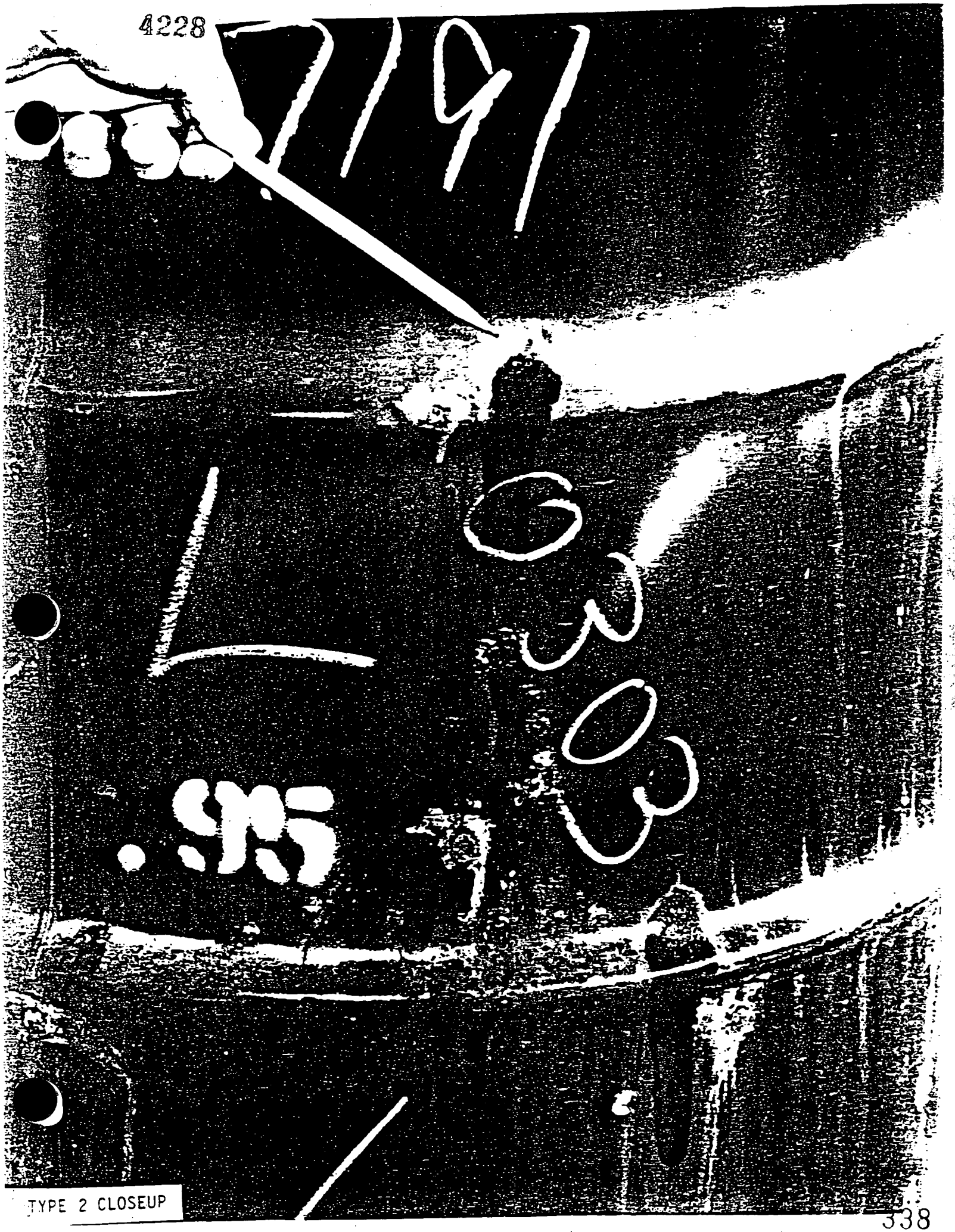
TYPE 1 CLOSEUP

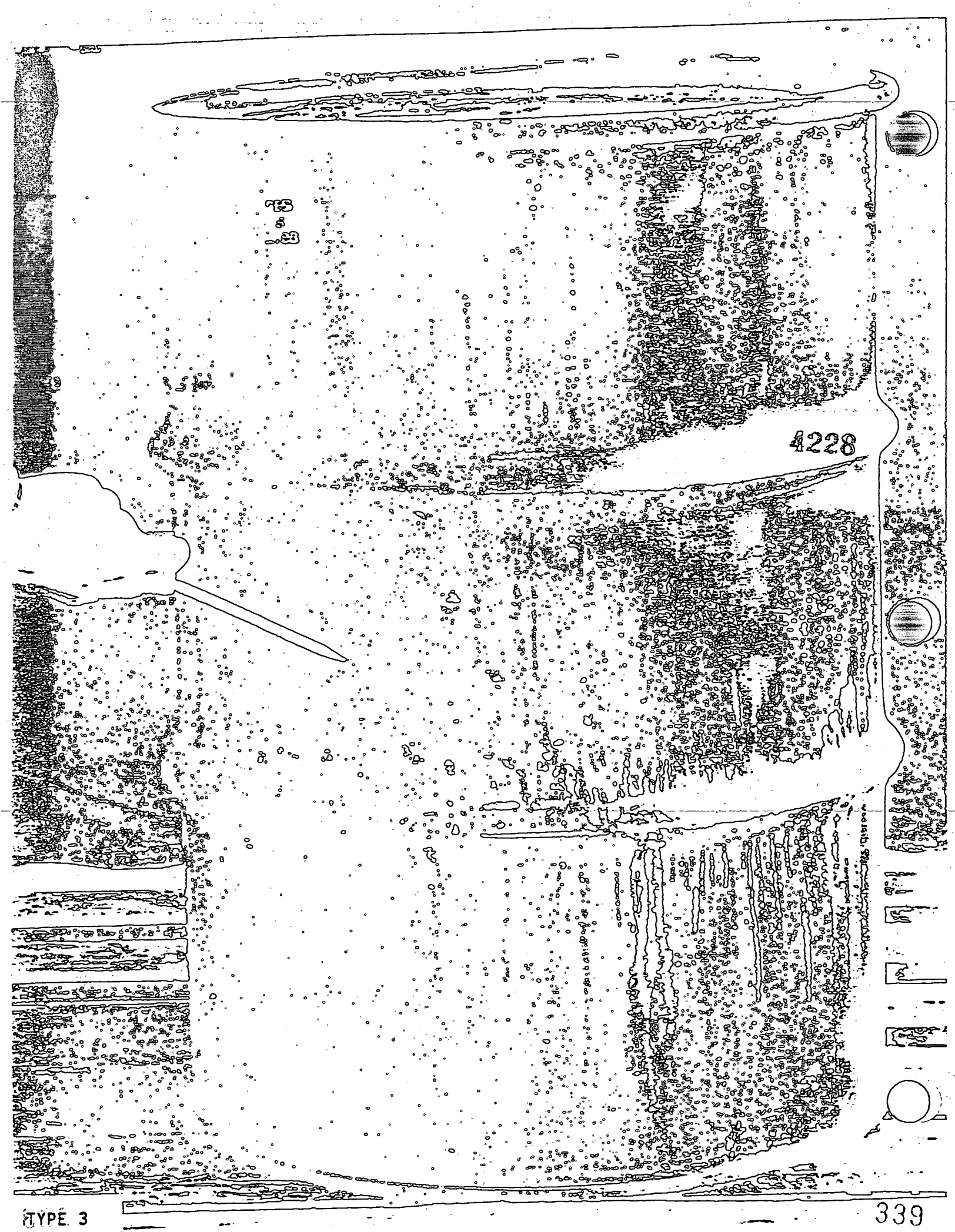
4228



337

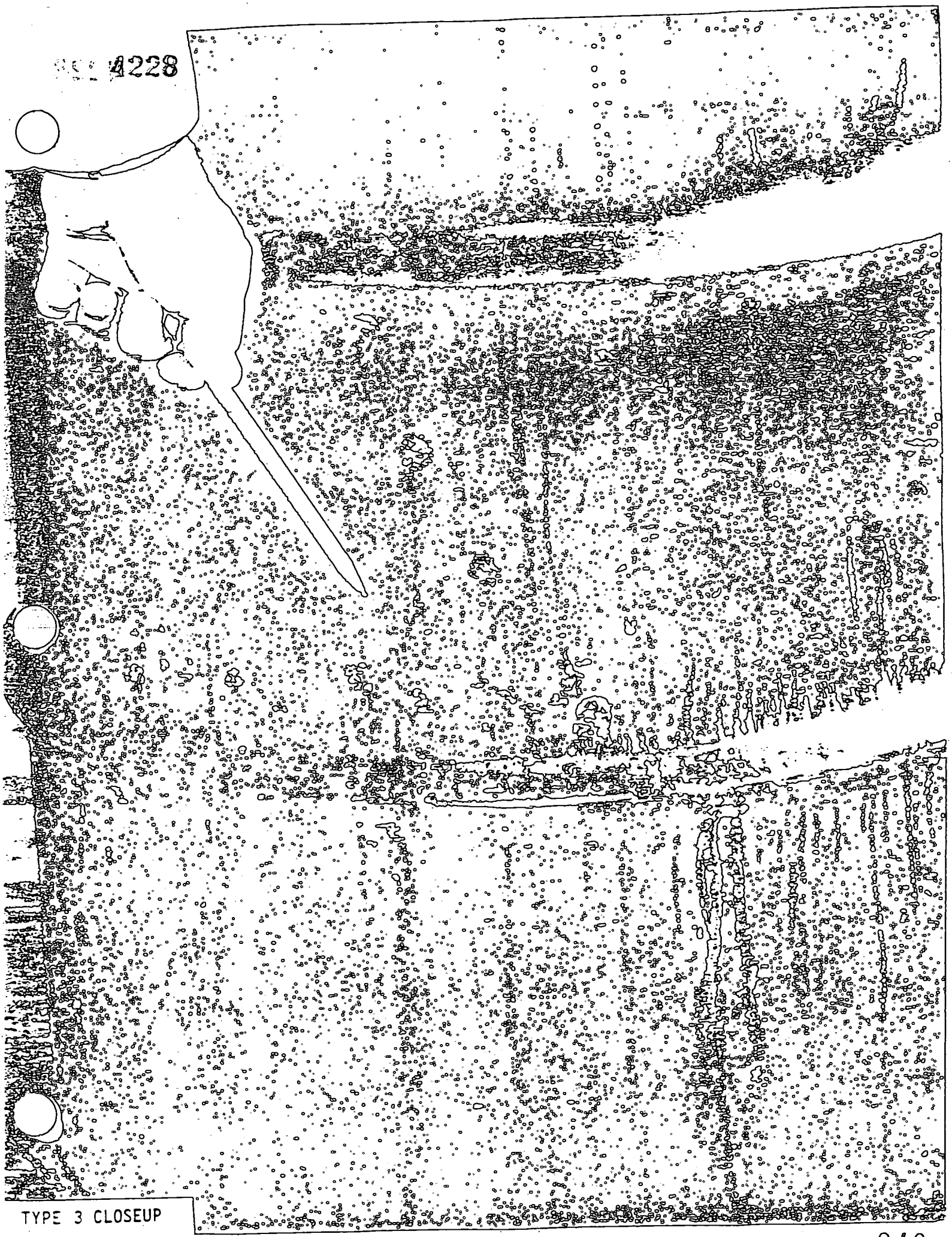
TYPE 2


4228
TYPE 2 CLOSEUP



TYPE 3

4228



TYPE 3 CLOSEUP

FMPC DRUM MANAGEMENT PLAN

ADDENDUM I

APRIL 1991

HYDROGEN GENERATING MATERIAL

The FMPC currently has materials containing uranium metal stored inside drums on site. When uranium combines with oxygen from any water present in the drums, hydrogen gas is formed.

FMPC has determined that some drums of RCRA and uncharacterized material have the potential to buildup hydrogen gas from this chemical reaction. In order to preclude any potential problems, FMPC plans to vent the drums to remove any hydrogen buildup that may have occurred. In addition, air filters will be added to the drum lids to exhaust any future hydrogen generated inside the drum.

The filter being added is a carbon-carbon composite high efficiency particulate air (HEPA) filter. The 3/4 inch carbon-carbon filter is 90% porous by volume, has a flow rate of 200 ml per minute at one inch of water, is resistant to radiation and acid damage, and which continues to function when exposed to moisture.

To simulate the overturning of a drum, FMPC tested the leaking of the proposed vents with one foot of head water. These vents had an average time of seven hours before leaking began. As is evidenced by this testing, FMPC believes enough time exists to respond to any overturned drum with minimal, if any release to the environment.

The filter will be inserted into the 3/4 inch bung opening of the new drum lid. The new lid will be placed on the drum and the drum will then be moved into storage. The use of this vent allows the drums to be managed safely with minimal risk to human health or the environment.

RESTORATION PROCEDURE	STORAGE OF RADIOACTIVE MATERIAL	SOP 1-C-608 AREA: Plant 1
Authorization: X R. L. Gardner, Manufacturing	Supersedes: None	Issue Date: 08-13-90

1.0 PURPOSE

The purpose of this procedure is to provide the requirements for storing radioactive material.

2.0 APPLICABILITY

This procedure shall apply to designated Plant 1 radioactive material storage areas.

3.0 RESPONSIBILITIES

3.1 Supervisors shall be responsible for the following:

3.1.1 Coordinating and notifying support organizations of assistance as required per this procedure.

3.1.2 Specifying storage location for material in accordance with FMPC-2084, "Radiation Control Manual".

3.1.3 Ensuring only trained personnel handle radioactive material.

3.1.4 Distributing documentation as required per this SOP.

3.1.5 Performing required inspections of storage facilities.

3.1.6 Ensuring that AEDO is notified of any release to the environment and that a Minor Event Report (MER) is completed.

3.1.7 Ensuring authorized storage configurations, aisle spacing, material segregation and other storage requirements are maintained per this SOP.

3.1.8 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection for the process being performed.

3.1.9 Providing operators with the required respiratory protection.

3.1.10 Contacting Radiological Safety to perform a survey prior to storing the radioactive material.

3.2 Solid Waste Compliance shall be responsible for the following:

3.2.1 Performing surveillances of radioactive material storage areas according to regulatory requirements.

3.2.2 Assuring proper characterization and classification of FMPC waste streams.

3.0 RESPONSIBILITIES (cont.)

3.2.3 Ensuring applicable regulation requirements are incorporated into this procedure and are being followed at the FMPC.

3.2.4 Performing surveillances of radioactive material storage area records to ensure adequacy and completeness.

3.3 Operators shall be responsible for complying with this SOP and notifying supervisor immediately of spills, leaks, releases or any unusual conditions.

3.4 Materials Control & Accountability shall be responsible for the following:

3.4.1 Maintaining current radioactive material inventory.

3.4.2 Preparing, maintaining and signing inventory and identification records per this SOP.

4.0 DEFINITIONS

4.1 Material Characterization - An evaluation which provides the physical and chemical characteristics and major radiological content and concentration of the material.

4.2 FMPC Lot Marking System - A 15 digit alpha numeric coding system used to identify nuclear material to ensure separation of depleted, normal, and enriched uranium or thorium materials.

4.3 Non-Characterized Material - Radioactive material that is suspected to have constituents on the Environmental Protection Agency Hazardous Waste List.

4.4 Resource Conservation & 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 all hazardous waste.

4.5 Short Term Material - Radioactive material stored only for a maximum of six months.

4.6 Radioactive Material - Material composed of radioactive or radioactively contaminated material in excess of safe limits for unconditional release.

R - MATERIAL REVISED, ADDED, OR DELETED.

5.0 REFERENCES

5.1 SOP 20-C-902, "Liquid Propane Gas (LPG) Powered Handstackers and Tuggers"

5.2 SOP 1-C-101, "Sampling Residue and Waste Material"

5.3 SOP 1-C-804, "Overpacking Deteriorated Containers"

5.4 SOP 20-C-904, "General Nuclear Safety Requirements"

5.5 SOP 1-C-604, "Inspection of Containerized and Drummed Residues"

5.6 SOP-01-104, "Segregation of Wooden Pallets"

5.7 SOP 20-C-601, "Packaging Low Level Radioactive Waste (L-LRW) for Offsite Disposal"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 Respiratory protection provided by the supervisor shall be worn when required.

6.3 A HEPA type filter vacuum cleaner or a vacuum system approved by IH&S shall be used during spill cleanup with a current DOP test label properly affixed to vacuum.

6.4 Leather-palm gloves shall be worn when handling drums, operating equipment and when handling rough, sharp-edged or contaminated materials.

6.5 Any release of radioactive material outside of storage container shall be reported to the supervisor immediately.

6.6 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to Radiological Safety for evaluation. The involved employees shall report to Medical Services at the end of their shift or as directed to submit a urine sample and again report at the start of their next shift to submit another urine sample.

7.0 PROCEDURE

7.1 Preparing Containers for Storage

7.1.1 Upon delivery of radioactive material to the storage area, inspect container(s) and accompanying paperwork per the "Radioactive Material Pre-Storage Checklist", Form FMPC-REST-3183 (See Figure 1).

NOTE: An MC&A representative shall be notified for inventory update.

NOTE: An "NM Transfer Record/NM Receipt Record/Material Identification Record" (68/69 card) is not required for radioactive material received from offsite.

7.1.1.1 If an unacceptable item is noted, complete "Corrective Action" and "Date Corrected" section on the "Radioactive Material Pre-Storage Checklist".

NOTE: If container is acceptable, proceed to Step 7.1.2.

7.1.2 Sign the "NM Transfer Record/NM Receipt Record/Material Identification Record", 68/69 card (See Figure 2). Request the Waste Management Supervisor and the Nuclear Materials Reporting Specialist to sign 68/69 card.

7.1.2.1 If the container holds radioactive material received from offsite, complete the "Nuclear Material Receiving Report," Form FMPC-ADMS-613 (Figure 3) and the "Offsite Nuclear Materials Receipt Verification and Disposition Report", Form FMPC-ADMS-PRO-1131-1 (Figure 4) and transmit to supervisor.

NOTE: Supervisor shall forward Form FMPC-ADMS-613 to MC&A.

7.1.3 Paint bare metal, chipped paint areas, or rust areas using the same color of rust inhibiting paint.

CAUTION: **RESPIRATORY PROTECTION SHALL BE WORN WHILE PERFORMING THIS STEP.**

NOTE: Remove loose paint or rust with a metal brush before painting.

7.1.4 Request Nuclear Materials Reporting Specialist to record data for LLRM Inventory database.

7.1.5 Check to ensure hazardous material warning label (See Figure 5) affixed on container. If label(s) do not have coating, apply polyurethane coating.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.1.6 Sign the completed "Radioactive Material Pre-Storage Checklist", Form FMPC-REST-3183 and obtain the other required signatures. Submit signed form to the supervisor.

7.1.7 Notify MC&A when container is moved form one location to another location.

7.2 Storage

7.2.1 Using forklift or handstacker, move radioactive material containers to storage per Table 1.

NOTE: Handstacker shall be inspected and operated per SOP 20-C-902.

7.2.1.1 If additional action is determined which is not listed on Table 1, notify supervisor.

7.3 Inspection

7.3.1 Inspect radioactive material containers on a periodic basis as determined by supervisor. Complete the "Radioactive Material Container/Storage Discrepancy Record", Form FMPC-REST-3182 (See Figure 6) during inspection by recording only the container/storage area discrepancies.

NOTE: Refer to Table 2 for inspection criteria.

7.3.1.1 If an unacceptable condition is noted on Form FMPC-REST-3182, refer to Tables 1 and 2 for corrective action.

7.3.1.2 If other items of concern are noted during inspection, notify supervisor for corrective action.

7.3.2 When inspection is completed, submit Form FMPC-REST-3182 to the supervisor.

NOTE: The inspector and supervisor shall sign the completed form.

NOTE: The supervisor shall maintain records of completed remediation.

R - MATERIAL REVISED, ADDED, OR DELETED.

8.0 APPLICABLE FORMS

8.1 Form FMPC-REST-3182, "Radioactive Material Container/Storage Discrepancy Record"

8.2 Form FMPC-REST-3183, "Radioactive Material Container Pre-Storage Checklist"

8.3 Form FMPC-ADMS-613, "Nuclear Material Receiving Report"

8.4 Form FMPC-AC-1990, "NM Transfer Record"

8.5 Form FMPC-AC-2220, "Nuclear Material Receipt Record"

8.6 Form FMPC-AC-2221, "Material Identification Record"

8.7 Form FMPC-ADMS-PRO-1131-1, "Offsite Nuclear Materials Receipt Verification and Disposition Report"

R - MATERIAL REVISED, ADDED, OR DELETED.

TABLE 1
STORAGE REQUIREMENTS FOR RADIOACTIVE MATERIAL

STORAGE REQUIREMENT	APPLICABLE RADIOACTIVE MATERIAL			
	CONTAINERIZED		NON-CHARAC-TERIZED WASTE	NON-CONTAINERIZED FREE-RELEASE MATERIAL
	LONG TERM	SHORT TERM		
1 Stack maximum of three containers high	X	X	X	
2 Group containers per lot number	X	X	X	X
3 Maintain forklift accessibility to rows	X	X	X	X
4 Spacing must be facility dependent	X	X	X	X
5 Store drummed material on pallets	X	X	X	
6 Container markings and labels shall be visible in aisle	X	X	X	
7 Aisles shall be accessible for inspection	X	X	X	
8 May be stored on or off pad				X
9 Nuclear safety requirements apply per SOP 20-C-904	X	X	X	

R - MATERIAL REVISED, ADDED, OR DELETED.

TABLE 2
RADIOACTIVE MATERIAL STORAGE INSPECTION

ITEM	INSPECTION ITEM	INSPECTION CRITERIA	CORRECTIVE ACTION REQUIRED
Container	Hole	An opening in the container including breach, gouge, puncture or leak.	Overpack per SOP 1-C-804.
Container	Dent	A crease, depression or hollow made by blow or pressure; a concave distortion which jeopardizes the integrity of the container. A dent in the top or bottom rim.	Overpack per SOP 1-C-804.
Container	Bulge	A swollen area, a convex distortion, an outward bend which jeopardizes the integrity of the container.	Overpack per SOP 1-C-804.
Container	Corrosion	A container exhibiting exterior rust which is flaking or discoloration and bulging from interior rust.	Overpack per SOP 1-C-804.
Configu-ration	Spacing	Aisle spacing must be three feet between pallets and between rows of pallets for non-characterized material. All other material must be spaced per supervisor's direction.[1]	Move container(s).
Pallet	Boards	Inspect for broken boards per criteria of SOP 01-104.	Replace or repair pallet.
Container	Labeling	A hazardous material label, FMPC lot marking code, and gross weight must be visible and legible on the container.[2]	Affix label or stencil with enamel paint the required markings in 2 inch letters.

(1) Excluding requirements for nuclear safe masses per SOP 20-C-904.

(2) Enriched material shall include labeling requirements of SOP 20-C-904.

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RADIOACTIVE MATERIAL CONTAINER PRE-STORAGE CHECKLIST

STORAGE AREA: FMPC INVENTORY NO.: DATE:

ITEM NO.	INSPECTION ITEM	ACCEPTABLE YES	ACCEPTABLE NO	CORRECTIVE ACTION	DATE CORRECTED
1	Form FMPC-CONT-1945-XX card complete			Complete form per SOP 20-C-601 or 1-C-604(1).	
2	68/69 card complete			Notify supervisor.	
3	Shipping manifest and waste characterization complete(2)			Notify supervisor.	
4	Container free of spilled/leaked material			Notify supervisor and contain spill/ leak per SOP 20-C-606	
5	Container free of damage (i.e. bare metal, hole, dent, bulge, corrosion)			Overpack per SOP 1-C-804.	
6	Container bolt ring secure			Secure or replace bolt ring.	
7	Material sampled/ factor assay performed for radionuclides and RCRA determination			Sample per SOP 1-C-101.	
8	FMPC Lot Number complete and stencil-led on container			Obtain and stencil lot number per SOP 20-C-601 or 1-C-604(1).	
9	Gross, net, and tare weight complete and stencilled on container			Stencil weights per SOP 20-C-601 or 1-C-604(1).	
10	"POOS" marking sten-cilled on container, if applicable			Stencil "POOS" marking on contain-er per SOP 20-C-601 or 1-C-604(1).	
11	Gross weight marking correct size (2")			Correct marking per SOP 20-C-601 or 1-C-604(1).	

RADIOACTIVE MATERIAL CONTAINER PRE-STORAGE CHECKLIST (SHEET 1 OF 2)
FORM NO. FMPC-REST-3183
Figure 1

R - MATERIAL REVISED, ADDED, OR DELETED.

RADIOACTIVE MATERIAL CONTAINER PRE-STORAGE CHECKLIST (cont.)

STORAGE AREA: FMPC INVENTORY NO.: DATE:

ITEM NO.	INSPECTION ITEM	ACCEPTABLE YES	ACCEPTABLE NO	CORRECTIVE ACTION	DATE CORRECTED
12	Container markings and labels correctly located per Figure 7[3]			Correct per Figure 7 or Figure 8.	
13	"Hazardous Material Warning Label" affixed to container			Affix label to container.	
14	Other labels affixed to container as applicable (Flammable)			Affix applicable labels per SOP 20-C-601 or 1-C-604[1].	
15	Pallet free of damage			Replace or repair pallet per SOP-01-104.	
16	Container plastic wrapping secure, if applicable			Secure, rewrap, or containerize.	

(1) SOP 20-C-601 is applicable to radioactive waste. SOP 1-C-604 is applicable to residues and refuse material.
(2) Applicable to material received from offsite.
(3) Box markings and labels shall be located as shown in Figure 8.

COMMENTS: _____

MC&A Signature Badge No.

Waste Management Signature Date

Inspector's Signature Date

RADIOACTIVE MATERIAL CONTAINER PRE-STORAGE CHECKLIST (SHEET 2 OF 2)
FORM NO. FMPC-REST-3183
Figure 1

R - MATERIAL REVISED, ADDED, OR DELETED.

NUCLEAR MATERIAL TRANSFER RECORD

CARD PL. NO. 68

NEGATIVE	DATE TRANSFERRED MO.	DAY	YEAR	SHIFT	TRANS. BY BADGE NO.

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

CARD SEQUENCE NO.: 92852

P.O. NO.: | SOURCE:
MATERIAL CLASS: | MATERIAL TYPE:
LOT SEQUENCE NO.:
MATERIAL DESCRIPTION:
SHAPE CODE:

MBA: (FROM) | PLANT:
MBA: (TO) | PLANT:
STORAGE LOCATION:

NO. OF CONTAINERS OR ITEMS: NUMBER | DESCRIPTION
GROSS WEIGHT:
TARE WEIGHT:

SIGNATURES: (SHIPPER) (TRANSPORTATION) (RECEIVER)

FMPC-AC-1990 (REV 10/7/88)

NUCLEAR MATERIAL RECEIPT RECORD

CARD PL. NO. 69

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

NEGATIVE	DATE RECEIVED MO.	DAY	YEAR	SHIFT	RECEIVED BY BADGE NO.

CARD SEQUENCE NO.: 92852

P.O. NO.: | SOURCE:
MATERIAL CLASS: | MATERIAL TYPE:
LOT SEQUENCE NO.:
MATERIAL DESCRIPTION:
SHAPE CODE:

MBA: (FROM)
MBA: (TO)
STORAGE LOCATION:

NO. OF CONTAINERS OR ITEMS: NUMBER | DESCRIPTION
GROSS WEIGHT:
TARE WEIGHT:

SIGNATURES: (SHIPPER) (TRANSPORTATION) (RECEIVER)

FMPC-AC-2220 (REV. 10/7/88)

MATERIAL IDENTIFICATION RECORD

CARD PL. NO. XX

NOTE: Green card is for receiver information ONLY and may be retained in file. DO NOT FORWARD to Data Processing. DO NOT LEAVE with the material.

NEGATIVE	DATE RECEIVED MO.	DAY	YEAR	SHIFT	RECEIVED BY BADGE NO.

CARD SEQUENCE NO.: 92852

P.O. NO.: | SOURCE:
MATERIAL CLASS: | MATERIAL TYPE:
LOT SEQUENCE NO.:
MATERIAL DESCRIPTION:
SHAPE CODE:

MBA: (FROM) | PLANT:
MBA: (TO) | PLANT:
STORAGE LOCATION:

NO. OF CONTAINERS OR ITEMS: NUMBER | DESCRIPTION
GROSS WEIGHT:
TARE WEIGHT:

SIGNATURES: (SHIPPER) (TRANSPORTATION) (RECEIVER)

FMPC-AC-2221 (REV 10/7/88)

NM TRANSFER RECORD/NM RECEIPT RECORD/MATERIAL IDENTIFICATION RECORD
FORMS FMPC-AC-1990, 2220, 2221
Figure 2

R - MATERIAL REVISED, ADDED, OR DELEED.

Westinghouse Materials Company of Ohio
P O. BOX 398704
CINCINNATI, OHIO 45239

NUCLEAR MATERIAL RECEIVING REPORT

NUCLEAR MATERIAL RECEIVING REPORT NO _____

DATE UNLOADED _____ 19 ____ DATE RECEIVED _____ 19 ____

RECEIVED FROM _____

CARRIER _____ CAR NUMBER _____ SEAL NUMBER _____

FREIGHT BILL NO _____ BILL LADING NO _____

NUMBER OF ITEMS RECEIVED _____ TYPE OF ITEMS RECEIVED _____ GROSS WEIGHT _____

MATERIAL DESCRIPTION AS PER BILLING _____ NLT NO _____

CHECKED BY _____ RECEIVED BY _____

NOTE The following must be completed by the person verifying receipt

CONSIGNOR'S INFORMATION			DESCRIPTION OF MATERIAL	RECEIVING SECTION INFORMATION			
LOT NUMBER	QUANTITY	WEIGHT LBS		GROSS LBS	TARE LBS	NET LBS	ELEMENT WGT

REMARKS (Related document numbers for additional material received) _____

FMPC ADMS-613 REV 5-77 (B)

RECEIVER TO MATERIALS CONTROL & ACCOUNTABILITY

NUCLEAR MATERIALS RECEIVING REPORT
FORM FMPC-ADMS-613
Figure 3

R - MATERIAL REVISED, ADDED, OR DELETED.

FMPC

Page ____ of ____ Pages

PRODUCTION OPERATIONS DEPARTMENT – RECEIVING GROUP (PLANT 1)

OFF-SITE NUCLEAR MATERIALS RECEIPT VERIFICATION AND DISPOSITION REPORT

Shipped From _____ Nuclear Mat'l Rec Report No. _____ Date Disposed _____

_____ Date Received _____ DOE 741 No. _____

Carrier _____ Shipper's Tally List Received with Shipment ☐ Yes

No. of containers on Nuclear Mat'l. Receiving Report _____ WMT No. _____ ☐ No

LINE ITEM	PRODUCTION RECEIVING DATA						
	SHIPPER'S I.D. NO.	NO OF CONTAINERS	MATERIAL DESCRIPTION	FMPC GROSS (LBS)	FMPC TARE (LBS)	FMPC NET (LBS)	SHIPPER'S NET WT. (LBS)
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							

DISPOSITION

LINE ITEMS INCLUDED	FMPC LOT NO. ASSIGNED	DELIVERED TO (CONSIGNEE)

Condition Received (Remarks & Recommendations): _____

Disposition by _____

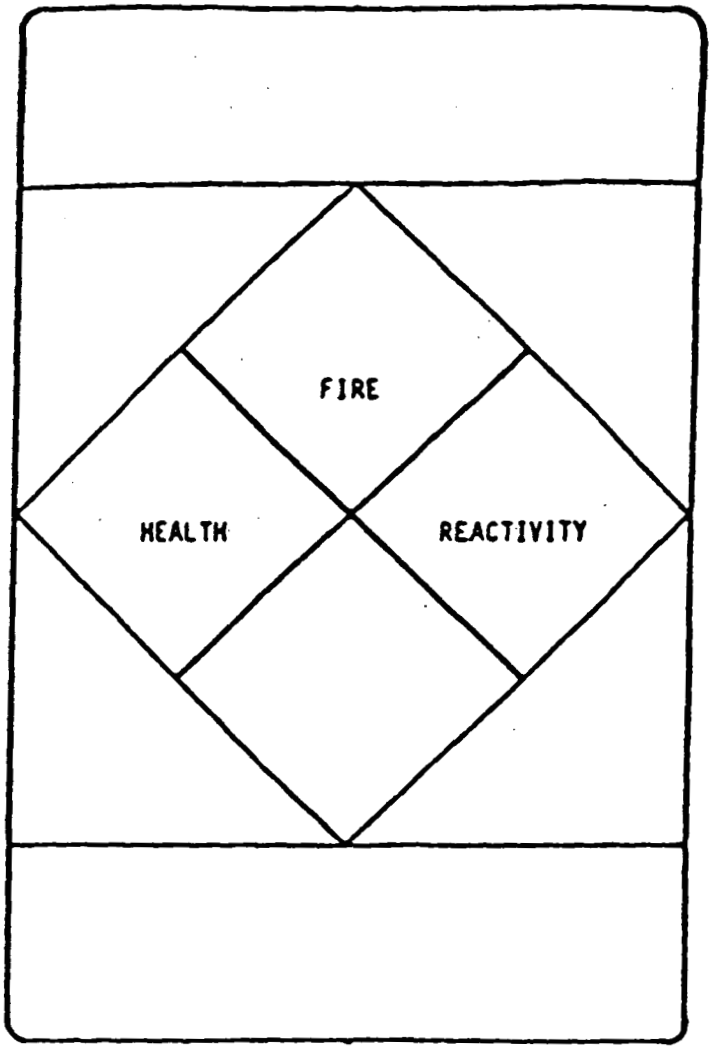
Persons Consulted in Reference to Disposition _____

NO	DISTRIBUTION OF COPIES
1	MC&A (RECORD COPY)
2	Receiving Group - Plant 1
3	Operations Scheduling & Planning
4	Production Records - Plant 1
5	Receiving Plant

FMPC-ADMS-PRO-1131-1 (REV 9/90)

OFFSITE NUCLEAR MATERIALS RECEIPT VERIFICATION AND DISPOSITION REPORT
FORM FMPC-ADMS-PRO-1131-1
Figure 4

R - MATERIAL REVISED, ADDED, OR DELETED.



"HAZARDOUS MATERIAL WARNING LABEL"
Figure 5

R - MATERIAL REVISED, ADDED, OR DELETED.

RADIOACTIVE MATERIAL CONTAINER/STORAGE DISCREPANCY RECORD

INSPECTOR'S NAME:_____ INSPECTOR'S BADGE NO.:_____

LOCATION:_____ DATE:_____ TIME:_____

FMPC LOT NUMBER	MC&A INVENTORY NUMBER	HOLE		SPACING		BROKEN PALLET BOARD		CORRECT LABELING		LOCATION NO.
		YES	NO	YES	NO	YES	NO	YES	NO	

COMMENTS:_____

INSPECTOR'S SIGNATURE:_____ DATE:_____

SUPERVISOR'S SIGNATURE:_____ DATE:_____

RADIOACTIVE MATERIAL STORAGE INSPECTION
FORM FMPC-REST-3182
Figure 6

R - MATERIAL REVISED, ADDED, OR DELETED.

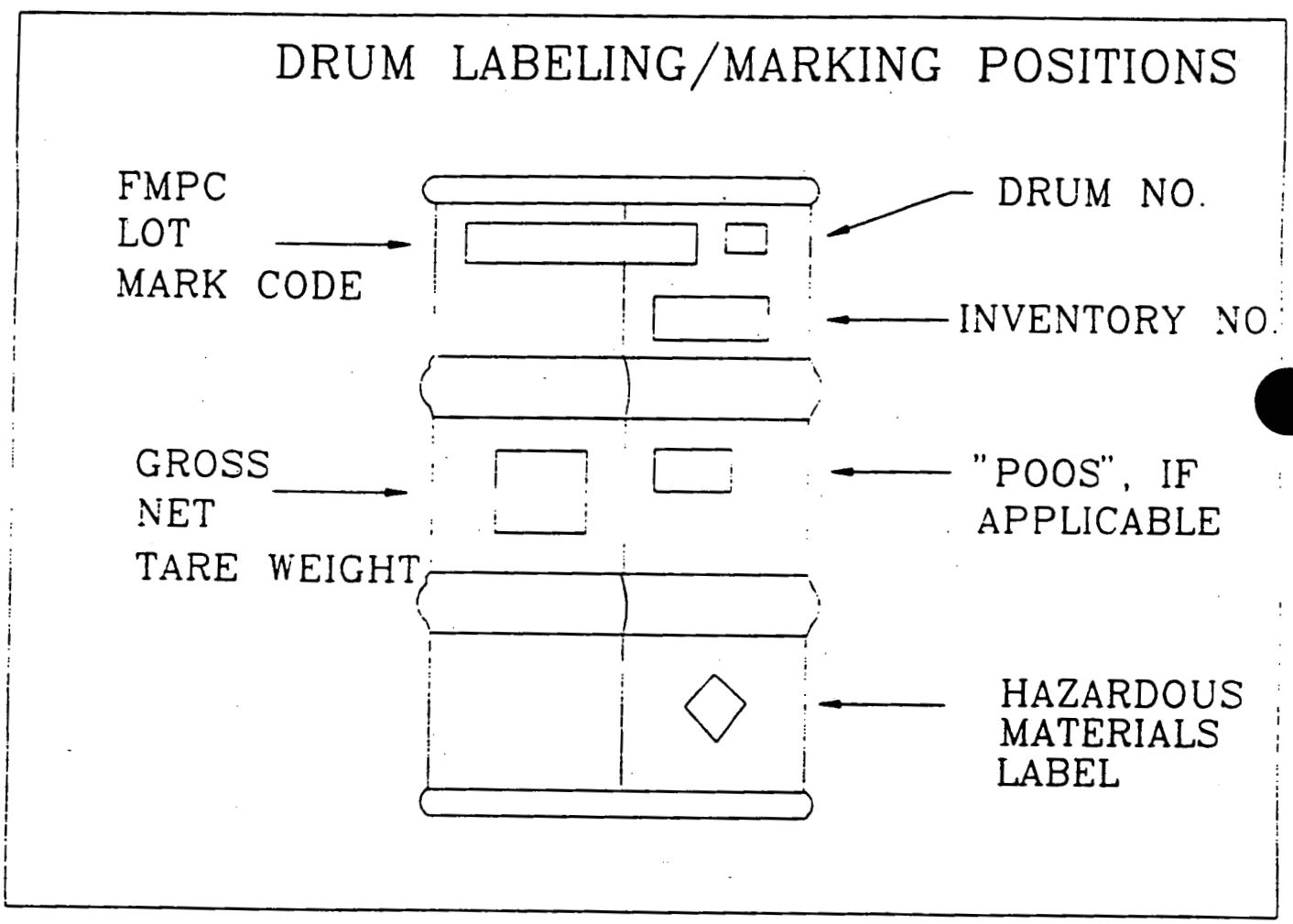


DIAGRAM OF RADIOACTIVE MATERIAL CONTAINER LABELING
Figure 7

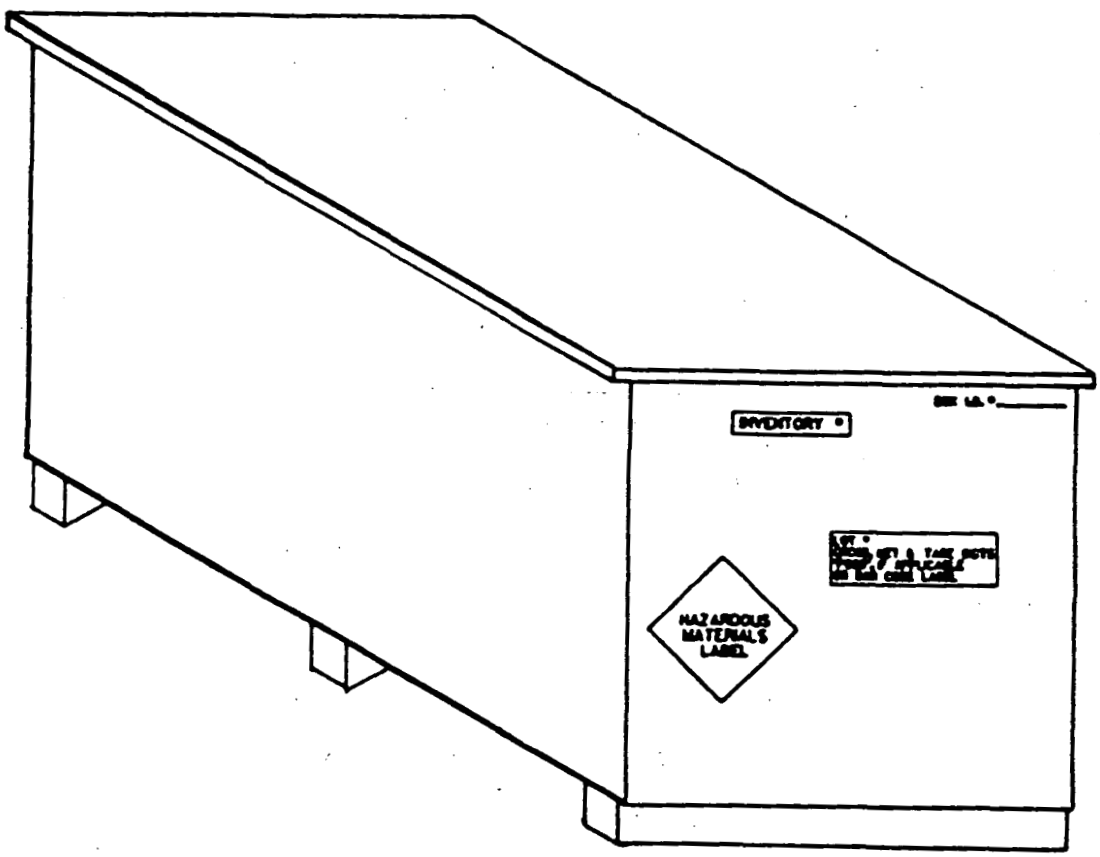


DIAGRAM OF LLRM BOX LABELING
Figure 8

R - MATERIAL REVISED, ADDED, OR DELETED.

RESTORATION PROCEDURE	STORAGE OF RADIOACTIVE MATERIAL	SOP 1-C-608 AREA: Plant 1
Authorization: R. L. Gardner, Manufacturing	Supersedes: None	Issue Date: 08-13-90

RECORD OF ISSUE/REVISIONS

DATE	REV. NO.	DESCRIPTION AND AUTHORITY
08-13-90	0	Procedure required for storing radioactive material per Request No. P89-448, initiated by K. Dunbar.

R - MATERIAL REVISED, ADDED, OR DELETED.

RESTORATION PROCEDURE	PACKAGING LOW LEVEL RADIOACTIVE WASTE (LLRW) FOR OFF-SITE DISPOSAL	SOP 20-C-601 AREA: As Applicable
Authorization: J. T. Grumski, Waste Management	Supersedes: 20-C-601, 10-11-88	Issue Date: 7-12-90

1.0 PURPOSE

This document provides the procedure for packaging contaminated waste for off-site disposal.

2.0 APPLICABILITY

This procedure is applicable to organizations at the FMPC which package low level radioactive waste including Construction personnel directed by WMCO.

3.0 RESPONSIBILITIES

3.1 The waste generator shall be responsible for complying with this SOP.

3.2 The supervisor of the waste generation area shall be responsible for the following:

3.2.1 Specifying applicable scale check procedures and standard tare weight of packages.

3.2.2 Ensuring packaging materials are available for operators.

3.2.3 Ensuring that trained personnel package waste material.

3.2.4 Determining disposition of material identified in this SOP.

3.2.5 Ensuring that personnel package waste for shipment to meet applicable NTS, DOT, and EPA regulations.

3.2.6 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection for the process being performed.

3.2.7 Providing operators with the required respiratory protection.

3.2.8 Ensuring the lid on an unfilled waste package is secured when no packaging is occurring to prevent additions of unknown materials.

3.2.9 Ensuring waste packages are weather-protected before, during, and after use to prevent moisture build-up.

3.2.10 Contacting Radiological Safety prior to opening any drum of radioactive or unknown material.

3.2.11 Contacting Industrial Hygiene prior to opening any drum suspected of containing asbestos.

R - MATERIAL REVISED, ADDED, OR DELETED.

3.0 RESPONSIBILITIES (cont.)

3.3 Waste Management shall be responsible for specifying the required waste container.

3.4 Solid Waste Compliance shall complete a RCRA determination as requested in accordance with this SOP.

4.0 DEFINITIONS

4.1 Low Level Radioactive Waste (LLRW) - Waste that contains radioactivity and is not classified as high level waste, transuranic waste, or spent nuclear fuel or 11e(2) byproduct material as defined by DOE Order 5820.2A. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may be classified as low-level waste, provided the concentration of transuranic is less than 100 n Ci/g.

4.2 Waste Generator - Organization (point of generation) at which waste is originated.

4.3 Overpack - A container into which one or more smaller containers are placed.

4.4 Bulk Shipment - Objects or material such as scrap wood, metal, paper bales, pallets and other items, contaminated with radioactive material that are in compliance with DOT Regulation 173.425(c) (1) (IV).

4.6 Waste Container - A container which meets DOT/NTS waste shipment and disposal requirements.

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

4.8 Respirable Fines - Particulates and vapors capable of being inhaled.

5.0 REFERENCES

5.1 SOP 1-C-101, "Sampling Residue and Waste Materials"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 Safety glasses with side shields shall be worn unless other eye protection is specified.

6.3 Respiratory protection provided by the supervisor shall be worn when required.

6.4 Leather-palm gloves shall be worn when handling drums/boxes/containers, operatng equipment, and when handling rough, sharp-edged, or contaminated material.

6.5 HEPA type filter vacuum cleaners or a vacuum system approved by IRS&T with a current DOP test label properly affixed to vacuum shall be used for cleaning.

6.6 Only certified personnel shall handle asbestos-containing materials.

6.7 Adequate ventilation must be provided when using silicone adhesive sealant.

6.8 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to Radiological Safety Technicians for evaluation. The involved employees shall report to Medical Services at the end of their shift to submit a urine sample and again report at the start of their next shift to submit another urine sample.

7.0 PROCEDURE

WARNING: A RADIOLOGICAL SAFETY TECHNICIAN SHALL BE PRESENT PRIOR TO OPENING ANY DRUM OF UNKNOWN RADIOACTIVE MATERIAL.

WARNING: AN INDUSTRIAL HYGIENE REPRESENTATIVE SHALL BE PRESENT PRIOR TO OPENING ANY DRUM SUSPECTED OF CONTAINING ASBESTOS.

CAUTION: PRIOR TO PERFORMING THE PACKAGING OPERATION, EACH CONTAINER SHALL BE INSPECTED BY THE WASTE GENERATOR TO ENSURE THE CONTAINER IS EMPTY.

NOTE: The waste generator shall package waste material in a container specified for disposal by Waste Management.

NOTE: Stencilling shall be one inch (minimum) legible block letters using waterproof ink/paint unless otherwise specified.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

NOTE: Respirable fines shall be packaged only in an overpack.

7.1 Filling 55 and 85 Gallon Drums

7.1.1 Check that a "Prohibited Materials List" (see Figure 1) is displayed in the loading area. If the list is not posted, notify the supervisor.

> **WARNING: ANY MATERIAL RECEIVED WHICH IS ON THE "PROHIBITED MATERIALS LIST" SHALL NOT BE PACKAGED. THE SUPERVISOR SHALL BE NOTIFIED FOR DISPOSITION.**

7.1.2 Obtain sample of material to be packaged per SOP 1-C-101 and request a RCRA determination and analysis to detect major radionuclides.

7.1.2.1 If analysis results determine material is RCRA, identify and package material per instructions provided by the supervisor.

7.1.2.2 If RCRA determination is negative, check "No" on "Prohibited Materials" item on Form FMPC-CONT-1945-XX Card (See Figure 2) and proceed to Step 7.1.3.

7.1.3 Inspect the empty drum for rust, dents, holes, or other damage.

7.1.3.1 If damaged, mark the lids of the damaged drums with a black "X".

7.1.3.2 Inform the supervisor of damaged drum condition and request disposition instructions.

7.1.4 Insert copy of sample analysis results inside the waterproof self-adhesive envelope, or equivalent, on the drum.

7.1.5 Stencil on the drum the lot and drum number in accordance with the FMPC Lot Marking and Color-Coding System or apply designated preprinted label (See Figure 4).

7.1.6 Weigh the empty drum per substeps 7.1.6.1 through 7.1.6.4.

7.0 PROCEDURE (cont.)

7.1.6.1 Inspect the scale to be used.

NOTE: The supervisor shall specify the scale.

NOTE: The scale shall be inspected and operated in accordance with the SOP applicable to the area.

7.1.6.2 Move the drum on to the scale.

NOTE: The method of transporting the drum shall be specified by the supervisor.

7.1.6.3 Obtain the tare weight.

7.1.6.4 Remove the drum from the scale and move to the loading area.

7.1.7 Stencil the tare weight on the drum (See Figure 4).

7.1.8 Affix "Hazardous Material Warning Label" (See Figure 5) to drum as shown in Figure 4.

7.1.9 Record the data from the drum on to "Item Production/Certification/Identification" XX Card, Form FMPC-CONT-1945-XX (See Figure 2).

7.1.10 Remove the drum lock ring and lid.

7.1.11 By estimation, fill the 55 gallon drum to a maximum of 1,200 pounds or the 85 gallon drum to 1,000 pound maximum.

CAUTION: DO NOT FILL THE DRUM ABOVE THREE INCHES FROM THE TOP.

NOTE: Because weight varies according to material type, the volume of material packed will vary.

7.1.12 Place a lid on the drum.

7.1.13 Secure the drum lid by installing a bolt-type lock ring and tighten the bolt.

7.1.14 Weigh drum per Item 7.4.

7.1.15 Mark the drum with the gross weight and net weight using two inch (minimum) letters.

7.0 PROCEDURE (cont.)

7.1.16 Complete the "Item Production/Certification/Identification" XX Card, Form FMPC-CONT-1945-XX (see Figure 2) by entering the gross and net weights.

7.1.17 Using the hoist/crane and barrel grab or equipment specified by supervisor, place the drum with bolt of lock ring facing outward on a pallet.

7.1.18 Strap the drum(s) and move the pallet(s) to the storage area.

NOTE: The storage area shall be designated by the supervisor.

7.1.19 When the operation is completed and all pallets are stored, notify the supervisor that the drums are ready to be moved to the Waste Management Staging Area.

7.2 Filling a 48 Gallon Overpacked Drum

NOTE: The 48 gallon drum is referred to as the inner drum.

NOTE: The 55 gallon drum is referred to as the overpack drum.

7.2.1 Obtain sample of material in the inner drum per SOP 1-C-101 and request a RCRA determination and analysis to detect major radionuclides.

7.2.1.1 If analysis results determine material is RCRA, identify and package material per instructions provided by the supervisor.

7.2.1.2 If RCRA determination is negative, check "No" on the "Prohibited Materials" item on Form FMPC-CONT-1945-XX card (See Figure 2) and proceed to Step 7.2.2.

7.2.2 Obtain an inner drum and inspect for rust, dents, holes, or other damage.

7.2.2.1 If damaged, mark the lid of the damaged drum with a black "X".

7.2.2.2 Inform the supervisor of damaged drum condition and request disposition instructions.

7.2.3 Obtain an overpack drum and inspect for rust, dents, holes, or other damage.

7.0 PROCEDURE (cont.)

7.2.3.1 If damaged, mark the lid of the damaged drum with a black "X".

7.2.3.2 Inform the supervisor of damaged drum condition and request disposition instructions.

7.2.4 Remove the bolt ring and lid from the overpack drum.

7.2.5 Ensure the overpack drum contains no moisture. If moisture is present, remove moisture from the drum with a rag.

CAUTION: **OVERPACK DRUMS SHALL CONTAIN NO MOISTURE.**

7.2.6 Ensure the lot number, drum number, tare weight, gross weight, and net weight are stencilled on the overpack drum or a designated preprinted label is applied (See Figure 4).

7.2.7 Ensure that a completed "Item Production/Certification/Identification" XX card, Form FMPC-CONT-1945-XX accompanies the overpack drum. If not, complete a card using data from the drum.

7.2.8 As directed by the supervisor, place inner drum into the overpack drum.

7.2.9 Attach a filling collar to the inner drum.

7.2.10 By estimation, fill the inner drum to a maximum of 1200 pounds.

CAUTION: **DO NOT FILL THE DRUM ABOVE THREE INCHES FROM THE TOP.**

NOTE: Because weight varies according to material type, the volume of material packed may vary.

7.2.11 Clean loose fill material from the filling collar.

CAUTION: **DO NOT ALLOW LOOSE MATERIAL TO FALL INTO THE SPACE BETWEEN DRUMS.**

7.2.12 Remove the filling collar and place lid on inner drum.

7.2.13 Install a vertical lever lock ring on the inner drum and lock the ring in place.

7.2.13.1 If the drum contains respirable fines, secure the lever lock ring with a wire seal and record the seal number and date on Form FMPC-CONT-1945-XX (See Figure 2).

7.0 PROCEDURE (cont.)

7.2.14 Place lid on overpack drum and secure a bolt-type lock ring on the overpack drum for interplant shipment.

7.3 Overpacking Drums

NOTE: The inner drum refers to the filled drum to be placed inside the overpack drum.

7.3.1 If the material in the inner drum has not been sampled, remove a composite sample per SOP 1-C-101 and request a RCRA determination and analysis to detect major radionuclides.

7.3.1.1 If analysis results determine material is RCRA, identify and package material per the instructions of the supervisor.

7.3.1.2 If RCRA determination is negative, check "No" on the "Prohibited Materials" item on Form FMPC-CONT-1945-XX card (See Figure 2) and proceed to Step 7.3.2.

7.3.2 Ensure a vertical lever lock ring is installed on the inner drum.

7.3.3 Ensure the lot number, drum number, tare weight, gross weight, and net weight are stencilled on the inner drum or a designated preprinted label is applied (See Figure 4).

7.3.4 Ensure that a completed "Item Production/Certification/Identification" XX card, Form FMPC-CONT-1945-XX accompanies the inner drum. If not, complete a card using data from the drum.

7.3.5 Secure the lever lock ring by tightening the lock nut on the inner drum.

7.3.6 Obtain the correct size overpack drum to contain the drum to be overpacked per Table 1.

7.0 PROCEDURE (cont.)

TABLE 1
OVERPACK DRUM SIZE REQUIREMENTS

Drum to be Overpacked (Gallons)	Overpack Drum (Gallons)
24	30
30	55
48	55
55	85

7.3.7 Inspect the overpack drum for rust, dents, holes, or other damage.

7.3.7.1 If damaged, mark the lid of the damaged drums with a black "X".

7.3.7.2 Inform the supervisor of damaged drum condition and request disposition instructions.

7.3.8 Tare weigh the overpack drum per substeps 7.3.8.1 through 7.3.8.2.

7.3.8.1 If scale to be used has not been checked, inspect scale.

NOTE: The supervisor shall specify the scale.

NOTE: The scale shall be inspected and operated in accordance with the SOP applicable to the area.

7.3.8.2 Place drum on the scale and obtain tare weight.

7.3.9 Mark the tare weight on the overpack drum or apply designated preprinted label (See Figure 4).

7.3.10 Remove the bolt ring and lid from the overpack drum.

7.3.11 Ensure the overpack drum contains no moisture.

CAUTION: OVERPACK DRUMS SHALL CONTAIN NO MOISTURE.

7.3.11.1 If moisture is present, remove moisture from the drum with a rag.

7.0 PROCEDURE (cont.)

7.3.12 If not completed, inspect the hoist/crane to be used.

NOTE: The supervisor shall specify the hoist/crane to be used.

NOTE: Hoists/cranes shall be inspected and operated in accordance with the SOP applicable to the area.

7.3.13 Install a barrel grab over the inner drum.

7.3.14 Attach the barrel grab to the hoist/crane, lift the drum, and lower into the overpack drum.

WARNING: A SECOND OPERATOR SHALL USE A POLE TO STEADY 55 GALLON DRUMS.

NOTE: A forklift or handstacker may be used to lift drum as directed by the supervisor.

7.3.15 Remove the barrel grab from the drum.

7.3.16 Secure a lid and bolt-type lock ring on the overpack drum.

7.3.17 Stencil the overpack drum with drum number and lot number per FMPC Lot Marking and Color-Coding System (See Figure 4).

7.3.18 Affix Hazardous Material Warning Label (See Figure 5) on overpack drum per location in Figure 4.

7.3.19 Weigh the overpack per Item 7.4.

7.3.20 Mark the overpack drum with the gross weight and net weight using two inch (minimum) letters or apply designated preprinted label (See Figure 4).

7.3.21 Submit completed Form FMPC-CONT-1945-XX to the supervisor.

7.3.22 Using the hoist/crane and barrel grab, place the overpack drum, with bolt of lock ring facing outward, on a pallet.

7.3.23 Strap the overpack drum(s) and move the pallet(s) to the storage area.

NOTE: The storage area shall be designated by the supervisor.

7.3.24 When the operation is completed and all pallets are stored, notify the supervisor that overpack drums are ready to be moved to the Waste Management Staging Area.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.4 Weighing Singlepack/Overpack Drums

NOTE: A forklift or handstacker may be used to move drum as directed by supervisor.

7.4.1 If not already completed, inspect the scale to be used.

NOTE: The supervisor shall specify the scale to be used.

NOTE: The scale shall be inspected and operated in accordance with the SOP applicable to the area.

7.4.2 If not already completed, inspect the hoist/crane to be used.

NOTE: The supervisor shall specify the hoist/crane to be used or other equipment to move drum.

NOTE: The hoist/crane shall be inspected and operated in accordance with the SOP applicable to the area.

7.4.3 Install a barrel grab on the drum and attach the grab to the hoist/crane.

7.4.4 Using the hoist/crane, move the drum onto the scale.

7.4.5 Obtain the gross weight of the drum.

7.4.6 If the drum is over the specified weight limit, proceed as follows:

WARNING: MAXIMUM WEIGHT OF DRUMS SHALL BE 700 POUNDS FOR A 30 GALLON OVERPACK AND 1,200 POUNDS FOR 55 GALLON OVERPACKS, 55 GALLON SINGLEPACKS, AND 85 GALLON OVERPACKS. MAXIMUM WEIGHT OF 85 GALLON SINGLEPACKS SHALL BE 1,000 POUNDS.

7.4.6.1 Remove lock ring(s) and lid(s) from the drums.

7.4.6.2 Remove material from the drum until the drum is within limit. Place the removed material in an approved container.

NOTE: The removed material may be included in an underweight drum of the same lot or packaged as another drum of the same lot.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.4.6.3 Place lid securely on the drum.

7.4.6.4 If the drum contains respirable fines, install lever lock ring with a wire seal and record the seal number and date on Form FMPC-CONT-1945-XX (See Figure 2).

7.4.7 Using the hoist/crane, remove the drum from the scale and remove the grab from the drum.

7.5 Packaging Loose Material in Wood Boxes (4 ft. X 4 ft. X 7 ft.), (2 ft. X 4 ft. X 7 ft.), or (5 ft. X 5 ft. 6 inches X 37 inches)

7.5.1 Check that a Prohibited Materials List (See Figure 1) is displayed in the loading area. If not, notify the supervisor.

> WARNING: ANY MATERIAL RECEIVED WHICH IS ON THE "PROHIBITED MATERIALS LIST" SHALL NOT BE PACKAGED. THE SUPERVISOR SHALL BE NOTIFIED FOR DISPOSITION.

7.5.2 Notify supervisor a RCRA determination is required.

NOTE: Supervisor shall request Solid Waste Compliance to complete a RCRA determination.

7.5.2.1 If material is determined to be RCRA, identify and package material per instructions provided by the supervisor.

7.5.2.2 If RCRA determination is negative, check "No" on the "Prohibited Materials" item on Form FMPC-CONT-1945-XX card (See Figure 2) and proceed to item 7.5.3.

7.5.3 Visually inspect wooden boxes for holes, rot, or damage.

7.5.3.1 If damage is found, mark the top of the box with a black "X".

7.5.3.2 Notify the supervisor for disposition of damaged box.

7.5.3.3 Move rejected boxes to designated area.

7.5.4 Tare weigh each twentieth box per substeps 7.5.4.1 through 7.5.4.2.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.5.4.1 If scale to be used has not been checked, inspect scale.

NOTE: The supervisor shall specify the scale.

NOTE: The scale shall be inspected and operated in accordance with the SOP applicable to the area.

7.5.4.2 Place box on the scale and obtain tare weight.

7.5.5 Record the weight on a "Box Tare Weight Check," Form FMPC-PRO-2867 (See Figure 3).

7.5.6 Place wooden box in loading area and remove lid.

7.5.7 Line the box with a sheet of 0.006 inch plastic that is approximately 14 feet X 16 feet, or with a preformed liner.

7.5.8 Place sheets of wet-strength polypropylene-pulp super absorbent fabric in the bottom of the box or add one 50 pound bag of uncalcined diatomaceous earth spread evenly in the bottom of the box.

7.5.9 Load loose material into the box as tightly as possible and fill box completely. As necessary, add other waste material until box is full.

WARNING: DO NOT ADD MATERIAL THAT COULD CAUSE HEAT OR PRESSURE; FIRE OR EXPLOSION; TOXIC DUST, FUMES, OR GASES; OR FLAMMABLE FUMES/GASES.

CAUTION: WHEN LOADING THE BOX, DO NOT EXCEED 5,000 POUNDS GROSS WEIGHT.

7.5.9.1 If the box contains soil, add wet-strength polypropylene/pulp super absorbent fabric or one 50 pound bag of uncalcined diatomaceous earth in alternating layers, depending upon moisture level of soil, until the box is full.

7.5.10 When box is full, fold plastic over contents and place lid on box.

7.5.11 Using fabric strapping, secure lid on the box for interplant shipment by placing wire seal through strapping (see Figure 6).

7.5.12 Stencil or mark the lot number per FMPC Lot Marking & Color Coding System on the box (See Figure 7).

7.0 PROCEDURE (cont.)

7.5.13 Affix Hazardous Material Warning Label (See Figure 5) in location per Figure 7.

7.5.14 Ensure scale check has been performed per applicable SOP in area of packaging operation.

7.5.15 Weigh the box and complete an "Item Production/Certification/ Identification" card, Form FMPC-CONT-1945-XX (See Figure 2) with lot number, tare weight, gross weight, and net weight of the box.

7.5.16 Mark the side of the box with the gross weight in two inch (minimum) letters (See Figure 7).

7.5.17 Notify the supervisor that the boxes are ready to be moved to the Waste Management Staging Area.

7.6 Loading Drums Into Wooden Boxes

7.6.1 Check that a Prohibited Materials List (See Figure 1) is displayed in the loading area. If not, notify the supervisor.

> **WARNING: ANY MATERIAL RECEIVED WHICH IS ON THE "PROHIBITED MATERIALS LIST" SHALL NOT BE PACKAGED. THE SUPERVISOR SHALL BE NOTIFIED FOR DISPOSITION.**

7.6.2 Notify supervisor a RCRA determination is required.

NOTE: Supervisor shall request Solid Waste Compliance to complete RCRA determination.

7.6.2.1 If material is determined to be RCRA, identify and package material per instructions provided by the supervisor.

7.6.2.2 If RCRA determination is negative, check "No" on the "Prohibited Materials" item on Form FMPC-CONT-1945-XX card (See Figure 2) and proceed to item 7.6.3.

7.6.3 Visually inspect boxes for holes, wood deterioration, and damage.

7.6.3.1 If damage is found, mark top of box with a black "X".

7.6.3.2 Notify the supervisor of the damaged box condition and request disposition instructions.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.6.3.3 Move damaged boxes to designated areas.

7.6.4 Tare weigh each twentieth box per 7.5.4.1 through 7.5.4.2.

7.6.5 Record the weight on a "Box Tare Weight Check", Form FMPC-PRO-2867 (See Figure 3).

7.6.6 Place empty wooden boxes in loading area and remove the lid.

7.6.7 Add one fifty-pound bag of uncalcined diatomaceous earth spread evenly in the bottom of box or wet strength polypropylene-pulp super absorbent fabric.

7.6.8 Close lever lock rings on drums and secure by tightening the lock nut on the drum.

7.6.9 If not completed, inspect the hoist/crane to be used for lifting drums.

NOTE: The hoist/crane shall be inspected and operated per the SOP applicable to the area.

NOTE: The supervisor shall specify the hoist/crane to be used.

7.6.10 Place barrel grab over drum.

7.6.11 Attach an approved lifting device on each side of the drum lid ring.

NOTE: The supervisor shall specify the lifting device to be used.

7.6.12 Raise drum over top of the box.

7.6.13 Lower drum into box and remove lifting device.

CAUTION: **WHEN LOADING THE BOX, DO NOT EXCEED 5000 POUNDS GROSS WEIGHT.**

7.6.14 Add one 50 pound bag of uncalcined diatomaceous earth or sheets of wet strength polypropylene-pulp super absorbent fabric over the drums if condensation/frost is present or could develop on exterior of drums.

7.6.15 Place lid on box and secure for interplant shipment.

7.6.16 Using fabric strapping, secure lid on the box for interplant shipment by placing wire seal through strapping (see Figure 6).

7.0 PROCEDURE (cont.)

7.6.17 Obtain tabulated tare weight of box and contents from the Waste Technician.

7.6.18 Complete the "Item Production/Certification/Identification" card, Form FMPC-CONT-1945-XX per box, including the weight and contents.

7.6.19 Mark the side of box with gross weight in two inch letters (See Figure 7).

7.6.20 Stencil or mark shipment log number and identification number on side of box (See Figure 7).

7.6.21 Affix Hazardous Material Warning label (See Figure 5) in location noted in Figure 7.

7.6.22 Notify the supervisor that the box is ready to be moved to the staging area.

7.7 Filling Metal Boxes With Loose Material

7.7.1 Check that a Prohibited Materials List (See Figure 1) is displayed in the loading area. If not, notify the supervisor.

> **WARNING: ANY MATERIAL RECEIVED WHICH IS ON THE PROHIBITED MATERIALS LIST SHALL NOT BE PACKAGED. THE SUPERVISOR SHALL BE NOTIFIED FOR DISPOSITION.**

7.7.2 Notify supervisor a RCRA determination is required.

NOTE: Supervisor shall request Solid Waste Compliance to complete RCRA determination.

7.7.2.1 If material is determined to be RCRA, identify and package material per instructions provided by the supervisor.

7.7.2.2 If RCRA determination is negative, check "No" on the "Prohibited Materials" item on Form FMPC-CONT-1945-XX card (See Figure 2) and proceed to item 7.7.3.

7.7.3 Visually inspect boxes for rust, dents, or holes including the bottom.

7.7.3.1 If damaged, mark top of box with a black "X".

7.7.3.2 Notify supervisor of condition and request disposition.

7.7.3.3 Move rejected boxes to designated area.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.7.4 If the bottom of the box has a drain plug, ensure plug is securely in place.

7.7.5 Move the empty metal box to the staging area.

7.7.6 Remove banding and cardboard packing material from the metal box and place in a designated container.

7.7.7 Tare weigh each twentieth box per 7.5.4.1 through 7.5.4.2.

7.7.8 Record the weight on a "Box Tare Weight Check", Form FMPC-PRO-2867 (See Figure 3).

7.7.9 Remove lid and place in a designated location to prevent damage.

7.7.10 Add one fifty-pound bag of uncalcined diatomaceous earth spread evenly or sheets of wet-strength polypropylene pulp, super absorbent fabric in the bottom of the box.

7.7.11 Load loose materials in box as tightly as possible.

CAUTION: **MATERIAL SHALL NOT BE LOADED IN BOX ABOVE THREE INCHES FROM THE TOP.**

CAUTION: **WHEN LOADING THE BOX, DO NOT EXCEED 6,000 POUNDS GROSS WEIGHT.**

7.7.12 When box is full, place lid on box.

7.7.13 Using fabric strapping, secure lid on the box for interplant shipment by placing wire seal through strapping (see Figure 6).

7.7.14 If not already completed, perform scale check according to the applicable SOP in the area of the packaging operation.

NOTE: Supervisor shall specify the scale to be used.

NOTE: The scale shall be inspected and operated in accordance with the applicable scale procedure for the area of the packaging operation.

7.7.15 Weigh the box.

7.7.16 Mark the side of the box with the gross weight in two-inch (minimum) letters (See Figure 7).

7.0 PROCEDURE (cont.)

7.7.17 Affix Hazardous Material Warning Label (See Figure 5) in location as shown in Figure 7.

7.7.18 Stencil or mark the content description on the side of the box (Figure 7).

7.7.19 Fill out an "Item Production/Certification/Identification card, Form FMPC-CONT-1945-XX (See Figure 2), including standard tare weight specified by the supervisor, net weight, gross weight, and content description.

NOTE: Ensure the weight of box pins is included in gross weight.

7.7.20 Notify the supervisor that boxes are ready to be moved to the Waste Management staging area.

7.8 Loading Drums in Metal Boxes

7.8.1 Check that a Prohibited Materials List (See Figure 1) is displayed in the loading area. If not, notify the supervisor.

WARNING: ANY MATERIAL RECEIVED WHICH IS ON THE "PROHIBITED MATERIALS LIST" SHALL NOT BE PACKAGED. THE SUPERVISOR SHALL BE NOTIFIED FOR DISPOSITION.

7.8.2 Notify supervisor a RCRA determination is required.

NOTE: Supervisor shall request Solid Waste Compliance to complete RCRA determination.

7.8.2.1 If material is determined to be RCRA, package material per SOP 20-C-605.

7.8.2.2 If RCRA determination is negative, check "No" on the "Prohibited Materials" item on Form FMPC-CONT-1945-XX card (See Figure 2) and proceed to item 7.8.3.

7.8.3 Visually inspect boxes for rust, holes, or dents.

7.8.3.1 If damage is found, mark top of box with a black "X".

7.8.3.2 Notify supervisor of condition and request disposition instructions.

7.8.4 Place empty metal box in staging area.

7.8.5 Remove the banding and cardboard packing material from box and place in designated container.

7.0 PROCEDURE (cont.)

7.8.6 Tare weigh each twentieth box per 7.5.4.1 through 7.5.4.2.

7.8.7 Record the weight on a "Box Tare Weight Check", Form FMPC-PRO-2867 (See Figure 3).

7.8.8 Remove lid from metal box and place in designated location to prevent damage.

7.8.9 Check drums to ensure that lever lock rings are closed.

7.8.9.1 If the drum contains respirable fines, install wire seal through lever lock ring.

7.8.10 Complete an "Item Production/Certification/Identification Card", Form FMPC-CONT-1945-XXX (See Figure 2) per drum and insert the drum lot number and tare weight on the card.

7.8.11 Ensure that the hoist/crane to be used has been inspected.

NOTE: Inspect and operate the hoist/crane in accordance with the applicable SOP for the area.

7.8.12 Place barrel grab over drum.

7.8.13 Attach the lifting device specified by the supervisor on each side of the drum ring.

7.8.14 Position drum over the top of the box.

7.8.15 Lower drum into box and remove the lifting device.

7.8.16 Repeat steps 7.7.11 thru 7.7.15 until all drums are loaded.

CAUTION: **DO NOT EXCEED A MAXIMUM GROSS WEIGHT OF 6,000 POUNDS.**

7.8.17 When the box is filled, add a fifty-pound bag of uncalcined diatomaceous earth or sheets of wet-strength polypropylene pulp, super-absorbent fabric to the top of drums if condensation/frost is present or could develop on exterior of drums.

7.8.18 Place the lid on the box and secure the lid for interplant shipment.

7.8.19 Using fabric strapping, secure lid on the box for interplant shipment by placing wire seal through strapping (see Figure 6).

7.0 PROCEDURE (cont.)

7.8.20 Obtain tabulated tare weight of box and contents.

7.8.21 Record the tabulated tare box weight, contents, and gross weight on the FMPC-CONT-1945-XX card.

7.8.22 Stencil on the box the shipment log number, box identification, and gross weight (Figure 7).

NOTE: The gross weight marking shall be two inches (minimum).

7.8.23 Affix Hazardous Material Warning Label (See Figure 5) as shown in Figure 7.

7.8.24 Notify the supervisor that boxes are ready to be moved to the Waste Management staging area.

7.9 Loading Asbestos in Boxes

WARNING: ONLY CERTIFIED PERSONNEL SHALL HANDLE AND LOAD ASBESTOS-CONTAINING MATERIAL.

7.9.1 Check that a Prohibited Materials List (See Figure 1) is displayed in the loading area. If not, notify the supervisor.

WARNING: ANY MATERIAL RECEIVED WHICH IS ON THE "PROHIBITED MATERIALS LIST" SHALL NOT BE PACKAGED. THE SUPERVISOR SHALL BE NOTIFIED FOR DISPOSITION.

7.9.2 Notify supervisor a RCRA determination is required.

NOTE: Supervisor shall contact Solid Waste Compliance for RCRA determination.

7.9.2.1 If material is determined RCRA, identify and package per instructions provided by the supervisor.

7.9.2.2 If material is not RCRA, check "No" on the "Prohibited Materials" item on Form FMPC-CONT-1945-XX card (See Figure 2) and proceed to 7.9.3.

7.9.3 Visually inspect boxes for rust, holes, or dents.

7.9.3.1 If damage is found, mark the top of the box with a black "X".

7.9.3.2 Notify the supervisor of damaged box condition and request instructions.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.9.3.3 Move damaged boxes to designated area.

7.9.4 Move the empty box to the staging area.

7.9.5 Remove banding and cardboard packing material and place in a designated container.

7.9.6 Tare weigh each twentieth box per 7.5.4.1 through 7.5.4.2.

7.9.7 Record the weight on a "Box Tare Weight Check", Form FMPC-PRO-2867 (See Figure 3).

7.9.8 Remove and place box lid in a designated location to prevent damage.

7.9.9 Stencil lot number per FMPC Lot Marking & Coding System or content description on the box (See Figure 7).

7.9.10 Affix Hazardous Material Warning Label (See Figure 5) to box in location as shown in Figure 7.

7.9.11 Add one fifty-pound bag of uncalcined diatomaceous earth spread evenly in the bottom of the box.

7.9.12 Adhere "Danger-Asbestos" stickers on two sides and lid of box.

7.9.13 Check to ensure that asbestos is double bagged in labeled asbestos disposal bags.

7.9.14 Load asbestos in box.

CAUTION: **DO NOT EXCEED MAXIMUM GROSS WEIGHT OF 6,000 POUNDS FOR METAL BOXES/5,000 POUNDS FOR WOODEN BOXES.**

7.9.15 Place lid on the box.

7.9.16 Using fabric strapping, secure lid on the box for interplant shipment by placing wire seal through strapping (see Figure 6).

7.9.17 Perform scale check per the applicable SOP in the area of the packaging operation.

7.9.18 As directed by the supervisor, move box to scale.

7.9.19 Weigh the box.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.9.20 Mark the side of the box with gross weight in two inch letters (See Figure 7).

7.9.21 Fill out an "Item Production/Certification/Identification" card, Form FMPC-CONT-1945-XX (See Figure 2), including tare weight, lot number, content description, gross weight, and net weight.

7.9.22 Notify the supervisor that boxes are ready to be moved to the Waste Management staging area.

7.10 Packaging Material into Sea/Land Containers

7.10.1 Notify supervisor a RCRA determination is required.

NOTE: Supervisor shall request Solid Waste Compliance to complete RCRA determination.

7.10.1.1 If material is determined to be RCRA, identify and package material per instructions provided by the supervisor.

7.10.1.2 If RCRA determination is negative, check "No" on the "Prohibited Materials" item on Form FMPC-CONT-1945-XX card (See Figure 2) and proceed to item 7.10.2.

7.10.2 Check the container for damage such as structurally affecting dents, stress cracks, flaking paint, rust, holes, and water leaks.

NOTE: Do not place containers directly on ground.

7.10.2.1 If container is damaged, mark a black "X" on the side of the container.

7.10.2.2 Notify supervisor of damage and request disposition of damaged container.

7.10.2.3 Move unacceptable container to designated area.

7.10.3 Ensure that container tare weight is marked on the container. If not, notify the supervisor.

7.0 PROCEDURE (cont.)

7.10.4 Attach a Prohibited Materials List (See Figure 1) to the container in a visible location.

> **WARNING: ANY MATERIAL RECEIVED WHICH IS ON THE "PROHIBITED MATERIALS LIST" SHALL NOT BE PACKAGED. THE SUPERVISOR SHALL BE NOTIFIED FOR DISPOSITION.**

7.10.5 In a well ventilated area, apply a continuous bead of GE RTV SILICONE RUBBER ADHESIVE SEALANT, or equivalent, on all seams and corners of the container interior.

> **WARNING: VAPOR FROM SILICONE ADHESIVE IS HAZARDOUS.**

NOTE: Adhesive shall be applied to the farthest inside section first and outward from container to minimize inhalation of vapor.

NOTE: The bead of sealant shall be a minimum of 1/4 inch.

7.10.6 Check to ensure all vents are closed and sealed.

7.10.7 Line the container floors with wet-strength polypropylene/pulp super absorbent fabric, blotter paper, or uncalcined diatomaceous earth.

7.10.8 Cover the absorbent fabric, blotter paper or uncalcined diatomaceous earth with a 0.006 inch thick plastic sheet that extends at least 36 inches up each side of the container.

7.10.9 Place plywood on the container floor and up to approximately four feet in height on all sides.

NOTE: If top loading sea/land container, line the entire floor and sides with plywood.

7.10.10 Remove all container outside markings not related to load.

7.10.11 Load the container. Use all the space in the container.

CAUTION: AN UNSEALED CONTAINER SHALL BE LOCKED WHEN NOT ATTENDED.

7.10.12 After the container has been filled, clean the back ledge of the container.

7.0 PROCEDURE (cont.)

7.10.13 Line the box lid/door opening with 0.006 inch thick plastic, or similar material to a height of 18 inches.

7.10.14 Add a roll of wet-strength polypropylene/pulp super absorbent fabric extending width of container on base of lid/door.

7.10.14.1 If moisture is still present, add additional uncalcined diatomacious earth or sheets of wet-strength polypropylene, super-absorbent fabric as needed.

7.10.15 Using plywood and 2 inch x 4 inch wood, or other similar type materials, secure the load inside the container.

7.10.16 Seal the door/lid seam with a 1/4 inch minimum bead of GE RTV SILICONE RUBBER ADHESIVE SEALANT, or the equivalent.

> **WARNING: VAPOR FROM SILICONE ADHESIVE IS HAZARDOUS.**

7.10.17 Close one door and apply GE RTV SILICONE RUBBER ADHESIVE SEALANT, or the equivalent, around the crack. Then close and seal the other door.

7.10.18 Complete applicable sections of the "Item Production/Certification/ Identification" card, Form FMPC-CONT-1945-XX (See Figure 2).

7.10.19 Notify the supervisor that sea/land containers are ready to be moved to Waste Management staging area.

7.11 Packaging Other Bulk Shipments

7.11.1 Notify supervisor of bulk packaging requirements.

7.11.2 Check that a Prohibited Materials List (See Figure 1) is displayed in the loading area. If not, notify the supervisor.

> **WARNING: ANY MATERIAL RECEIVED WHICH IS ON THE "PROHIBITED MATERIALS LIST" SHALL NOT BE PACKAGED. THIS MATERIAL SHALL BE SEGREGATED AND SUPERVISOR NOTIFIED FOR DISPOSITION.**

7.11.3 Notify supervisor a RCRA determination is required.

NOTE: Supervisor shall request Solid Waste Compliance to complete RCRA determination.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.11.3.1 If material is determined to be RCRA, identify and package material per instructions provided by the supervisor.

7.11.3.2 If RCRA determination is negative, check "No" on the "Prohibited Materials" item on Form FMPC-CONT-1945-XX card (See Figure 2) and proceed to item 7.11.4.

7.11.4 Package and identify material or item per written instructions of the supervisor.

7.11.5 Complete an "Item Production/Certification/Identification" card, Form FMPC-CONT-1945-XX (See Figure 2) and, if necessary, a "Box Tare Weight Check", Form FMPC-PRO-2867 (See Figure 3).

7.11.6 Notify the supervisor when loading is complete.

8.0 APPLICABLE FORMS

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

8.2 FMPC-PRO-2867, "Box Tare Weight Check"

PACKAGING GUIDELINES FOR WASTE GENERATOR

PACKAGE HAS BEEN PROPERLY PREPARED FOR CLOSING:

- NO LIQUIDS OF ANY KIND HAVE BEEN PLACED IN CONTAINER
- HEAVY/BULKY ITEMS HAVE BEEN SECURED WITHIN CONTAINER
- ALL AVAILABLE SPACE HAS BEEN UTILIZED EFFICIENTLY
- PROHIBITED MATERIALS HAVE BEEN EXCLUDED (SEE BELOW)
- PACKAGING HAS NOT BEEN DAMAGED DURING LOADING
- LINER IS IN PLACE AND PROPERLY LAPPED AND SEALED

PROHIBITED MATERIALS

COMPRESSED GASES
(UNPUNCTURED AEROSOL CANS INCLUDED)

EXPLOSIVES

FREE LIQUIDS

FINE PARTICULATES (RESPIRABLE FINES)

HAZARDOUS WASTE
(SUSPECT RCRA MATERIALS INCLUDED)

CORROSIVE MATERIALS

ETIOLOGIC AGENTS

PROHIBITED MATERIALS LIST
Figure 1

R - MATERIAL REVISED, ADDED, OR DELETED.

CARD XX ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

CARD 65 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

CARD 66 ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION

ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION
Form No. FMPC-CONT-1945-XX
Figure 2

R - MATERIAL REVISED, ADDED, OR DELETED.

BOX TARE WEIGHT CHECK

BOX NO.	DATE	TARE WEIGHT (LBS.)	BADGE NO.

FMPC-PRO-2867

BOX TARE WEIGHT CHECK
FMPC-PRO-2867
Figure 3

R - MATERIAL REVISED, ADDED, OR DELETED.

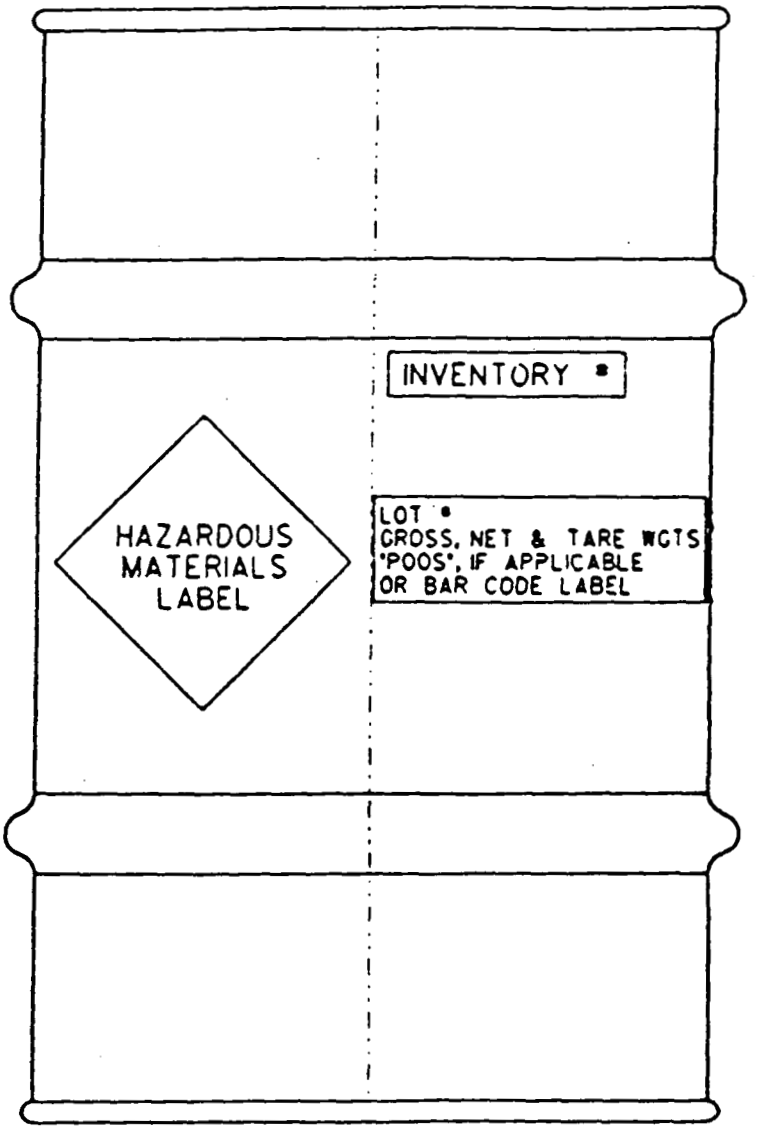
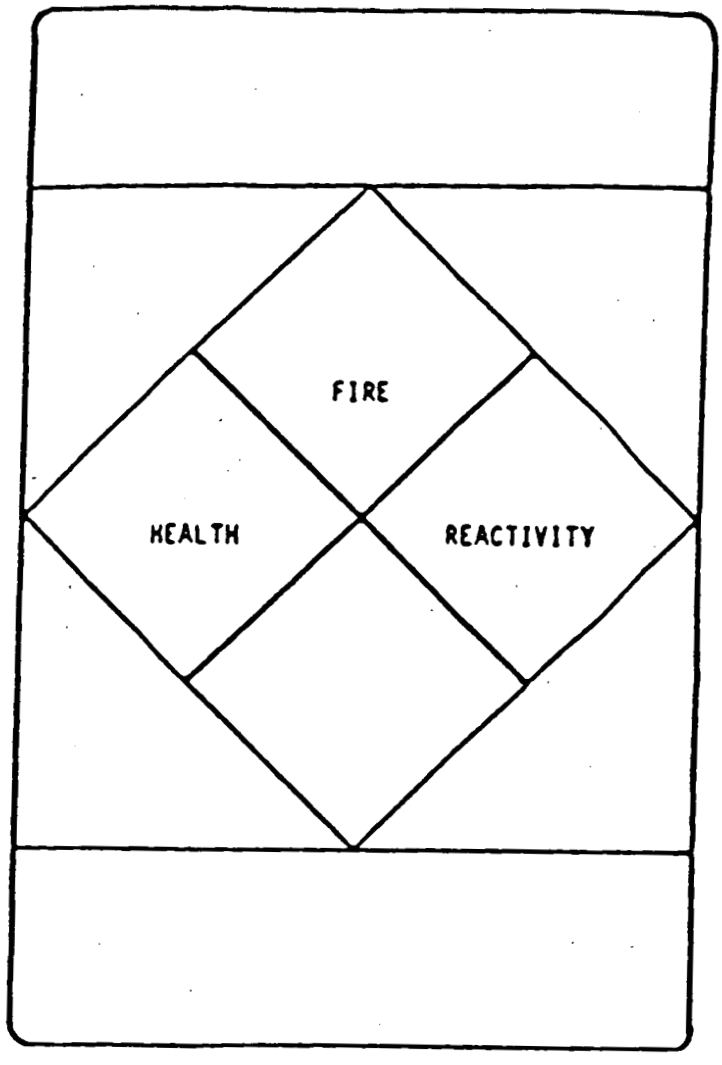


DIAGRAM OF LLRM CONTAINER LABELING
Figure 4

R - MATERIAL REVISED, ADDED, OR DELETED.



"HAZARDOUS MATERIAL WARNING LABEL"
Figure 5

R - MATERIAL REVISED, ADDED, OR DELETED.

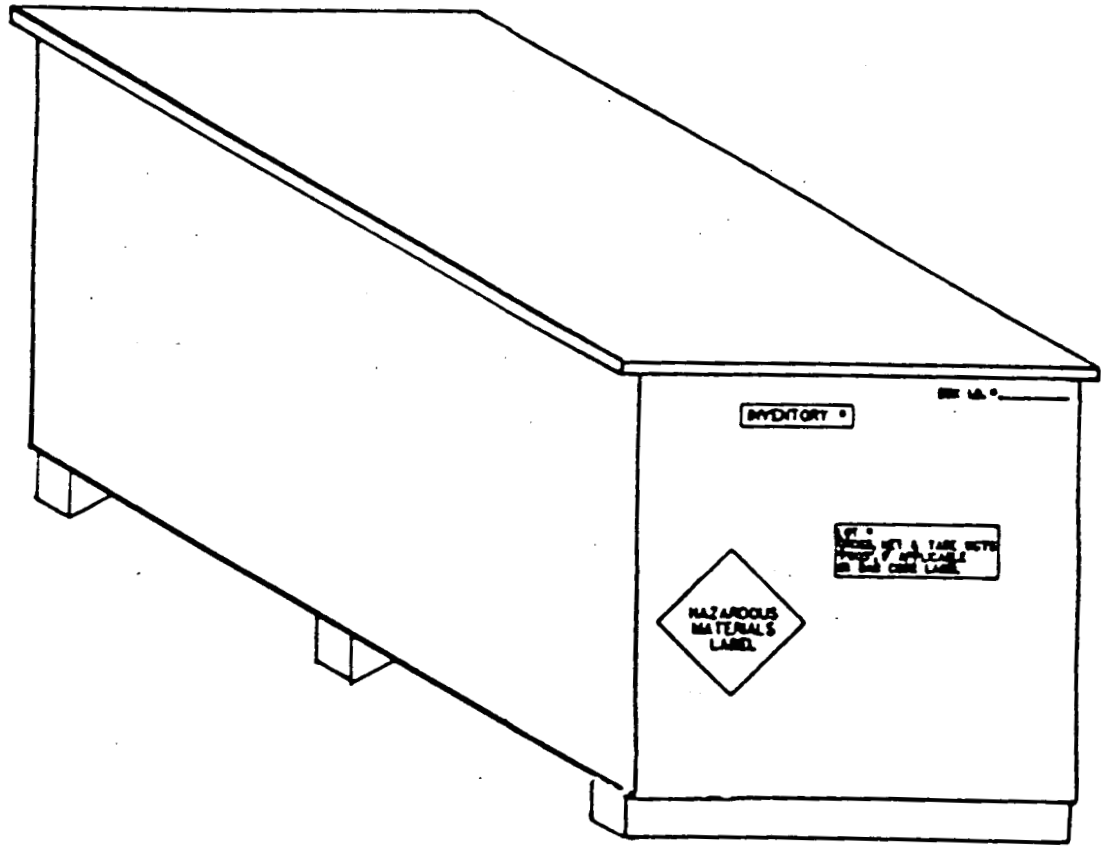
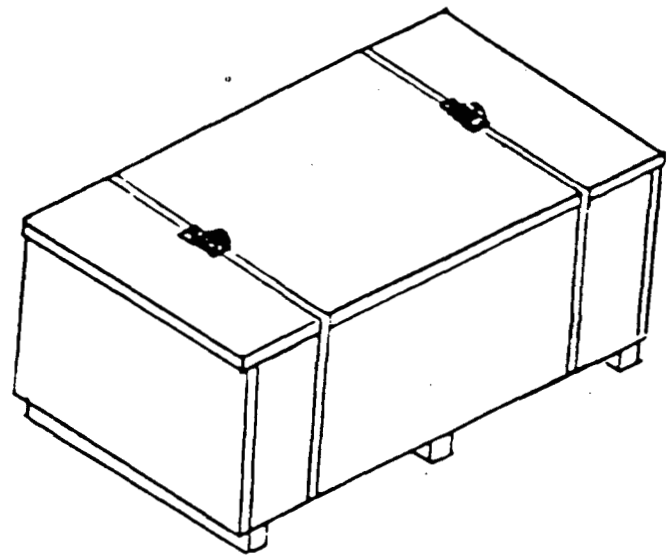


DIAGRAM OF LLRM BOX LABELING
Figure 6

R - MATERIAL REVISED, ADDED, OR DELETED.



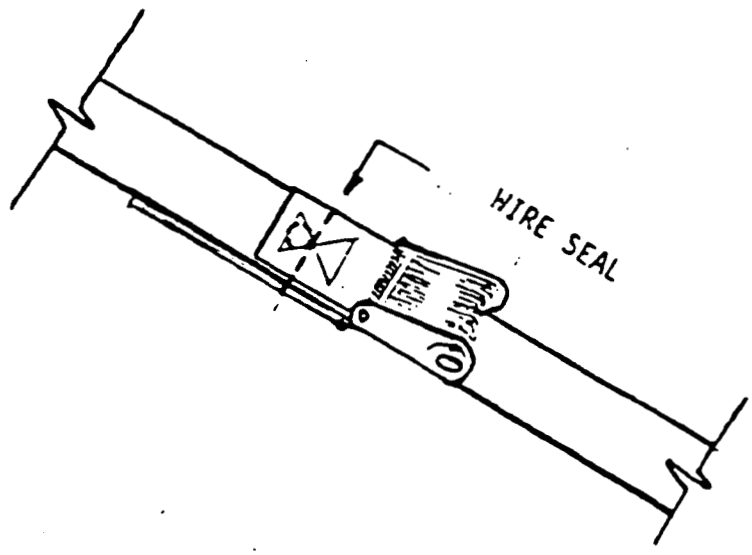


DIAGRAM OF BOX FOR INTERPLANT TRANSFER
Figure 7

R - MATERIAL REVISED, ADDED, OR DELETED.

RECORD OF ISSUE/REVISIONS

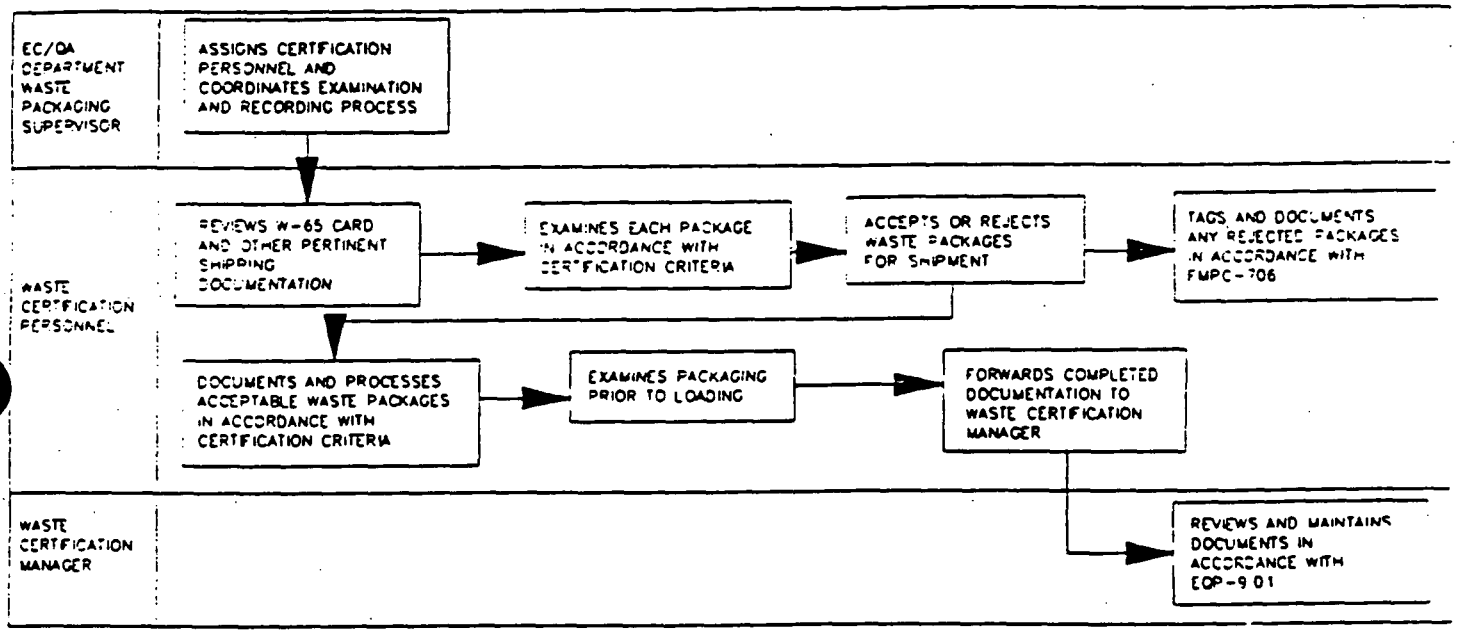
DATE	REV.NO.	DESCRIPTION AND AUTHORITY
07-07-87	N/A	Procedure requirement for packaging waste for off-site disposal per Request No. P87-151, initiated by K. J. Dunbar.
12-21-87	N/A	Revised procedure to incorporate audit recommendations per Request No. P87-229, initiated by J. E. Harmon.
07-25-88	N/A	Revised to incorporate CIOs C88-077, C88-081, and C88-097 thru C88-101, per Request Nos. P88-148, P88-162, P88-171, P88-172, P88-173, P88-174 and P88-175, initiated by K. J. Dunbar.
10-11-88	N/A	Reissued to incorporate CIO Nos. C88-067 (P88-140) and C88-068 (P88-141) and update to reflect current operating requirements per Request No. P88-189, initiated by K. J. Dunbar.
04-04-89	N/A	Added Step 7.5.8.1 and NOTE following 7.10.8 per Request P89-059, initiated by K. Dunbar.
10-20-89	N/A	Revised to incorporate CIO Nos. C89-020 (P89-306), C89-021 (P89-306), C89-021 (P89-307), C89-022 (P89-308), C89-056 (P89-310).
07-12-90	0	Reissued to update procedure per Request No. P89-433, initiated by K. A. Lawson. Revision program changed from "Page Revision Date" to "Revision No."

R - MATERIAL REVISED, ADDED, OR DELETED.

WESTINGHOUSE MATERIALS COMPANY OF OHIO - FMPC	4228	DOCUMENT NUMBER: EQP-12.03
ENVIRONMENTAL QUALITY PROCEDURE	SUBJECT: CERTIFICATION OF WASTE PACKAGE EXAMINATION AND SEALING FOR OFF-SITE SHIPMENT	REVISION: 0
		Page 1 of 19
	AUTHORIZED: (Manager, Environmental Compliance & Quality Assurance) Ellery D. Savage	Effective Date: 05/30/91

1.0 SCOPE

This procedure outlines the method for the certification of waste materials at the Feed Materials Production Center (FMPC) (for additional abbreviations, acronyms, and definitions refer to EQP-1.05) prior to offsite shipment, and is applicable to Low-Level Radioactive Waste (L-LRW) only.



2.0 PROCEDURE

2.1 Industrial Health and Safety Requirements

2.1.1 Leather palm gloves shall be worn by when handling sharp-edged or abrasive materials, containers, lids, and banding materials.

2.1.2 Safety glasses shall be worn by all personnel at all times in the process area, except when another type of eye protection equipment is specified.

2.1.3 A half-mask respirator equipped with radionuclide (purple) cartridges as specified by the Radiological Safety (RS) Technician shall be available for each person working with waste material and shall be used at the direction of the RS Technician.

2.1.4 Any circumstances of event which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake RS for evaluation. The involved personnel shall report to Medical Services at the end of their shift or as directed to submit a urine sample and again report at the start of their next shift to submit another urine sample.

2.1.5 Spill incidents involving RCRA materials shall be reported to the Spill Reporting Advisor in Environmental Compliance in accordance with Site Procedure FMPC-503, "FMPC Spill Incident Reporting and Cleanup."

2.2 General Requirements for Packaging L-LRW

2.2.1 All certification personnel verifying packaging and shipment of L-LRW to the Nevada Test Site (NTS) be trained and qualified on this procedure, NVO-325, and the Waste Certification Program Plan in accordance with EQP-6.04, Qualification of Waste Package Certifiers, or on EQP-6.05, Qualification of Waste Certification Officials.

2.2.2 Materials prohibited by NVO-325 and listed on the Prohibited Materials List (Attachment A) shall not be packaged for shipment.

2.2.3 Only materials approved by the NTS, Solid Waste Compliance and Waste Management shall be shipped. The Waste Certification Manager is responsible for making this information available to all personnel performing verification and certification work.

2.2.4 Only container designs approved for shipment by the NTS that meet the requirements of NVO-325 shall be used. For the purpose of this procedure only those container types verified as acceptable by the Waste Certification Manager, or another Certification Official, are to be used.

2.2.5 All packaging shall be in strong, tight containers that do not leak under normal transport and handling conditions, and which meet the criteria of Title 49 CFR 173.431 and 173.425.

2.2.6 Marking and labeling shall be in accordance with Title 49 CFR 172, Subparts D & E, as follows:

a. Container Number
b. Shipment Number
c. Gross Weight
d. Radioactive markings
e. Other marking and labeling as required for the packaged material

2.2.7 Packages certified and held for shipment must be secure and protected from weather and other adverse conditions having the potential to create an unacceptable condition. Covered or enclosed storage, which includes covering with plastic or tarpaulin are appropriate protective measures. If appropriate measures have not been taken, all packages concerned shall be reexamined by Certification personnel and recertified on the basis of the reexamination results.

2.3 Examination of Metal Drums Prior to Filling

Metal drum examination by Certification prior to filling is not a routine requirement, but may be performed on an audit basis as follows:
Physical Inspection - 50% of lot
W-65 Card comparison - 10% of lot
W-65 Card check for completeness and accuracy - 100% of lot
Results of examination shall be documented with an appropriate check list and signed by Certification personnel performing the examination. Criteria for examination shall include as a minimum:

2.3.1. Except for light rust, drum must be clean and empty.

2.3.2. Examine all surfaces of the drum and lid and reject for any of the following conditions.

a. A breach (a hole, crack, gash, etc.)
b. A dent or bulge which has creased, gouged, or may have otherwise significantly weakened the metal.
c. A dent greater than 1" in depth or extending over 6" in any direction.
d. A significant dent in the bottom rim. A significant dent is one that compromises the integrity of the container.
e. A significant dent in a rolling hoop. Each deficiency is to be evaluated for affect on the integrity of the container.
f. Rust causing exfoliation (scale), sever pitting, or other conditions having a detrimental effect on the serviceability of the waste container. (Small areas of exposed base metal, minor to moderate scratches, and slightly rusted spots are acceptable.)
g. Any deformation or out-of-round condition affecting the integrity of the sealing surface.

2.4 Examination of Metal Drum Filling

The filling of drums with low level radioactive waste materials shall be monitored by Certification personnel. The results of examination shall be documented on the "Waste Certification Examination Report 'Drum Filling'", QAC-881115-5 (Attachment B), and signed by those performing the examination. As a minimum, the examination shall include:

2.4.1 Visual verification that the materials packaged conform in appearance to the materials listed on the waste generator's certification record (currently W-65 card, FMPC-CONT-1945-XX, Attachment C).

2.4.2 If material is a respirable fine, verify that double containment is used in packaging.

2.4.2.1 Plant 8 residues shall be packaged in 48-gallon jug head type lever lock drum, sealed with a sequentially numbered wire seal, and contained in a 55-gallon bolt closure type overpack drum.

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2.4.2.2 Other miscellaneous materials may be overpacked with double containment, provided neither container will leak in normal handling and transport.

NOTE: As of the date this procedure is issued, approval has not been received to resume shipment of asbestos to the NTS. Also, there is no assurance that when and if shipment is resumed that asbestos in drums will be acceptable.

2.4.3 Verify that numbered seals are being used to secure inner containers.

2.4.4 Verify that bolt ring closure is used on outer drum, flange is in down position, and lid is secure. (If in doubt, grasp bolt ring with gloved hand and generate movement to determine if ring is loose.)

2.5 Examination of Metal Drums Prior to Loading Trailers For Transfer to Plant 1 (Waste Operations)

Examine packaged drums prior to loading on trailers for transfer to the Plant 1 Area. These drums are to be examined 100% on a best effort basis, and responsibility shall not be waived without the approval of Sitewide QA who shall notify Operations and Waste Management supervision of Certification's inability to perform the examination.

2.5.1. Receives the "Item Production/Certification/Identification" card FMPC-CONT-1945-XX (W-65 Card, Attachment C)

2.5.2 The lid shall be properly seated on the drum and held in place by a bolt ring closure. If bolt and flanges are not lower than rest of ring, then ring is positioned upside down.

2.5.3 Examine all surfaces of the drum and lid and reject for any of the following conditions.

a. A breach (a hole, crack, gash, etc.)
b. A dent or bulge which has creased, gouged, or may have otherwise significantly weakened the metal.
c. A dent greater than 1" in depth or extending over 6" in any direction.
d. A significant dent in the bottom rim. A significant dent is one that compromises the integrity of the container.
e. A significant dent in a rolling hoop. Each deficiency is to be evaluated for affect on the integrity of the container.
f. Rust causing exfoliation (scale), sever pitting, or other conditions having a detrimental effect on the serviceability of the waste container. (Small areas of exposed base metal, minor to moderate scratches, and slightly rusted spots are acceptable.)

g. Any deformation or out-of-round condition affecting the integrity of the sealing surface.

2.5.4 Complete "Waste Certification Examination Report 'Prior to Transfer'", QAC-881115-3 (Attachment D).

2.6 Examination of Wood Boxes Prior to Filling

On an occasional basis, wood boxes will be examined prior to filling to verify compliance. The examination shall be documented on a checklist, and shall include verification of the following:

2.6.1 The box design is approved for shipment to NTS.

2.6.2 The box is not damaged or seriously deteriorated (i.e. rot).

2.6.3 The box is free of holes, splits, or voids between plywood panels and framework.

2.6.4 The box is free of protruding fasteners.

2.6.5 The box is labeled, on opposite sides, with the manufacturer's name and shipping box serial number.

2.6.6 Lids, if in place, fit securely into the top recesses of the box and are free of severe warping, and voids.

2.6.7 Each box has three (four if the large 124 cu. ft. box) 1-1/4" width straps equidistant and horizontally around the perimeter.

2.6.8 Each box has a preformed plastic or 6-mil (0.006") sheet plastic liner. A preformed liner is required if box is to be filled with loose material such as scrap wood, metal, soil, or masonry.

2.6.9 Each box has a minimum of one 50 lb. bag of uncalcined diatomaceous earth (Dicalite) spread evenly in the bottom of the box, or an absorbent pad, covering the liner in the bottom of the box.

2.7 Monitoring of Wood Box Filling Prior to Closure

Wood box filling is to be monitored occasionally to verify compliance. Observance may include the filling process, or may only include observance after filling prior to closure. The results of the monitoring shall be documented on a checklist and shall verify the following:

2.7.1 A prohibited materials list is displayed in the loading area.

2.7.2 Box has a 6 mil (0.006") sheet plastic or a preformed plastic liner. A preformed liner is required if box is to be filled with loose material such as scrap wood, metal, soil, or masonry.

NOTE: A plastic liner is not required if box is being loaded with heavy metal items.

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2.7.3 When loading with heavy items, floor seams and one foot up each corner are caulked.

2.7.4 Box contents agrees with documentation on FMPC-CONT-1945-XX (W-65 card, Attachment C).

2.7.5 No prohibited items are being or have been packaged.

NOTE: Depending on the contents, all materials in a filled package may not be visible. The examiner should view as much of the contents as possible by looking into the box from different angles, and making use of inspection equipment such as mirrors, boroscopes, etc. as available.

2.7.6 Verify that visible internal structure of box is undamaged.

2.7.7 Sheets of wet-strength polypropylene/pulp super absorbent fabric have been placed in the bottom of the box or that one 50 lb. bag of uncalcined diatomaceous earth has been added and spread evenly in the bottom of the box.

2.7.8 If the box contains soil, wet-strength polypropylene/pulp super absorbent fabric or one 50 lb. bag of uncalcined diatomaceous earth has been added in alternating layers accounting for moisture level of soil.

2.7.9 Complete "Waste Certification Wood Box Examination Filling," QAC-881206-1 (Attachment E).

2.8 Monitoring Wood Box Closure Activities

Wood box closure activities shall be monitored occasionally to verify compliance. Results of the monitoring shall be documented on a check list and shall verify the following:

2.8.1 Plastic is folded over contents of box.

2.8.2 Form FMPC-CONT-1945-XX, "Item Production/Certification/Identification" card (W-65 Card, Attachment C) is filled out properly.

2.8.3 No moisture is visible on either the inside or the outside of the box.

2.8.4 RTW Silicone Adhesive, or equivalent, has been applied in a continuous bead (1/4 inch minimum) between lid and box.

2.8.5 Box is banded vertically with three 1-1/4 inch metal bands, one band on each end of the box and one in the middle of the box.

2.8.6 Box lid shall be fastened using ten penny nails on 3 inch centers and two sixteen penny galvanized nails on each side panel into two inch by four inch on top panel (8 places) providing proper closure.

2.8.7 Box does not exceed 5000 pounds gross weight.

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2.8.8 Check for damage to the box and lid. No holes, cracks, or deterioration (i.e. rot) which would permit leakage or lessen the structural integrity of the box are acceptable.

2.8.9 Complete "Waste Certification Wood Box Examination Filled Box," QAC-881206-2 (Attachment F).

2.9 Examination of Metal Boxes Prior to Filling

2.9.1 Metal box examination by Certification prior to filling is not required but should be performed on a monitoring basis. Criteria for examination shall include as a minimum:

a. Metal box must be a light color, usually white for Uranium contaminated rubble, gray for Thorium contaminated rubble.
b. Containers must be clean and empty.
c. Each container shall be well constructed of steel with all seams adequately welded.
d. The containers shall be free of holes, severe gouges, and significant deformations causing structural weakness or improper sealing.
e. The containers shall be free of rust causing exfoliation (scale), severe pitting, or other conditions having a detrimental effect on the serviceability of the waste container.

2.9.2 For all box designs having drain plugs, verify that box has been checked for a drain plug, and if found the drain plug has been tightened.

a. A red dot on the lower left hand front of the box shall indicate that the plug has been tightened.
b. A black dot on the lower left hand front of the box shall indicate that there is no drain plug.
c. All metal boxes shall have either a red or black dot marked.

2.10 Examination of Metal Boxes at Closure After Filling

2.10.1 Metal box must be a light color, usually white for Uranium contaminated rubble, gray for Thorium contaminated rubble.

2.10.2 Containers must be clean.

2.10.3 Each container shall be well constructed of steel with all seams adequately welded.

2.10.4 The containers shall be free of holes, severe gouges, and significant deformations causing structural weakness or improper sealing.

2.10.5 The containers shall be free of rust causing exfoliation (scale), severe pitting, or other conditions having a detrimental effect on the serviceability of the waste container.

2.10.6 For all box designs having drain plugs, verify that box has been checked for a drain plug, and if found the drain plug has been tightened.

a. A red dot on the lower left hand front of the box shall indicate that the plug has been tightened.
b. A black dot on the lower left hand front of the box shall indicate that there is no drain plug.
c. All metal boxes shall have either a red or black dot marked.

2.10.7 If container has been observed during loading operation ensure that wet-strength polypropylene/pulp super absorbent fabric or uncalcined diatomaceous earth is properly placed in and around the container so that all moisture is absorbed and no free liquid is visible.

2.10.8 If steel boxes are used as overpack containers for previously inspected containers, no further inspection of the contents is required.

2.10.9 Examine container at closure as follows :

a. Verify form FMPC-CONT-1945-XX (W-65 Card, Attachment C) is completed accurately.
b. Verify that Radioactive material markings (2 sides) and FMPC container number markings are present and legible.
c. Verify that all unnecessary marking have been removed or covered.
d. Verify that gross weight does not exceed 6,000 pounds.
e. Verify marked gross weight value is consistent with shipment paperwork.
f. Verify that a foam rubber or similar type gasket is on the sealing surface of the lid, or the lid is sealed with a durable sealant.
g. Verify that lid is properly placed on the box.
h. Verify locking pins required for the container are in place with the locking notches below the straps and fully engaged to full thickness of strap over entire locked surface edge of notch.
i. If bolted retainer ring is on, verify all bolts are securely in place.
j. Verify the lid is secured with two 1-1/4" steel straps.

2.10.10 For boxes filled with construction rubble, complete the "Construction Rubble Examination Metal Boxes" checklist, QAC-881206-3 (Attachment G).

2.11 <u>Examination of Sea/Land Cargo Containers Prior to Filling</u>

2.11.1 Sea/Land container examination by Certification prior to filling is not required but should be performed on a monitoring basis. Criteria for examination shall include as a minimum:

2.11.1.1 Containers must be clean and empty.

2.11.1.2 Each container shall be well constructed of steel with all seams adequately welded.

2.11.1.3 The containers shall be free of holes, severe gouges, and significant deformations causing structural weakness or improper sealing.

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2.11.1.4 The containers shall be free of rust causing exfoliation (scale), severe pitting, or other conditions having a detrimental effect on the serviceability of the waste container.

2.11.1.5 Verify a tare weight is marked on the container.

2.11.1.6 Verify that a 1/4" minimum continuous bead of RTW Silicone Adhesive Sealant, or equivalent, has been applied on all seams and corners of the container interior.

2.11.1.7 Verify that the container floors have been lined with wet-strength polypropylene/pulp super absorbent fabric, blotter paper, or uncalcined diatomaceous earth.

2.11.1.8 Verify that the absorbent fabric, blotter paper or uncalcined diatomaceous earth has been covered with a 0.006 mil thick plastic sheet that extends at least 36 inches up each side of the container.

2.11.1.9 Verify that plywood has been placed on the container floor and up to four feet in height on all sides. If container is top loading Sea/Land container, verify that the entire floor and sides are lined with plywood.

2.11.1.10 Verify that all container outside markings not related to the load have been removed.

2.11.1.11 Verify that a prohibited materials list has been attached to the container in a visible location.

2.11.1.12 After the container has been filled, verify that the back ledge of the container is clean.

2.11.1.13 Verify that the lid/door opening has been lined with 0.006 mil thick plastic or similar material to a height of 18 inches.

2.11.1.14 Verify that the load inside the container has been secured with plywood and 2" X 4" wood, or other similar type materials.

2.11.1.15 Verify that all doors and around all sealing surfaces have been caulked with RTW Silicone Adhesive Sealant, or the equivalent.

2.12 <u>Examination of Sea/Land Cargo Containers at Closure After Filling</u>

2.12.1 Each container shall be well constructed of steel with all seams adequately welded.

2.12.2 The containers shall be free of holes, severe gouges, and significant deformations causing structural weakness or improper sealing.

2.12.3 The containers shall be free of rust causing exfoliation (scale), severe pitting, or other conditions having a detrimental effect on the serviceability of the waste container.

2.12.4 If Sea/Land container has been observed during loading operation ensure that wet-strength polypropylene/pulp super absorbent fabric or uncalcined diatomaceous earth is properly placed in and around the container so that all moisture is absorbed and no free liquid is visible.

2.12.5 Examine Sea/Land containers at closure as follows :

a. Verify form FMPC-CONT-1945-XX (W-65 card, Attachment C) is completed accurately.
b. Verify that all unnecessary marking have been removed or covered.
c. Verify that caulking is around all doors and around all sealing surfaces, and that the metal doors are securely closed, and two metal bands secure the two door latches together.
d. If Sea/Land container is top loading, verify that a foam rubber or similar type gasket is on the sealing surface of the lid, or the lid is sealed with a durable sealant.
e. Verify that a prohibited materials list has been attached to the container in a visible location.

2.13 Examination of Baled Trash

2.13.1 Examine baled trash as follows:

a. Each bale shall have minimum of six (6) bands or straps for binding.
b. Free liquids are prohibited. Be watchful of liquids in pockets of water in a bags. Condensation in plastic bags is acceptable unless excessive.
c. Prohibited materials are not allowed in accordance with "Prohibited Materials List" (Attachment A).

NOTE: Reject bale if prohibited materials or suspicious items (i.e. asbestos) are present, and mark W-65 card accordingly.

d. "Bale Examination" checklist (Attachment H) is completed.
e. Using a barrel grab lift and turn the bale to check underside.
f. Ensure that form FMPC-CONT-1945-XX (W-65 card, Attachment C) is complete and accurate for each bale.
g. Initial and date the W-65 card after examining the card and bale.

NOTE: If bale is designated wet (to be sent to Plant 1 for drying) initial card but note that bale is wet (unacceptable for shipment).Wet bales will be recertified at Plant 1 prior to packaging for shipment.

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h. Make entry in log book at the baler.
i. Enter bale inspection on computer in Waste Packaging Office.

3.0 REFERENCES

3.1 NVO-325, Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements
3.2 FMPC-503, FMPC Spill Incident Reporting and Cleanup
3.3 FMPC-704, Minor Event Reporting System
3.4 EQP-1.05, Abbreviations, Acronyms, and Definitions
3.5 FMPC-706, Deviation and Corrective Action Reporting
3.6 EQP-9.01, Designation, Preparation, Storage and Maintenance of Quality Documents
3.7 EQP-12.04, Certification of Loading and Shipment of Low-Level Radioactive Waste

4.0 ATTACHMENTS

4.1 Attachment A - Prohibited Materials List
4.2 Attachment B -Waste Certification Examination Report, "Drum Filling"
4.3 Attachment C -Item Production/Certification/Identification Card
4.4 Attachment D -Waste Certification Examination Report, "Prior to Transfer"
4.5 Attachment E -Waste Certification Wood Box Examination Filling
4.6 Attachment F -Waste Certification Wood Box Examination Filled Box
4.7 Attachment G - Construction Rubble Examination Metal Boxes
4.8 Attachment H -Bale Examination

PROHIBITED MATERIALS

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Nonradioactive Material

Pressurized Vessels

Explosives

Radioactive Gases

High-Level Waste

Pyrophoric Materials

Toxic or Poisonous Materials

Liquid Metals

Flammable Substances

Alkaline Metals

Reactive Materials (could cause fire)

Liquid Organic Waste or Waste that contains any free liquid

Ashes, Dry Powders or Respirable Fines (unless immobilized or a double containment package is used)

If the Waste is Ionized or Immobilized the pH must be greater than 4

Attachment B
Page 1 of 1

WASTE CERTIFICATION EXAMINATION REPORT
"DRUM FILLING"

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WASTE CERTIFICATION
EXAMINATION REPORT
"DRUM FILLING"

DATE: _____ LOCATION: _____

CERTIFICATION SPECIALIST MATERIAL: _____

_____

LOT NO.: _____

DRUM #	INSIDE DRUM	OUTSIDE DRUM	NO LIQUIDS	I.S. LID	MTL. OK	SEAL OK .	W-65 COMP.	INITIAL ALL OK

Deviations Noted: Yes_____ No_____

Deviation Corrective Action Completed :

Production Supervisor: _____ Date:_____

Waste Certification Specialist:_____ Date:_____

QAC-881115-5, Rev.1 (09/23/89)

Attachment C
Page 1 of 1

ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION CARD

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CARD XX **ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION** 129702

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

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR

WASTE DESCRIPTION AND COMMENTS

PACKAGE TYPE	
PACKAGE SIZE	

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

PLANT	PROD. MBA
PLANT TO	MBA TO

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE

SUPERVISOR SIGNATURE DATE

FMPC-CONT-1945-R3 (REV 12/19/88)

*U.S. GPO: 1990-749-781

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Attachment D
Page 1 of 1

WASTE CERTIFICATION EXAMINATION REPORT "PRIOR TO TRANSFER"

4228

WASTE CERTIFICATION
EXAMINATION REPORT
"PRIOR TO TRANSFER"

(Rev. 8/31/88)

DATE:_____ LOCATION:_____

CERTIFICATION SPECIALIST MATERIAL:_____

_____

LOT NO.:_____ _____

DRUM #	O.S. DRUM	O.S. LID	BOLT	RING	DRUM I.D.	WTS. OK .	W-65 (10%)	ALL OK

Deviations Noted: Yes_____ No_____

Deviation Corrective Action Completed :

Production Supervisor: _____ Date:_____

Waste Certification Specialist:_____ Date:_____

WASTE CERTIFICATION WOOD BOX EXAMINATION
FILLING

4228

WASTE CERTIFICATION
WOOD BOX EXAMINATION
FILLING

INFORMATION

MTL. TYPE: _____ BOX S/N(): _____

REQUESTOR: _____ LOCATION : _____

EXAMINATION (Waste Certification)

DATE CHECKED	STATUS	INITIALS

CERTIFICATION (Waste Certification)

Deviation Reportable: YES_____ NO_____

Nonconformance Record Number:_____

Date Deviation Corrected:_____

I hereby certify the above woodbox has been examined to the best of my knowledge, as defined by the above criteria, requirements of this procedure, & SOP 20-C-601.

Signed:_____
(Waste Certification)

Date: _____

QAC-881206-1, Rev. 1 (12/15/88)

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WASTE CERTIFICATION WOOD BOX EXAMINATION
FILLED BOX

WASTE CERTIFICATION
WOOD BOX EXAMINATION
FILLED BOX

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INFORMATION

MTL. TYPE: _____ BOX S/N(): _____

GENERATOR: _____ LOCATION : _____

EXAMINATION

	INITIALS
1. Check for damage to the box and lid. Verify no holes, cracks or defects which would permit leakage or lessen the structural integrity of the box.	_____
2. Verify clarity of shipment number and container number.	_____
3. Verify Gross Weight is marked on each box.	_____
4. Verify three metal bands are secure and located vertically with one in the center of the box and the remaining two equidistant from the center, one on each side, or verify that large boxes are secured with four evenly spaced bands.	_____
5. Verify no standing water on the box.	_____
6. Verify W-65 card information matches information marked on box.	_____
7. Verify the existence of the Low Specific Activity (LSA), Reportable Quantity (RQ), label identification, as applicable.	_____
8. Verify the existence of durable sealant compound between the lid and the box.	_____
9. Verify the existence of nails, attaching the lid to the box.	_____

CERTIFICATION (Waste Certification)

Deviation Reportable: YES_____ NO_____

Nonconformance Record Number:_____

Date Deviation Corrected:_____

I hereby certify the above woodbox has been examined to the best of my knowledge, as defined by the above criteria, requirements of this procedure, & SOP 20-C-601.

Signed:_____
(Waste Certification)

Date: _____

QAC-881206-2, Rev. 2 (12/15/88)

CONSTRUCTION RUBBLE EXAMINATION METAL BOXES

4228

CONSTRUCTION RUBBLE EXAMINATION
METAL BOXES

RECORD :
Container S/N : _____ Date : _____

PRIOR TO LOADING:

1. Verify that the container has no holes, tears or creases. _____
2. Verify drain plug is installed, if applicable _____
3. Verify the container lid is not damaged (including the gasket). _____
4. Verify that one bag of Uncalcined diatomaceous earth or absorbent pad is placed on top of soil. _____
5. Only correct materials are placed in container. _____
6. No free liquids are visible in the container. _____
7. Verify only unsaturated wood is used as topping-off material. _____
8. Verify gross weight of container does not exceed 6000 lbs. _____
9. Verify caulking/gasket, banding (2) and pins are all in place. _____
10. Verify the data record (W-65) is filled out correctly. _____

Note : Any deviations from the checklist will require a deviation report to be issued and a Nonconformance tag placed on the container. The deviation must be resolved prior to removal of the Nonconformance tag.

Deviation Noted: Yes_____ NO_____

I hereby certify that the above checklist has been completed and witness that the above items are correct to the best of my knowledge.

Signed : _____ Date : _____
(Waste Certification)

QAC-881206-3, Rev. 1 (12/08/88)

BALE EXAMINATION

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BALE EXAMINATION

BALE NUMBER_____ DATE_____

EXAMINATION:

1. Verify correct materials are placed in bale where visible. _____

2. No visual evidence of free liquids or seepage from bale, nor is material in bale saturated to the extent that seepage could be expected during bundling, handling and transport. _____

3. Verify the data record (W-65) is filled out correctly. _____

NOTE: Any deviations from the checklist will require a deviation report to be issued and a Nonconformance tag placed on the container. The deviation must be resolved prior to removal of the Nonconformance tag.

Deviation Noted: Yes_____ No_____

I hereby certify that the above checklist has been completed and witness that the above items are correct to the best of my knowledge.

Signed:_____ Date:_____
(Waste Certification)

1.0 PURPOSE

This document provides the procedure for preparing low level radioactive waste for shipment offsite.

2.0 APPLICABILITY

This procedure shall apply to low level radioactive waste received in Plant 1 from the waste generator for shipment offsite.

3.0 RESPONSIBILITIES

3.1 The supervisor shall be responsible for the following:

3.1.1 Coordinating and notifying supporting organizations of assistance as required per this SOP.

3.1.2 Determining disposition of items as defined in this SOP.

3.1.3 Ensuring packaging materials are available for operators.

3.1.4 Designating area for rejected containers.

3.1.5 Notifying shipment coordinator of rejected container(s).

3.1.6 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection for the process being performed.

3.1.7 Providing operators with the required respiratory protection.

3.1.8 Ensuring that only trained personnel prepare low level radioactive waste for shipment.

3.1.9 Authorizing waste shipments.

3.2 The Radiation Safety Technician (RST) shall be responsible for the survey of each container classified as low level radioactive waste.

3.3 Waste Shipment Coordinator shall prepare and coordinate all documentation required for a waste shipment.

3.4 Operator shall be responsible for complying with this SOP.

3.5 Quality shall be responsible for certifying each container for shipment.

4.0 DEFINITIONS

4.1 Waste Generator - Organization (point of generation) at which waste is originated.

4.2 Transport Index - A dimensionless (rounded up to the first decimal place) number placed on the label of a package to designate the degree of control to be exercised by those handling the package. The number is from the higher of the two following derivations: (1) the maximum radiation level (in mR/h) at one meter from the package; and (2) for fissile Class II and III shipments, an index is calculated for criticality control purposes.

5.0 REFERENCES

None

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 Safety glasses with side shields shall be worn unless other eye protection is specified by IRS&T.

6.2 Respiratory protection provided by the supervisor shall be worn when required.

6.3 Leather-palmed gloves shall be worn to protect the hands from rough material and contamination.

6.4 HEPA type filter vacuum cleaners or an IRS&T approved vacuum system with a current DOP test sticker properly affixed to vacuum shall be used for cleaning.

R 6.5 Any circumstance which could have resulted in an intake of radioactive
R materials by inhalation, ingestion or absorption shall immediately be
R reported to a supervisor. The supervisor shall immediately report the
R circumstance of possible radioactive materials intake to IRS&T Radiological
R Safety Section for evaluation. The involved personnel shall report to the
R Urine Sampling Station at the end of their shift to complete a
R Investigation Report (IRR) (Form FMPC-ES&H-1458), and submit and incident
R urine sample. The involved employees shall also report to the Urine
R Sampling Station at the start of their next shift to submit a followup
R urine sample. Employees are responsible for complying with additional
R requirements as specified by the Radiological Safety Section.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE

7.1 Waste Container Inspection and Identification

7.1.1 Move waste container for shipment to Waste Operations Staging Area.

7.1.2 Check the container for damage such as dents, rust, holes, cracks, water leaks, and defects.

7.1.2.1 If container is damaged, mark damaged container with a red "X" on the lid and contact supervisor for area of disposition. Move damaged containers to area designated by supervisor.

7.1.3 Ensure Item Production/Certification/Identification" XX card, Form FMPC-CONT-1945-XX is complete. Notify supervisor if card is not complete.

R 7.1.4 Notify supervisor to request the Waste Shipment Coordinator to assign shipment log number and waste stream identification number.

R R R R NOTE: Waste packages shall be marked with the appropriate thirteen alpha-numeric character waste stream identification number and a six digit numeric character container identification number unique to each shipment.

7.1.5 Stencil or mark assigned shipment log number, container identification
R number, and waste stream identification number in one inch (minimum)
R block or legible letters with waterproof ink on the top center and/or
R side of container.

R R NOTE: The box serial number shall be used as the container identification number.

R R R NOTE: Container identification numbers less than six digits are to be preceded by zeros (e.g. Container #25432 would be changed to 025432. Container #5 would be changed to 000005).

7.1.5.1 For Sea/Land containers with seven digit numbers, change to six numbers by deleting the suffix (e.g. 178936-1 shall be 178936).

7.1.6 Notify supervisor that an RST is required to survey container.

7.1.7 Move container(s) to holding area and cover with tarpaulin, or equivalent cover.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.2 Drum Preparation

7.2.1 Torque lock ring bolt to 45(±5) ft-lbs using certified break-away torque wrench.

7.2.2 Tighten the locking nut against the threaded flange (right flange) by hand and then tighten 1/4 turn using wrench (See Figure 1).

7.2.3 Dab bolt with red paint as a visual code designating that the tightening procedure has been completed.

7.2.4 Thread safety wire through hole in either the bolt head or threaded portion of bolt and around threaded portion of bolt ring and fasten (See Figure 1).

7.2.5 Touch-up paint scratches on container.

7.2.6 Check outside of drums for moisture. Remove moisture with rag and dispose of rag in designated container.

R R 7.2.7 Notify MC&A to write shipment document using a LLRW Shipment Preparation Worksheet.

7.2.8 Move drum(s) to holding area and cover with tarp, or equivalent cover.

7.3 Wooden Box Preparation

7.3.1 Check inside and outside of box for moisture.

7.3.1.1 If moisture is present on outside of container, remove moisture with rag and dispose of rag in designated container.

7.3.1.2 If moisture is inside container, add uncalcined diatomaceous earth or wet-strength, polypropylene-pulp, super-absorbent fabric.

7.3.2 Apply GE-RTW Silicone adhesive, or equivalent, in a continuous bead (1/4 inch minimum to 1/2 inch maximum) on top edges of vertical 3/4 inch panel lid.

7.3.3 Place lid on box.

7.3.4 Band the box vertically with three 1-1/4 inch metal bands by placing one band on each end of the box and one in the middle (See Figure 2).

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.3.5 Notify supervisor that box requires lid to be secured.

NOTE: Box lid shall be fastened using 10 penny nails on three inch centers and two 16 penny galvanized nails on side panel into each 2 inch x 4 inch on top panel (eight places).

R 7.3.6 Notify MC&A to write shipment document using a LLRW Shipment Preparation
R Worksheet.

7.3.7 Move box to holding area and cover with tarp, or equivalent cover.

7.4 Metal Box Preparation

7.4.1 Check inside and outside of box for moisture.

7.4.1.1 If moisture is present on container outside, remove with rag and dispose of rag in designated container.

7.4.1.2 If moisture is inside container, add uncalcined diatomaceous earth or wet-strength, polypropylene-pulp super-absorbent fabric.

7.4.2 Using forklift, place box on stand and check bottom for dents, holes, or stress cracks.

NOTE: Truck forks shall be removed from stand while inspecting box for damage.

7.4.2.1 If a dent is deep or metal protruding more than one inch from box surface, reject box.

7.4.3 Check bottom of box for drain hole/plug. If there is a drain hole but no plug, contact supervisor.

7.4.3.1 If a drain hole/plug is present, tighten the drain plug. Paint red dot on lower, left front of box to indicate plug has been tightened.

7.4.3.2 If drain hole/plug is not present, paint a black dot on lower, left front of box to indicate box has been checked.

7.4.4 Check runners on box for drain holes. Place check mark next to red or black dot to indicate runners have been checked.

NOTE: Each runner should have two drain holes.

7.4.4.1 If drain holes are not present, drill holes in runner.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.4.5 Ensure gasket on lid is in place.

7.4.5.1 If gasket is damaged, apply GE-RTV silicone adhesive (or equivalent) in a continuous bead (1/4 inch minimum to 1/2 inch maximum) on top edges of vertical 3/4 inch panel lid.

7.4.6 Using fork lift, position lid on box.

7.4.7 Band box with two metal bands.

NOTE: Metal band shall be 1-1/4 inch wide X .044 inch thick mangus P/W (paint/waxed), tensile strength of 7,610 lbs, 5.3 ft/lb, 100 lbs/coil, located equidistance from center.

7.4.8 For box with wedge type pins, insert pins through the straps located on the upper perimeter of the box so that the locking notches are below the straps.

CAUTION: **DO NOT USE PINS(S) IF THE LOCKING NOTCHES ARE 1/4 INCH OR MORE BELOW THE BOX STRAPS.**

CAUTION: **DO NOT USE PINS IF ANGLE OF PIN IS LESS THAN OR GREATER THAN 90 DEGREES.**

7.4.9 For box with bolt type closure, insert self-tap hex-head bolt through flange on lid and the hole on the top of the box.

7.4.10 Tighten hex-head bolts with an impact or socket wrench.

7.4.11 Touch-up paint scratches.

7.4.12 Check outside of box for moisture.

7.4.12.1 If moisture is present, remove with rag and dispose of rag in designated container.

R 7.4.13 Notify MC&A to write shipment document using a LLRW Shipment Preparation
R Worksheet.

7.4.14 Move box(s)to holding area and cover with tarp, or equivalent cover.

7.5 Baled Trash Preparation (See Figure 3)

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.5.1 Place wooden pallet in staging area.

7.5.2 Place bagged bale on pallet.

7.5.3 Position open bag over center of pallet with long side marked "L" in front.

NOTE: Plastic bags used to contain baled trash shall be FLEX-IRON Bulk Bags (or equivalent).

7.5.4 Place absorbent pad inside outer bag.

7.5.5 Using barrel grab, lift bale and place into bag opening.

7.5.6 Lift sides of the bag over the bale.

7.5.7 Remove barrel grabs.

7.5.8 Fold over open end of bag opening and tape closed.

7.5.9 Prepare a second bale by repeating Steps 7.5.1 through 7.5.8.

7.5.10 Place wood pallet on first bale and position the second bale on top of the wood pallet.

7.5.11 Place a third wood pallet on top of the second bale.

7.5.12 Cut two 1-1/4 inch wide pieces of banding to proper length to pass around the outside of the closed sides of the top and bottom pallets.

7.5.13 Cut four strips of corrugated cardboard approximately 12 x 48 inch. Fold cardboard strips in half lengthwise.

7.5.14 Place 12 x 48 inch strips of corrugated cardboard between banding and of pallet.

7.5.15 Tighten and secure banding with clip. Install a second banding clip on end of the cut banding.

NOTE: Do not over tighten banding so as to cut into ends of bulk bag.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.5.16 Weigh bale and mark the gross weight in two inch (minimum) letters on the top wood pallet.

NOTE: Markings shall be in block or legible letters using waterproof ink unless otherwise specified.

7.5.17 Mark the top wood pallet with the shipment log number and bundle number in one inch letters.

7.5.18 On the back of a blank weight ticket, write the shipment number and bundle number.

7.5.19 Staple the weigh card to the opposite side of pallet where shipment log number, bundle number and gross weight are located.

7.5.20 Notify supervisor the package is ready for radiological survey.

NOTE: Supervisor shall contact RST for survey.

7.5.21 Move to holding area and cover with tarp, or equivalent cover.

7.6 Container Verification

7.6.1 Notify supervisor that the shipment documentation requires completion by the Waste Shipment Coordinator.

7.6.2 After verifying documentation is complete, move the shipment to shipping lanes for final preparation.

7.6.3 Notify supervisor that a smear test of the container is required.

NOTE: Container must be smeared within 48 hours of shipment.

7.7 Drum Shipment Inspection

7.7.1 Check drum for damage such as dents, rust, holes, cracks, water leaks, and defects.

7.7.1.1 If drum is damaged, mark lid with a red "X", stop shipment and notify supervisor. Move damaged drum to area designated by supervisor.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.7.2 Check for the existence and clarity of the shipment log number and container identification number.

R R R **NOTE**: The shipment log number, container identification number, and waste stream identification number shall be marked in one inch (minimum) letters using black waterproof ink or black paint.

7.7.3 Check that the gross weight is marked in two inch (minimum) letters on each drum.

7.7.4 Ensure jam nut is locked to opposite side of bolt head with flat side against ring harness.

7.7.5 Ensure safety wire is installed on bolt.

7.7.6 Check bolt ring/drum seal to ensure proper seat of locking ring on drum.

7.7.7 Touch-up paint scratches.

7.7.8 Check for moisture on outside of drum.

7.7.8.1 If moisture is present, remove with rag and dispose of rag in designated container.

7.7.9 Affix LSA (Low Specific Activity), LQ (Limited Quantity) or RQ (Reportable Quantity) labels to container.

7.8 Wooden Box Shipment Inspection

7.8.1 Check box for damage such as holes, cracks, water leaks, or defects.

7.8.1.1 If box is damaged, stop shipment, mark lid of box with a red "X", and notify supervisor. Move damaged box to area designated by supervisor.

7.8.2 Visually verify the existence and clarity of the shipment log number and container identification number.

R R R **NOTE**: The shipment log number, container identification number, and waste stream identification number shall be marked in one inch (minimum) letters using black waterproof ink or black paint.

7.8.3 Ensure gross weight is marked in two inch (minimum) letters on each box.

7.0 PROCEDURE (cont.)

7.8.4 Ensure that three metal bands are secure and located vertically with one in the center and the remaining two equidistance from the center.

7.8.5 Check for moisture on outside of box.

7.8.5.1 If moisture is present, remove with rag and dispose of rag in designated container.

7.8.6 Affix LSA (Low Specific Activity), LQ (Limited Quantity) or RQ (Reportable Quantity) labels to box.

7.9 Metal Box Shipment Inspection

7.9.1 Check for damage such as dents, rust, holes, cracks, water leaks, and defects.

7.9.1.1 If box is damaged, mark lid of box with a red "X" and contact supervisor for area of disposition. Using forklift, move damaged box to area designated by supervisor.

7.9.2 Ensure drain plug is secure by checking for red paint dot on the lower left hand front of box.

7.9.3 Ensure wedge type pins (if used) are secure.

CAUTION: **WEDGE-TYPE PINS MUST BE REPLACED IF THE LOCKING NOTCH OF THE PIN IS 1/4 INCH OR BELOW THE BOX STRIPS.**

CAUTION: **WEDGE-TYPE PINS MUST BE REPLACED IF ANGLE OF PIN IS LESS THAN OR GREATER THAN 90 DEGREES.**

7.9.4 Ensure bolt type locking devices (if used) are secure.

7.9.5 Check for the existence and clarity of the shipment log number and container identification number.

R NOTE: The shipment log number, container identification number, and
R waste stream identification number shall be marked in one inch
R (minimum) letters using black waterproof ink or black paint.

7.9.6 Visually verify gross weight is marked in two inch (minimum) letters on box.

7.9.7 Ensure two bands are located vertically on box, secure, and equidistant from center.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.9.8 Touch-up paint scratches.

7.9.9 Check for moisture on box.

7.9.9.1 If moisture is present, remove with rag and dispose of rag in designated area.

7.9.10 Affix LSA (Low Specific Activity), LQ (Limited Quantity) or RQ (Reportable Quantity) labels to box.

7.10 Sea/Land Container Shipment Inspection

7.10.1 Check the sea/land container for damage such as structurally affecting dents, severe rust, holes, stress cracks, flaking paint, or water leaks.

7.10.1.1 If container is damaged, mark door of damaged container with a red "X" and contact supervisor for area of disposition. Move damaged container to area designated by supervisor.

7.10.2 Check for markings not pertaining to load and paint over if found.

7.10.3 Check for the existence and clarity of the shipment log number and container identification number.

R NOTE: The shipment log number, container identification number, and
R waste stream identification number shall be marked in one inch
R (minimum) letters using black waterproof ink or black paint.

7.10.4 Ensure gross weight is marked in two inch letters (minimum) on side of container.

7.10.5 Ensure caulking is around doors and sealing surfaces.

7.10.6 Ensure doors are securely closed with two bands.

7.10 7 Ensure that bottom edge and forklift indentations of container are clean.

7.10.8 Check for moisture on outside of container.

7.10.8.1 If moisture is present, remove moisture with rag and dispose of rag in designated container.

7.10.9 Affix or stencil LSA (Low Specific Activity), LQ (Limited Quantity) or RQ (Reportable Quantity) labels to box as specified by RST.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.11 Baled Trash Shipment Inspection

7.11.1 Check baled trash package for holes, tears, water leaks, and defects.

7.11.1.1 If damaged package is found, mark side of damaged package with a red "X" and contact supervisor for area of disposition. Move damaged package to area designated by supervisor.

7.11.2 Ensure wooden pallets are in place.

7.11.3 Ensure Flex-Con Bulk Bag opening is taped closed.

7.11.4 Ensure banding is in place and secure with clips.

7.11.5 Ensure strips of cardboard are secure under banding so that banding is not cutting into package.

7.11.6 Verify the existence and clarity of the shipment log number and bundle number.

R NOTE: The shipment log number, container identification number, and
R waste stream identification number shall be marked in one inch
R (minimum) letters using black waterproof ink or black paint.

7.11.7 Ensure gross weight is marked in two-inch letters (minimum) on side of package.

7.11.8 Check for moisture on outside of package. If moisture is present, remove with rag and dispose of rag in designated container.

7.11.9 Affix LSA (Low Specific Activity), LQ (Low Quantity) or RQ (Reportable Quantity) labels to package as specified by the RST.

7.12 Bulk Shipment Inspection

7.12.1 Check items/material for loose contamination.

7.12.2 Check for the existence and clarity of markings for gross weight in two inch (minimum) letters, shipment log number, and package identification number on package.

7.12.3 Check that package has no sharp protruding objects which could puncture transport vehicle lining.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.12.4 If package is damaged, mark damaged package with a red "X" and contact supervisor for area of disposition. Move damaged package to area designated by supervisor.

7.12.5 Check for moisture on outside of package.

7.12.5.1 If moisture is present, remove with rag and dispose of rag in designated container.

7.13 Final Documentation Prior to Loading

NOTE: The Waste Management Supervisor and the Waste Certification Specialist shall authorize the release of each shipment by signing the Waste Shipment Authorization Checklist, Form No. QA:WC:06.

NOTE: Quality & Safety shall affix certification sticker NV-211 to each container and authorize container.

R NOTE: MC&A shall prepare a shipping order (Form FMPC-CONT-558) for
R Nuclear Material.

7.13.1 Notify supervisor that shipment is ready for loading.

7.14 Closing Type A-7A Metal Shipping Containers (See Figure 4)

7.14.1 Remove the Lid Edge Protector from the container.

7.14.2 Position the container lid on edge with the bottom facing out and leaning against the container.

NOTE: The lid shall be leaning at an angle so that the lid will not fall.

7.14.3 Install a neoprene sponge rubber gasket on the lid sealing surface.

7.14.4 Place the lid into position on top of the container.

7.14.5 Secure the lid as follows:

7.14.5.1 Using the tool provided, install "L" clips in sequence on corners, sides, front, and back of the container.

NOTE: Four clips shall be in place on each side of the container, three clips in front and three in back for a total of 14 clip.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

NOTE: The clips are the primary container closing/locking devices.

7.14.5.2 Using a wide edged blunt chisel, bend the bottom edge of the clip locking strap inward until the strap is secured.

7.14.6 Install the Lid Edge Protector on the container.

7.14.7 Using 3/8 x 16 hex bolts, washers, and hex head elastic stop nuts, secure the edge protector on the container.

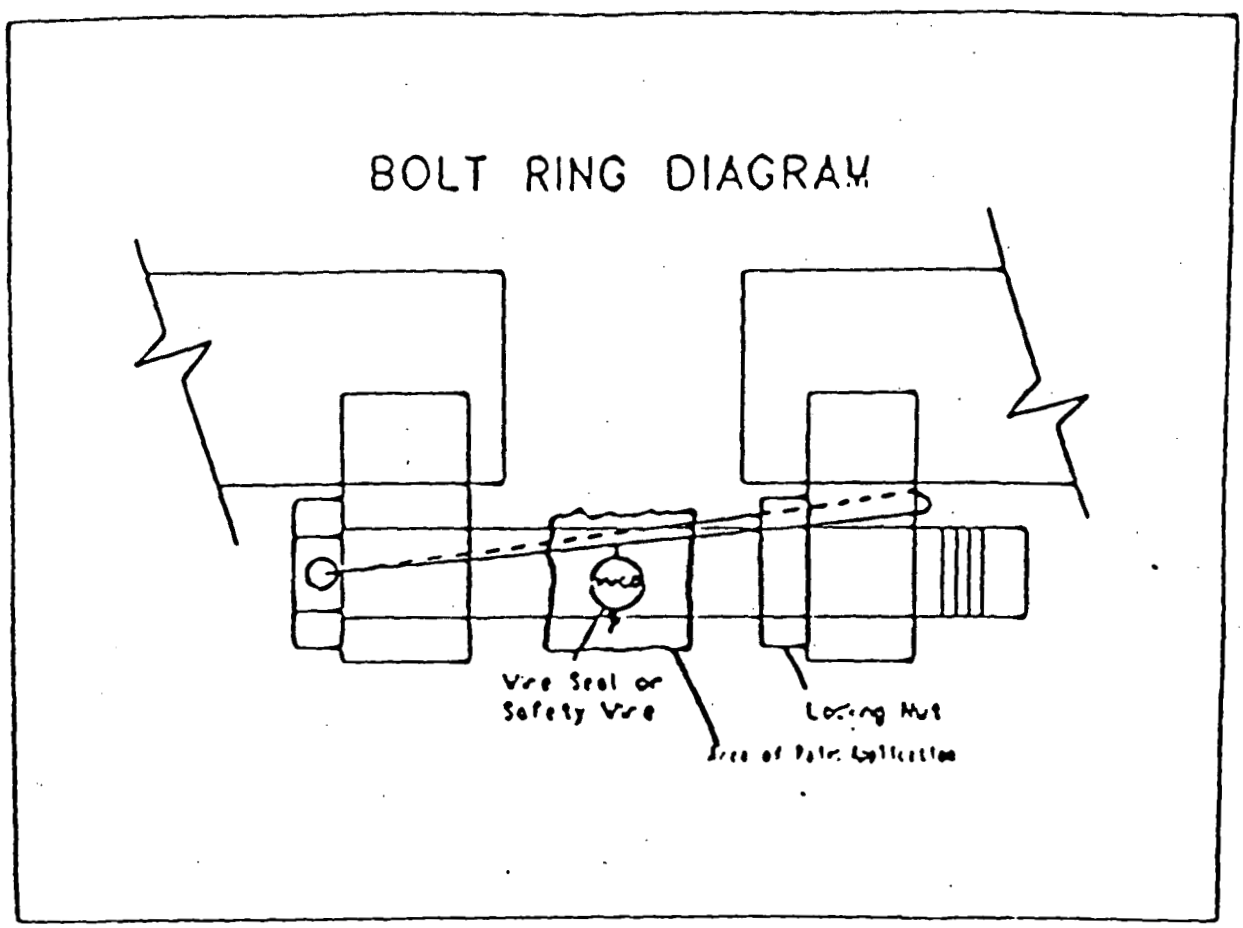
NOTE: The hex bolts are used to hold the edge protector in place and not for lid security.

7.14.8 Finger tighten each hex nut.

7.14.9 Tighten the hex bolts until a minimum of two threads are visible beyond the nut.

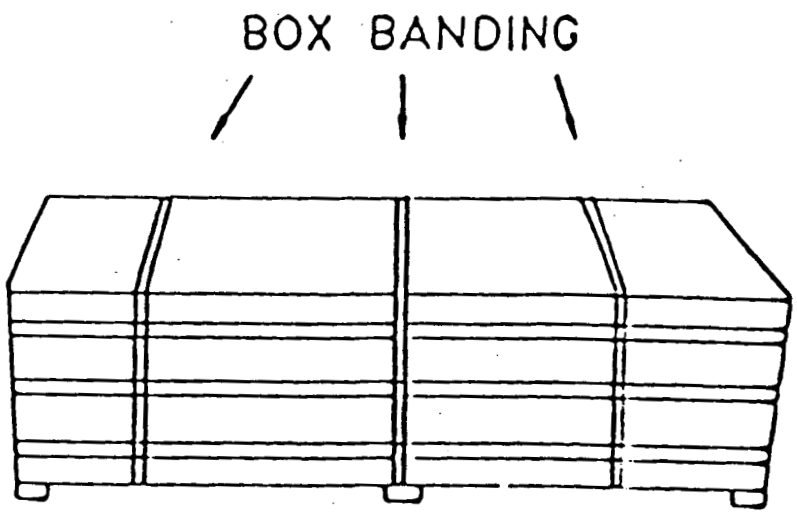
8.0 APPLICABLE FORMS

None



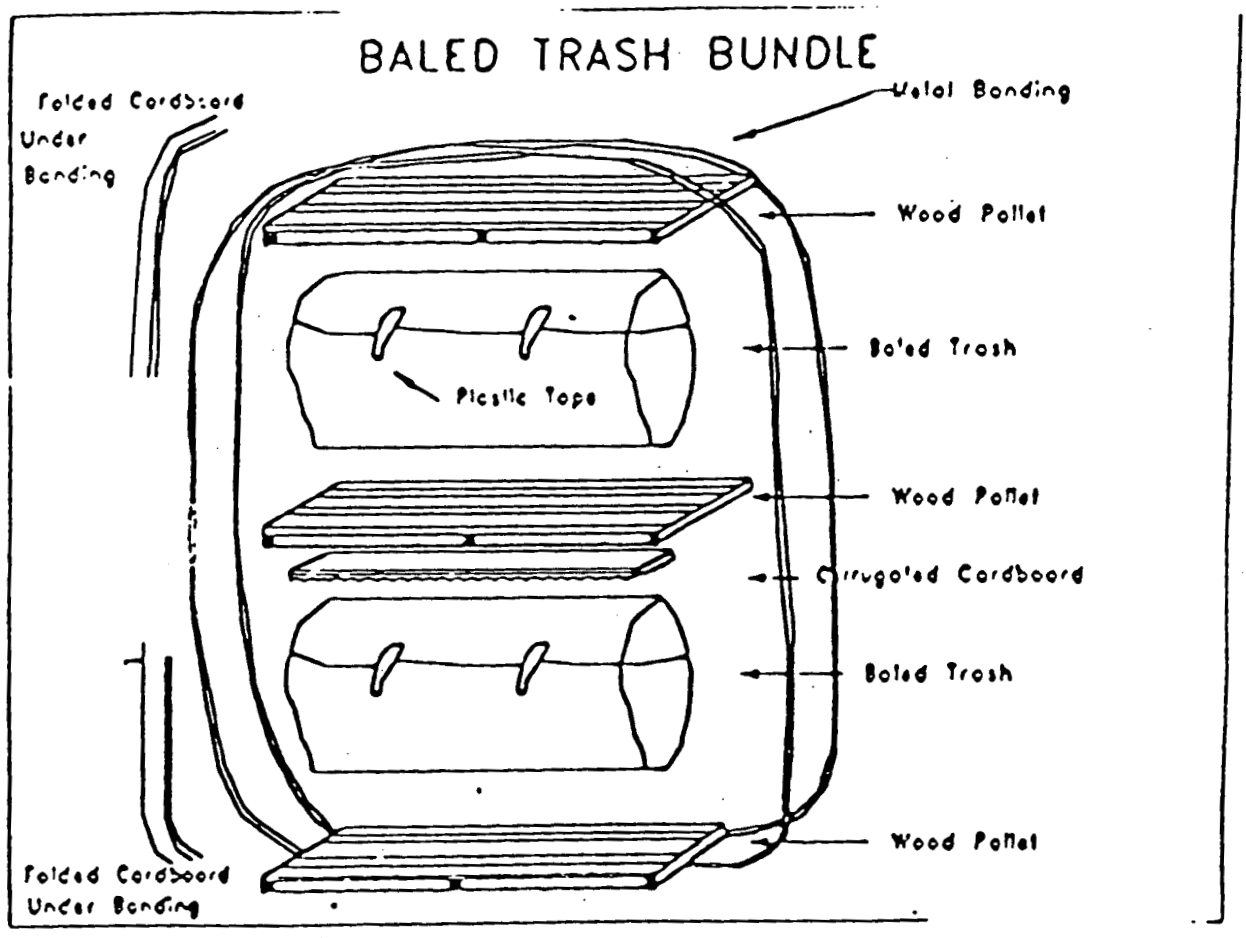
LOCK RING PAINT AND BOLT AND SAFETY WIRE INSTALLATION
Figure 1

R - MATERIAL REVISED, ADDED, OR DELETED.



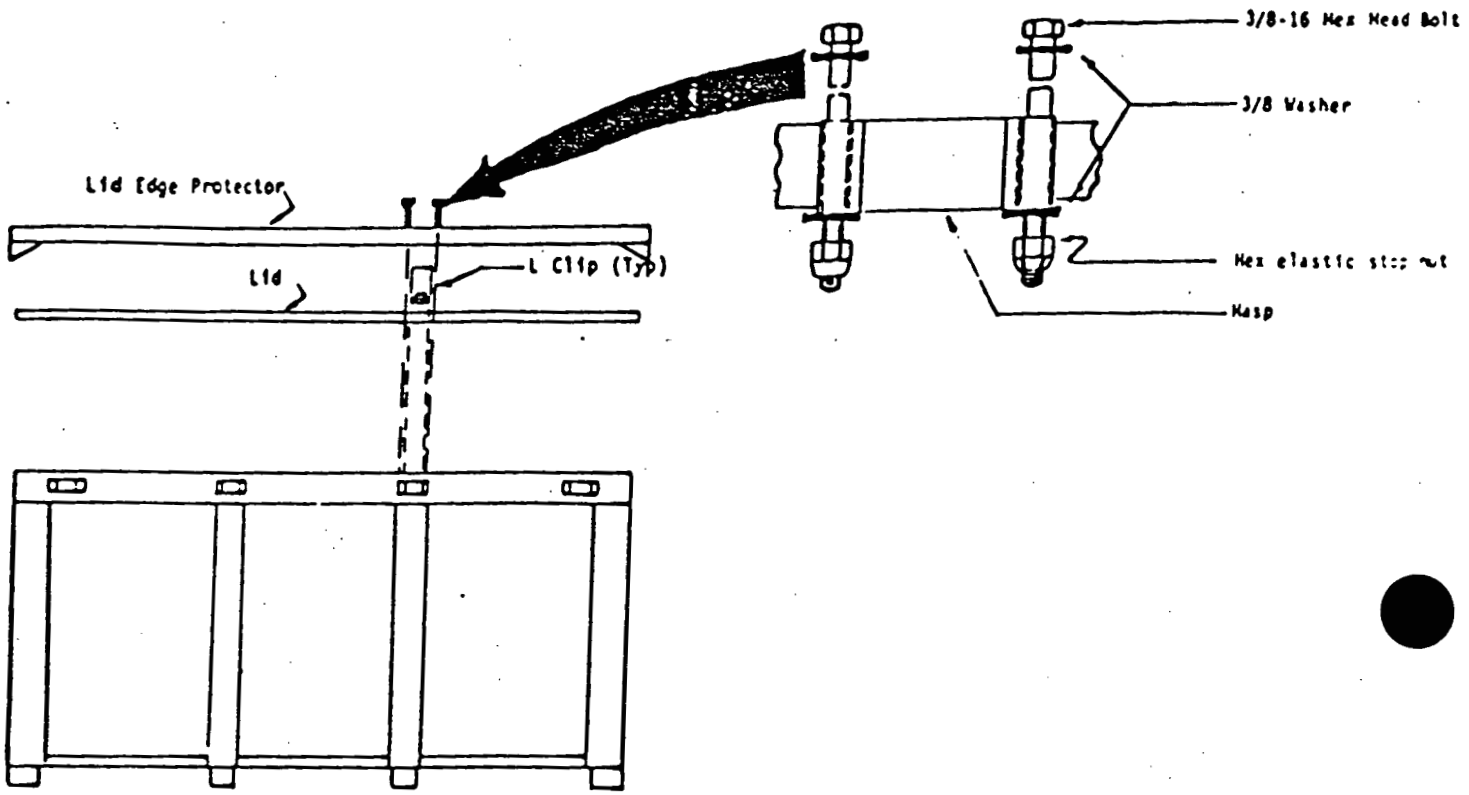
BOX BANDING
Figure 2

R - MATERIAL REVISED, ADDED, OR DELETED.

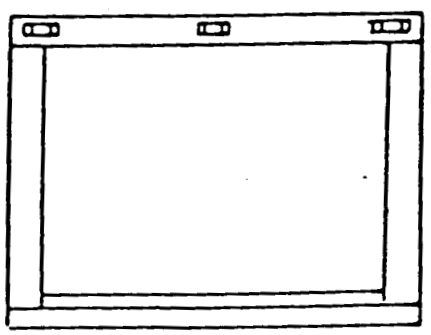


BALED TRASH FINAL PREPARATION
Figure 3

R - MATERIAL REVISED, ADDED, OR DELETED.



SIDE VIEW



FRONT VIEW

LID INSTALLATION
Figure 4

R - MATERIAL REVISED, ADDED, OR DELETED.

RECORD OF ISSUE/REVISIONS

DATE	REV. NO	DESCRIPTION AND AUTHORIZATION
07-07-87	N/A	Procedure requirement for low level (L-LRW) shipment preparation per Request No. P87-150, initiated by K. J. Dunbar.
01-05-88	N/A	Revised to incorporate recommendations from QA/internal audit per Request No. P87-230, initiated by J. E. Harmon.
04-03-89	N/A	Reissued to include final sea/land container preparation and baled trash, and also general update of procedure per Request P88-257, initiated by K. J. Dunbar.
08-21-90	0	Reissued to reflect current operations per Request No. P89-396, initiated by K. A. Lawson. Revision program changed from "Page Revision Date" to "Revision No.".
09-17-90	1	Revised to incorporate CIO Nos. C90-054, C90-055, per Request Nos. P90-339 and P90-341.
06-11-91	2	Revised to include addition of waste stream identification number, clarify container identification, and update 6.5 per Request No. P91-226, initiated by S. Brown.

R - MATERIAL REVISED, ADDED, OR DELETED.

WESTINGHOUSE MATERIALS
COMPANY OF OHIO - FMPC

STANDARD OPERATING PROCEDURE	Title: Preparation and Shipment of Radioactive Materials (Low Level Wastes)	SOP-TRF-46-C-110 Department: Security Acquisition and Materials Logistics Section: Traffic

Authorization: P. C. Weddle PC Weddle — Supersedes: 12/16/88

Author: C. E. Block CE Block WRD 4/4/89 — Revision Date: 04/03/89

1.0 POLICY

It is Westinghouse Materials Company of Ohio's (WMCO) policy to control the shipment of all materials and equipment from WMCO to ensure accountability, safe transport, and compliance with applicable federal, state, and local transportation regulations as well as DOE Orders and directives.

2.0 SCOPE

This procedure shall apply to WMCO's Traffic and Transportation Departments in ensuring that low level radioactive wastes (radioactive materials) are properly packaged, marked, labeled, loaded, and secured, and proper shipping documents are in full compliance with WMCO, DOT/DOE and NTS regulations and directives.

3.0 DEFINITIONS

3.1 Department of Transportation Title 49 Code of Federal Regulations - Hazardous Materials Regulations, which promulgates Federal regulations which govern the packaging and transportation of hazardous materials, hazardous substances, and hazardous wastes.

3.2 LSA - Low Specific Activity - Material in which the activity is essentially uniformly distributed and in which the estimated average concentration per gram of contents does not exceed the specifications of Section 173.403(n) of Title 49 CFR.

3.3 Criteria for limited quantities of radioactive materials are as follows:

A. The radiation level at any point on the external surface of the package does not exceed 0.5 millirem per hour.

B. The package does not contain more than 15 grams of Uranium-235.

3.4 LLW - Low Level Waste (Authorization for packaging, marking, labeling and shipping is the same as for Radioactive Materials)

3.5 Exclusive Use Vehicle - A vehicle equipped with a securely attached exterior enclosure, which during normal transport restricts the access of unauthorized persons to the cargo space containing the radioactive material.

3.6 Radioisotope and Radionuclide - For the purpose of transportation, these terms are synonymous with "Radioactive Materials" and identify specific isotopes of chemical elements that have radioactive properties.

3.7 Containers or Packages - 55-gallon drums, 85-gallon drums, six each 55-gallon drum metal overpacks and wooden boxes.

3.8 ERMT - Environmental and Radiological Monitoring Technician

3.9 Tally Sheet and Radioactive Waste Management - Storage and Disposal Form - Detailed description of shipment as to container identification numbers, contents, contamination levels, radioisotope and radionuclide, and gross weights.

3.10 Bulk Materials - Objects of nonradioactive material externally contaminated with radioactive material. These objects or articles such as scrap wooden pallets and boxes must be suitably wrapped or enclosed.

3.11 Radioactive Placards - One placard each must be displayed on both sides and front and rear of each transport vehicle when the vehicle is loaded with radioactive material.

4.0 RESPONSIBILITIES

4.1 Materials Control and Accountability Section - will provide Traffic Department an approved shipping order covering the Low Level Waste (form FMPC-AC-558), accompanied by all tally sheets and Radioactive Waste Management - Storage and Disposal forms as prepared by Waste Operations.

4.2 Waste Operations Personnel - will place on the truck dock (south of Building 71) the physical shipment intact for verification by the Traffic and Transportation Sections prior to loading onto the vehicle.

4.3 Waste Certification Personnel - provide independent oversight and affixes markings and NTS's Certification Label NV 211 on each container.

4.4 Stores Receiving Checker inspects and verifies the shipment against the tally sheet.

4.5 ERMT - Monitors the vehicle prior to and after loading and records readings.

4.6 Transportation Supervisor - Inspects the transport vehicle, records findings, and accepts or rejects equipment as suitable for intended use. Also, supervises loading of the shipment onto the transport vehicle.

4.7 Transportation Laborers - Under the direction of a Transportation Supervisor prepares the transport vehicle for loading and securing shipment.

4.8 Industrial Truck Operator - Under the direction of a Transportation Supervisor loads the shipment into the transport vehicle for proper weight distribution.

5.0 GENERAL

5.1 Shipments of LLW (Radioactive Materials) are made by exclusive use vehicle service only. Shipper must load and consignee must unload the contents, the vehicle remains closed, with a pre-numbered tamper-proof seal.

5.2 Weight limits shall be adhered to so that:

Six (6) drum metal overpacks cannot exceed 6,000 pounds overall gross weight.

55-gallon drums cannot exceed 1,200 pounds overall gross weight

30-gallon drums cannot exceed 700 pounds overall gross weight

85-gallon drums, when used as metal overpacks for 55-gallon drums, cannot exceed 1,200 pounds, plus tare weight of the drum.

85-gallon drums, when used as a package, cannot exceed 1,000 pounds overall gross weight

Wooden boxes cannot exceed 5,000 pounds overall gross weight

Sea land containers cannot exceed 42,000 pounds gross weight (see Item 7.1.6.1, A.1 for exceptions)

6.0 PROCEDURE

6.1 Loading of Packaged LLW for Shipment (Drums and Metal Boxes)

	Responsibility	Action
6.1.1	MC&A Department	Provides a request for material shipment by submitting a fully-approved Shipping Order on form FMPC-AC-558, including all tally sheets and Radioactive Waste Management - Storage and Disposal forms, a day ahead of desired shipment date.
6.1.2	Waste Operations Personnel	An overall plan of shipments will be provided indicating shipment needs at least a week in advance. Provide material to be shipped in properly-loaded, marked and labeled containers to the Plant 1 truck dock located south of Building 71.
6.1.3	Receiving Section Checker	Verifies containers of material are properly recorded on the tally sheet with correct container identification numbers, quantities, and gross weights. Further checks are for gross weights marked on the exterior of all containers, NV 211 labels attached, LSA or Limited Quantity labels attached as required. Inspects each

container for any defects which would render rejection of the container for shipment. Should any defects be found, the shipment will not be loaded onto the vehicle until corrected or the shipment will be returned to Waste Operations for rework. Weighs the loaded vehicle and affixes Radioactive Placards when required.

6.1.4 Waste Certification Personnel — Verifies and completes an independent overall check sheet during the loading of the vehicle to assure compliance with this procedure.

6.1.5 ERMT — Monitors the vehicle prior to loading and records results on form FMPC ES&H-1596-1 to assure the vehicle is not contaminated.

6.1.6 Transportation Supervisor — Inspects the vehicle for condition of roadworthiness and completes form FMPC-SA&ML-PUR-2495. Any significant defects in the vehicle will be cause for rejection and the equipment returned to the carrier unused.

6.1.6.1 Supervises the loading of the vehicle such that:

A.1 Drummed materials will be loaded and shored into the vehicle per the Supervisor for proper weight distribution.

A.2 If the drummed material is split into two groups for proper weight distribution, the front unit will be encircled with 1-1/4 inch steel strapping, connected with two Signode clips, double-crimped, and two-by-four wood shoring nailed to the floor behind the unit.

The rear unit will be placed so proper weight distribution is maintained.

The drums will be placed behind the picket brace (See attachments O and P) that is nailed on the floor at the front of the rear unit and encircled with 1-1/4 inch steel strapping connected with two Signode clips,

double-crimped, and providing the trailer has no metal plate directly behind the rear unit, two-by-four wood shoring will be nailed to the floor behind the unit.

A.3 Drummed material requiring double-decking into a vehicle will be loaded in a similar manner as above, except the floor will be loaded solid.

A piece of plywood will be placed on the top of the first deck and the second deck of drums will be loaded from the front to rear. Both rows of drums will be encircled with 1-1/4 inch steel strapping, with two Signode clips, double-crimped.

Providing the trailer has no metal plate directly behind the drums two-by-four wood shoring will be nailed to the floor behind the first deck of drums.

B.1 **Six-drum metal overpacks** will be placed into the vehicle for proper weight distribution. Normally, these shipments contain either seven (7) or eleven (11) containers. With seven (7) containers, the containers are split, with three (3) in the front unit and four (4) in the rear unit. If more/less than seven containers make up the shipment, they will be split for proper weight distribution and loaded in the same manner as for seven (7). When there are eleven (11) containers, they are loaded straight down the center of the vehicle floor.

B.2 **Shoring of SIX-DRUM metal overpacks**

Seven (7) metal overpacks - Front Unit

Two sets of brakeman plates are nailed to the floor of the vehicle (prior to loading) with 1-1/4 inch steel strapping threaded through each plate. Two of these units are used to encircle each load unit (2 Bands),

which are tightened and fastened with two Signode clips, double-crimped.

(Note: The bands have plastic protectors on the edges of the first and last container to keep the bands from breaking.)

Seven (7) metal overpacks - Rear Unit

A 2" x 4" wooden bracing (see attachment Q) is installed in front of the containers and the same method of steel banding is installed as on the front unit.

If more/less than seven containers make up the shipment, they will be split for proper weight distribution and shored in the same manner as for seven (7).

Eleven (11) metal overpacks

Same steel banding method is used as for seven. Band the first six (6) as one unit, and the last five (5) as one unit.

C. Inspects the loaded trailer and executes the LLW Shipment Checklist and NTS Notification form and off-site Tie-down Inspection - Vehicle Inspection form FMPC-SA&ML-PUR-2495.

6.1.7 Waste Certification Personnel — Completes the ongoing oversight of the shipment loading and records observations on Waste Certification Checklists.

6.1.8 ERMT — Monitors the vehicle to assure contamination levels are in compliance with Title 49 CFR criteria levels Readings are recorded on FMPC-ES&H-1596-1 and FMPC-ES&H-1993-1 forms.

Note: **The carriers' tractor cab (after it is connected to the loaded trailer) <u>MUST</u> be monitored prior to departing the FMPC. The readings must be 2.0 millirem per hour or less, if they exceed this limit the shipment cannot be released.**

6.1.9 Transportation Supervisor

After all inspections have been completed, assuring the load is secured properly, the transport vehicle is taken to the truck scale and weighed. Thus, assuring axle weights are within legal limits for the states that the vehicle must pass through. A Checker will print the weights on FMPC-PRO-238 form in the automatic printer at the truck scale.

An envelope containing copies of the Tally Sheet and Radioactive Waste Management - Storage and Disposal form of the shipment will be fastened to the rear container when possible or stapled to the trailer wall inside of the trailer doors for NTS use upon opening the trailer at destination.

Close the trailer doors properly and apply a numbered tamper proof seal to the locking mechanism.

When "Radioactive Placards" are required. Assure one each is placed on both sides, front and rear of the vehicle.

Turn into the Specialist A/Traffic all completed forms utilized in the preparation of the shipment and transport vehicle.

6.1.10 Specialist A/Traffic

Prepares all shipping documents in compliance with Title 49 CFR. Issues instructions to carriers' drivers; i.e., Carrier/Driver Instructions - Radioactive Shipments, a signed copy of bill of lading and ETA of shipment at NTS.

Notifies NTS by FTS telephone, pertinent data on the shipment, departure time, ETA and the carriers' driver name.

Complete all sections of the LLW Shipment Checklist and NTS Notification form to assure each step of the operation is documented prior to release of the shipment.

6.1.11 Security	Prior to the vehicle departing the FMPC, Security will verify the trailer number and numbered tamper proof seal against the bill of lading that the driver will have in his/her possession. If they match, the vehicle can be released. If they do not match, hold the vehicle and immediately notify the Traffic Manager.

6.2 Loading of Bulk Shipment of LLW (Baled Trash, Wooden Boxes, Scrap Wood, etc.)

Responsibility	Action
6.2.1 MC&A Department	Provides a request for material shipment by submitting a fully approved Shipping Order on form FMPC-AC-558, including all tally sheets and Radioactive Waste Management - Storage and Disposal form a day ahead of desired shipment date.
6.2.2 Waste Operations Personnel	An overall plan of shipments will be provided indicating shipment needs at least a week in advance. Provide securely banded stacks of scrap wooden pallets, scrap wooden boxes, compacted baled trash, wooden boxes of contaminated articles with LSA and NV 211 labels applied, identification number and gross weight plainly marked on each individually banded stack of material to the Plant 1 truck dock.
6.2.3 Receiving Section Checker	Verifies that contaminated article containers are properly recorded on the tally sheet with correct container identification numbers, quantities and gross weights marked on the exterior of all banded stacks, NV 211 labels attached, LSA labels applied. Inspects each container of contaminated articles for any defects or loose contamination which would reject it for shipment. Should any defects be found, the shipment will not be loaded onto the vehicle until corrected or the shipment will be returned to Waste Operations for rework. Weighs the loaded vehicle, and affixes Radioactive Placards when required.

6.2.4 Waste Certification Officer — Monitors the loading of the vehicle to assure compliance with this procedure.

6.2.5 ERMT — Monitors the vehicle prior to loading and records results on form FMPC ES&H-1596-1 to assure the vehicle is not contaminated.

6.2.6 Transportation Supervisor — Inspects the vehicle for condition of roadworthiness and complete form FMPC-SA&ML-PUR-2495. Any significant defects in the vehicle will be cause for rejection and the equipment returned to the carrier unused.

A. **Trailer lining - Scrap Wooden Pallets**

The inside of the vehicle, front sides, rear and floor will be lined with plastic. Floor covered with single-faced cardboard.

Two sets of brakeman plates are nailed to the floor (set on top of the plastic and cardboard) in the front section of the vehicle and two sets in the rear section of the vehicle with 1-1/4 inch steel strapping threaded through each plate.

The scrap wooden pallets will be loaded into the vehicle two stacks wide and after the first six, double stacks are loaded. They are banded over the top with two bands and the bands are tightened and fastened with two signode clips, double-crimped.

The rear unit is loaded and secured in the same manner as the front unit.

Laborers will then take the plastic and fold over the entire load fastening the top to the pallets with staples and tape. When complete, the entire load of pallets will be enclosed as one package.

B. **Trailer lining - Scrap Wooden Boxes**

The inside of the vehicle, front sides, rear and floor will be lined with plastic. Floor covered with single-faced cardboard.

Two sets of brakeman plates are nailed to the floor (set on top of the plastic and cardboard) in the front section of the vehicle and two sets in the rear section of the vehicle with 1-1/4 inch steel strapping threaded through each plate.

The scrap wooden boxes will be loaded two-wide down the center of the trailer floor, leaving approximate equal space between the vehicle sides and the boxes.

Transportation personnel will nail wooden 2 x 4 along the outside of each row of boxes.

1 1/4 inch steel strapping will encircle the entire load, tightened and fastened with two Signode clips, double-crimped.

Laborers will then take the plastic and fold over the entire load fastening the top to the boxes with staples and tape. When complete the entire load of boxes will be enclosed as one package.

C. **Lining, Loading and Shoring - Compacted baled trash**

The floor and approximately three (3) feet up the sides and rear are covered with plastic sheet. Floor covered with single-faced cardboard.
The compacted bales of trash will be placed into the vehicle for proper weight distribution. Normally, these shipments consist of twenty bales of compacted trash. The bales are double stacked and loaded straight down the center of the vehicle floor.

Two sets of brakeman plates are nailed to the floor of the vehicle with 1-1/4 inch steel strapping threaded through each plate, in both the front section and rear section of the vehicle. Six side cleats with 1/1/4 inch steel strapping are nailed to the floor on both sides of the vehicle floor for cross banding of the bales.

After the first five double stacks of bales are loaded, the front section of steel strapping encircles the unit, bands tightened and fastened with two Signode clips, double-crimped.

The cross bands are placed over stack numbers one, three, and five. Under the bands, single-faced cardboard is folded for a minimum of 4-ply protection of the top bales plastic enclosure. the bands are tightened and fastened with two Signode clips, and double-crimped.

The rear section is banded in the same manner except cross bands will be over bale numbers seven, nine, and ten.

D. **Loading and Shoring - Wooden boxes of contaminated articles**

The inside of the vehicle will be lined in the same manner as specified in Section 6.2.6 (C).

The wooden boxes of contaminated articles will be placed into the vehicle for proper weight distribution. Normally, these shipments consists of sufficient numbers to require partial double-decking. When double-decking is required, the double stacks are banded together prior to loading.

Two sets of brakeman plates are nailed to the floor (set on top of the plastic and cardboard) in the front section of the vehicle and two sets in the rear section of the vehicle with 1-1/4 inch steel strapping threaded through each plate.

The boxes will be loaded straight down the center of the vehicle floor.

Two bands are used to encircle the first six (6) boxes as one unit and the last five (5) as one unit.

Inspects the loaded trailer and executes the LLW Shipment Checklist and NTS Notification form and off-site Tie-down Inspection - Vehicle Inspection form FMPC-SA&ML-PUR-2495.

6.2.7 Waste Certification Personnel

Completes the ongoing oversight of the shipment loading and records observations on Waste Certification Checklists.

6.2.8 ERMT

Monitors the vehicle to assure radiation and contamination levels are in compliance with Title 49 CFR criteria levels. Readings are recorded on FMPC-ES&H-1596-1 and FMPC-ES&H-1993-1 forms.

Note: **The carriers' tractor cab (after it is connected to the loaded trailer) <u>MUST</u> be monitored prior to departing the FMPC. The readings must be 2.0 millirem per hour or less, if they exceed this limit the shipment cannot be released.**

6.2.9 Transportation Supervisor

After all inspections have been completed, assuring the load is secured properly, the transport vehicle is taken to the truck scale and weighed. Thus, assuring axle weights are within legal limits for the states that the vehicle must pass through.

A Checker will print the weights on FMPC-PRO-238 form in the automatic printer at the truck scale.

An envelope containing copies of the Tally Sheet and Radioactive Waste Management - Storage and Disposal form of the shipment will be fastened to the rear container when possible or stapled to the trailer wall inside of the trailer doors for NTS use upon opening the trailer at destination.

Close the trailer doors properly and apply a numbered tamper proof seal to the locking mechanism.

"Radioactive Placards" are required. Assure one each is placed on both sides, front and rear of the trailer.

6.2.10 Specialist A/Traffic

Prepares all shipping documents in compliance with Title 49 CFR. Issues instructions to carriers' drivers; i.e., Carrier/Driver Instructions - Radioactive Shipments, a signed copy of bill of lading and ETA of shipment at NTS.

Notifies NTS by FTS telephone, pertinent data on the shipment, departure time, ETA and the carriers' driver.

Complete all section of the LLW Shipment Checklist and NTS Notification form to assure each step of the operation is documented prior to release of the shipment.

6.2.11 Security	Prior to the vehicle departing the FMPC, Security will verify the trailer number and numbered tamper proof seal against the bill of lading that the driver will have in his/her possession. If they match, the vehicle can be released. If they do not match, hold the vehicle and immediately notify the Traffic Manager.

7.0 PROCEDURE

7.1 Loading of Sea Land Containers

Responsibility	Action
7.1.1 MC&A Department	Provides a request for material shipment by submitting a fully-approved Shipping Order on form FMPC-AC-558, including all tally sheets and Radioactive Waste Management - Storage and Disposal forms, a day ahead of desired shipment date.
7.1.2 Waste Operations Personnel	An overall plan of shipments will be provided indicating shipment needs at least a week in advance. Prepares the sea land containers interior prior to loading and secures the doors after loading in accordance with SOP-20-C-601. Notifies Transportation that the sea land container is ready to be weighed and loaded onto a flat bed truck.
7.1.3 Receiving Section Checker	Verifies containers of material are properly recorded on the tally sheet with correct container identification numbers, quantities, and gross weights. Further checks are for gross weights marked on the exterior of all containers, NV 211 labels attached, LSA or Limited Quantity labels attached as required. Inspects each container for any defects which would render rejection of the container for shipment. Should any defects be found, the shipment will not be loaded onto the vehicle until corrected or the shipment will be returned to Waste Operations for rework. Weighs the loaded vehicle and affixes Radioactive Placards when required.

7.1.4	Waste Certification Personnel	Verifies and completes an independent overall check sheet during the loading of the vehicle to assure compliance with this procedure.
7.1.5	ERMT	Monitors the vehicle prior to loading and records results on form FMPC-ES&H-1596-1 to assure the vehicle is not contaminated.
7.1.6	Transportation Supervisor	Inspects the vehicle for condition of roadworthiness and completes form FMPC-SA&ML-2495. Any significant defects in the vehicle will be cause for rejection and the equipment returned to the carrier unused.

7.1.6.1 Supervises the loading of the vehicle such that:

A.1 Transports the sea land container to the truck scales for weighing. Provides weight ticket to Waste Operations for preparation of shipping order form FMPC-AC-558, Tally Sheet and Radioactive Waste Management - Storage and Disposal form. If the container exceeds 42,000 gross pounds, a waiver MUST be approved by the Manager, Transportation Regulatory Compliance as to whether or not it may be shipped.

A.2 The shipment may consist of one or two sea land containers, depending on the gross weight of each.

A.3 The sea land containers will be loaded onto the flat bed truck with either a yard lift or crane depending on gross weight of the container (See Attachment R).

A.4 If the shipment consists of only one container, it will be placed on the truck for proper axle weight distribution, with the doors of the container facing the rear of the truck.

A.5 If the shipment consists of two containers, they will be placed on the

truck for proper axle weight distribution, with the doors of the front unit facing to the rear and the rear unit facing the front.

A.6 Sea land containers will be secured to the flatbed truck as follows: (1) four (4) nylon straps over each unit secured to the frame of the trailer; (2) chains placed and secured in front of and behind the bottom of each container fastened to the trailer bed; and a 2 X 4 nailed to the trailer floor at the rear of each unit.

A.7 Inspects the loaded trailer and executes the LLW Shipment Checklist and NTS Notification form and Off-site Tie-down Inspection - Vehicle Inspection form FMPC-SA&ML-PUR-2495.

7.1.7 Waste Certification Personnel — Completes the ongoing oversight of the shipment loading and records observations on Waste Certification Checklists.

7.1.8 ERMT — Monitors the vehicle to assure contamination levels are in compliance with Title 49 CFR criteria levels Readings are recorded on FMPC-ES&H-1596-1 and FMPC-ES&H-1993-1 forms.

Note: **The carriers' tractor cab (after it is connected to the loaded trailer) <u>MUST</u> be monitored prior to departing the FMPC. The readings must be 2.0 millirem per hour or less, if they exceed this limit the shipment cannot be released.**

7.1.9 Transportation Supervisor

After all inspections have been completed, assuring the load is secured properly, the transport vehicle is taken to the truck scale and weighed. Thus, assuring axle weights are within legal limits for the states that the vehicle must pass through. A Checker will print the weights on FMPC-PRO-238 form in the automatic printer at the truck scale.

An envelope containing copies of the Tally Sheet and Radioactive Waste Management - Storage and Disposal form of the shipment will be hand carried by the driver and delivered to NTS personnel at the burial site for their use.

Assure doors are properly closed and applies a tamper proof numbered seal to the locking mechanism.

When "Radioactive Placards" are required. Assure one each is placed on both sides, front and rear of the container.

Turn into the Specialist A/Traffic all completed forms utilized in the preparation of the shipment and transport vehicle.

7.1.10 Specialist A/Traffic

Prepares all shipping documents in compliance with Title 49 CFR. Issues instructions to carriers' drivers; i.e., Carrier/Driver Instructions - Radioactive Shipments, a signed copy of bill of lading and ETA of shipment at NTS.

Notifies NTS by FTS telephone, pertinent data on the shipment, departure time, ETA and the carriers' driver name.

Complete all sections of the LLW Shipment Checklist and NTS Notification form to assure each step of the operation is documented prior to release of the shipment.

7.1.11 Security

Prior to the vehicle departing the FMPC, Security will verify the trailer number and numbered tamper proof seal against the bill of lading that the driver will have in his/her possession. If they match, the vehicle can be released. If they do not match, hold the vehicle and immediately notify the Traffic Manager.

8.0 Applicable Documents

Transportation Manual
Department of Transportation Title 49 Code of Federal Regulations

9.0 Forms Used

Shipping Order - form FMPC-AC-558
LLW Shipment Checklist and NTS Notification form
Offsite Loading - Tie Down Inspection - Vehicle Inspection - form FMPC-SA&ML-PUR-2495
Radioactive Material Limited Quantity Labels - forms FMPC-T-1623-1 and FMPC-PRO-1623-2
NV-211 Packaging Certification - FMPC-WM-234
Label - Radioactive-LSA, UN2912
Tally Sheet - form FVC-VAB 614
Radioactive Waste Management Storage and Disposal Form - form FVC-VAB 614
Vehicle Radiation Monitoring Report - form FMPC-ES&H-1596-1
Radiological Survey Report - form FMPC-ES&H-1993-1
Weight Ticket - form FMPC-PRO-238
Carrier/Driver Instructions, Radioactive Shipments form

).0 Attachments

Attachment A - Shipping Order
Attachment B - LLW Shipment Checklist and NTS Notification
Attachment C - Offsite Loading - Tie Down Inspection - Vehicle Inspection
Attachment D - Radioactive Material Limited Quantity Labels
Attachment E - NV-211 Packaging Certification
Attachment F - Label, Radioactive-LSA, UN2912
Attachment G - Tally Sheet
Attachment H - Radioactive Waste Management - Storage and Disposal
Attachment I - Vehicle Radiation Monitoring Report
Attachment J - Radiological Survey Report
Attachment K - Weight Ticket
Attachment L - Carrier/Driver Instructions, Radioactive Shipments
Attachment M - Waste Certification Preliminary Trailer Checklist
Attachment N - Waste Certification Final Trailer/Vehicle Checklist
Attachment O - Drawing of Picket Wooden Brace
Attachment P - Shoring Diagram of Picket Wooden Brace
Attachment Q - Diagram of 2" x 4" Wooden Bracing
Attachment R - Loading of Sea Land Containers

NOTE Spaces m[illegible] are for use of classification stamps when required

ATTACH
SOP-TRF-[illegible]-C-110
REVISION - 3/1/8[illegible]

FEED MATERIALS PRODUCTION CENTER
SHIPPING ORDER FOR NUCLEAR MATERIAL

A

Date Prepared

SHIP TO		ROUTING			SHIPPERS AUTHORIZATION NO	SHIPPING [illegible]
STREET		PREPAID	CAR OR TRAILER NO	SEAL NO	SHIPPED FROM PLANT	ORIGINATOR [illegible]
CITY	STATE	COLLECT	BILL OF LADING NO	QUALITY CONTROL APPROVAL		DATE SHIPPED
SPECIAL INSTRUCTIONS			COUNTRY CONTROL NO	PROJECT NO		TIME SHIPPED

Type of Material _____ NLO Production Order No _____ Originator's Signature _____

Station RIS _____ DOE 741 No _____ Shipment Authorized By _____

NUCLEAR MATERIALS REPRESENTATIVE

NMC DATA			ORIGINATOR'S DATA						MATERIAL CONTROL DATA						
FROM MBA	COST CODE	741 NO	PO NO	LOT NUMBER	QUANTITY	WEIGHT (LBS) GROSS	TARE	NET	ANAL CODE	ELE ANAL	ELE LBS	ELE GRAMS OR KGS	LIMIT CHECK ELE	ISO ANAL	U GRAMS OR KGS

DISTRIBUTION OF COPIES

NMA [illegible]	5	Cost Accounting
Shipping Group	6	Originator of Shipping Order
[illegible] Control		

I _____ certify _____ Audited by _____ Date _____
that this shipment was made on the above date
after complying with all security regulations

4

45

4228

REVISION 3
SOP-TRF-46-C-110

FMPC
SECURITY, ACQUISITION & MATERIALS LOGISTICS - TRANSPORTATION SECTION

LLW SHIPMENT CHECKLIST & NTS NOTIFICATION

4228

DATE:	SHIPMENT NO.:	B/L NO.:	SS SO NO.:	CARRIER:	TRAILER NO.:

	LSA	DEPARTURE TIME:	ETA: / NOTIFICATION TO NTS ☐ (FTS. 575-6307)
	RQ	FROM:	
	LTD. QTY.	TO:	
	DRUMS	DATE:	
	WASTE CERTIFICATION CONTAINER TOTALS, WEIGHTS & CURIES OF LSA/LTD QTY - RQ SHEETS	BY WHOM:	
	BOXES	TO WHOM	
	SMEAR SHEETS	☐ FACSIMILE SENT	☐ DRIVER GIVEN DOSIMETER BADG
	WASTE MANAGEMENT STORAGE & DISPOSAL SHEETS DELIVERED — PER NTS	MONITORING REPORTS:	
	TALLY SHEETS		
	CARRIER/DRIVER INSTRUCTION PACK (2)		
	NEVADA PERMIT		
	INCOMING/EMPTY BEFORE LOADING		
	OUTGOING/LOADED		
	TRACTOR CAB		
	OFFSITE LOADING-TIE DOWN-VEHICLE INSPECTION REPORT		
	WEIGHT TICKET		
	CHECKED TALLY SHEET (BY CHECKER)		

DRIVER RECEIVES:
COPY OF B/L, TALLY SHEET, INSTRUCTION PACK, NEVADA PERMIT, & ENVELOPE FOR CONSIGNEE WITH TALLY SHEET & MEMO B/L

SPECIALIST A/TRAFFIC:	TRANSPORTATION SUPERVISOR: (REVIEW)	TRAFFIC MANAGER: (REVIEW)

	CONDITION OF CONTAINERS	LOADERS:
	CONTAINER PROPERLY LABELED	
	RADIOACTIVE PLACARDS (FOR LSA ONLY)	
	ENVELOPE WITH STORAGE & DISPOSAL SHEETS AND TALLY SHEETS IN TRAILER	
	TRAILER LINED WITH PLASTIC & CARDBOARD ON FLOOR— SCRAP WOODEN PALLETS AND/OR BOXES ENCLOSED WITH PLASTIC AS ONE PACKAGE	

Transportation Supervisor: _____

452

FMPC-SAML-3065 (4/5/89)

ATTACHMENT C
SOP-TRF-46-C-110

FMRC
SECURITY ACQUISITION & MATERIALS LOGISTICS DEPARTMENT - TRANSPORTATION SECTION

OFFSITE LOADING — TIE DOWN INSPECTION — VEHICLE INSPECTION

4228

Date: _____

ODITY:	CARRIER:	TRAILER NO.:	SEAL NO.:
			FA-WMCO

BALE/BOX/DRUM/SEA LAND CONTAINER NUMBERS:

LSA _____
LSA-RQ _____
LQ _____
LQ-RQ _____
TOTAL _____

DISCREPANCIES DETECTED	CORRECTED		SHIPMENT REJECTED	
	YES	NO	YES	NO

Checked By _____
SIGNATURE - CHECKER

TIE-DOWN INSPECTION AND CHECK-OFF SHEET

INSPECTION ITEM	YES	NO
Wood shoring installed to prevent longitudinal or lateral movement		
strapping around the cargo securing as a stable shipment		
...en weight dictates, containers divided into two units, one front and one rear of trailer not exceeding approximately 20,000 pounds each		
1¼" steel strapping utilized (5450 lbs. minimum tensile strength)		
____ each anchor plates or "U" bolts fastened to underframe (____ each side of unit) placed and secured for ____ transverse bands over unit		
Four each brakeman plates or "U" bolts fastened to underframe (two for each band) placed under each unit and secured for two longitudinal bands, securing the boxes/skids 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		
..... Chains		
..... 2 X 4s		

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					
Condition of Roof			Condition of Rear Doors			Detected Evidence of Sabotage		

Overall appearance: _____

General Comments: _____

epted: _____ Rejected: _____

Checked By: _____
SIGNATURE - TRANSPORTATION SUPERVISOR

NO.	DISTRIBUTION OF COPIES
	Transportation Section *(RECORD COPY)*

FMRC-SAML-2495 (REV 4/5/89)

RADIOACTIVE MATERIAL LIMITED QUANTITY, NOS UN2910

FMPC-T-1823-1 (7/31/98)

FROM: FMPC

This package conforms to the conditions and limitations specified in 49 CFR 173.421 for excepted radioactive material, limited quantity, n.o.s., UN-2910."

FMPC-PRO-1823-4 (3/18/98)

4228

NV-211

PACKAGING CERTIFICATION

THIS CERTIFIES THAT THIS PACKAGE AND ITS CONTENTS ARE IN ACCEPTABLE CONDITION FOR TRANSPORTATION ACCORDING TO DOT & DOE/NV REQUIREMENTS.

DATE: _____

CERTIFIED BY: _____

TITLE: CERTIFICATION OFFICER

ORGANIZATION: FMPC

FMPC-WM-234 (12/9/88)

Radioactive-LSA
UN-2912

FVC-VAB 614

12/10/87
09.41.20

TO: Reynolds Electric and Engineering Co., Inc.
U.S. DOE, Nevada Test Site, Zone 2
Mercury, NV 89023
Attention: G. Kendall

NEVADA TEST SITE SHIPMENT
TALLY SHEET

LOT NUMBER N003 811 V002 W008
LOT NUMBER N003 826 V002 W023
LOT NUMBER N003 826 V002 W024

FROM: Westinghouse Materials Company of Ohio
P. O. Box 398704
Cincinnati, OH 45239

LOT NUMBER	CONT. NO.	GROSS WT. (POUNDS)	TARE WT. (POUNDS)	NET WT. (POUNDS)	U ASSAY	PERCENT U-235	PERCENT U-238	U POUNDS	ELEMENT WT(gms)	U-235 ISOTOPE WT(gms)	U 238 ISOTOPE WT(gms)	U-235 Ci	U 238 Ci	VOLUME CU FT
W023	1	335.0	72.0	263.0	0.540	1.050	98.89	1.4	644	6.8	637	1.4505E-05	2.1232E-04	8.00
W023	2	301.0	72.0	229.0	0.540	1.050	98.89	1.2	561	5.9	555	1.2630E-05	1.8487E-04	8.00
W023	3	294.0	72.0	222.0	0.540	1.050	98.89	1.2	544	5.7	538	1.2243E-05	1.7922E-04	8.00
W023	4	303.0	72.0	231.0	0.540	1.050	98.89	1.2	566	5.9	560	1.2740E-05	1.8649E-04	8.00
W023	5	305.0	72.0	233.0	0.540	1.050	98.89	1.3	571	6.0	564	1.2850E-05	1.8810E-04	8.00
W023	6	293.0	72.0	221.0	0.540	1.050	98.89	1.2	541	5.7	535	1.2188E-05	1.7842E-04	8.00
W023	7	264.0	72.0	192.0	0.540	1.050	98.89	1.0	470	4.9	465	1.0589E-05	1.5500E-04	8.00
W023	8	341.0	72.0	269.0	0.540	1.050	98.89	1.5	659	6.9	652	1.4836E-05	2.1717E-04	8.00
W023	9	336.0	72.0	264.0	0.540	1.050	98.89	1.4	647	6.8	639	1.4560E-05	2.1313E-04	8.00
W023	10	320.0	72.0	248.0	0.540	1.050	98.89	1.3	607	6.4	601	1.3677E-05	2.0021E-04	8.00
W023	11	353.0	72.0	281.0	0.540	1.050	98.89	1.5	688	7.2	681	1.5497E-05	2.2685E-04	8.00
W023	12	348.0	72.0	276.0	0.540	1.050	98.89	1.5	676	7.1	669	1.5222E-05	2.2282E-04	8.00
W023	13	355.0	72.0	283.0	0.540	1.050	98.89	1.5	693	7.3	685	1.5608E-05	2.2847E-04	8.00
W023	14	346.0	72.0	274.0	0.540	1.050	98.89	1.5	671	7.0	664	1.5111E-05	2.2120E-04	8.00
W023	15	365.0	72.0	293.0	0.540	1.050	98.89	1.6	718	7.5	710	1.6159E-05	2.3654E-04	8.00
W023	16	346.0	72.0	274.0	0.540	1.050	98.89	1.5	671	7.0	664	1.5111E-05	2.2120E-04	8.00
W023	17	274.0	72.0	202.0	0.540	1.050	98.89	1.1	495	5.2	489	1.1141E-05	1.6308E-04	8.00
W023	18	318.0	72.0	246.0	0.540	1.050	98.89	1.3	603	6.3	596	1.3567E-05	1.9860E-04	8.00
W023	19	286.0	72.0	214.0	0.540	1.050	98.89	1.2	524	5.5	518	1.1802E-05	1.7276E-04	8.00
W023	20	316.0	72.0	244.0	0.540	1.050	98.89	1.3	598	6.3	591	1.3457E-05	1.9698E-04	8.00
W023	21	287.0	72.0	215.0	0.540	1.050	98.89	1.2	527	5.5	521	1.1858E-05	1.7357E-04	8.00
W023	22	294.0	72.0	222.0	0.540	1.050	98.89	1.2	544	5.7	538	1.2243E-05	1.7922E-04	8.00
W023	23	285.0	72.0	213.0	0.540	1.050	98.89	1.2	522	5.5	516	1.1747E-05	1.7196E-04	8.00
W023	24	281.0	72.0	209.0	0.540	1.050	98.89	1.1	512	5.4	506	1.1527E-05	1.6873E-04	8.00
W023	25	333.0	72.0	261.0	0.540	1.050	98.89	1.4	639	6.7	632	1.4394E-05	2.1071E-04	8.00
W023	26	351.0	72.0	279.0	0.540	1.050	98.89	1.5	683	7.2	676	1.5387E-05	2.2524E-04	8.00
W023	27	333.0	72.0	261.0	0.540	1.050	98.89	1.4	639	6.7	632	1.4394E-05	2.1071E-04	8.00

03/29/89
10:28:59

Reynolds Electrical and Engineering Inc.
Radioactive Waste Management-Storage & Disposal

DESCRIPTION: Cu-Contaminated Sump Cake

Prepared by: [signature]
Date 3/29/89 Area Code Phone FTS 774-8647
Approved: Responsible Personnel
[signature]
Date 3/30/89 Area Code Phone FTS 774-8647

SECTION 1

CARD	SHIPMENT NUMBER	O	C	D	S	O	FY	YR	Q	NUCLIDE CATEGORY	CURIE QUANTITY	C	GROSS VOLUME	F	GROSS WT(lbs)	P	OVERPACKS 95 BOXES	OVERPACKS 0 DRUMS	OVERPACKS 0 OTHER
	2 9	10	11	12	13	14	15	16	17	25	26 34	35	36 44	45	46 54	55			
2	WML89172	O	N	L	O	B	8	9	2	2	4.559E-03		7.600E+02		3.041E+04				
											0.0045593		760.00		30405.0				

SECTION 2

CARD	NUCLIDE DESCRIPTION	QUANTITY	C	S	COMMENTS
	2 15	16 24	25	26 27	
3	U-238	4.321E-03	C	1	12965 GRAMS
3	U-235	2.382E-04	C	2	110 GRAMS

SECTION 3

CARD	WASTE CODE	VOLUME CU.FT.	X COMB.	WEIGHT LBS.	S	COMMENTS
	23	4 12	13 14 16	17 25	26 27	28
4	DS	7.600E+02	F 0	3.041E+04	P	1 834

SECTION 5

CARD	CONT NUMBER	ASSAY DATE	CLASS CODE	CONT/AT CODE	GROSS WEIGHT LBS	GROSS VOLUME CU.FT.	RADIATION AT SURF mrem/hr	RADIATION AT 3 FT mrem/hr	PRIMARY ELEMENT & ISOTOPIC	PRIMARY CURIE QUANTITY	SECONDARY ELEMENT & ISOTOPIC	SECONDARY CURIE QUANTITY	PRIMARY ISOTOPE WEIGHT GRAMS	SECONDARY ISOTOPE WEIGHT GRAMS
6/7	1	03/29/89	2122	8342222	322.0	8.00	0.30	0.30	U-238	7.1222E-05	U-235	3.6500E-06	214	1.7
6/7	2	03/29/89	2122	8342222	376.0	8.00	0.30	0.30	U-238	8.6606E-05	U-235	4.4384E-06	260	2.1
6/7	3	03/29/89	2122	8342222	337.0	8.00	0.30	0.30	U-238	7.5495E-05	U-235	3.8690E-06	227	1.8
6/7	4	03/29/89	2122	8342222	325.0	8.00	0.30	0.30	U-238	7.2076E-05	U-235	3.6938E-06	216	1.7
6/7	5	03/29/89	2122	8342222	319.0	8.00	0.30	0.30	U-238	4.4402E-05	U-235	2.4794E-06	133	1.2
6/7	6	03/29/89	2122	8342222	326.0	8.00	0.30	0.30	U-238	4.5660E-05	U-235	2.5497E-06	137	1.2
6/7	7	03/29/89	2122	8342222	302.0	8.00	0.30	0.30	U-238	4.1346E-05	U-235	2.3088E-06	124	1.1
6/7	8	03/29/89	2122	8342222	317.0	8.00	0.30	0.30	U-238	4.4042E-05	U-235	2.4593E-06	132	1.1
6/7	9	03/29/89	2122	8342222	310.0	8.00	0.30	0.30	U-238	2.8508E-05	U-235	1.6853E-06	86	0.8
6/7	10	03/29/89	2122	8342222	315.0	8.00	0.30	0.30	U-238	2.9107E-05	U-235	1.7207E-06	87	0.8
6/7	11	03/29/89	2122	8342222	313.0	8.00	0.30	0.30	U-238	2.8868E-05	U-235	1.7065E-06	87	0.8
6/7	12	03/29/89	2122	8342222	302.0	8.00	0.30	0.30	U-238	2.7550E-05	U-235	1.6287E-06	83	0.8
6/7	13	03/29/89	2122	8342222	293.0	8.00	0.30	0.30	U-238	2.6472E-05	U-235	1.5649E-06	79	0.7
[illegible]	14	03/29/89	2122	8342222	313.0	8.00	0.30	0[illegible]	U-238	2.8868E-05	U-235	1.7065E-06	87	0.8
	15	03/29/89	2122	8342222	313.0	8.00	0.30	C[illegible]	U-238	2.8868E-05	U-235	1.7065E-06	87	0.8

ATTACHMENT I
SOP-TRF-46-C-110

FMPC

ENVIRONMENT SAFETY & HEALTH ENVIRONMENTAL & RADIOLOGICAL WORK PLAN

VEHICLE RADIATION MONITORING REPORT

4228

Date Monitored _____ Monitored by _____

Carrier Name _____

Vehicle Type: Tractor trailer ☐ Other motor vehicle ☐ Railcar ☐ Open flatbed ☐ Covered ☐

Other ☐ (explain) _____

License no. / motor vehicle _____ State _____

Trailer or railcar identification _____

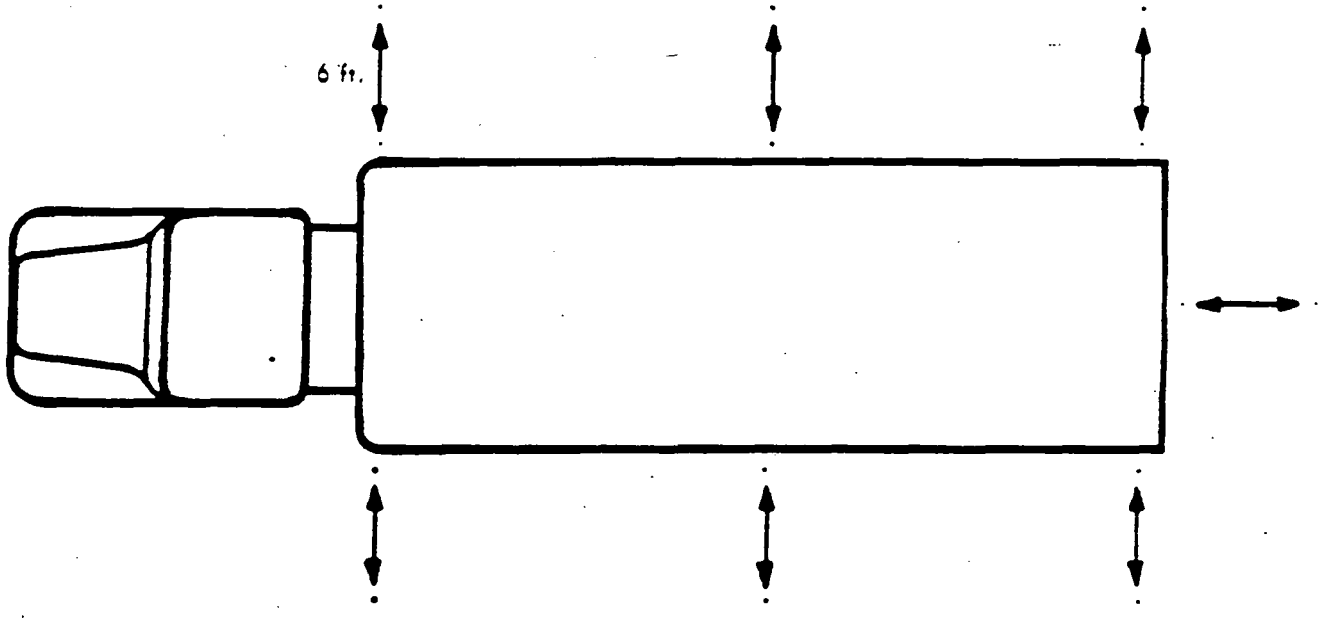
Is this an exclusive use vehicle? Yes ☐ No ☐

Vehicle Status: (a) Outgoing ☐ (b) Incoming ☐ (c) Outgoing empty (not "exclusive use") ☐ (d) Empty before loading

(e) Outgoing empty ("exclusive use") ☐ (f) If (e) is checked, is vehicle to remain "exclusive use"? Yes ☐ No ☐

Is visible contamination present? Yes ☐ No ☐ If yes, show on diagram

Dose rate shown by asterisks in mrem/hr. Surface alpha contamination, circled, in d/m/100cm².



(1) Same locations apply to van-type trucks. For railcars, disregard cab section but show dose rates found at each end
(2) Measurements at 6 ft. not required if all readings at vehicle surface are not greater than 10 mrem/hr

Survey Instruments Used

Alpha — Type or Model No _____ Serial No _____

Beta-gamma — Type or Model No. _____ Serial No _____

Additional information attached? (E&RM copy only) Yes ☐ No ☐

459

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1	Environmental & Radiological Monitoring (original copy)
2	Transportation Supervisor

FMPC 5640 596 (REV. 8-1-86)

ATTACHMENT J
SOP-TRF-46-C-110

FMPC

ENVIRONMENT SAFETY & HEALTH - ENVIRONMENTAL & RADIOLOGICAL MONITORING

RADIOLOGICAL SURVEY REPORT

Date

Time

LOCATION

ERST

ROUTE TO

4228

REASON FOR SURVEY

☐ ROUTINE ☐ SPECIAL REQUEST _____ SOP# _____

COMMENTS

INSTRUMENTS

MODEL	SERIAL NUMBER	BKRD

ANALYZE FOR ☐ ALPHA ☐ BETA-GAMMA ☐ TOTAL U ☐ PARTICULATE

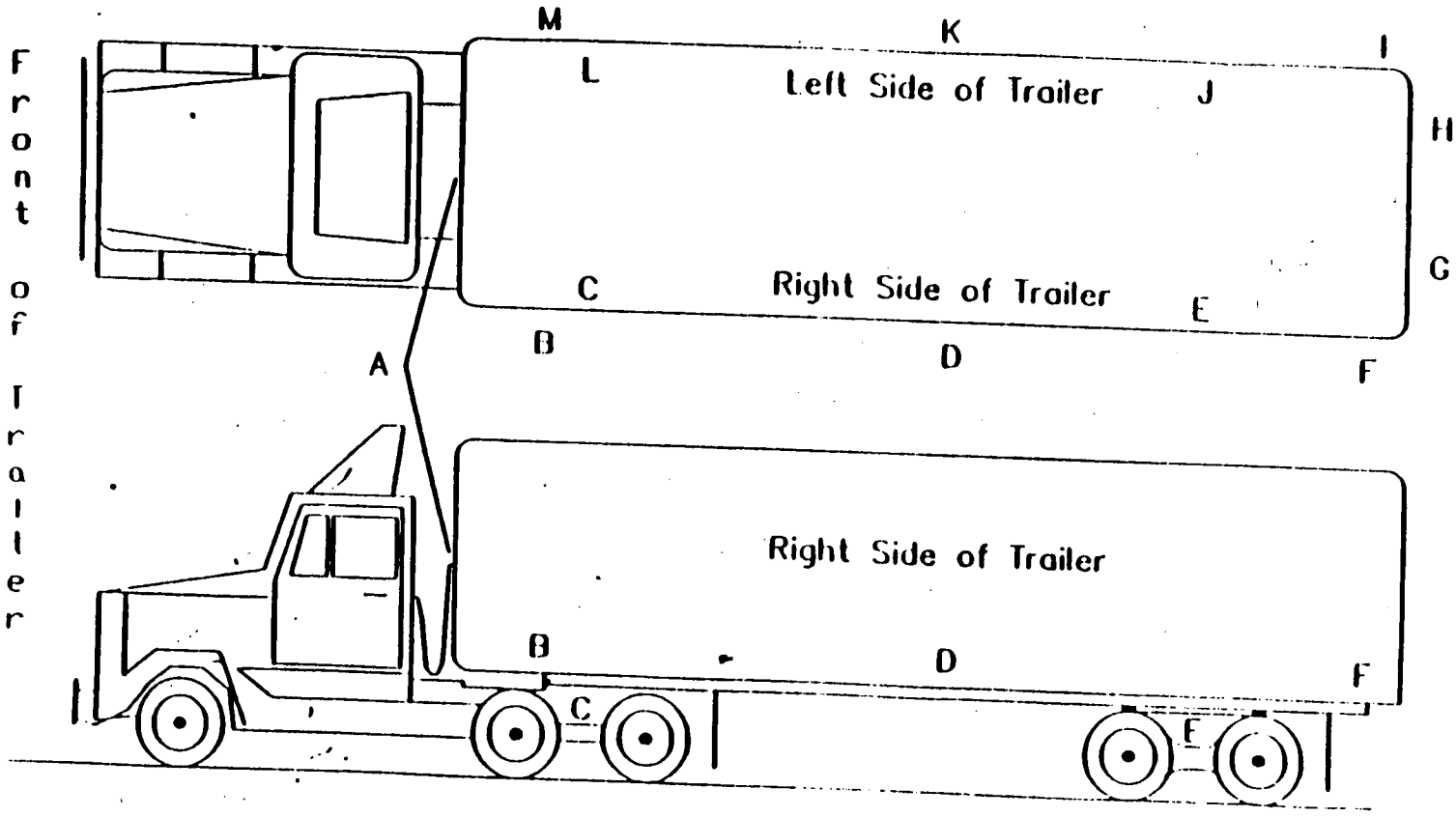
TYPE OF SURVEY ☐ CONTAMINATION ☐ STACK FILTER ☐ RADIATION ☐ OTHER _____

SAMPLE NUMBER	ITEM NUMBER	DESCRIPTION	DOSE RATE		DPM ALPHA		DPM BETA-GAMMA	
			CONTACT	3 FT	100 CM²	PROBE	100 CM²	PROBE

NO.	DISTRIBUTION OF COPIES
1	Environment Safety & Health
2	Analytical Laboratory
3	Transportation

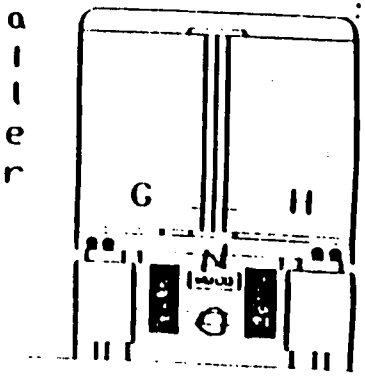
FMPC-ESH-1980-1 (10/3/88)

460



Smear Locations

A - Front End of Trailer
B - Right Front Side of Trailer
C - Right Front Wheel Splash Area
D - Right Middle Side of Trailer
E - Right Underside of Wheel Well
F - Right Rear Side of Trailer
G - Right Rear Door of Trailer
H - Left Rear Door of Trailer
I - Left Rear Side of Trailer
J - Left Underside of Wheel Well
K - Left Middle Side of Trailer
L - Left Front Wheel Splash Area
M - Left Front Side of Trailer
N - REAR BUMPER
O - REAR LOWER CROSSBAR



ATTACHMENT 1. Trailer Smear Locations

FMPC

WEIGHT TICKET DATE

LOT NUMBER: ▶	GROSS WEIGHT:
DRUM NUMBER: ▶	TARE WEIGHT:
MATERIAL TYPE: ▶	NET WEIGHT:
OPERATOR: ▶	ZERO:
SHIRT: ▶	CHECKWEIGHT:

FMPC-PRO-238 (REV 12/18/88)

TRAILER NO.:

CARRIER/DRIVER INSTRUCTIONS
RADIOACTIVE SHIPMENTS

B/L: 4288

SSSO:

DATE:

FROM: Westinghouse Materials Company of Ohio
P. O. Box 398704
Cincinnati, OH 45239-8704

IMPORTANT
DRIVER TO CALL DAN OR CHARLIE EACH WEEKDAY MORNING COLLECT ON (513) 738-6620

IN THE EVENT OF AN INCIDENT OR DELAY AT NIGHT OR ON WEEKENDS, CALL SECURITY ON (513) 738-6295 COLLECT

CHECK IF APPLICABLE

☐ A. The shipping documents attached to this form contain the information prescribed by DOT regulations for a shipment of Radioactive Materials. These documents must accompany all carriers of this shipment. Accessibility of these documents must be in accordance with 49 CFR 177.81.

☐ B. VEHICLE CARRYING RADIOACTIVE MATERIALS (EXCLUSIVE USE). Under "EXCLUSIVE USE PROVISIONS" you will conform to the requirements specified in the attached Exclusive Use form, Exhibit 1.

☐ C. VEHICLE CARRYING RADIOACTIVE MATERIALS (NOT EXCLUSIVE USE). With the addition of this shipment, the total transport index on your vehicle shall not exceed 50.

D. ALL DRIVERS CARRYING RADIOACTIVE MATERIALS

☐ 1. You have inspected the load and agree it is properly secured against movement. 49 CFR 177.834.

☐ 2. Proper packaging, marking, labeling, and Shipper's Certification is indicated on the attached shipping papers.

☐ 3. Package marking or labeling, if necessary, is provided and affixed by the shipper. The carrier is responsible for replacing any labels that are lost or damaged.

☐ 4. Vehicle placarding, if necessary, is provided and affixed by the shipper. The carrier is responsible for replacing any placards that are lost or damaged. 49 CFR 172.506.

☐ 5. You are advised that certain shipments of Radioactive Materials cannot be transported through or on certain highway facilities; i.e.; tunnels, bridges, tollroads, etc. Check routings in advance to prevent delays. See Exhibit 2 for suggested routing through Las Vegas, NV.

☐ 6. In the event of an accident or emergency, notify the DOE Emergency Operations Center, Oak Ridge, TN (615) 576-1005, collect, day or night. Compliance to DOT Notification procedures specified in 49 CFR 171.15 and 171.16 is mandatory (see Exhibit 3). For Emergency Instructions, see Exhibit 4.

☐ 7. For Radiological assistance, you may contact the nearest Regional Coordinating Office of the U. S. Department of Energy. See Exhibit 5 for Regional Offices and their telephone numbers.

☐ E. DRIVER QUALIFICATION. You have been informed that the Federal Motor Carrier Regulations (DOT) require specific Driver Qualifications, if not exempted, for carriers of Hazardous Materials. 49 CFR 177.825.

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VEHICLE DRIVER'S ACKNOWLEDGEMENT

BIRTH DATE:	BIRTH PLACE:	SOCIAL SECURITY NUMBER:	☐ P/U DRIVER ☐ ROAD DRIVER
SIGNATURE:	COMPANY:	DATE OF SHIPMENT:	

U. S. Department of Energy
C/O Westinghouse Materials Company of Ohio
Fernald, Ohio

INSTRUCTIONS REGARDING CONTROLS FOR RADIOACTIVE SHIPMENTS CONSIGNED AS EXCLUSIVE USE (SOLE USE OR FULL LOAD)

Carrier: _____

Conveyance No(s).: _____

Shipper's Bill of Lading No.: _____ Date: _____

RESPONSIBILITY

These written instructions are provided to the carrier named on the shipping papers for the above referenced shipment and are to be maintained with said shipping papers. It is the carrier's responsibility to ensure that these instructions are conveyed to its driver(s) and administrative personnel, as appropriate, for the duration of the movement to final destination.

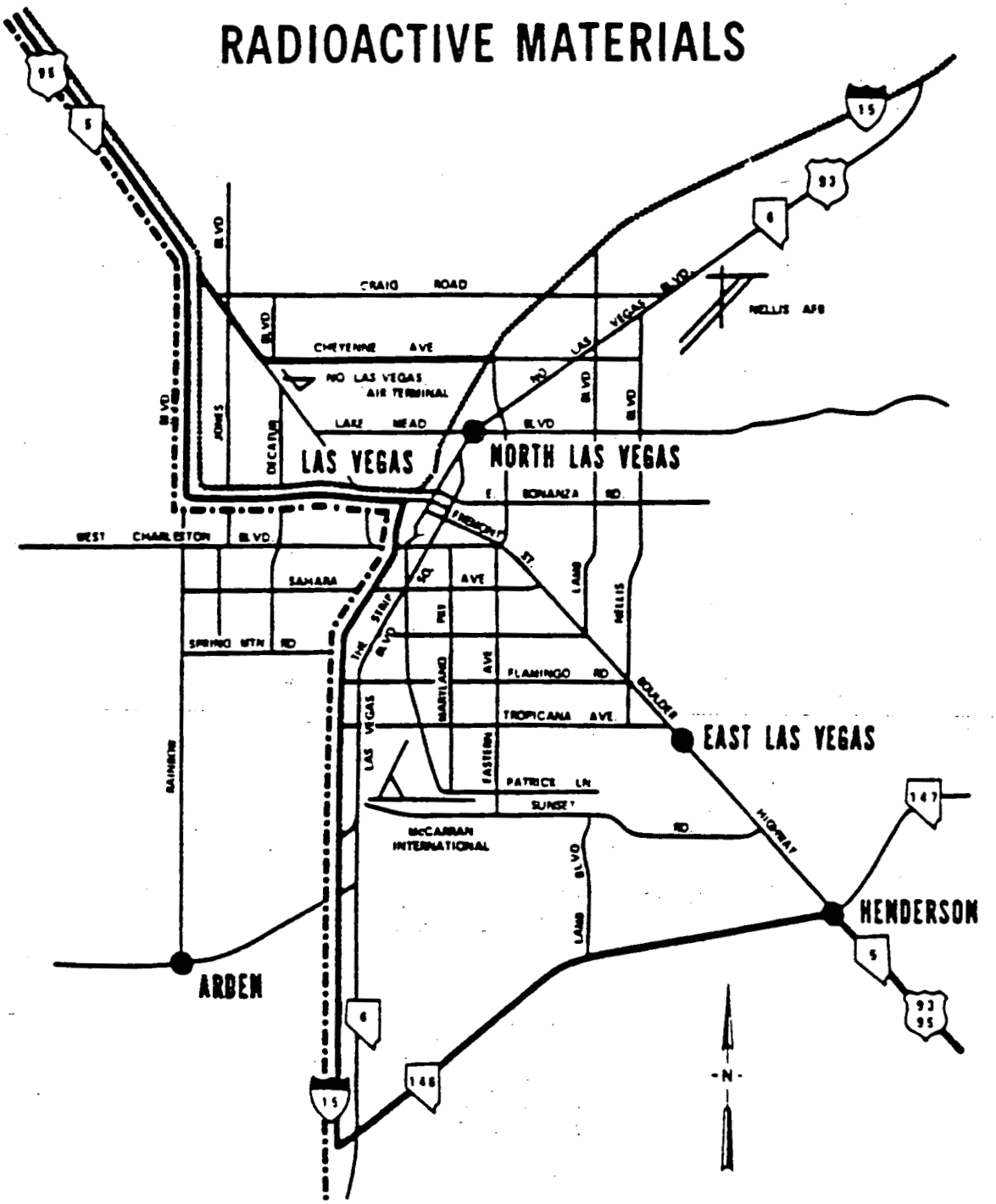
INSTRUCTIONS

1. *Maintain exclusive use of this vehicle for the duration of the movement. No other freight is to be loaded with this shipment except as directed by the consignor.*
2. *All loading or unloading of freight in this shipment shall only be done, or as directed, by the consignor or consignee.*
3. *The carrier is to move this shipment without delay, but in accordance with the legal statutes of the jurisdictions.*
4. *Stops enroute are to be minimized to the extent practical and limited to accepted safe haven areas.*
5. *The carrier is to take positive steps enroute and during necessary stops to segregate this shipment from other freight, buildings, and personnel, so as to minimize potential exposures.*
6. *The carrier is to make periodic inspection of equipment, load, and placarding at appropriate intervals enroute to ensure maintenance of shipment safety controls.*
7. *To the maximum extent practical, the carrier, when movement is by highway, is to use interstate or limited access divided highways and avoid high density urban areas, especially where circumferential interstate highways are available to allow avoidance of travel through the highest populated portion of an urban area.*

SPECIAL HANDLING INSTRUCTIONS

1. *If provided, by highway, the carrier driver is to maintain visual contact with escort(s).*
2. *Radiation surveys enroute will be made only with acceptable monitoring devices and the consignor or consignee will be notified that such monitoring has been done and by whom. Radiation surveys taken at destination by authorized personnel of the consignee will be provided to the carrier on request or the carrier will be notified if there are contamination levels that would warrant taking the conveyance out of service.*
3. *The carrier is to take the appropriate emergency response actions should an accident or spillage occur enroute. The carrier will make notification as indicated on accompanying shipping papers in the event of delay, accident, or other emergency enroute.*
4. *In the event that this is a Highway Route Controlled shipment per the shipping paper, the carrier is to comply with the requirements of DOT 49 CFR 177.825.*

ROUTES FOR VEHICLES TRANSPORTING RADIOACTIVE MATERIALS



LAS VEGAS AREA

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EXHIBIT 3
NOTIFICATION PROCEDURES
49 CFR 171.15 and 171.16

§171.15 Immediate notice of certain hazardous materials incidents.

(a) At the earliest practicable moment, each carrier who transports hazardous materials (including hazardous wastes) shall give notice in accordance with paragraph (b) of this section after each incident that occurs during the course of transportation (including loading, unloading and temporary storage) in which as a direct result of hazardous materials:

(1) A person is killed;

(2) A person receives injuries requiring his hospitalization;

(3) Estimated carrier or other property damage exceeds $50,000;

(4) Fire, breakage, spillage, or suspected radioactive contamination occurs involving shipment of radioactive material. (See also §§174.45, 175.45, 176.48, and 177.807 of this subchapter.); or

(5) Fire, breakage, spillage, or suspected contamination occurs involving shipment of etiologic agents; or

(6) A situation exists of such a nature that, in the judgment of the carrier, it should be reported in accordance with paragraph (b) of this section even though it does not meet the criteria of paragraph (a)(1), (2), or (3) of this section; e.g., a continuing danger to life exists at the ene of the incident.

(b) Each notice required by paragrpah (a) of this section shall be given to the Department by telephone (toll free) on 800-424-8802. Notice involving etiologic agents may be given the Director, Center for Disease Control, U.S. Public Health Service, Atlanta, Ga., Area Code (404) 633-5313, in place of the notice to the Department or (toll call) on 202-267-2675. Each notice must include the following information:

(1) Name of reporter.

(2) Name and address of carrier represented by reporter.

(3) Phone number where reporter can be contacted.

(4) Date, time, and location of incident.

(5) The extent of injuries, if any.

(6) Classification, name, and quantity of hazardous materials involved, if such information is available.

(7) Type of incident and nature of hazardous material involvement and whether a continuing danger to life exists at the scene.

(c) Each carrier making a report under this section shall also make the report required by §171.16.

Note.—Under 40 CFR 302.6 EPA requires persons in charge of facilities (including transport vehicles, vessels, and aircraft) to report any release of a hazardous substance in a quantity equal to or greater than its reportable quantity, as soon as that person has knowledge of the release, to the U.S. Coast Guard National Response Center at (toll free) 800-424-8802 or (toll) 202-267-2675. [52 8590 March 19, 1987]

§171.16 Detailed hazardous material incident reports.

(a) Each carrier who transports hazardous materials shall report in writing in duplicate on DOT Form F5800.1[1] to the Department within 15 days of the date of discovery, each incident that occurs during the course of transportation (including loading, unloading, or temporary storage) in which, as a direct result of the hazardous materials, any of the circumstances set forth in §171.15(a) occurs or there has been an unintentional release of hazardous materials from a package (including a tank) or any quantity of hazardous waste has been discharged during transportation. If a report pertains to a hazardous waste discharge:

(1) A copy of the hazardous waste manifest for the waste must be attached to the report, and (2) An estimate quantity of the waste removed fr scene, the name and address of the facility to which it was taken, and the manner of disposition of any unremoved waste must be entered in Part H of the report (Form F 5800.1).

(b) Each carrier making a report under this section shall send that report to the Information Systems Manager, Research and Special Programs Administration, Department of Transportation, Washington, D.C. 20590.

(c) Except as provided in paragraph (d) of this section, the requirements of paragraph (a) of this section do not apply to incidents involving the unintentional release of hazardous materials being transported under the following proper shipping names:

(1) Consumer commodity.

(2) Battery, *electric storage*, wet, filled with acid *or* alkali.

(3) Paint and paint related material when shipped in packagings of five gallons or less.

(d) The exceptions to incident reporting provided in paragraph (c) of this section do not apply to:

(1) Incidents required to be reported under §171.15(a);

(2) Incidents involving transpo aboard aircraft; nor

(3) Incidents involving the transportation of hazardous waste.

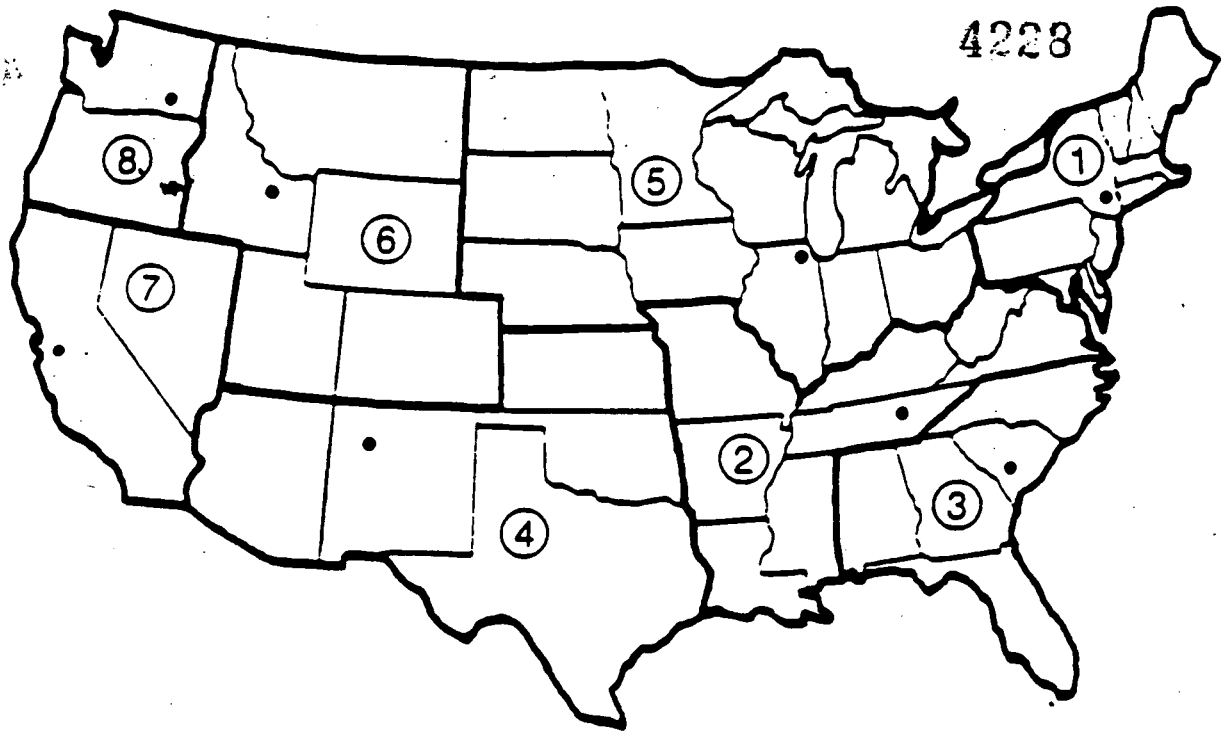
(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53; App. A to Part 1)

[Amdt. 171-7, 35 FR 16837, Oct. 3, 197[illegible] as amended by Amdt. 171-56, 45 FR 73652, Nov. [illegible] 1980; Amdt. 171-57, 45 FR 80829, Dec. 8, 1980; Amdt. No. 171-65, 47 FR 24584, June 7, 1982; Amdt. 171-66, 47 FR 43064, Sept. 30, 1982; Amdt. 171-72, 48 FR 17095, Apr. 21, 1983]

[1]Filed as part of the original document

EXHIBIT 4
EMERGENCY INSTRUCTIONS

1. Evacuate personnel from the emergency site in the direction from which the wind is blowing to stay clear of smoke, mist or other airborne particles.
2. Isolate the area from traffic and spectators.
3. Contact State Police and/or local law enforcement agency for assistance.
4. Sealed containers, if lying on the roadway, may be moved to the side of the road or right-of-way. **Do not** attempt to move and/or repackage material from any open container until authorized to do so by the proper authorities.
5. Obtain names and addresses of all persons involved. Write down a description, sequence times of all aspects of the emergency situation.
6. Make no statements to the press, news media or the general public, unless instructed by the shipper or other proper authority.



DEPARTMENT OF ENERGY

REGIONAL COORDINATING OFFICES

FOR

RADIOLOGICAL ASSISTANCE

AND

GEOGRAPHICAL AREAS OF RESPONSIBILITY

	REGIONAL COORDINATING OFFICE	POST OFFICE ADDRESS	TELEPHONE FOR ASSISTANCE
1	BROOKHAVEN AREA OFFICE	UPTON, L.I. NEW YORK 11973	(516) 282-2200
2	OAK RIDGE OPERATIONS OFFICE	P. O. BOX E OAK RIDGE, TENNESSEE 37830	(615) 576-1005 OR (615) 525-7885
3	SAVANNAH RIVER OPERATIONS OFFICE	P. O. BOX A AIKEN, S.C. 29802	(803) 725-3333
4	ALBUQUERQUE OPERATIONS OFFICE	P. O. BOX 5400 ALBUQUERQUE, NEW MEXICO 87115	(505) 844-4667
5	CHICAGO OPERATIONS OFFICE	9800 S. CASS AVE. ARGONNE, ILLINOIS 60439	DUTY HOURS: (312) 972-4800 OFF HOURS: (312) 972-5731
6	IDAHO OPERATIONS OFFICE	550 SECOND ST IDAHO FALLS, IDAHO 83401	(208) 526-1515
7	SAN FRANCISCO OPERATIONS OFFICE	1333 BROADWAY OAKLAND, CALIFORNIA 94612	(415) 273-4237
8	RICHLAND OPERATIONS OFFICE	P. O. BOX 550 RICHLAND, WASHINGTON 99352	(509) 373-3800

MPC-SA&M-2934-5 (1/4/88)

EXHIBIT 5

ZARDOUS MATERIALS TRANSPORTATION PERMIT 00081

T NUMBER
081

DEPARTMENT OF
MOTOR VEHICLES AND PUBLIC SAFETY
HIGHWAY PATROL DIVISION
555 Wright Way
Carson City, Nevada 89711-0590

COPY MUST BE IN DRIVERS' COMPARTMENT OF VEHICLE

ER INFORMATION

0067

ISSUE DATE: 881018

ARRIER: RANGER TRANSPORTATION

EXPIRATION: 891231

DRESS: 7960 ARLINGTON EXPWY
JACKSONVILLE, FL 32211

EPHONE: (904)724-0600

'AZARDOUS MATERIALS TRANSPORTATION PERMIT 01551

ERMIT NUMBER
01551

DEPARTMENT OF
MOTOR VEHICLES AND PUBLIC SAFETY
HIGHWAY PATROL DIVISION
555 Wright Way
Carson City, Nevada 89711-0590

COPY MUST BE IN DRIVERS' COMPARTMENT OF VEHICLE

ARRIER INFORMATION

00067

ISSUE DATE: 891120

CARRIER: RANGER TRANSPORTATION

EXPIRATION: 901231

ADDRESS: 7960 ARLINGTON EXPWY
JACKSONVILLE, FL 32211

TELEPHONE: (904)724-0600

WASTE CERTIFICATION PRELIMINARY TRAILER CHECKLIST

4228

Trailer No._____

	Approved	Badge
Verify that ERMT has surveyed trailer prior to loading and recorded results on Form ES&H-1596-1 to assure the trailer is not contaminated.	_____	_____
Verify that the condition of trailer is acceptable:		
trailer floor	_____	_____
interior	_____	_____
roof	_____	_____
rear doors	_____	_____
tires	_____	_____
Any discrepancies must be reported immediately to the Transportation Supervisor	_____	_____

Comments: _____

_____

Verify that the trailer has been lined properly according to SOP-TRF-46-C-110 prior to loading.	_____	_____
Visually verify that the packages have been properly tied-down according to SOP-TRF-46-C-110.	_____	_____

I hereby certify that the above checklist has been completed and witness that all items are correct to the best of my knowledge.

Signed: _____ Company: _____
(Certification Personnel)

Date: _____

Signed: _____
(Transportation Supervisor)

WASTE CERTIFICATION FINAL TRAILER/VEHICLE CHECKLIST

Carrier _____ Trailer No. _____

	Approved	Badge
Verify that ERMT has surveyed the trailer/vehicle and recorded results on Vehicle Radiation Monitoring Report (Form FMPC-ES&H-1596-1).	_____	_____
Compare and verify that information recorded on Bill of Lading is consistent with the Tally Sheet and Manifest (Form FVC-VAB-614). Report any discrepancies to Traffic Manager.	_____	_____
Bill of Lading No. _____		
Verify that the envelope with the Manifest and Tally Sheet are in trailer.	_____	_____
Verify that the proper placards are in place if required.	_____	_____
Verify that driver has performed safety inspection of vehicle prior to leaving the FMPC:		
headlights	_____	_____
turn signals	_____	_____
brake lights	_____	_____
horn	_____	_____
braking check test	_____	_____
tires	_____	_____

Comments: _____

_____

Verify that a seal has been placed on the trailer and that the trailer number and the seal number match the seal number recorded on the Bill of Lading. Report any discrepancies to Traffic Manager.	_____	_____
Seal No. _____		

Date Shipped: _____ Time Shipped: _____

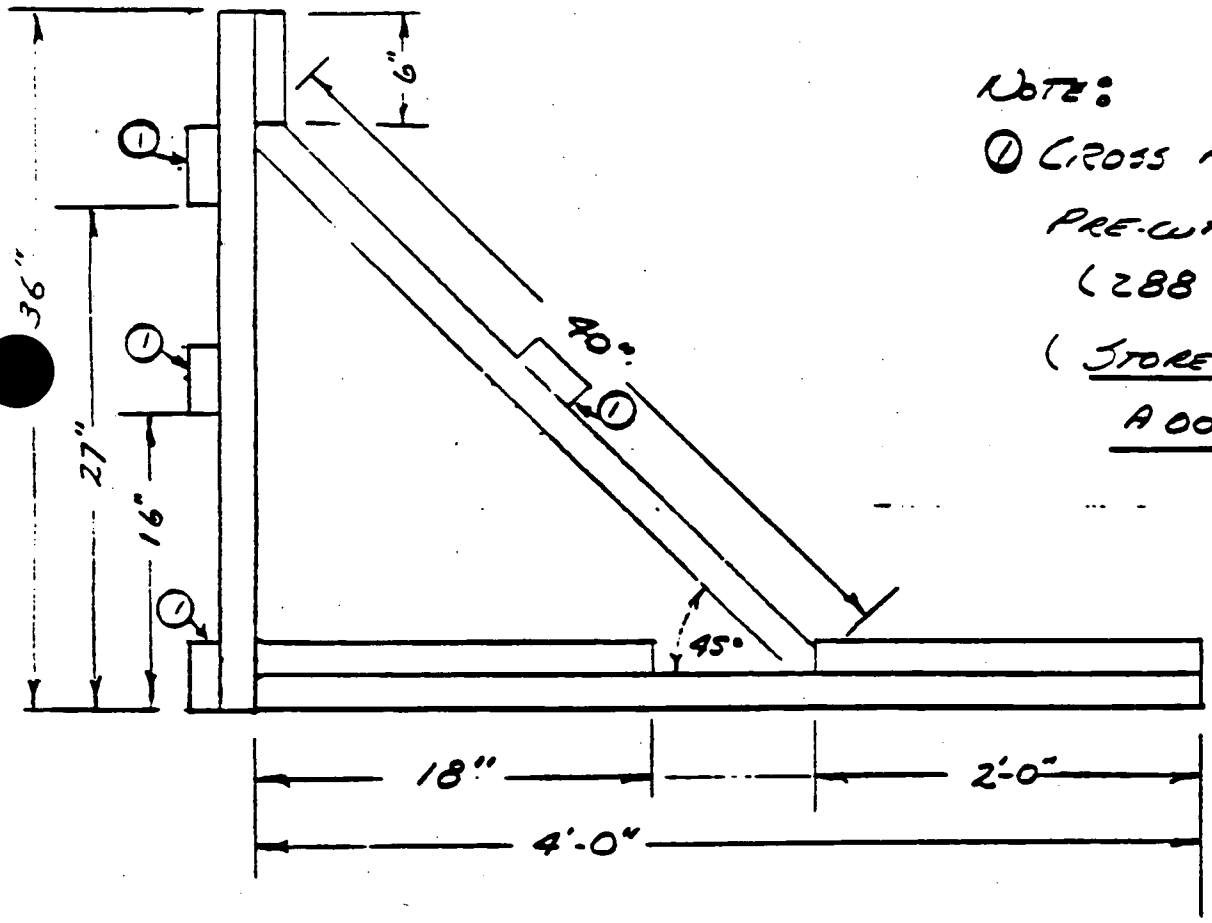
I hereby certify that the above checklist has been completed and witness that all items are correct to the best of my knowledge.

Signed: _____ Company: _____
(Certification Personnel)

TRUCK PICKETT WOODEN BRACE ASSEMBLY.

MATERIAL:

2"x 4"x 8' PINE LUMBER



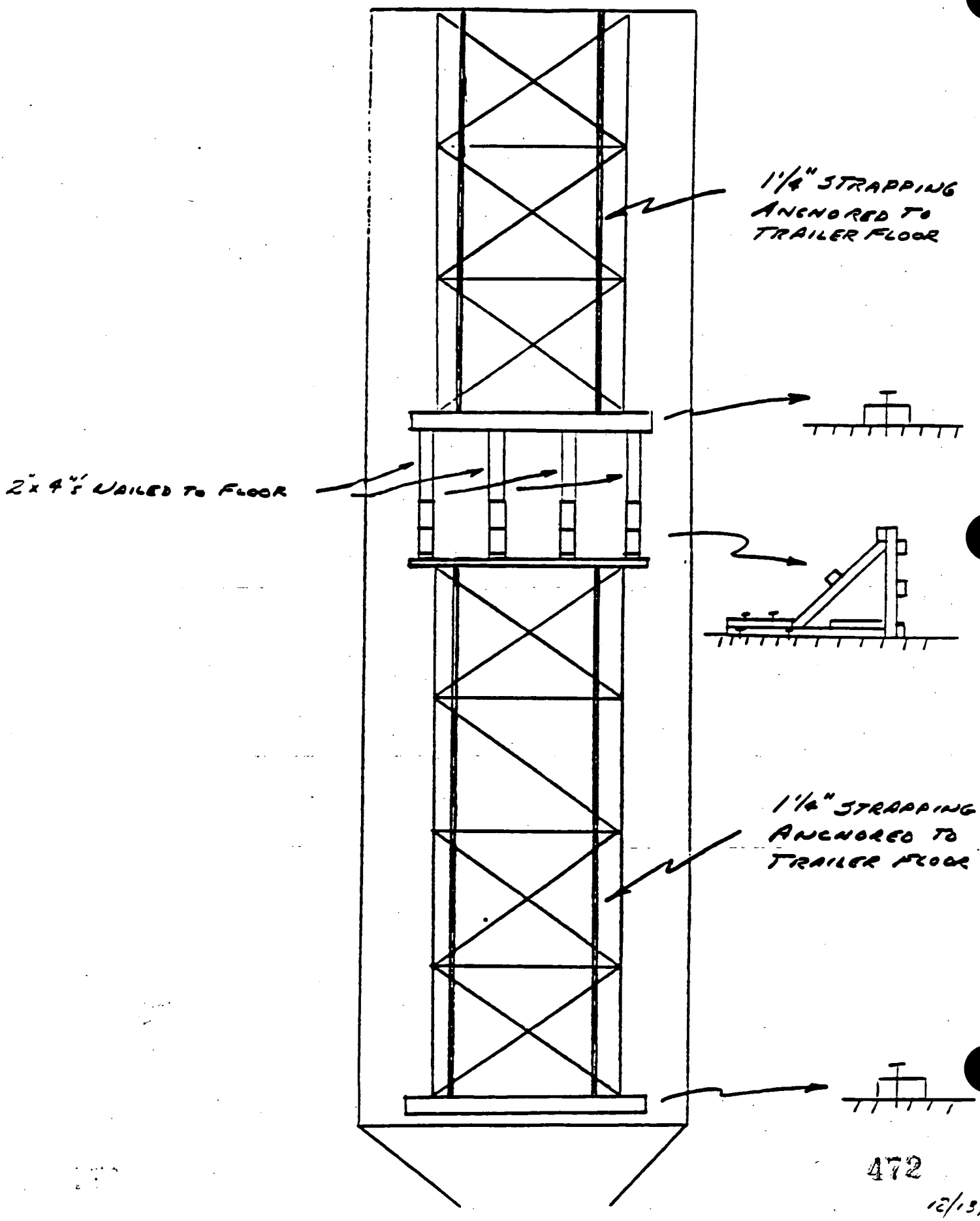
NOTE:

(1) CROSS MEMBERS 2"x4"x
PRE-CUT STUDS SHORT
(288 PER BUNDLE)
(STORES STOCK NO.
A 00363)

NOT TO SCALE

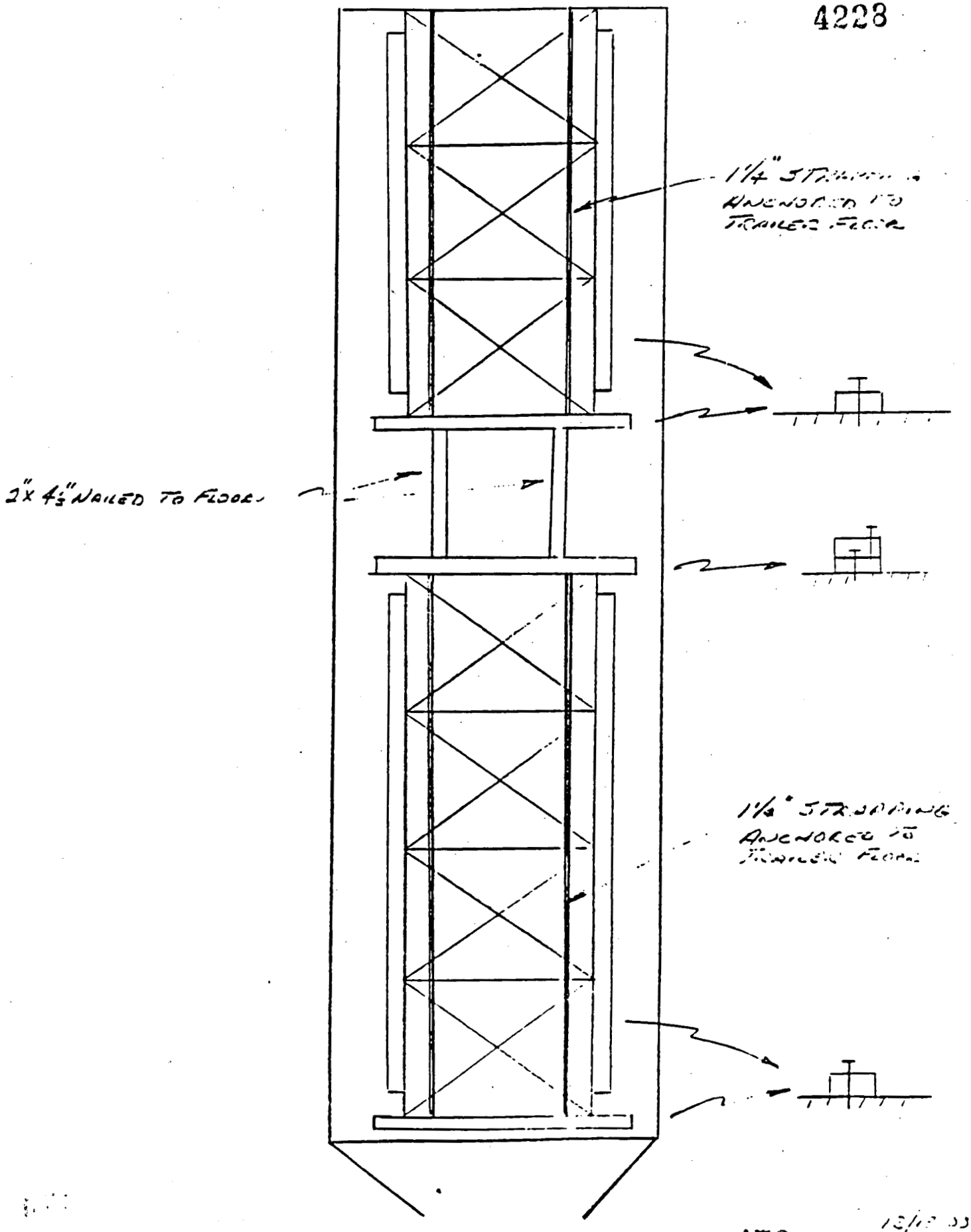
REVISED 12/7/88
12/13/88

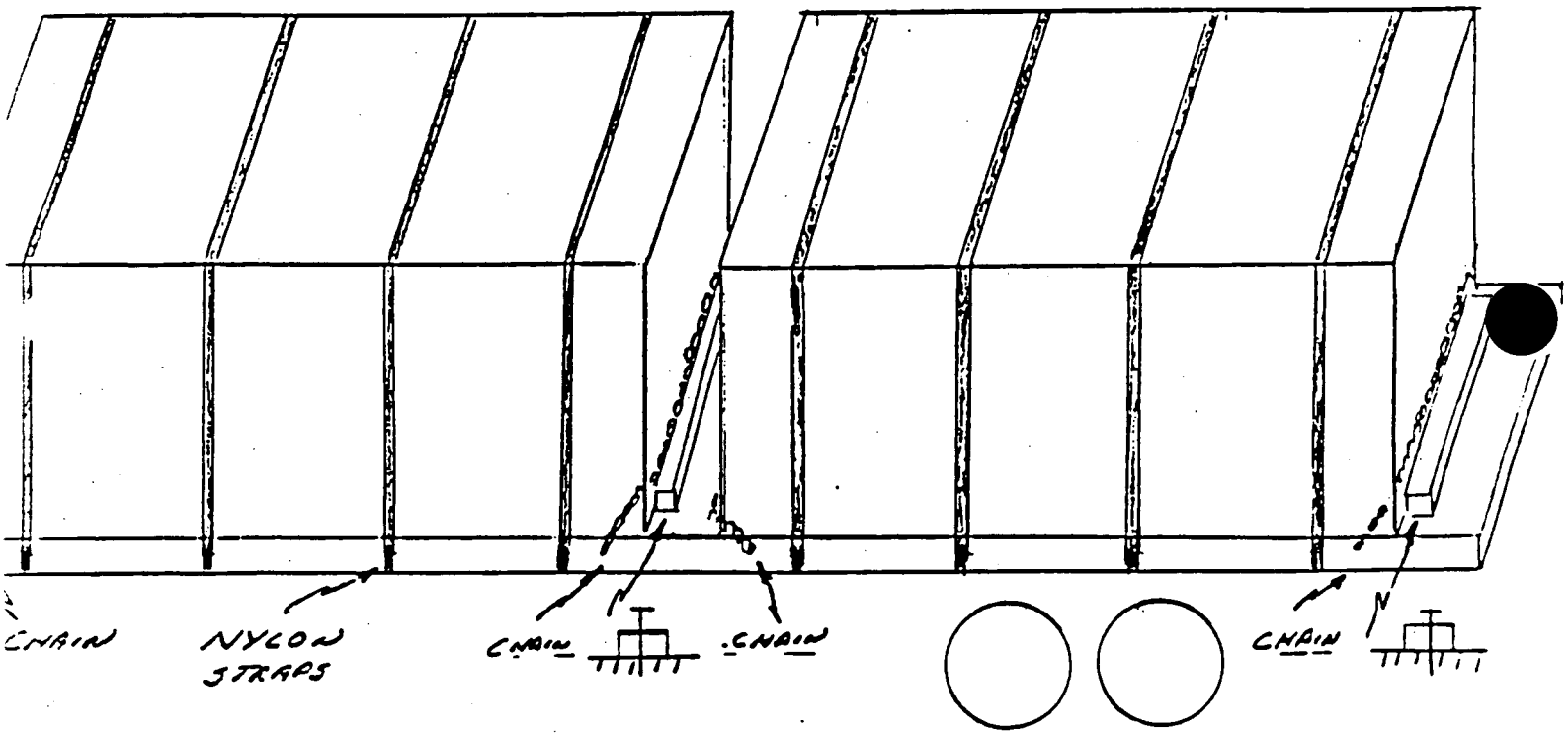
ATTACHMENT P
SOP-TRF-46-C-110



12/13/88

4228


1¼" STRAPPING ANCHORED TO TRAILER FLOOR
2"X 4½" NAILED TO FLOOR
1¼" STRAPPING ANCHORED TO TRAILER FLOOR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UNCONTROLLED COPY

Vestinghouse Materials Company of Ohio

Revision: 1

Safety Procedures	Title: Radioactive Material Shipping and Receiving	SP-P-35-009
		Department: IRS&T Section: RS

Authorization: Supersedes: None
Revision Date: 7/24/91

1.0 PURPOSE

Set administrative guidelines in the shipping and receiving of Radioactive Material at the FMPC.

2.0 SCOPE

Establish the radiological surveys and limits for all radioactive materials received or shipped, and all vehicles used for radioactive material shipments or deliveries. It does not apply to materials to be transported exclusively on site.

3.0 DEFINITIONS

NONE

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 initiation of that work.

4.2 The Radiological Safety Technician (RST) shall be responsible for surveying packages and vehicles and making required reports and notifications in accordance with SP-P-35-031.

5.0 GENERAL

NONE

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6.0 PROCEDURE

6.1 Surveys shall be performed within the following time frames:

6.1.1 Incoming packages nonexclusive use vehicle - As soon as practical but not more than three (3) hours after receipt during normal working hours.

6.1.2 All vehicles - prior to arrival inside protected area fence.

6.1.3 All Vehicles - Prior to leaving site

6.1.4 Outgoing package - within 48 hours of leaving or loading into lockable van/trailer

6.2 General Survey Requirements

6.2.1 Package shall be swiped using dry filter paper. At least 300 square centimeters (cm^2) of each package shall be swiped.

6.2.2 Packages shall be surveyed for dose rate at the surface and at one meter (3.3 ft.). Vehicles shall be surveyed for dose rate at the surface and at two meters (6.6 ft.).

6.3 All dose rate surveys for this procedure shall be conducted using a G-M side window survey meter, smears are counted on a simultaneous alpha/beta proportional counter.

6.4 Contamination and radiation limits for this procedure are specified in Attachment A.

6.5 Requirements for incoming and outgoing packages

6.5.1 Survey surface for dose rate.

6.5.2 Survey for dose rate at one meter.

6.5.3 Survey for removable contamination.

6.5.4 Record dose rate and smear results on form FMPC-OSH-1993-1 (Attachment B) and FMPC-OH-1993-2 (Attachment C). For shipments requiring additional information on the radioactive material being shipped (radionuclide, net. weight., and curies) form FMPC-ES&H-1596 should be completed (Attachment D).

PROCEDURE (continued)

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6.6 Requirements for Exclusive Use Shipments

6.6.1 Loaded vehicles shall be spotted away from other sources of ionizing radiation, to minimize error, except railroad cars may be coupled together.

6.6.1.1 Survey the exterior surface for dose rates.

6.6.1.2 Survey for dose rates at 2 meters from the exterior surface.

6.6.1.3 Smear areas as outlined in step 6.6.2

6.6.1.4 Record dose rate and smear results on form FMPC-OH-1993-1 (Attachment B) and 1993-2 (Attachment C).

6.6.1.5 For Over-The-Road-Trucks - Survey for dose rate at the top back of the driver's and passenger's seats or at the back wall of the sleeper whichever is appropriate after the over-the-road-tractor has been hooked up. Record the result on form FMPC-ES&H-1596-1 (Attachment E).

6.6.2 Smear locations for specific vehicles

6.6.2.1 Closed Vans - Swipe of the floor and shoring of the trailer behind the last packages and the apron (metal floor area under and exterior to the rear door) of the trailer.

6.6.2.2 Open Top Trailer - Swipe any surfaces which may have been contaminated.

6.6.2.3 Flatbed Trailers - Swipe accessible bed areas.

6.6.2.4 Box Cars - Swipe accessible areas of floor, shoring and apron(s) before door(s) are closed.

6.6.2.5 Gondolas - Swipe accessible areas which may have become contaminated. (Container surfaces may be swiped at surveyor's option.)

6.6.2.6 Flatcars - Swipe accessible areas of flatcar floor.

6.7 Records Distribution

The original copy of all survey records shall be sent to Records Management and a copy to Transportation.

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7.0 APPLICABLE DOCUMENTS

7.1 DOE Order 5480.11 "Radiation Protection for Occupational Workers"

7.2 SP-P-35-031, "Event Notification and Reporting of Radiological Safety Occurrences"

8.0 FORMS USED

8.1 FMPC-OS&H-1993, Radiological Survey Report.

8.2 FMPC-1993-2, Radiological Survey Report (continuation sheet).

8.3 FMPC-ES&H-1596, Shipment Radiation Monitoring Report.

8.4 FMPC-ES&H-1596-1, Vehicle Radiation Monitoring Report.

9.0 ATTACHMENTS

9.1 Attachment A, Maximum Allowable Radiation and Contamination Levels.

9.2 Attachment B, Radiological Survey Report.

9.3 Attachment C, Radiological Survey Report (continuation).

9.4 Attachment D, Shipment Radiation Monitoring Report.

9.5 Attachment E, Vehicle Radiation Monitoring Report.

ATTACHMENT A

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MAXIMUM ALLOWABLE CONTAMINATION AND RADIATION LEVELS

	REMOVABLE CONTAMINATION LEVELS (dpm/ 100cm^2)	RADIATION LEVELS (mrem/hr)
EXCLUSIVE USE VEHICLE	EMPTY, STENCILED "RADIOACTIVE MATERIALS USE ONLY" < 10,000 ALPHA, < 10,000 BETA [1] EMPTY,NOT STENCILED "RADIOACTIVE MATERIALS USE ONLY" < 1,000 ALPHA, < 1,000 BETA, < 5000 ALPHA OR BETA DIRECT FRISK [2]	LOADED - SURFACE: 200, TWO METER: 10, CAB: 2 EMPTY STENCILED "RADIOACTIVE MATERIALS USE ONLY" - INTERIOR SURFACE: 10, INTERIOR ONE METER: 2 EMPTY NOT STENCILED "RADIOACTIVE MATERIALS USE ONLY" - INTERIOR SURFACE: 0.5
EXCLUSIVE USE PACKAGE	ALL SURFACES: < 1,000 ALPHA, < 1,000 BETA [2]	FLATBED - 200 CLOSED VAN,FIXED POSITION PACKAGE - 1000
FLATBED TRAILER OR SEA/LAND CONTAINER	ALL ACCESSIBLE SURFACES: < 20 ALPHA, < 100 BETA	FLATBED: VERTICLE PLANE FROM EDGE OF BED - 200, TWO METER- 10, CAB - 2 SEA/LAND CONTAINER - SURFACE: 200, TWO METER - 10,
NON-EXCLUSIVE USE VEHICLE	ALL SURFACES: < 1,000 ALPHA, < 1,000 BETA, < 5,000 ALPHA OR BETA DIRECT FRISK [2]	EMPTY - NOT DETECTABLE ABOVE BACKGROUND
NON-EXCLUSIVE USE PACKAGE	ALL SURFACES: < 1,000 ALPHA, < 1,000 BETA [2]	SURFACE DOSE RATE - 200

[1] FOR URANIUM CONTAMINATION ONLY. FOR NUCLIDES OTHER THAN URANIUM, THE LIMITS ARE 10 TIMES ATTACHMENT 2 OF DOE ORDER 5480.11 FOR THE SPECIFIC NUCLIDE.

FOR URANIUM CONTAMINATION ONLY. FOR NUCLIDES OTHER THAN URANIUM, THE LIMITS ARE 1 TIMES ATTACHMENT 2 OF DOE ORDER 5480.11 FOR THE SPECIFIC NUCLIDE.

ATTACHMENT B

RADIOLOGICAL SURVEY REPORT

4223

FMPC
INDUSTRIAL, RADIOLOGICAL SAFETY & TRAINING - RADIOLOGICAL SAFETY
RADIOLOGICAL SURVEY REPORT

Date: LOCATION: AREA
Time: LEVEL: Page of

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

COMMENTS:

INSTRUMENTS

MODEL	SERIAL NUMBER	CALIBRATION DATE	BKRD	EFF

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 CONTACT	γ 3 FT	β 3 FT	DPM ALPHA 100 CM²	DPM ALPHA PROBE	DPM BETA-GAMMA 100 CM²	DPM BETA-GAMMA PROBE

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

FMPC-IRS&T-1993-1 (REV 3/14/90)

4228

ATTACHMENT C

RADIOLOGICAL SURVEY REPORT (CONTINUATION SHEET)

FMPC

INDUSTRIAL, RADIOLOGICAL SAFETY & TRAINING - RADIOLOGICAL SAFETY

RADIOLOGICAL SURVEY REPORT (CONTINUATION SHEET)

ITEM NUMBER	GRID COORDINATES	DESCRIPTION	CORRECTED DOSE RATE (mRem/hr)				DPM ALPHA		DPM BETA-GAMMA	
			γ	β/γ	γ	β/γ				
			CONTACT	CONTACT	3 FT	3 FT	100 CM²	PROBE	100 CM²	PROBE

ATTACHMENT D

4228

SHIPMENT RADIATION MONITORING REPORT

Westinghouse Materials Company of Ohio

SHIPMENT RADIATION MONITORING REPORT
ENVIRONMENT, SAFETY & HEALTH - ENVIRONMENTAL & RADIOLOGICAL MONITORING

DATE MONITORED: NUMBER OF PACKAGES: ERMT:

TYPE OF SHIPMENT: ☐ INCOMING ☐ OUTGOING "EXCLUSIVE USE" SHIPMENT? ☐ Yes ☐ No

SHIPPER: ☐ WMCO ☐ MARTIN MARIETTA ☐ ROCKY FLATS ☐ OTHER _____

CONSIGNEE: ☐ WMCO ☐ MARTIN MARIETTA ☐ ROCKY FLATS ☐ _____

PACKAGE TYPE: ☐ 55 GALLON DRUM ☐ T-HOPPER ☐ CRATE ☐ OTHER _____ WMCO Shipment No _____

SHIPMENT BY: ☐ Truck ☐ Rail Car ☐ OTHER NONROUTINE (EXPLAIN FULLY)

REMARKS

PACKAGE NUMBER	RADIOACTIVE MATERIAL			DOSE RATE, mR/hr		SURFACE CONTAMINATION		
	RADIO-NUCLIDE	NET WT *	CURIES*	PACKAGE SURFACE	3' FROM SURFACE	β - γ c m/100cm²	ALPHA c m/100cm²	DIRECT OR SMEARS*

Additional information attached? (E&RM copy only): ☐ Yes ☐ No

* Outgoing shipments only.

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1	Environmental & Radiological Monitoring (RECD COPY)
2	Transportation Supervisor
3	[illegible]

INSTRUMENTS

	MODEL	SERIAL NUMBER
ALPHA		
BETA-GAMMA		

ATTACHMENT E

4228

VEHICLE RADIATION MONITORING REPORT

FMPC

ENVIRONMENT SAFETY & HEALTH ENVIRONMENTAL & RADIOLOGICAL MONITORING

VEHICLE RADIATION MONITORING REPORT

Date Monitored _____ Monitored By _____

Carrier Name _____

Vehicle Type Tractor trailer ☐ Other motor vehicle ☐ Railcar ☐ Open flatbed ☐ Covered ☐

Other ☐ (explain) _____

License no. if motor vehicle _____ State _____

Trailer or railcar identification _____

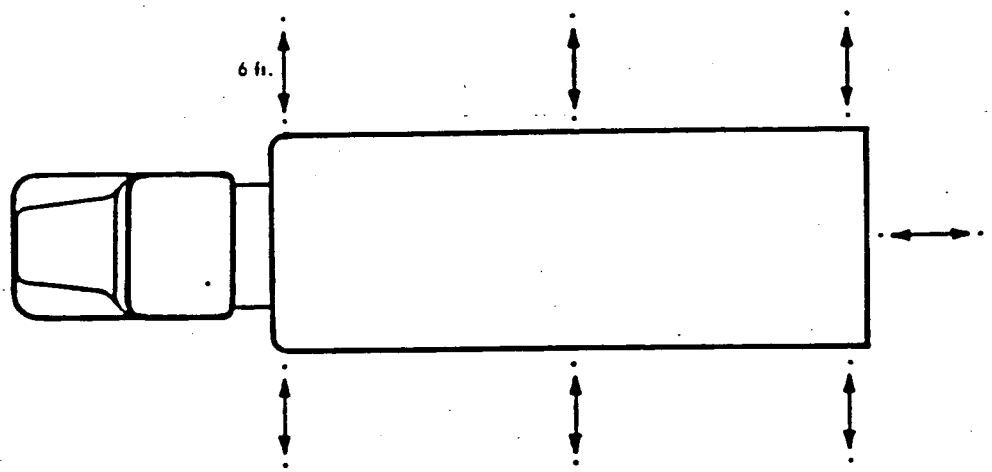
Is this an exclusive use vehicle? Yes ☐ No ☐

Vehicle Status (a) Outgoing ☐ (b) Incoming ☐ (c) Outgoing empty not "exclusive use" ☐ (d) Empty before loading ☐

(e) Outgoing empty, "exclusive use" ☐ (f) If (e) is checked is vehicle to remain "exclusive use"? Yes ☐ No ☐

Is visible contamination present? Yes ☐ No ☐ If "yes", show on diagram

Dose rate shown by asterisks in mrem/hr. Surface alpha contamination, circled, in d/m/100cm².



(1) Same locations apply to van-type trucks. For railcars, disregard cab section but show dose rates found at each end
(2) Measurements at 6-ft not required if all readings at vehicle surface are not greater than 10 mrem/hr

Survey Instruments Used

Alpha — Type or Model No _____ Serial No _____

Beta-gamma — Type or Model No _____ Serial No _____

Additional information attached? (E&RM copy only): Yes ☐ No ☐

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2	Transportation Supervisor

FMPC-ES&H-1596-1 REV 8 28 86

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ISSUE AND REVISION RECORD

DATE OF CHANGE	REVISION NUMBER	AFFECTED PAGES	REASON FOR CHANGE
8/06/86	0	ALL	Original issue of the procedure
12/21/87	1	4	To include controls for record maintenance and retention periods.
7/24/91	2	ALL	To incorporate organizational changes, and update procedure throughout.

WESTINGHOUSE MATERIALS COMPANY OF OHIO - FMPC 4228		DOCUMENT NUMBER: EQP-12.04
ENVIRONMENTAL QUALITY PROCEDURE	SUBJECT: CERTIFICATION OF LOADING AND SHIPMENT OF LOW-LEVEL RADIOACTIVE WASTE	REVISION: 0
		Page 1 of 39
	AUTHORIZED: (Manager, Environmental Compliance & Quality Assurance) Allery D. Savage	Effective Date: 05/30/91

1.0 SCOPE

This procedure establishes a detailed method for the certification of Low-Level Radioactive Waste (L-LRW) packages (for additional abbreviations, acronyms, and definitions refer to EQP-1.05), the loading of L-LRW materials and the examination of highway transport vehicles for exclusive use shipments only at the Feed Materials Production Center (FMPC) to ensure compliance with applicable federal regulations.

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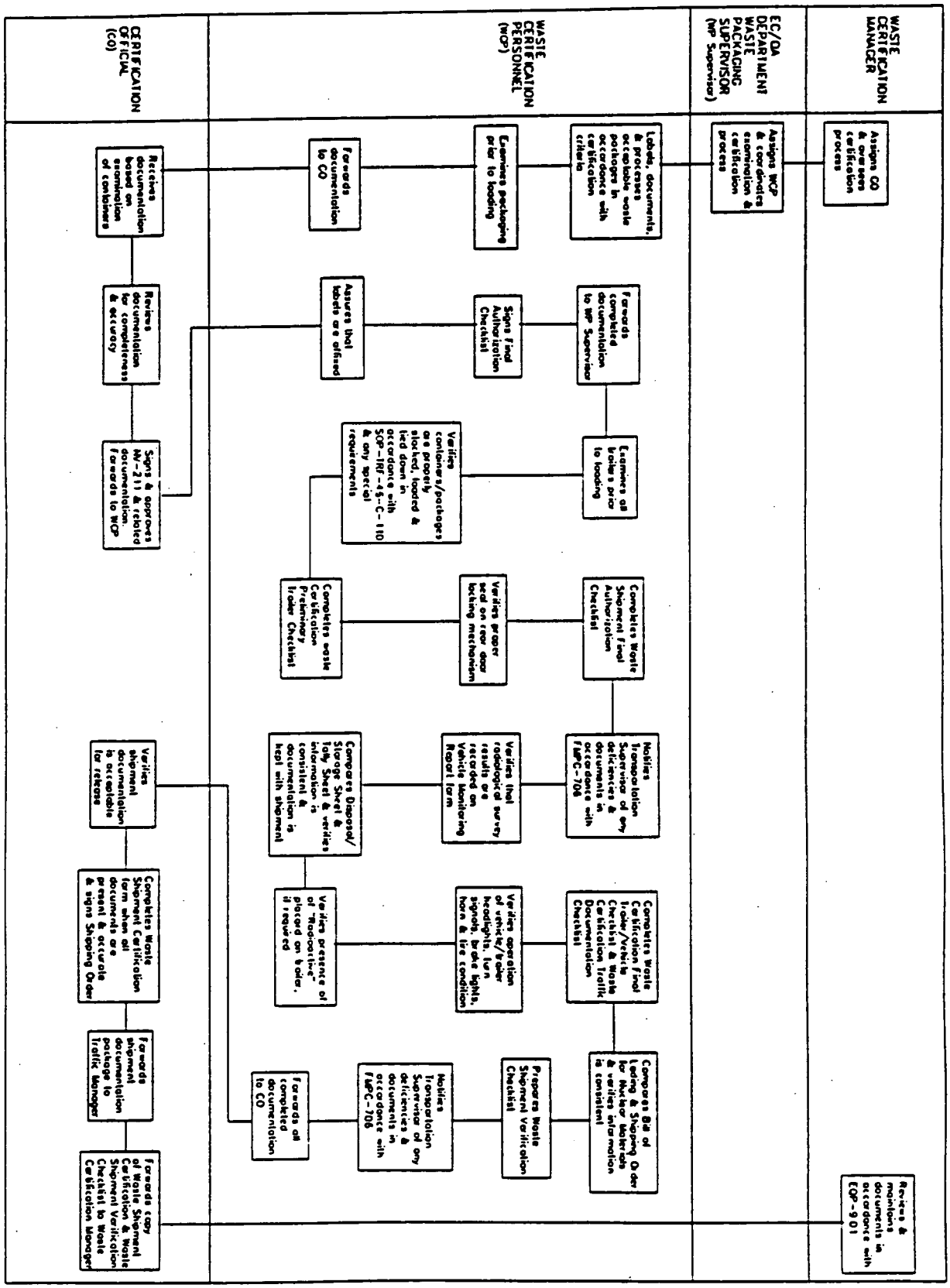
WASTE CERTIFICATION MANAGER
EC/QA DEPARTMENT WASTE PACKAGING SUPERVISOR (WP Supervisor)
WASTE CERTIFICATION PERSONNEL (WCP)
CERTIFICATION OFFICIAL (CO)
Assigns CO & oversees certification process
Assigns WCP & coordinates examination & certification process
Labels, documents, & processes acceptable waste packages in accordance with criteria
Examines packaging prior to loading
Forwards documentation to CO
Receives documentation based on examination of containers
Forwards completed documentation to WP Supervisor
Signs Final Authorization Checklist
Assures that labels are affixed
Reviews documentation for completeness & accuracy
Examines all trailers prior to loading
Verifies containers/packages are properly blocked, loaded & tied down in accordance with SOP-IRF-4S-C-110 & any special requirements
Signs & approves NV-211 & related documentation. Forwards to WCP
Completes Waste Shipment Final Authorization Checklist
Verifies proper seal on rear door locking mechanism
Completes waste Certification Preliminary Trailer Checklist
Notifies Transportation Supervisor of any deficiencies & documents in accordance with FMPC-706
Verifies that radiological survey results are recorded on Vehicle Monitoring Report form
Compares Disposal/ Storage Sheet & Tally Sheet & verifies information is consistent & documentation is kept with shipment
Completes Waste Certification Final Trailer/Vehicle Checklist & Waste Certification Traffic Documentation Checklist
Verifies operation of vehicle/trailer headlights, turn signals, brake lights, horn & tire condition
Verifies presence of "Radioactive" placard on trailer, if required
Compares Bill of Lading & Shipping Order for Nuclear Materials & verifies information is consistent
Prepares Waste Shipment Verification Checklist
Notifies Transportation Supervisor of any deficiencies & documents in accordance with FMPC-706
Forwards all completed documentation to CO
Verifies shipment documentation is acceptable for release
Completes Waste Shipment Certification form when all documents are present & accurate & signs Shipping Order
Forwards shipment documentation package to Traffic Manager
Forwards copy of Waste Shipment Certification & Waste Shipment Verification Checklist to Waste Certification Manager
Reviews & maintains documents in accordance with EQP-901

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2.0 PROCEDURE

2.1 Event Notification and Reporting Requirements

2.1.1 All unplanned or unwanted events or incidents shall be immediately reported to supervision. In the supervisor's absence the Assistant Emergency Duty Officer (AEDO) shall be notified for proper notification and reporting in accordance with topical manual, FMPC-2182, "Emergency and Non-Routine Event Notification and Reporting."

2.1.2 Supervision shall evaluate all unplanned or unwanted events or incidents for determination of reportability as a Minor Event in accordance with site procedure, FMPC-704, Minor Event Reporting System.

2.1.3 Any circumstance of event which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to supervision. The supervisor shall immediately report the circumstance of possible radioactive materials intake to Radiological Safety (RS) for evaluation.

2.2 Industrial Health and Safety Requirements

2.2.1 Leather palm gloves shall be worn when handling sharp-edged or abrasive materials, containers, lids and banding materials.

2.2.2 Safety glasses shall be worn by all personnel at all times posted areas, except when another type of eye protection equipment is specified.

2.2.3 Supervisors shall be responsible for contacting Industrial Hygiene for chemical air contaminants, or RS for radioactive contaminants, to determine appropriate respiratory protection. Determination of requirements shall be made in accordance with topical manual, FMPC-2128, Industrial Hygiene and Safety Manual.

2.2.4 Respirators, as determined required per 2.2.3, shall be available by supervision for each person working with waste material and shall be used in accordance with topical manual, FMPC-2084, Radiation Control Manual.

2.2.5 Any personnel involved with circumstances of an event which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall report to Medical Services to submit a urine sample at the end of their shift, or as directed by their supervision, and again at the start of their next shift.

2.3 General Requirements For Transporting L-LRW and LSA Waste

NOTE: EQP-12.03 must be completed prior to implementation of this procedure.

2.3.1 All certification personnel verifying packaging and shipment of L-LRW to the Nevada Test Site (NTS) shall be trained and qualified on this procedure, EQP-12.03, NVO-325, and the Waste Certification Program Plan in accordance with Quality Assurance Procedure EQP-6.04, Qualification of Waste Package Certifiers, or on Quality Assurance Procedure EQP-6.05, Qualification of Waste Certification Officials.

2.3.2 Materials prohibited by NVO-325 and/or listed on the "Prohibited Materials List" (Attachment A) shall not be packaged for shipment.

2.3.3 Only materials approved by NTS, Solid Waste Compliance and Waste Management shall be shipped. The Quality Department Waste Certification Manager is responsible for making this information available to all personnel performing verification and certification work.

2.3.4 Only container designs approved for shipment by the NTS that meet the requirements of NVO-325 and CFR 49 shall be used. For the purpose of this procedure only those container types verified as acceptable by the Waste Certification Manager, or another Certification Official, are to be used.

2.3.5 All packaging shall be in strong, tight containers that do not leak under normal transport and handling conditions, and which meet the criteria of Title 49 CFR 173.421 and 173.425.

2.3.6 White Metal box containers may not exceed 6000 lbs. maximum gross weight, wood box containers may not exceed 5000 lbs., 48 or 55 gallon drums may not exceed 1200 lbs. maximum gross weight, 85 gallon drums may not exceed 1000 lbs. maximum gross weight, 85 gallon overpacks may not exceed 1280 lbs. maximum gross weight, or as specified in EQP-12.03.

2.3.7 Marking and labeling shall be in accordance with Title 49 CFR 172, Subparts D & E, as follows:

a. Container Number
b. Shipment Number
c. Gross Weight
d. Radioactive markings
e. Other marking and labeling as required for the packaged material

2.3.8 Packages certified and held for shipment must be secure and protected from weather and other adverse conditions having the potential to create an unacceptable condition. Covered or enclosed storage, which includes covering with plastic or tarpaulin are appropriate protective measures. If appropriate measures have not been taken, all packages concerned shall be reexamined by Waste Certification Personnel and recertified on the basis of the reexamination results.

2.3.9 Beta/Gamma radiation levels shall not exceed 200 millirem/hour measured externally at the surface or 10 millirem/hour measured externally at one (1) meter in accordance with 49 CFR 173.441.

Alpha emitters	220 DPM/100 cm^2
Beta/Gamma emitters	2200 DPM/100 cm^2

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2.3.10 No container leakage is permitted under normal transport conditions in accordance with 49 CFR 173.425.

2.4 Examination of Packages in Staging Area

This examination will be performed at the loading area by Waste Certification Personnel who have been properly trained in this procedure and NVO-325 prior to loading any packages into trailers for shipment to NTS. Results shall be documented on "Waste Shipment Final Authorization Checklist" (Attachment B).

2.4.1 Examination of Drums Prior to Loading

Examines sealed drums prior to loading on trailers for shipment to NTS. These drums are to be examined 100% by Waste Certification Personnel.

2.4.1.1 The lid shall be properly seated on the drum and held in place by a bolt ring closure. If bolt and flanges are not lower than rest of ring, then ring is positioned upside down.

2.4.1.2 Checks for red paint on ring bolt to indicate it has been tightened to 45 (± 5) ft-lbs. using torque wrench (Attachment B).

2.4.1.3 Checks for safety wire threaded through hole in with the bolt head or threaded portion of bolt and around threaded portion of bolt ring and fastened (Attachment C). Check that jam nut is locked to opposite side of bolt head or threaded with flat side against ring harness.

2.4.1.4 Examines all surfaces of the drum and lid and reject for any of the following conditions.

a. A breach (a hole, crack, gash, etc.)
b. A dent or bulge which has creased, gouged, or may have otherwise significantly weakened the metal.
c. A dent greater than 1" in depth or extending over 6" in any direction.
d. A significant dent in the bottom rim. A significant dent is one that compromises the integrity of the container.
e. A significant dent in a rolling hoop which may affect the integrity of the container.
f. Rust causing exfoliation (scale), severe pitting, or other conditions having a detrimental effect on the serviceability of the waste container (small areas of exposed base metal, minor to moderate scratches, and slightly rusted spots are acceptable).

g. Any deformation or out-of-round condition affecting the integrity of the sealing surface.

2.4.1.5 Checks exterior of container for exposed bare metal requiring touch-up painting.

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2.4.1.6 Checks exterior of drums for moisture.

2.4.1.7 Checks that the gross weight does not exceed 1200 lbs. and that it is marked in two inch (minimum) letters on each drum.

2.4.1.8 Checks labels and markings against "Storage & Disposal Data Sheet" (Attachment D), "Tally Sheet" (Attachment E) , and computer printout (Attachment F) "Circle Copy" for the particular shipment for weight and labels accuracy.

2.4.1.9 Notify Waste Operations Supervisor of any nonconformance found and checks that they are corrected prior to loading.

2.4.1.10 Apply "NV-211 Packaging Certification Label" to each package upon satisfactory examination (Attachment G).

2.4.2 Examination of Wood Boxes Prior to Loading

Examines wood boxes at the loading area prior to loading on trailers for shipment to NTS. These boxes are to be examined 100% by Waste Certification Personnel. Results shall be documented on "Waste Shipment Final Authorization Checklist" (Attachment B).

2.4.2.1 Checks for damage to the box and lid. No holes, cracks, or deterioration (i.e. rot) which would permit leakage or lessen the structural integrity of the box are acceptable.

2.4.2.2 No moisture is visible on either the inside or the outside of the box.

2.4.2.3 RTW Silicone Adhesive, or equivalent, has been applied in a continuous bead (1/4 inch minimum) between lid and box.

2.4.2.4 Box is banded vertically with three 1-1/4 inch metal bands, one band on each end of the box and one in the middle of the box.

2.4.2.5 Box lid shall be fastened using ten penny nails on 3 inch centers and two sixteen penny galvanized nails on each side panel into two inch by four inch on top panel (8 places) providing proper closure.

2.4.2.6 Box does not exceed 5000 pounds gross weight and that it is marked in two inch (minimum) letters on each box.

2.4.2.7 Checks labels and markings against "Storage & Disposal Data Sheet" (Attachment D), "Tally Sheet" (Attachment E), and computer printout (Attachment F) "Circle Copy" for the particular shipment for weight and labels accuracy.

2.4.2.8 Notifies Waste Operations Supervisor of any nonconformance found and checks that they are corrected prior to loading.

2.4.2.9 Apply "NV-211 Packaging Certification Label" to each package upon satisfactory examination (Attachment G).

2.4.3 Examination of Metal Boxes Prior to Loading

Examines metal boxes at the loading area prior to loading on trailers for shipment to NTS. These boxes are to be examined 100% by Waste Certification Personnel. Results shall be documented on "Waste Shipment Final Authorization Checklist" (Attachment B).

2.4.3.1 Metal box must be a light color, usually white for Uranium contaminated rubble, gray for Thorium contaminated rubble.

2.4.3.2 Containers must be clean.

2.4.3.3 Each container shall be well constructed of steel with all seams adequately welded.

2.4.3.4 The containers shall be free of holes, severe gouges, and significant deformations causing structural weakness or improper sealing.

2.4.3.5 The containers shall be free of rust causing exfoliation (scale), severe pitting, or other conditions having a detrimental effect on the serviceability of the waste container.

2.4.3.6 For all box designs having drain plugs, verify that box has been checked for a drain plug, and if found the drain plug has been tightened.

a. A red dot on the lower left hand front of the box shall indicate that the plug has been tightened.
b. A black dot on the lower left hand front of the box shall indicate that there is no drain plug.
c. All metal boxes shall have either a red or black dot marked.

2.4.3.7 Examines container for proper closure as follows :

a. Verifies that Radioactive material markings (2 sides) and FMPC container number markings are present and legible. Shipment number, log number and container identification number shall be clearly marked in one inch (minimum) letters using black waterproof ink.

b. Verify that all unnecessary marking have been removed or covered.
c. Verify that gross weight does not exceed 6,000 pounds and that it is marked in two inch (minimum) letters on each box.
d. Verify that a foam rubber or similar type gasket is on the sealing surface of the lid, or the lid is sealed with a durable sealant.
e. Verifies that lid is properly placed on the box.
f. Verifies locking pins required for the container are in place with the locking notches below the straps and fully engaged to full thickness of strap over entire locked surface edge of notch.
g. If the bolt type utilizes a bolted retainer ring, verify all bolts are securely in place.
h. Verifies the lid is secured with two 1-1/4" steel straps.

2.4.3.8 Checks labels and markings against "Storage & Disposal Data Sheet" (Attachment D), "Tally Sheet" (Attachment E), and computer printout (Attachment F) "Circle Copy" for the particular shipment for weight and labels accuracy.

2.4.3.9 Checks exterior of container for exposed bare metal requiring touch-up painting.

2.4.3.10 Notifies Waste Operations Supervisor of any nonconformance found and checks that they are corrected prior to loading.

2.4.3.11 Applies "NV-211 Packaging Certification Label" to each package upon satisfactory examination (Attachment G).

2.4.4 <u>Examination of Sea/Land Cargo Containers Prior to Loading</u>

Examines sea/land containers at the loading area prior to loading on trailers for shipment to NTS. These containers are to be examined 100% by Waste Certification Personnel. Results shall be documented on "Ready to Ship" Checklist (Attachment H).

2.4.4.1 Each container shall be well constructed of steel with all seams adequately welded.

2.4.4.2 The containers shall be free of holes, severe gouges, and significant deformations causing structural weakness or improper sealing.

2.4.4.3 The containers shall be free of rust causing exfoliation (scale), severe pitting, or other conditions having a detrimental effect on the serviceability of the waste container.

2.4.4.4 Verifies that the exterior of the sea/land is in good condition.

a. Verifies that all unnecessary markings have been removed or covered.

b. Verifies that caulking is around all doors and around all sealing surfaces, and that the metal doors are securely closed, and two metal bands secure the two door latches together.

c. Verifies gross weight of sea/land and that it is marked in two inch (minimum) letters on each sea/land.

d. Verifies that Radioactive material markings (2 sides) and FMPC container number markings are present and legible. Shipment number, log number and container identification number shall be clearly marked in one inch (minimum) letters using black waterproof ink.

e. If Sea/Land container is top loading, verifies that a foam rubber or similar type gasket is on the sealing surface of the lid, or the lid is sealed with a durable sealant.

f. Verifies that the sea/land container has been painted.

2.4.4.5 Checks labels and markings against "Storage & Disposal Data Sheet" (Attachment D), "Tally Sheet" (Attachment E), and computer printout (Attachment F) "Circle Copy" for the particular shipment for weight and labels accuracy.

2.4.4.6 Apply "NV-211 Packaging Certification Label" to each package upon satisfactory examination. (Attachment G)

2.4.5 <u>Examination of Bales Prior to Loading</u>

Examines bales at the loading area prior to loading on trailers for shipment to NTS. Bales are to be examined 100% by Waste Certification Personnel. Results shall be documented on "Waste Shipment Final Authorization Checklist" (Attachment B).

2.4.5.1 Verifies that each bundle of trash is properly constructed:

a. Consists of two bales of trash covered with Flex-Iron Bulk Bags or equivalent.

b. Each bag covered bale is mounted on a wood pallet.

c. Two of these subparts are stacked one on top of each other and a third wood pallet is positioned on top.

d. Two 1-1/4 inch straps of banding are wrapped around to secure the bundle and tightened with banding clips.

e. Cardboard strips are positioned to keep the metal banding strips from cutting into the bales.

f. Checks baled trash package for holes, tears, water leaks, and defects.

2.4.5.2 Verifies the top wood pallet is labeled with the shipment number and bundle number in one inch letters.

2.4.5.3 Verifies that markings are legible and waterproof ink has been used.

2.4.5.4 Verifies that the gross weight is marked on the top wood pallet

2.4.5.5 Checks labels and markings against "Storage & Disposal Data Sheet" (Attachment D), "Tally Sheet" (Attachment E), and computer printout (Attachment F) "Circle Copy" for the particular shipment for weight and labels accuracy.

2.4.5.6 Notifies Waste Operations Supervisor of any nonconformance found and Checks that they are corrected prior to loading.

2.4.5.7 Applies "NV-211 Packaging Certification Label" to each package upon satisfactory examination (Attachment G).

2.5 Examination of Package Markings and Labels

Immediately prior to transport loading, Waste Certification Personnel verify that the required markings and labels are applied to containers and grouped together. Marking and labeling in accordance with Title 49 CFR 172 Subparts D & E, is required as follows:

a. Each acceptable package shall have a "Radioactive LSA" label as required, form FMPC-T-1623 (Attachment I), if the surface dose rate exceeds 0.5 mR/hr. or the U-235 content exceeds 15 grams.
b. Each acceptable package shall have a "RADIOACTIVE-LIMITED QUANTITY" Label, FMPC-REST-1623-1 (Attachment I) if the surface does rate is equal to or less than 0.5 mR/hr. and the U-235 content is less than or equal to 15 grams.
c. Each package which contains 0.1 Curries or greater of Uranium must be labeled "RQ" in conjunction with the requirements of sections 2.5.a. and 2.5.b. (Attachment I).
d. Each acceptable package will have the letters "WML" and the shipment number on the package exterior. This may be either stenciling in one inch block or legible letters using black waterproof ink on bar code label.
e. Each acceptable package shall have a separate package number on the exterior. This may be either stenciling in one inch block or legible letters using black waterproof ink on bar code label.
f. Each acceptable package shall have the gross weight marked on the exterior. This may be either stenciling in two inch block or legible letters on bar code label.
g. Each package certified as acceptable for NTS disposal shall have a required "NV-211 Packaging Certification Label," FMPC-Q&S-234 or FMPC-Q&S-234-1 (Attachment G), affixed after examination of the package and shortly before or during loading. The label shall be displayed on the side of the package in a group pattern with other labels and markings.

2.6 Documentation of Examination and Deviations

Immediately prior to transport loading, Waste Certification Personnel assure that all examinations are properly documented on the applicable checklist, as required; assures that nonconforming conditions are documented and processed as follows:

2.6.1 Any deviations observed should be documented on the appropriate checklist.

2.6.2 Any waste package rejected due to non-acceptable or non-authorized contents or physical damage to the containers shall have a nonconformance tag attached to it as identification (See FMPC-706). Deviations shall be corrected prior to affixing "NV-211 Packaging Certification Label." Uncorrectable deviations or lack of prompt or appropriate action, or chronic and/or systematic errors must be documented on a Deviation or Corrective Action Report in accordance with FMPC-706.

2.6.3 Any waste packages rejected due to improper labeling or identification shall be corrected prior to affixing a "NV-211 Packaging Certification Label." If no acceptable solution can be defined, a nonconformance tag shall be attached and a Deviation Report shall be issued in accordance with FMPC-706.

2.6.4 Forwards appropriate forms and documentation to Certification Official for review, approval, and certification.

NOTE: Disposal of any rejected containers, lids, bolt rings, or lever rings shall be the responsibility of Waste Operations or the generator of the package.

2.7 Preliminary Certification

Waste Certification Personnel examine the transport trailer prior to loading and completes the appropriate checklist.

2.7.1 Examines the transport trailer/vehicle as follows:

2.7.1.1 Verifies that the RS Technician has surveyed each trailer/vehicle prior to loading and has recorded results on the "Vehicle Radiation Monitoring Report," form FMPC-ES&H-1596-1 (Attachment J), to ensure that radiation and contamination levels do not exceed the requirements listed in 49 CFR 173.441.

2.7.1.2 Determines the condition of the trailer/vehicle by examining the trailer/vehicle floor, interior, roof, roof interior, rear door, rear door gasket, and tires. Any of the following conditions shall be brought to the attention of the Traffic Manager:

a. holes or "soft" areas in floor or roof which would allow possible leakage and/or jeopardize the structural integrity of the trailer/vehicle
b. liquid or oily substances on interior surfaces
c. non-securing or poor sealing rear doors
d. tires
   1. insufficient tread (2/32" min. trailer, 4/32" min. tractor)
   2. separation of tread
   3. punctures
   4. bulges
   5. underinflated (use manufacturer's recommended pressure, cold)
   6. flats

2.7.1.3 Examines the lining of trailer/vehicle for compacted baled trash and verifies that the floor and approximately three (3) feet up the side and rear walls are covered with plastic sheet, and that the floor is covered with single-faced cardboard or approved equivalent.

2.7.1.4 Completes the "Waste Certification Preliminary Trailer Checklist" (Attachment K) or the "Waste Certification Preliminary Trailer Checklist (Sea/Lands)" (Attachment L).

2.8 Examination of Drums

Waste Certification Personnel examine drums at loading and verifies that drums have been properly stacked, loaded and tied down in accordance with SOP-TRF-46-C-110 and that the following requirements have been met:

2.8.1 Drummed materials requiring proper weight distribution have been placed into the vehicle split into two groups:

a. the front unit is encircled with 1-1/4" steel strapping, connected with two clips, double-crimped, and 2 x 4 wood shoring nailed to the floor behind the unit.
b. the rear unit is placed so as the proper weight distribution is maintained and a wood picket brace is constructed at the front of the group. Drums behind the picket brace are encircled with 1-1/4" steel strapping connected with two clips, double-crimped, and providing no metal plate is directly behind the group, 2 x 4 wood shoring is nailed to the floor behind the group.

2.8.2 Double-decked drummed material has been loaded in a similar manner as paragraph 2.8.1, except for the following:

a. the floor is loaded solid,
b. a piece of plywood has been placed on the top of the first deck and the second deck of drums has been loaded from the front to the rear. Both rows of drums have been encircled with 1-1/4" steel strapping, with two clips, double-crimped,
c. two-by-four wood shoring has been nailed to the floor behind the first deck of drums, if no metal plate is directly behind the drums.

2.9 Examination of Metal Boxes

Waste Certification Personnel examine metal boxes at trailer loading and verifies they are not damaged, that metal boxes have been loaded and tied down in accordance with SOP-TRF-46-C-110 and that the following requirements have been met:

2.9.1 Metal Boxes have been placed into the vehicle correctly for proper weight distribution. Normally, these shipments contain either seven (7) to ten (10) containers. With seven (7) containers a split of three (3) in the front unit and four (4) in the rear unit is required. Ten (10) containers are to be loaded straight down the center of the vehicle floor. When the number of containers making up the shipment are not seven (7) or ten (10), they are to be loaded them in the same manner as for seven (7).

2.9.2 Front Unit (2-5 boxes) were shored using two sets of brakeman plates nailed to the floor of the vehicle (prior to loading) with 1-1/4" steel strapping threaded through each plate. Two of these units are used to encircle each load unit (2 bands) and shall be tightened and fastened with two clips, double-crimped. The bands have plastic protectors on the edges of the first and last container to keep the bands from breaking.

2.9.3 Rear Unit (2-5 boxes) has been shored using 2" X 4" brace in front of the containers. Use same method of steel banding as on the front unit.

2.9.4 The shoring of ten (10) metal boxes has been accomplished using the same steel banding method as used for seven (7). The first five (5) have been banded as one unit, and the last five (5) as one unit.

2.10 Examination of Wooden Boxes

Waste Certification Personnel examine wooden boxes at loading and verifies they are not damaged and that wooden boxes are properly stacked, loaded and tied down in accordance with SOP-TRF-46-C-110 and that the following requirements have been met:

2.10.1 Wooden boxes have been placed into the vehicle for proper weight distribution. Normally, these shipments consist of sufficient numbers to require partial double-decking. When double-decking is required the double stacks shall be banded together prior to loading.

2.10.2 Two sets of brakeman plates have been nailed to the floor (set on top of the plastic and cardboard) in the front and rear section of the vehicle with 1-1/4" steel strapping threaded through each plate.

2.10.3 Boxes are loaded straight down the center of the vehicle floor.

2.10.4 Two (2) bands have been used to encircle the first six (6) boxes as one unit and the last five (5) as one unit.

2.11 Examination of Compacted Baled Trash

2.11.1 Waste Certification Personnel examine compacted baled trash at loading and verifies that compacted baled trash has been properly stacked, loaded and tied down in accordance with SOP-TRF-46-C-110 and that the following requirements have been met:

2.11.1.1 Compacted bales of trash placed for proper weight distribution have been double stacked and loaded straight down the center of the vehicle floor. Normally, these shipments consist of twenty-two (22) bales (11 packages) of compacted trash.

2.11.1.2 Two sets of brakeman plates have been nailed to the floor (set on top of the plastic and cardboard) in the front and rear section of the vehicles with 1-1/4" steel strapping threaded through each plate. Six side cleats with 1-1/4" steel strapping have been nailed to the floor on both sides of the vehicle for cross banding of the bales.

2.11.1.3 After the first five double stacks of bales have been loaded, the front unit has been encircled with steel strapping and the bands tightened and fastened with two clips, double-crimped.

2.11.1.4 Cross bands have been placed over stack numbers one, three, and five. Single-faced cardboard has been folded for a minimum of 4-ply protection and placed under the bands of the top bales plastic enclosure. The bands have been tightened and fastened with two clips double-crimped.

2.11.1.5 The rear section has been banded in the same manner as the front section except that cross bands have been placed over bale numbers seven, nine and ten.

2.12 Examination of Sea/Land Cargo Containers

Waste Certification Personnel examine Sea/Land container at loading, checks the maximum gross weight on container with actual gross weight, and verifies that container has been loaded and tied down in accordance with SOP-TRF-46-C-110 and that the following requirements have been met:

2.12.1 Sea/Land containers have been placed onto a flat bed truck for proper axle-weight distribution. For a shipment consisting of one container, the doors of the container shall be facing the rear of the truck. For a shipment consisting of two containers the doors of the front unit shall be facing to the rear and the rear unit shall be facing the front of the truck.

2.12.2 If the container or shipment exceeds 42,000 gross pounds, a waiver must be approved by the Manager, Transportation Regulatory Compliance and Certification Official as to whether or not it may be shipped. A copy of the appropriate letter will be attached to the "Ready to Ship" Checklist when it is prepared during the check of incoming paperwork.

2.12.3 Containers have been secured to the flatbed truck with four (4) nylon straps over each unit secured to the frame of the trailer, chains have been placed and secured in front of and behind the bottom of each container fastened to the trailer bed, and a 2 x 4 has been nailed to the trailer floor at the rear of each unit.

2.13 General Examination Activities After Loading

Waste Certification Personnel shall conduct the following activities after the trailer has been loaded:

NOTE: Two (2) photographs of the packages shall be taken prior to closing the doors of the trailer. Photos are also required of flat bed loads. Include information on shots to be taken.

2.13.1 Verifies that the trailer is locked or a numbered tamper-indicating seal is applied to the rear door locking mechanism whenever the trailer is unattended overnight or for any other extended period. If a seal or lock is not used prior to resumption of loading or closure of the van, an examination shall be made to verify that the packages previously loaded were not disturbed and no unauthorized packages or materials were placed in the shipment.

2.13.2 Completes the examination of the loaded trailers for NTS shipments and completes the "Waste Shipment Final Authorization Checklist" (Attachment B).

2.13.3 Reports, by copy of the appropriate checklist, any deficiencies to the Transportation Supervisor for correction. Checklists which include deficiencies are recorded and tracked on a deficiency log. Documents any repetitive or uncorrected deficiencies in accordance with FMPC-706.

2.13.4 Forwards all completed documentation to the the individual who will be making the final inspection at Traffic prior to release of the trailer.

2.14 Final Trailer/Vehicle Examination

Waste Certification Personnel conduct a final examination of the vehicle/trailer after closure as follows:

2.14.1 Verifies that the shipment, associated paperwork and transport vehicle is acceptable for release.

2.14.2 Verifies that RS Technician has surveyed the trailer/vehicle and recorded the results on the "Vehicle Radiation Monitoring Report," form FMPC-ES&H-1596-1 (Attachment J), and that these results are within specification.

2.14.3 Compares the "Storage & Disposal Data Sheet" (Attachment D) with the "Bill of Lading" (Attachment M) to verify that the following information is correct:

a. Number and type of containers
b. Total curie content
c. Shipment gross and net weight
d. Shipment number

2.14.4 Verifies that an envelope containing copies of the "Tally Sheet," "Storage & Disposal Data Sheet" (refer to EQP-12.03), and LSA/RQ, LQ (Limited Quantity) documentation of the shipment is fastened to the rear container when possible or stapled to the trailer wall inside of the trailer doors for NTS use upon opening the trailer at the destination. If the shipment is not in a closed van, verifies that the "Tally Sheet" and "Storage & Disposal Data Sheet" are in the envelope which is to be delivered by the driver.

2.14.5 Verifies the presence of "Radioactive" placard on both sides, front and rear of vehicle/trailer.

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NOTE: A shipment containing limited quantity packages exclusively does not require these placards.

2.14.6 Verifies that the following are operational on the vehicle/trailer. Completes the "Waste Certification Final Trailer/Vehicle Checklist" (Attachment N).

a. Headlights
b. Turn signals
c. Brake lights
d. Horn
e. Tire condition, per section 2.7.1.2 of this procedure

2.14.7 Compares the "Bill of Lading" (Attachment M) and the "Shipping Order for Nuclear Material," form FMPC-CONT-558 (Attachment O), to verify the following:

a. Trailer Number
b. Shipment Number
c. Gross Wt. and Net Wt.
d. Bill of Lading Number
e. Shipping Order Number
f. Seal Number
g. Lot Number
h. Container Number (for Sea/Land containers)

2.14.8 Verifies that a seal has been placed on the trailer and that the trailer number and the seal number match the seal number recorded on the "Bill of Lading" (Attachment M), and reviews the "LLW Shipment Checklist" (Attachment Q), and the "Off-Site Loading Tie-Down Inspection-Vehicle Inspection" Form (Attachment S).

2.14.9 Completes the "Waste Certification Final Trailer/Vehicle Checklist" (Attachment N), and "Waste Certification Traffic Shipment Documentation Checklist" (Attachment P).

2.14.10 Verifies that the gross weight on all documentation is within 100 lbs. of actual.

2.14.11 When instructed, completes the "Waste Shipment Verification Checklist" (Attachment T), for the Certification Official by verifying the following information:

a. Radiation Monitoring Sheets
b. Off-Site Tie Down Inspection/Vehicle Inspection Form
c. Weight Ticket
d. Shipping Order
e. Bill of Lading
f. Disposal/Storage Sheet
g. Tally Sheet
h. Radiological Survey Report
i. LLW Shipment Checklist

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j. Sea/Land Container "Ready to Ship" (If applicable)
k. Waste Certification Preliminary Trailer Checklist
l. Waste Certification Traffic Shipment Documentation Checklist
m. Waste Certification Final Trailer/Vehicle Checklist
n. Item Production/Certification/Identification Card

2.14.12 Reports all deficiencies on the appropriate checklist. Repetitive or uncorrected deficiencies are documented in accordance with FMPC-706.

NOTE: Uncorrected deviations must be resolved before Quality Department can provide a release of the shipment.

2.14.13 Notifies the Certification Official that shipment paperwork is complete and available for final review.

2.14.14 Forwards completed documentation to Waste Certification Manager who reviews and maintains documents in accordance with WMCO-QAP-9.01.

3.0 REFERENCES

3.1 NVO-325, Nevada Test Site Defense Waste Acceptance Criteria, Certification and Transfer Requirements
3.2 FMPC-503, FMPC Spill Incident Reporting and Cleanup
3.3 FMPC-704, Minor Event Reporting System
3.4 EQP-1.05, Abbreviations, Acronyms, and Definitions
3.5 EQP-6.04, Qualification of Waste Package Certifiers
3.6 EQP-6.05, Qualification of Waste Certification Officials
3.7 FMPC-706, Deviation and Corrective Action Reporting
3.8 EQP-9.01, Designation, Preparation, Storage and Maintenance of Quality Documents
3.9 EQP-12.03, Certification of Waste Package Examination and Sealing for Off-Site Shipment
3.10 SOP-TRF-46-C-110, Preparation and Shipment of Radioactive Material (Low-Level Waste)
3.11 SOP 20-C-601, Packaging Low Level Radioactive Waste (L-LRW) for Offsite Disposal
3.12 SOP 1-C-602, Low Level Radioactive Waste (L-LRW) Shipment Preparations

4.0 ATTACHMENTS

4.1 Attachment A, Prohibited Materials List
4.2 Attachment B, Waste Shipment Final Authorization Checklist
4.3 Attachment C, Bolt Diagram
4.4 Attachment D, Storage & Disposal Data Sheet
4.5 Attachment E, Tally Sheet
4.6 Attachment F, Computer Printout - "Circle Copy"
4.7 Attachment G, NV-211 Packaging Certification Labels

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4.8	Attachment H,	"Ready to Ship" Checklist (for Sea/Lands)
4.9	Attachment I,	Radioactive-LSA, Radioactive-Limited Quantity, & "RQ" Labels
4.10	Attachment J,	Vehicle Radiation Monitoring Report
4.11	Attachment K,	Waste Certification Preliminary Trailer Checklist
4.12	Attachment L,	Waste Certification Preliminary Trailer Checklist Sea/Lands)
4.13	Attachment M,	Bill of Lading
4.14	Attachment N,	Waste Certification Final Trailer/Vehicle Checklist
4.15	Attachment O,	Shipping Order for Nuclear Material
4.16	Attachment P,	Waste Certification Traffic Shipment Documentation Checklist
4.17	Attachment Q,	LLW Shipment Checklist
4.18	Attachment S,	Off-Site Loading Tie-Down Inspection-Vehicle Inspection Form
4.19	Attachment T,	Waste Shipment Verification Checklist

PROHIBITED MATERIALS LIST

Nonradioactive Material

Pressurized Vessels

Explosives

Radioactive Gases

High-Level Waste

Pyrophoric Materials

Toxic or Poisonous Materials

Liquid Materials

Flammable Substances

Alkaline Metals

Reactive Materials (could cause fire)

Liquid Organic Waste or Waste that contains any Free Liquid

Ashes, Dry Powders or Respirable Fines (unless immobilized or a double containment package is used)

If the Waste is Ionized or Immobilized the pH must be greater than 4

WASTE SHIPMENT FINAL AUTHORIZATION CHECKLIST

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WASTE SHIPMENT FINAL AUTHORIZATION CHECKLIST

SHIPMENT NUMBER: WML-_____

WASTE DESCRIPTION: _____

Waste Package Description:

Package Type _____

Number of Packages _____ Verified by (Initials) _____

VERIFICATION CRITERIA PER QAP 12.09

Verify the following:

1. Information on packages matches REECO Radioactive Waste Management - Storage & Disposal Sheet (Circle Copy) and no inappropriate information present on packages. _____
2. No unauthorized materials loaded. _____
3. No free liquids on or emitting from packages. _____
4. No significant package defects such as dents, rust, holes, cracks, or tears (baled trash). _____
5. Proper closure of container lid. _____
6. Packages are free of adhering or entrapped soil, debris, etc. _____

Verify the following where applicable:

Drums: Presence of safety wire on bolts. _____

Locking nut tightened (red paint on bolt). _____

Lid and ring are seated properly. _____

Wood boxes: Lid nailed and secure, adequate caulking, and three 1 1/4" metal bands present (one on each end and one in middle) and secure. _____

Holes drilled in false bottom, runners secure and no severly bowed sides or liquid seepage. _____

Metal boxes: Required number of wedge type locking pins are fully engaged catching lower edge of locking strap and are at least even with locking strap. _____

Two 1 1/4" metal bands are banded tightly with two banding clips on each band equidistant from center around package. _____

Presence of a red dot (drain plug exists) or a black dot (no drain plug). _____

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WASTE SHIPMENT FINAL AUTHORIZATION CHECKLIST
(continued)

Existance of gasket around lid when possible. _____

Open holes in runners. _____

Baled trash: Two 1 1/4" metal bands and two banding clips on each band strapped evenly and tightly completely around the outside of the closed sides of the top and bottom pallets. _____

Corrugated cardboard present on top of bale and under banding in area of band/pallet contact. _____

Shipment information located on the top pallet of each bundle. _____

Verify shipment number, FMPC, and package number are stenciled in 1-inch block letters located on top center and on the side of all packages except for baled trash (sides only). _____

LOADING INFORMATION

Verify presence of the following labels:
DOT Radiation Labels, Radioactive LSA and LQ/RQ as applicable. _____

Package containing asbestos require asbestos label, ORM-C. RQ should be stenciled next to ORM-C only when quantity of asbestos meets EPA and 49 CFR reportable quantity limits. _____

NV-211 label dated and signed by an authorized package certifier. _____

Verify the loading of the shipment concurs with the criteria established in SOP TFR-46-C-110, Section 6.1. _____

Shipment Number Loaded:_____ Time:_____ Date:_____

Trailer Number:_____ Seal Number:_____

I hereby certify that the above checklist has been completed and witness that the above items are correct to the best of my knowledge.

Signed:_____ Date:_____
QA Waste Packaging

Comments:_____

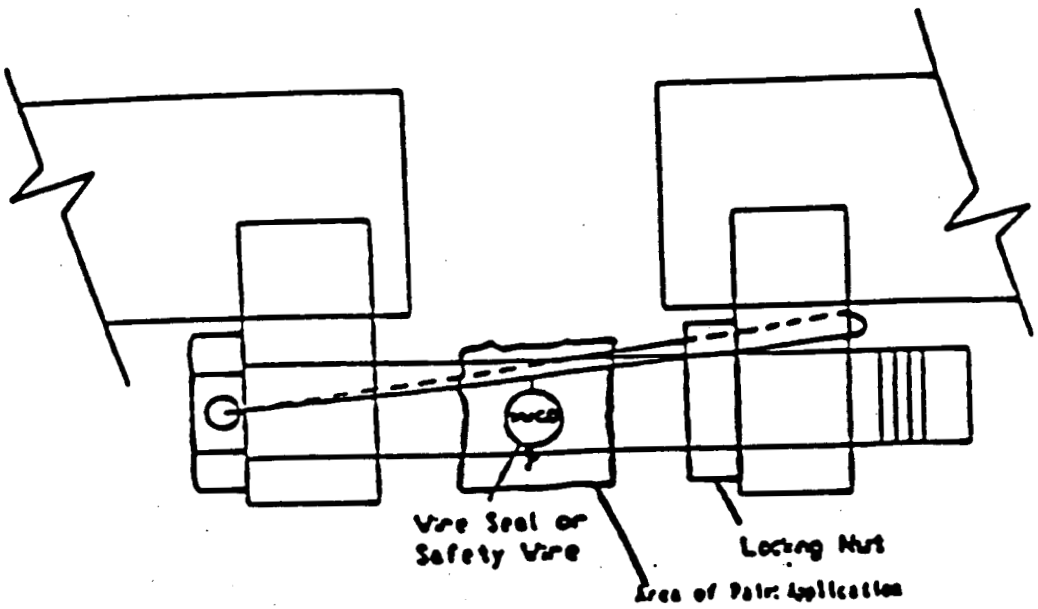
_____

Signed:_____ Date:_____
Waste Operations Supervisor

Copies to :Waste Certification Files
Waste Operations (original)

QAC-881115-1, Rev. 1 (03/01/90)

BOLT DIAGRAM



Attachment D
Page 1 of 1

STORAGE & DISPOSAL DATA SHEET

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WL-90 091

02/27/90
14:50:10

Reynolds Electrical and Engineering Co., Inc.
Radioactive Waste Management-Storage & Disposal

DESCRIPTION: Construction Rubble
Maintenance Rubble

Prepared by: [signature]
Date: 2/27/90 Area Code Phone: FTS 776-8647

Approved: Responsible Personnel
[signature]
Date: 2-27-90 Area Code Phone: FTS 776-8647

SECTION 1

CARD	SHIPMENT NUMBER	O	C	D	S	O	FY	YR	S	NUCLIDE CATEGORY	CURIE QUANTITY	C	GROSS VOLUME	F	GROSS WT(lbs)	P	OVERPACKS
	2 9	10	11	12	13	14	15	16	17	25 26 34		35	36 44	45	46 54	55	0 BOXES 10 DRUMS 0 OTHER 0
2	WL90091	O	N	L	O	8	9	0	2	2	2.795E-04		1.020E+03		2.461E+04		
											0.0002794		1020.00		24605.0		

SECTION 2

CARD	NUCLIDE DESCRIPTION	QUANTITY	C	S	COMMENTS
	2 15	16 24	25	26 27	
3	U-238	2.707E-04	C	1	810 GRAMS
3	U-235	8.754E-06	C	2	4 GRAMS

SECTION 3

CARD	WASTE CODE	VOLUME CU.FT.	% COMB.	WEIGHT LBS.	S	COMMENTS
	23	4 12	13 14	16 17 25	26 27	28
3	00	8.160E+02	F	0 1.804E+04	P	1 835
3	00	2.040E+02	F	0 6.570E+03	P	2 841

SECTION 5

CARD	CONT NUMBER	ASSAY DATE	CLASS CODE	CONT/AT CODE	GROSS WEIGHT LBS	GROSS VOLUME CU.FT.	RADIATION AT SURF mrem/hr	RADIATION AT 3 FT mrem/hr	PRIMARY ELEMENT & ISOTOPIC	PRIMARY CURIE QUANTITY	SECONDARY ELEMENT & ISOTOPIC	SECONDARY CURIE QUANTITY	PRIMARY ISOTOPE WEIGHT GRAMS	SECONDARY ISOTOPE WEIGHT GRAMS
6/7	1	05/09/89	2122	8352122	1674.0	102.00	0.30	0.30	U-238	1.5039E-05	U-235	4.8630E-07	45	0.2
6/7	2	05/09/89	2122	8352122	1875.0	102.00	0.30	0.30	U-238	1.5039E-05	U-235	4.8630E-07	45	0.2
6/7	3	05/09/89	2122	8352122	1674.0	102.00	0.30	0.30	U-238	1.5039E-05	U-235	4.8630E-07	45	0.2
6/7	4	05/09/89	2122	8412122	2930.0	102.00	0.30	0.30	U-238	3.0079E-05	U-235	9.7270E-07	90	0.5
6/7	5	05/09/89	2122	8352122	4293.0	102.00	0.30	0.30	U-238	6.0158E-05	U-235	1.9454E-06	180	0.9
6/7	6	05/09/89	2122	8352122	1537.0	102.00	0.30	0.30	U-238	1.5039E-05	U-235	4.8630E-07	45	0.2
6/7	7	05/09/89	2122	8352122	2923.0	102.00	0.30	0.30	U-238	3.0079E-05	U-235	9.7270E-07	90	0.5
6/7	8	05/09/89	2122	8412122	3640.0	102.00	0.30	0.30	U-238	4.5118E-05	U-235	1.4590E-06	135	0.7
6/7	9	05/09/89	2122	8352122	1300.0	102.00	0.30	0.30	U-238	1.5039E-05	U-235	4.8630E-07	45	0.2
6/7	10	05/09/89	2122	8352122	2759.0	102.00	0.30	0.30	U-238	3.0079E-05	U-235	9.7270E-07	90	0.5

TALLY SHEET

4228

MAR:90 091

02/27/90
14:50:01

TO: Reynolds Electric and Engineering Co., Inc.
U.S. DOE, Nevada Test Site, Zone 2
Mercury, NV 89023
Attention: G. Kendall

NEVADA TEST SITE SHIPMENT
TALLY SHEET
LOT NUMBER W050-100-P003-9023
LOT NUMBER W050-100-P003-A334

FROM: Westinghouse Materials Company of Ohio
P. O. Box 398704
Cincinnati, OH 45239

LOT NUMBER	CONT. NO.	GROSS WT. (POUNDS)	TARE WT. (POUNDS)	NET WT. (POUNDS)	U ASSAY	PERCENT U-235	PERCENT U-238	U POUNDS	ELEMENT WT(gms)	U-235 ISOTOPE WT(gms)	U-238 ISOTOPE WT(gms)	U-235 Ci	U-238 Ci	VOLUME CU FT
A334	1	1674.0	630.0	1044.0	0.010	0.500	99.48	0.1	45	0.2	45	4.8430E-07	1.5039E-05	102.00
A334	2	1875.0	630.0	1245.0	0.010	0.500	99.48	0.1	45	0.2	45	4.8430E-07	1.5039E-05	102.00
A334	3	1674.0	630.0	1044.0	0.010	0.500	99.48	0.1	45	0.2	45	4.8430E-07	1.5039E-05	102.00
9023	4	2930.0	630.0	2300.0	0.010	0.500	99.48	0.2	91	0.5	90	9.7270E-07	3.0079E-05	102.00
A334	5	4293.0	630.0	3663.0	0.010	0.500	99.48	0.4	181	0.9	180	1.9434E-06	6.0158E-05	102.00
A334	6	1537.0	630.0	907.0	0.010	0.500	99.48	0.1	45	0.2	45	4.8430E-07	1.5039E-05	102.00
A334	7	2923.0	630.0	2293.0	0.010	0.500	99.48	0.2	91	0.5	90	9.7270E-07	3.0079E-05	102.00
9023	8	3648.0	630.0	3018.0	0.010	0.500	99.48	0.3	136	0.7	135	1.4590E-06	4.5118E-05	102.00
A334	9	1300.0	630.0	670.0	0.010	0.500	99.48	0.1	45	0.2	45	4.8430E-07	1.5039E-05	102.00
A334	10	2759.0	630.0	2129.0	0.010	0.500	99.48	0.2	91	0.5	90	9.7270E-07	3.0079E-05	102.00
TOTALS		24605.0	6300.0	18305.0				1.8	815	4.1	810	8.7348E-06	2.7071E-04	1020.00
					--- LOT TOTALS ---									
9023	2	6570.0	1260.0	5310.0				0.5	227	1.1	226	2.4317E-06	7.5197E-05	204.00
A334	8	18035.0	5040.0	12995.0				1.3	588	2.9	587	6.3222E-06	1.9557E-04	816.00

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COMPUTER PRINTOUT - "CIRCLE COPY"

WML-90 091

Reynolds Electrical and Engineering Co., Inc.
Radioactive Waste Management-Storage & Disposal

PACKAGE NO.	NET WT	TARE WT	GROSS WT	LSA	LQ	RQ
1	1044.00	630.00	1674.00	X		
2	1245.00	630.00	1875.00	X		
3	1044.00	630.00	1674.00	X		
4	2300.00	630.00	2930.00	X		
5	3663.00	630.00	4293.00	X		
6	907.00	630.00	1537.00	X		
7	2293.00	630.00	2923.00	X		
8	3010.00	630.00	3640.00	X		
9	670.00	630.00	1300.00	X		
10	2129.00	630.00	2759.00	X		

NV-211 PACKAGING CERTIFICATION LABELS

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NV-211 **PACKAGING CERTIFICATION**

This certifies that this container and its contents are in acceptable condition for transportation and waste disposal according to DOT (49 CFR), EPA (40 CFR), and DOE/NV (NVO-325) requirements.

DATE: _____

CERTIFIED BY: _____

TITLE: CERTIFICATION OFFICIAL

ORGANIZATION: FMPC

FMPC-O&S-234 (REV. 9/7/89)

NV-211 **PACKAGING CERTIFICATION**

This certifies that this container and its contents are in acceptable condition for transportation and waste disposal according to DOT (49 CFR), EPA (40 CFR), and DOE/NV (NVO-325) requirements.

DATE: _____

CERTIFIED BY: _____

TITLE: PACKAGE CERTIFIER

ORGANIZATION: FMPC

FMPC-O&S-234-1 (REV. 9/7/89)

Attachment H
Page 1 of 1

"READY TO SHIP" CHECKLIST (FOR SEA/LANDS)

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WASTE CERTIFICATION CHECKLIST
SEA LAND CONTAINER
"READY TO SHIP"

INFORMATION (Waste Operations)

DATE: _____ SHIPMENT NUMBER: _____

MTL. TYPE: _____ BOX ___ S/N: _____

MTL. TYPE: _____ ___ _____

LOCATION : _____ WEIGHTS: Gross _____ BOX 1 _____ BOX 2

_____ Tare _____ _____

_____ Net _____ _____

EXAMINATION CRITERIA (Waste Certification)

Initials

Trailer No.: _____

0. Verify "Item Production/Certification/Identification" XX card is completed accurately. Form Number FMPC-ES&H-1945-XX. _____
1. Radioactive material markings present. (2 sides) _____
2. Container Number-FMPC marking present. _____
3. All unnecessary markings have been removed or covered. _____
4. Marking is complete as follows:
   Proper shipping label(s) identified (LSA, RQ, LQ) _____
   Gross weight identified _____
5. Marked weight values match above values. _____
6. The box door has been sealed by caulking and a metal band is attached to both door latches. _____
7. Seal number _____ affixed to container. _____

PLACE NV-211 ON DOOR OF CONTAINER WHEN ABOVE CRITERIA IS SATISFACTORILY MET.

CERTIFICATION (Waste Certification)

I hereby certify the above items have been examined and the above items are correct to the best of my knowledge.

Signed: _____
(Waste Certification)

Date: _____

DAC-880930-1, Rev. 2 (08/15/89)

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RADIOACTIVE-LSA, RADIOACTIVE-LIMITED QUANTITY, & "RQ" LABELS

Radioactive-LSA

RADIOACTIVE-LIMITED QUANTITY

UN-2910

FROM: FMPC

This package conforms to the conditions and limitations specified in 49 CFR 173.421 for excepted radioactive material, limited quantity, n.o.s., UN-2910.

FMPC-REST-1623-1 (REV. 10/23/89)

RQ

Attachment J
Page 1 of 1

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VEHICLE RADIATION MONITORING REPORT

FMPC
ENVIRONMENT SAFETY & HEALTH - ENVIRONMENTAL & RADIOLOGICAL MONITORING

VEHICLE RADIATION MONITORING REPORT

Date Monitored: _____ Monitored by: _____

Carrier Name: _____

Vehicle Type: Tractor-trailer ☐ Other motor vehicle ☐ Railcar ☐ Open flatbed ☐ Covered ☐

Other ☐ (explain) _____

License no., if motor vehicle: _____ State: _____

Trailer or railcar identification: _____

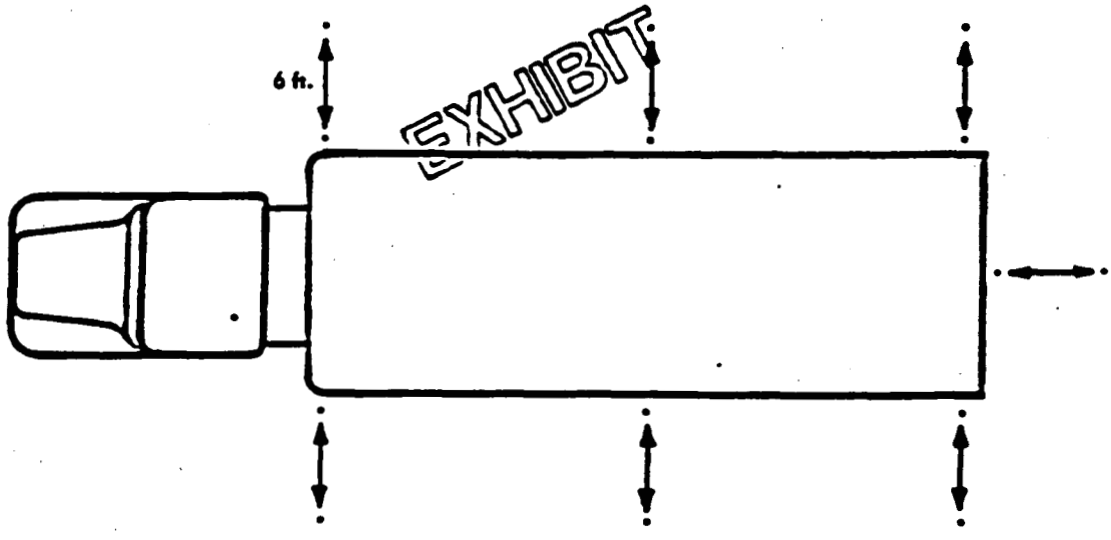
Is this an exclusive use vehicle? Yes ☐ No ☐

Vehicle Status: (a) Outgoing ☐ (b) Incoming ☐ (c) Outgoing empty, not "exclusive use" ☐ (d) Empty, before loading ☐

(e) Outgoing empty, "exclusive use" ☐ (f) If (e) is checked, is vehicle to remain "exclusive use"? Yes ☐ No ☐

Is visible contamination present? Yes ☐ No ☐ If "yes", show on diagram.

Dose rate shown by asterisks in mrem/hr. Surface alpha contamination, circled, in d/m/100cm².



(1) Same locations apply to van-type trucks. For railcars, disregard cab section but show dose rates found at each end.
(2) Measurements at 6-ft. not required if all readings at vehicle surface are not greater than 10 mrem/hr.

Survey Instruments Used

Alpha — Type or Model No. _____ Serial No. _____

Beta-gamma — Type or Model No. _____ Serial No. _____

Additional information attached? (E&RM copy only): Yes ☐ No ☐

NO.	DISTRIBUTION OF COPIES
1	Environmental & Radiological Monitoring record copy
1	Transportation Supervisor

FMPC-ESH 1390-1 REV 6/25/86

Attachment K
Page 1 of 1

WASTE CERTIFICATION PRELIMINARY CHECKLIST

4228

WASTE CERTIFICATION PRELIMINARY TRAILER CHECKLIST

TRAILER NUMBER: _____

1. Verify the RST has surveyed trailer prior to loading and recorded results on form ES&H-1596-1 to assure the trailer is not contaminated. _____

2. Verify the condition of trailer floor, interior, roof, sides, exterior, rear doors and tires are acceptable. Any discrepancies must be reported immediately to the Transportation Supervisor. _____

Comments: _____

_____

3. Verify the trailer has been lined properly according to SOP-TRF-46-C-110 prior to loading. _____

4. Visually verify that the packages have been properly tied-down according to SOP-TRF-46-C-110. _____

   Shipment Number: _____

5. Visually verify that the loaded trailer rear doors are secured with a tamper indicating seal. _____

   Seal Number: _____

I hereby certify that the above checklist item have been verified and that all the above items are correct to the best of my knowledge.

Signed : _____
(Certification Personnel)

Date : _____

Signed : _____
(Transportation Supervisor)

Date : _____

Attachment L
Page 1 of 1

WASTE CERTIFICATION PRELIMINARY CHECKLIST (SEA/LANDS)

4228

WASTE CERTIFICATION PRELIMINARY TRAILER CHECKLIST (SEALANDS)

Rev. 10/10/89

Trailer Number:_____ Shipment Number:_____

1. Verify the ERMT has surveyed trailer prior to loading and recorded results on form ES&H-1596-1 to assure the trailer is not contaminated . _____

2. Verify the trailer floor, exterior and tires are acceptable for loading . Any discrepancies must be reported immediately to the transportation supervisor . Any nonconfomances or outstanding DCAR must be resolved before shipment can be released . _____

Comments: _____

_____

3. Visually verify that the sealand containers have been properly tied down with, four straps on each container, chain and 2X4 on front and back of load . _____

4. Visually verify the sealand containers rear doors are secured with a tamper proof DOT approved seal . _____

Container #1:_____Seal number:_____Box #:_____
Container #2:_____Seal number:_____Box #:_____

I hereby certify that the above checklist has been completed and witness that all above information is correct to the best of my knowledge .

Signed :_____
(Certification Personnel)

Date :_____

Signed :_____
(Transportation Supervisor)

Date :_____

Attachment M
Page 1 of 1

BILL OF LADING 4228

STRAIGHT BILL OF LADING — SHORT FORM — ORIGINAL — NOT NEGOTIABLE

CARRIER	DATE	CARRIER'S I. D.	SHIPPER'S NO.

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading by the carrier of the property described in the Original Bill of Lading.

AT FERNALD, OHIO

FROM USDOE, c/o Westinghouse Materials Company of Ohio
ACTING UNDER DOE CONTRACT DE-AC05-86OR21600

The property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below, which said carrier (the word carrier being understood throughout this contract as meaning any person or corporation in possession of the property under the operation of this Bill of Lading) agrees to carry to its usual place of delivery at said destination, if on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Official, Southern, Western and Texas Freight Classifications in effect on the date hereof, if this is a rail or a rail-water shipment, or (2) in the applicable motor carrier classifications or tariffs if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back hereof, set forth in the classification or tariff which governs the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

(Mail or street address of consignee — For purposes of notification only.)

Consigned to: _____

Destination: _____ State of: _____ County of: _____

Route: _____

Delivering Carrier: _____ Vehicle No.: Trs. #

Car Initial: _____ Car No.: _____ Seal No.: FA/WMCO

NUMBER PACKAGES	HM	DESCRIPTION OF ARTICLES, SPECIAL MARKS, AND EXCEPTIONS	* WEIGHT (Subject to Correction)	CLASS OR RATE	CHECK COLUMN
		IN THE EVENT OF AN ACCIDENT OR EMERGENCY, NOTIFY THE DOE EMERGENCY OPERATIONS CENTER, OAK RIDGE, TN — 615-576-1005, COLLECT, DAY OR NIGHT.			

Subject to Section 7 of Conditions of applicable bill of lading, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement.
The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

WMCO
(Signature of consignor)

If charges are to be prepaid, write or stamp here, "To be Prepaid."

Received $ _____ to apply in prepayment of the charges on the property described hereon.

Agent or Cashier

Per _____
(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$ _____

* If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "carrier's or shipper's weight."
NOTE - Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.
The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding _____ per _____

+ THIS SHIPMENT IS CORRECTLY DESCRIBED.
CORRECT WEIGHT IS
_____ LBS
SUBJECT TO VERIFICATION BY THE E. W. & I. BUREAU
NATIONAL WT. AGREEMENT

* Shipper's imprint in lieu of stamp; not a part of bill of lading approved by Interstate Commerce Commission.

741 NO.: _____

SS - SO NO.: _____

MSO NO.: _____

EQUAL EMPLOYMENT OPPORTUNITY — The nondiscrimination clauses contained in section 202 of Executive Order 11246 relative to equal employment opportunity for all persons without regard to race, creed, color, or national origin, and the implementing rules and regulations of the President's Committee on Equal Employment Opportunity which, to the extent not inconsistent with Executive Order 11246, remain in full force and effect as those of the Secretary of Labor, are incorporated herein.

THIS SHIPMENT is subject to the terms and conditions set forth in the standard form of the U. S. Government bill of lading and to any available special rates or charges.

* This shipment is the property of and the freight charges are assumed by the U. S. Government. Subject to the provisions of Section 16721 Quotation No. (Tender No. _____ Effective _____).
* IT IS UNDERSTOOD AND AGREED THAT THIS SHIPMENT IS MADE BY THE CONSIGNOR FOR AND ON BEHALF OF THE U. S. GOVERNMENT; THAT THE CONSIGNOR IS AUTHORIZED TO AND WILL MAKE ANY PAYMENT DUE HEREUNDER AS CONSIGNOR OR SHIPPER FROM GOVERNMENT FUNDS ADVANCED AND AGREED TO BE ADVANCED TO IT BY THE U. S. DEPARTMENT OF ENERGY AND NOT FROM ITS OWN ASSETS; AND THAT NOTHING HEREIN SHALL PRECLUDE LIABILITY OF THE GOVERNMENT FOR ANY PAYMENT PROPERLY DUE HEREUNDER IF FOR ANY REASON SUCH PAYMENT IS NOT MADE BY THE CONSIGNOR FROM SUCH GOVERNMENT FUNDS.
* THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION.

USDOE, c/o Westinghouse Materials Company of Ohio, shipper

Per _____

Permanent post office address of shipper.

P. O. BOX 398704 CINCINNATI, OHIO 45239
AREA CODE 513 738-6200

Per _____ Agent

MPC-AD65-462 (REV. 9/19/88)

Attachment N
Page 1 of 1

WASTE CERTIFICATION FINAL TRAILER/VEHICLE CHECKLIST

4228

WASTE CERTIFICATION FINAL TRAILER/VEHICLE CHECKLIST

(Rev.12/06/89)

Carrier:_____ Trailer No. :_____ Shipment No. :_____

Initials

1. Verify the RST has surveyed the trailer/vehicle and recorded results on Vehicle Radiation Monitoring Report (Form FMPC-ES&H-1596-1). _____

2. Verify the proper placards are in place, as required. _____

3. Verify the driver has performed a safety inspection of vehicle prior to leaving the FMPC: _____

   headlights _____ horn _____
   turn signals _____ tires _____
   brake lights _____ braking check test (optional) _____

4. Verify the envelope with Manifest and Tally Sheets is in trailer. _____

5. Verify that a seal has been placed on the trailer doors and that the trailer number and seal number match the trailer and seal number recorded on the Bill of Lading. Report all discrepancies to the Traffic Manager. _____

   Seal Number: _____

6. Verify all lot markings and weights on the Tally Sheet match the lot markings and weights on the Shipping Order. _____

Date Shipped: _____ Time Shipped: _____

I hereby certify that the above items have been verified and are correct to the best of my knowledge.

Signed:_____ Date:_____
(Waste Certification Personnel)

NOTE: UPON SATISFACTORY COMPLIANCE WITH THE ABOVE CHECKLIST CERTIFICATION PERSONNEL SHOULD SIGN THE SHIPPING ORDER AT THE SPACE MARKED "QUALITY CONTROL APPROVAL".

QAC-881115-1, Rev. 2

Attachment 0
Page 1 of 1

SHIPPING ORDER FOR NUCLEAR MATERIAL

4228

NOTE Spaces marked "A" are for use of classification stamps when required.

Westinghouse Materials Company of Ohio
SHIPPING ORDER FOR NUCLEAR MATERIAL

A

Date Prepared: _____

SHIP TO:	ROUTING:			SHIPPING AUTHORIZATION NO.:	SHIPPING ORDER NO.:
STREET:	PREPAID:	CAR OR TRAILER NO.:	SEAL NO.:	SHIPPED FROM PLANT:	ORIGINATOR NO.:
CITY: / STATE:	COLLECT:	BILL OF LADING NO.:	QUALITY CONTROL APPROVAL:		DATE SHIPPED:
SPECIAL INSTRUCTIONS:		COUNTRY CONTROL NO.:	PROJECT NO.:		TIME SHIPPED:

Type of Material _____ FMPC Production Order No _____ Originator's Signature _____

Station RIS _____ DOE 741 No _____ Shipment Authorized By _____ (NUCLEAR MATERIALS MANAGEMENT REPRESENTATIVE)

NMC DATA			ORIGINATOR'S DATA					MATERIAL CONTROL DATA							
FROM / COST / VEN / CODE /	741 NO	PO NO	LOT NUMBER	QUANTITY	WEIGHT (LBS) GROSS	TARE	NET	ANAL CODE	ELE ANAL	ELE LBS	ELE GRAMS OR KGS	LIMIT (ERROR) ELE	ISO ANAL	U-235 GRAMS OR KGS	LIMIT (ERROR) U

DISTRIBUTION OF COPIES	
1 NMA (RECORD COPY)	5 Cost Accounting
2 Shipping Group	6 Originator of Shipping Order
3 Security Control	
4 Production Control	

NMC 158 (REV 6-89)

I, _____ certify that this shipment was made on the above date after complying with all security regulations

A

Audited by _____ Date _____

A

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Attachment P
Page 1 of 1

WASTE CERTIFICATION TRAFFIC SHIPMENT DOCUMENTATION CHECKLIST

4228

Waste Certification Traffic Shipment Document Checklist

	Bill/Lading(B/L)	Shipping Order(S.O.)
Ship #		
B/L#		
S.O.#		
Trailer#		
Date Prep		
Mat.Type		
Gross Wt.		
Tare Wt.		
Net Wt.		
E.T.A.		
Seal #		
MCA sign		
# of cont.		
LSA/LQ/RQ		

	Low Level Checklist		Packaging Information	
Ship #			Hazard Class	
B/L #			Material Form	
S.O.#			Chemical Form	
All Checks			Labels Required	
3 sign			Packaging Type	

Radiation Monitoring Sheets

	Empty	Outgoing	Survey	Cab
Trailer#				
Date/Time				
Survey com.				

*Complete liscense # _____
*Temporary Seal # _____

Container Radiological Sheets

	Date	Time	Data Complete	Ship #
Initials				
Resmears				

	Off Site Tie Down		Contaminated Articles Sheet	
Ship #			Curies	
Trailer #			Signature	
Seal #			Data Complete	
Sup.Sign				

*3 Tally Sheets & 1 Storage/Disposal Sheet present _____
*Driver Inst. Pack complete and numbered _____
*Weight Ticket *Ft. Axle _____ * Rear Axle _____ * GR. Wt. _____
(Maxium weight on front or rear axle 34,000 lbs.)

QAC-880731-1, Rev.1 (10/10/89)

Attachment Q
Page 1 of 1

LLW SHIPMENT CHECKLIST

4228

FMPC
SECURITY, ACQUISITION & MATERIALS LOGISTICS - TRANSPORTATION SECTION
LLW SHIPMENT CHECKLIST & NTS NOTIFICATION

DATE:	SHIPMENT NO.:	B/L NO.:	SS SO NO.:	CARRIER:	TRAILER NO.:

	LSA	DEPARTURE TIME:	ETA:	NOTIFICATION TO ☐ (FTS: 575-63
	RQ	FROM:		
	LTD. QTY.	TO:		
	DRUMS	DATE:		
	WASTE CERTIFICATION CONTAINER TOTALS. WEIGHTS & CURIES OF LSA/LTD QTY - RQ SHEETS	BY WHOM:		
	BOXES	TO WHOM		
	SMEAR SHEETS	☐ FACSIMILE SENT	☐ DRIVER GIVEN DOSIMETER BAC	
	WASTE MANAGEMENT STORAGE & DISPOSAL SHEETS DELIVERED — PER NTS	MONITORING REPORTS:		
	TALLY SHEETS			
	CARRIER/DRIVER INSTRUCTION PACK (2)			
	NEVADA PERMIT			
	INCOMING/EMPTY BEFORE LOADING			
	OUTGOING/LOADED			
	TRACTOR CAB			
	OFFSITE LOADING-TIE DOWN-VEHICLE INSPECTION REPORT			
	WEIGHT TICKET			
	CHECKED TALLY SHEET (BY CHECKER)			

DRIVER RECEIVES:
COPY OF B/L, TALLY SHEET, INSTRUCTION PACK, NEVADA PERMIT, & ENVELOPE FOR CONSIGNEE WITH TALLY SHEET & MEMO B/L

SPECIALIST A/TRAFFIC:	TRANSPORTATION SUPERVISOR: (REVIEW)	TRAFFIC MANAGER: (REVIEW)

	CONDITION OF CONTAINERS	LOADERS:
	CONTAINER PROPERLY LABELED	
	RADIOACTIVE PLACARDS (FOR LSA ONLY)	
	ENVELOPE WITH STORAGE & DISPOSAL SHEETS AND TALLY SHEETS IN TRAILER	
	TRAILER LINED WITH PLASTIC & CARDBOARD ON FLOOR— SCRAP WOODEN PALLETS AND/OR BOXES ENCLOSED WITH PLASTIC AS ONE PACKAGE	
T	sportation Supervisor: _____	

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Attachment S
Page 1 of 1

OFF-SITE LOADING TIE-DOWN INSPECTION - VEHICLE INSPECTION FORM

FMPC
SECURITY, ACQUISITION & MATERIALS LOGISTICS DEPARTMENT - TRANSPORTATION SECTION

OFFSITE LOADING — TIE DOWN INSPECTION — VEHICLE INSPECTION

4228

Date: _____

COMMODITY:	CARRIER:	TRAILER NO.:	SEAL NO.:
			FA-WMCO

BALE/BOX/DRUM/SEA LAND CONTAINER NUMBERS:

LSA _____
LSA-RO _____
LQ _____
LQ-RO _____
TOTAL _____

DISCREPANCIES DETECTED	CORRECTED YES	CORRECTED NO	SHIPMENT REJECTED YES	SHIPMENT REJECTED NO

Checked By _____
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 exceeding approximately 20,000 pounds each		
¾" steel strapping utilized (5450 lbs. minimum tensile strength)		
____ each anchor plates or "U" bolts fastened to underframe (____ each side of unit) placed and secured for ____ transverse bands over unit		
Four each braceman plates or "U" bolts fastened to underframe (two for each band) placed under each unit and secured for two longitudinal bands, securing the boxes/skids 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 braceman plates secured with eight each 2" nails		
Sea Land Containers ..... 4 each nylon straps		
..... Chains		
..... 2 X 4s		

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					
Condition of Roof			Condition of Rear Doors			Detected Evidence of Sabotage		

Overall appearance: _____

General Comments: _____

Accepted: _____ Rejected: _____

Checked By: _____
SIGNATURE - TRANSPORTATION SUPERVISOR

NO.	DISTRIBUTION OF COPIES
1	Transportation Section (RECORD COPY)

FMPC-SAML-2486 (REV. 4/5/88)

4228

WASTE SHIPMENT VERIFICATION CHECKLIST

WASTE SHIPMENT VERIFICATION

Date _____ Time _____

Shipment No. WML- _____ Trailer No. _____ No./Type Container _____

1. Storage & Disposal Data Sheet

   A. Material Descsription _____
   B. Signed _____ Shipment No. WML- _____
   C. Total Curries _____
   D. Total Weight(Gross) _____
   E. Total Volume _____
   F. Type Container _____
   G. Date _____ Time _____
   H. Check of "G" for all copies _____

2. Tally Sheet

   Shipment No. WML- _____ Date _____ Time _____
   Check of Date & Time of all copies in Pkg. _____

A. Lot Number	Gross Weight	Net Weight
Totals		

   B. Total containers _____ Totals agree with "1" above _____
   C. Field check of Tally Sheet included _____

3. Shipping Order for Nuclear Material (FMPC-ES&H-558-3 REV. 1/29/87)

   A. Shipping Order No. _____ B/L No. _____
   B. 741 No. FVC-VAB _____ Seal No. FA-WMCO _____
   C. Trailer No. _____ MC & A Signed _____
   D. Material Type _____
   E. Lot Nos. agrees with Tally Sheet _____ Total Quantity _____
   F. Gross Weight _____* Element Analysis _____*
   G. Tare Weight _____* Element Lbs. _____*
   H. Net Weight _____* Element Grams or Kgs _____*
   I. Iso Analysis _____* U235 Grams or Kgs _____*
   J. Est. Time of Arrival _____
   K. *Totals (listed) & Individual Lot values (not listed) agree with Tally Sheet. _____

4. Bill of Lading

   B/L No. _____ Trailer No. _____ Seal No.FA/WMCO _____
   741 No.FVC-VAB- _____ SS-SO No. _____
   ETA : _____
   Number of containers:

		Type Container	Gross Wt.	Net Wt.
LSA _____	RQ _____			
	NON-RQ _____			
LQ _____	RQ _____			
	NON-RQ _____			
Totals				

   _____ Above information agrees with Shipping Order & Tally Sheet.
   _____ Remainder of information of Bill of Lading checked.

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WASTE SHIPMENT VERIFICATION CHECKLIST
(continued)

WASTE SHIPMENT VERIFICATION

5. Low Level Waste Shipment Checklist and NTS Notification Form

   A. Shipment No. WML-_____ B/L No. _____
   SS-60 No. _____
   B. Data on line 5A agrees with B/L and Shipping Order _____
   Completed except for Departure Time and Traffic Manager review _____

6. Radiation Monitoring Sheet (FMPC ES&H-1596-1) For:
   A. Trailer Empty _____ Trailer ID _____
   B. Trailer Loaded _____ Trailer ID _____
   C. Cab Only _____ Trailer ID _____ License No._____
   D. Loaded Vehicle Radiological Survey _____ Trailer ID _____
   E. Temporary Seal Numbers _____

7. Container Radiological Data
   Initial Dose Rate Data _____ 48 Hour Smears: Date_____Time_____
   Equal to or less than 48 hours prior to Load Time _____

8. Weight Ticket
   Load Weight _____ Rear Axle Wt._____ Drive Wt._____

9. Off-Site Tie-Down Inspection Form (FMPC SAML 2495 REV 4/5/89)
   Shipment No. WML-_____Trailer No._____ Seal No. FA/WMCO_____
   A. Checked and signed in two places _____

10. LSA/RQ, LQ documentation
    One copy in Traffic File package _____
    One copy in envelope for Driver _____
    A. Signed if non-computer report _____
    B. Wt. checks with Tally Sheet _____
    C. Curies checks with Disposal Sheet or Tally Sheet _____

11. Driver Instructions Complete (2 sets) _____
    Tally sheet also in envelope _____
    All Written identity & information checks _____

12. Waste Certification Checklist present, signed and in agreement with other documentation.
    A._____ Waste Certification Preliminary Trailer Checklist

    B._____ Waste Certification Traffic Shipment Documentation Checklist

    C._____ Waste Certification Final Trailer/Vehicle Checklist

Shipping Order signed by Certification Official _____

Shipment released on _____ at _____AM/PM

Signed _____

List Nonconformances found:

_____

_____

NVO-325
UC-70B

NVO-325
UC-70B

4228

NEVADA TEST SITE
DEFENSE WASTE ACCEPTANCE CRITERIA, CERTIFICATION, AND TRANSFER REQUIREMENTS

OCTOBER 1988

PREPARED JOINTLY BY

THE U.S. DEPARTMENT OF ENERGY NEVADA OPERATIONS OFFICE

AND

REYNOLDS ELECTRICAL & ENGINEERING CO., INC.

524

ABSTRACT

The Nevada Test Site (NTS) Defense Waste Acceptance Criteria, Certification, and Transfer Requirements establishes procedures and criteria for safe transfer, disposal, and storage of defense transuranic, low-level, and mixed waste at the NTS. Included are an overview of the NTS defense waste management program; the NTS waste acceptance criteria for transuranic, low-level, and mixed wastes; waste certification requirements and guidance; application to submit waste; and requirements for waste transfer and receipt.

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately-owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof.

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NVO-325
UC-70B Distribution

NEVADA TEST SITE
DEFENSE WASTE ACCEPTANCE CRITERIA, CERTIFICATION, AND TRANSFER REQUIREMENTS

October 1988

Prepared jointly by

U.S. Department of Energy
Nevada Operations Office

and

Reynolds Electrical & Engineering Co., Inc.
Defense Waste Management Department

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LIST OF ACRONYMS

ALARA	As Low As Reasonably Achievable
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
DOE/NV	U.S. Department of Energy/Nevada Operations Office
DOT	U.S. Department of Transportation
DWMD	Defense Waste Management Department (REECo)
EPA	U.S. Environmental Protection Agency
LLW	Low-Level Waste
MW	Mixed Waste
NTS	Nevada Test Site
RCRA	Resource Conservation and Recovery Act
REECo	Reynolds Electrical & Engineering Co., Inc.
RWMS	Radioactive Waste Management Site
TRU	Transuranic
WAC	Waste Acceptance Criteria
WIPP	Waste Isolation Pilot Plant

SECTION 1

DEFENSE WASTE MANAGEMENT AT THE NEVADA TEST SITE

1.1 Purpose and Scope

This document establishes U.S. Department of Energy Nevada Operations Office (DOE/NV) defense radioactive waste acceptance criteria and requirements for waste certification and transfer. These criteria and requirements apply to all waste received at the Nevada Test Site (NTS) Area 3 and Area 5 Radioactive Waste Management Sites (RWMS) for storage or disposal. The generator approval process also is outlined. (A selected glossary of pertinent terminology is provided as Appendix A.)

The requirements in this document apply to both onsite and offsite waste generators and replace the requirements of NVO-185, Rev. 4, Operational Radioactive Defense Waste Management Plan for the Nevada Test Site dated January 1985. (NVO-185) will continue to exist as a DOE/NV defense low-level waste management program planning document.)

1.2 Policy

The policy of DOE/NV is to receive, store, and dispose of radioactive wastes generated by DOE defense programs in a manner consistent with DOE Order 5820.2A, "Radioactive Waste Management," and on a noninterference basis with DOE/NV prime program missions. This policy is designed to ensure that present and future radiation exposures are kept as low as reasonably achievable (ALARA) and do not exceed the radiation protection standards established in DOE Order 5480.11, "Requirements for Radiation Protection," and NVO-232, Radiation Safety Manual for the Nevada Test Site. This policy also is designed to protect the environment from any chemical hazards in the waste in accordance with the Resource Conservation and Recovery Act (RCRA) and amendments.

The Area 3 RWMS and the Area 5 RWMS are the only two NTS locations approved by DOE/NV for disposal of defense low-level waste. The following waste types are accepted at these NTS waste management sites.

Low-Level Waste (LLW): All radioactive waste not classified as high-level waste, spent nuclear fuel, transuranic waste, uranium mill tailings, or mixed waste. LLW is accepted for disposal only. Packaged LLW is disposed at the Area 5 RWMS; bulk LLW is disposed at the Area 3 RWMS.

Mixed Waste (MW): LLW containing both radioactive and hazardous components as defined by the Atomic Energy Act and RCRA, respectively. MW is accepted for disposal only at the Area 5 RWMS.

Transuranic (TRU) Waste: Radioactive waste containing alpha-emitting radionuclides having atomic numbers greater than 92 and half-lives greater than 20 years in concentrations greater than 100 nCi/g at the time of assay. TRU waste is accepted at the Area 5 RWMS only for interim storage pending reshipment to the Waste Isolation Pilot Plant (WIPP).

Defense waste that is classified for security reasons is accepted only at the Area 5 RWMS and only with prior written approval from DOE/NV.

Waste will be accepted only from generators approved by DOE/NV, with all generators and packages reviewed for compliance with the requirements of this document and additional requirements as may be established by DOE/NV. Nonradioactive hazardous waste will not be accepted for disposal or storage at NTS from onsite or offsite generators. Radioactive material generated at, or obtained from, NTS may be returned to NTS for disposal subject to the requirements of this document.

1.3 Responsibility

A. The DOE/NV Manager has those responsibilities and authorities as assigned in DOE Order 5820.2A. He provides authority to waste generators to dispose of defense low-level waste at the NTS and grants any exemptions to the requirements of this document. The Director of the Health Physics and Defense Waste Division has been delegated authority for DOE/NV defense waste management. The Director of the Safeguards and Security Division has been delegated authority to grant approval for acceptance of classified waste.

B. Reynolds Electrical and Engineering Co., Inc. (REECo), as the NTS waste management contractor, is responsible for the safe management of defense waste at the NTS. The REECo Defense Waste Management Department (DWMD) conducts NTS defense waste management activities, which include operation, maintenance, and environmental surveillance of the Area 3 RWMS and the Area 5 RWMS.

1.4 Exemptions

The DOE/NV Manager may approve exemptions to the criteria specified in this document. All requests must be submitted to DOE/NV in writing and a copy of the exemption request shall also be sent to REECo DWMD. A safety analysis is required for any exemptions. All significant exemptions to the criteria specified in this document must be approved by the DOE/NV Manager prior to shipment. See Section 4.1 of this document to obtain more information on applying for exemptions to NVO-325 criteria; also contact DOE/NV (Commercial: 702-295-3181; FTS: 575-3181).

1.5 Forecasting

For each waste stream forecast of estimated waste volume, waste type, number and type of packages, and number of shipments shall be provided to DOE/NV and REECo DWMD to aid in planning for future waste shipments. Forecasts shall be prepared for a three-fiscal-year period with the first fiscal year divided into four three-month increments; that is, October through December, January through March, April through June, and July through September (see Figure 1). Forecasts shall be updated every six months and are due by September 15 and March 15. REECo DWMD personnel use these forecasts to project manpower, equipment, storage area, and disposal area requirements. Failure to provide these forecasts promptly may delay acceptance of waste shipments.

1.6 Funding

Disposal operations at the NTS are incrementally financed by approved waste generators prepaying their estimated waste volumes by at least a fiscal quarter in advance. The generator should prepare purchase orders, addressed to REECo, based upon a minimum of two quarters estimated waste volume and consistent with the forecasts identified above and the prevalent disposal charge per cubic foot. Separate purchase orders should be provided for each waste type, that is, TRU waste, LLW, and MW. Upon receipt of the purchase orders, REECo will bill the projected amount for the first succeeding quarter. Prompt payment thereof will be expected. One month before the beginning of each succeeding quarter, REECo will bill against the generator's forecasted volumes and associated purchase orders. Adjustments of any amount paid, based on variances between actual and forecasted volumes, are not contemplated unless there is a significant variance, either over or under, between actual costs incurred and the payment. Generators may adjust any quarterly forecast prior to the initiation of billing by REECo for that quarter.

1.7 Implementation Plan

The waste acceptance criteria, characterization, and certification requirements detailed in this document are effective immediately. All waste generators, both on- and offsite, shall submit to DOE/NV and REECo DWMD a schedule for complying with the requirements within 90 days of issuance of this document. Between revisions, DOE/NV will advise all generators, in writing, of any additional requirements for waste acceptance at NTS waste management sites.

3-YEAR WASTE SHIPMENT FORECAST

GENERATOR PREPARED BY DATE

FORECAST PERIOD	WASTE STREAM NUMBER	WASTE TYPE	CONTAINER			NO. OF SHIPMENTS	TOTAL VOLUME
			TYPE	SIZE	#		
FY 19							
10/01-12/31							
1/01 - 3/31							
4/01 - 6/30							
7/1 - 9/30							
FY 19							
FY 19							

REMARKS _____

Figure 1. Example of Three-Year Waste Shipment Forecast

SECTION 2

DEFENSE WASTE ACCEPTANCE CRITERIA

The following NTS waste acceptance criteria (WAC) have been established to assure that U.S. Department of Transportation (DOT) and U. S. Environmental Protection Agency (EPA) requirements are met and to satisfy operational concerns at NTS waste management sites. Complying with these WAC will allow proper disposition of defense TRU waste, LLW, and MW at NTS waste management sites. Clarifications of the WAC and assistance on compliance requirements can be obtained from the DOE/NV Defense Waste Branch (Commercial: 702-295-3181; FTS: 575-3181) or from REECo DWMD (Commercial: 702-295-6406; FTS: 575-6406).

Any TRU waste designated for NTS interim retrievable storage is considered newly- generated and must be certified by the generator as being in compliance with the WIPP WAC. That is, waste must meet all documentation, waste form, and packaging requirements of the WIPP WAC. (See WIPP-DOE-069, as updated.) TRU mixed waste is not accepted at NTS for interim storage.

Requests for storage of classified TRU waste that meets the waste package criteria in Section 2.1 and the general waste form criteria in Section 2.2.1, items B through H, will be considered on a case-by-case basis. Other classified waste must meet all the requirements of this document unless specific exemptions have been granted by the DOE/NV Manager.

2.1 Waste Package Criteria

The NTS waste package criteria include regulatory criteria to meet DOT and EPA requirements and criteria established to meet specific requirements at NTS waste management sites.

2.1.1 General Regulatory Criteria

Defense waste shipped to NTS waste management sites for storage or disposal must be packaged in accordance with all DOT regulations. At a minimum, the following criteria shall be met for both onsite and offsite waste.

A. Design. Type A packaging shall be designed to meet Title 49 Code of Federal Regulations (CFR) 173.411, "General Design Requirements," and Title 49 CFR 173.412, "Additional Design Requirements for Type A Packages." Type B packaging must meet the applicable requirements of Title 10 CFR 71. Strong, tight packaging used for shipping limited quantities of LLW and low specific activity waste excepted by Title 49 CFR 173.421 and 173.425, respectively, must be constructed so that it will not leak during normal transportation and handling conditions.

Bulk LLW shall be shipped in closed transport vehicles in accordance with Title 49 CFR 425(c). Containment of bulk waste shall be such that RWMS personnel can offload the waste without contaminating personnel or equipment.

B. Nuclear Safety. The quantity of fissile materials within a package shall be limited so that an infinite array of such packages will remain subcritical. This quantity shall be determined on the basis of a specific nuclear safety analysis, considering credible accident situations, and taking into account the actual materials in the waste. (See Title 49 CFR 173.451, "Fissile Materials - General Requirements.")

C. Nuclear Heating. The quantity of radioactive materials shall be limited for each waste matrix and package type so that the effects of nuclear decay heat will not adversely affect the physical or chemical stability of the contents or package integrity. Also see Title 49 CFR 173.442, "Thermal Limitations," for temperature limits of accessible external package surfaces.

D. Radiation Levels. The external radiation levels for packages shall not exceed 200 millirem per hour on contact during handling, shipment, and disposal unless specifically excepted by DOT regulations. (See Title 49 CFR 173.441, "Radiation Level Limitations.") Type B containers that will be unloaded by remote procedures will be addressed on a case-by-case basis.

E. External Contamination. Packages shall be within DOT contamination limits upon receipt at NTS. (See Title 49 CFR 173.443, "Contamination Control.")

F. Activity Limits. The activity limits listed in Title 49 CFR 173.431, "Activity Limits for Type A and Type B Packages," shall be met. Where applicable, the activity limits of Title 49 CFR 173.421, "Limited Quantities of Radioactive Materials," and 173.425, "Transport Requirements for Low Specific Activity Radioactive Materials," shall be met for strong, tight packages.

G. Multiple Hazards. Waste shall be packaged according to the level of hazard as defined in Title 49 CFR 173.2, "Classification of Material Having More than One Hazard." Incompatible MW shall be packaged in accordance with Title 40 CFR 264.177, "Special Requirements for Incompatible Wastes."

H. Marking and Labeling. Waste shipped to the NTS from offsite must be marked and labeled as required in Title 49 CFR 172, Subparts D and E. Mixed waste packages of 110 gallons or less must also be marked in accordance with Title 40 CFR 262.32(b). Intrasite shipments shall be marked and labeled in accordance with the requirements of NVO-232. Marking and labeling of the waste packages shall be for chemically hazardous material, if present, in addition to the radioactive material. Limited quantity MW must be classified according to requirements for hazardous material as defined by Title 49 CFR 173.2.

Additionally each waste package shall be marked with a unique package identifier, or a combination of the shipment number and a package number, so that the package can be identified from another package within the shipment or from another set of packages.

2.1.2 NTS Specific Package Criteria

The use of properly designed packaging reduces the chance of radiological or occupational safety occurrences during transportation, handling, and disposal operations. In addition, preplanning the size and load of each package is essential to reducing the number of waste shipments to NTS and the space required for disposal. DOE/NV has adopted the following criteria to assure that the NTS waste management sites, specifically the Area 5 RWMS, are operated safely and efficiently. The criteria shall be incorporated in the design of all waste packaging, including strong, tight containers.

A. Closure. The package closure shall be sturdy enough that it will not be breached under normal handling conditions and will not serve as a weak point for package failure.

B. Strength. Except for waste packaged in steel drums, the waste package (packaging and contents) shall be capable of supporting a uniformly distributed load of 4,000 lbs/ft^2 (19500 kg/m^2). This is required to support other waste packages and earth cover without crushing during stacking and covering operations.

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

D. Size. DOE/NV recommends that 4- x 4- x 7-ft (1.2- x 1.2- x 2.1-m) or 4- x 2- x 7-ft (1.2 x 0.6 x 2.1-m) (WHL) boxes or 55-gallon (210-liter) drums be used. While these sizes allow optimum stacking efficiency in disposal cells, other dimensions are acceptable with approval of DOE/NV.

E. Weight. In addition to the weight limits set for specific packaging designs, NTS imposes limits of 9,000 pounds (4,082 kg) per box and 1,200 pounds (544 kg) per 55-gallon drum. Packages exceeding 9,000 pounds require crane removal and, if approved for shipment, must be shipped in removable-top trailers.

F. Loading. Waste packages shall be loaded to ensure that the interior volume is as efficiently and compactly loaded as practical. High-density loading will allow efficient RWMS space utilization and provide a more stable waste form that will reduce subsidence and enhance the long-term performance of the disposal site.

G. Nonstandard Type A Packaging. If a waste generator uses DOT Type A packaging not evaluated under the DOE Type A Package Certification Program (see MLM-3245, DOT 7A Type A Certification Document), the generator shall have on file a safety analyses of the containment and packaging systems for review by DOE/NV.

H. Package Protection. The generator shall take the following precautions to protect the waste package after closure. The requirements of Title 40 CFR 264, Subpart I, "Use and Management of Containers," shall be met for MW packages.

1. Each waste package shall be prepared for shipment so as to minimize damage during transit. (Minor damage incurred during transit, not attributable to poor packaging, will be repaired at the RWMS without charge to the waste generator. Costs for repairs of damage caused by waste generator or carrier negligence as well as any necessary decontamination may be charged to the waste generator.)

2. The preshipment storage environment shall be controlled to avoid adverse influence from weather or other factors on the containment capability of the waste packaging during handling, storage, and transport. The generator preparing waste for preshipment storage shall take all reasonable precautions to preclude the accumulation of moisture on or in packages prior to their arrival at the NTS.

I. Onsite Transfer. For onsite transfer of unpackaged or bulk materials, contamination on external surfaces shall be fixed, covered, or contained sufficiently for safe transfer and in accordance with NVO-232, Radiation Safety Manual for the Nevada Test Site, requirements.

2.2 Waste Form Criteria

Defense waste accepted at NTS must be radioactive and meet the following waste form criteria.

2.2.1 General Waste Form Criteria

These waste form criteria are based on current DOE LLW management practices and guidelines. DOE/NV recognizes that these requirements may need to be modified for certain waste streams. However, any modifications must be tailored to the specific waste stream and intended disposal environment, i.e., shallow land disposal (SLD) or greater confinement disposal (GCD), and must not compromise the performance objectives for the disposal site or violate any permit requirements.

A. Transuranics. LLW must have a transuranic nuclide concentration not greater than 100 nCi/g.

B. Hazardous Material. LLW offered for disposal at NTS waste management sites shall not exhibit any characteristics of, or be listed as, hazardous waste as identified in Title 40 CFR 261, "Identification and Listing of Hazardous Waste."

C. Free Liquids. LLW disposed at NTS waste management sites must not contain free liquids. Waste containing liquids shall be solidified or have an absorbent, stabilizer, or both, added and mixed so that there will not be any free liquid during packaging, handling, transport, and disposal. Ion exchange resins must be dewatered and solidified to be considered as a solid waste. Liquid waste solidified by the urea-formaldehyde process will not be accepted. Minor liquid residue remaining in well-drained containers, or liquids which have been entrapped, are acceptable. In no cases shall free liquid content exceed 0.5 percent by volume.

D. Particulates. Fine particulate wastes shall be immobilized so that the waste package contains no more than one weight percent of less-than-ten-micrometer-diameter particles, or 15 weight percent of less-than-200-micrometer-diameter particles, with radioactive contamination. When immobilization is impractical, the waste packaging shall include a sealed liner and be overpacked.

E. Gases. Radioactive gases shall be stabilized or absorbed so that pressure in the waste packaged does not exceed 1.5 atmospheres at 20°C. Compressed gases as defined by Title 49 CFR 173.300, including unpunctured aerosol cans, will not be accepted for disposal.

F. Stabilization. Where practical, waste shall be treated to reduce volume and provide a more physically and chemically stable waste form. If necessary the waste shall be treated to assure that significant quantities of harmful gases, vapors, or liquids are not generated. Wastes shall not significantly react with the packaging during normal storage, shipping, and handling time.

G. Etiologic Agents. LLW containing pathogens, infectious wastes, or other etiologic agents as defined in Title 49 CFR 173.386 will not be accepted for disposal at NTS.

H. Chelating Agents. LLW containing chelating or complexing agents at concentrations greater than one percent by weight will not be accepted.

I. GCD Waste. LLW waste that meets the following waste form guidelines must be identified for placement in GCD at the Area 5 RWMS LLW Management Unit.

1. Wastes defined by DOE Order 5820.2A, Chapter III, as not being suitable for SLD. For example, LLW designated as greater-than-class C as defined in Title 10 CFR 61.55, "Waste Classification."

2. Volatile or mobile radionuclides when properly packaged to be acceptable for shipping, e.g., high-specific-activity tritium.

3. Radioactive material that would exist in a concentration greater than 0.1 millicurie per gram when decayed for 100 years. For example:

   a. cesium-137 at concentrations greater than 1 millicurie per gram.

   b. strontium-90 at concentrations greater than 1 millicurie per gram.

   c. cobalt-60 at concentrations greater than 50 curies per gram.

   d. radium-226 at concentrations greater than 0.1 millicurie per gram.

4. Other waste forms, on a case-by-case basis, that do not meet NTS requirements for SLD.

J. Bulk LLW. Bulk LLW shall be solid and meet the requirements of Title 49 CFR 173.425(c)(1). Bulk waste is accepted for disposal only at the Area 3 RWMS Bulk Waste Management Unit.

2.2.2 Additional Criteria for Mixed Waste

Waste offered for SLD at the Area 5 RWMS MWMU must be hazardous as defined in Title 40 CFR 261, "Identification and Listing of Hazardous Waste," or state regulations, and be radioactive (intermixed with radioactive material). Mixed waste will not be accepted for GCD or for bulk disposal.

Except for the restriction against chemically hazardous materials, MW must meet all the waste form criteria listed in Section 2.2.1 for LLW. In addition, MW must meet the following criteria.

A. Treated Waste. Mixed waste must receive any required treatment prior to shipping the waste to the Area 5 RWMS. Mixed waste can only be treated according to EPA-approved methods.

B. Restricted Waste. Mixed waste prohibited from land disposal under Title 40 CFR 268, "Land Disposal Restrictions," will not be accepted unless treated as specified under Title 40 CFR 268, Subpart D, "Treatment Standards."

C. Reactive Waste. Reactive or ignitable waste that has not been treated, rendered, or mixed in accordance with Title 40 CFR 264.312, "Special Requirements for Ignitable or Reactive Waste," will be reviewed for acceptance. Explosives, pyrophoric materials, or high-heat generators are not acceptable for MW disposal. Cyanide- and sulfide-bearing wastes in concentrations greater than ten percent by weight as CN^- or S^- will not be accepted. (If accepted for disposal, potentially incompatible waste must be identified by the most appropriate compatibility group listed in Title 40 CFR 264, Appendix V, "Examples of Potentially Incompatible Waste.")

D. Liquids: 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).

E. Polychlorinated Biphenyls (PCBs): PCB-contaminated waste will not be accepted for disposal at NTS unless the PCB concentration meets municipal solid waste disposal levels. See Title 40 CFR 761.60 for PCB disposal requirements.

SECTION 3

WASTE CHARACTERIZATION AND CERTIFICATION

The generator must obtain detailed waste characterization data and certify compliance with the WAC detailed in Section 2.

3.1 Waste Characterization

A waste characterization program needs to address the combined requirements of DOE Order 5820.2A for TRU waste and LLW, and Title 40 CFR 264 for MW. All TRU waste and LLW must be characterized to show that it contains no chemically hazardous constituents, i.e., they must be shown not to be MW. The generator is responsible for identifying each MW stream in accordance with Title 40 CFR 261. DOE/NV also will impose the requirements of Title 40 CFR 264.13, "General Waste Analysis," on the generator.

3.1.1 Waste Sampling and Analysis

TRU waste and LLW sampling and analysis shall be performed in accordance with recognized industry methods and standards. All MW shall be sampled in accordance with EPA requirements and methods, e.g., EPA-SW-846, Test Methods for Evaluating Solid Waste. A waste characterization program based on sampling and analysis should include the following elements in its waste analysis plan.

A. Sample collection methodologies and documentation that sample collection methodologies are appropriate for the types of waste being sampled, will produce representative samples, and are approved methods. The number, location, and frequency of samples to be collected.

B. Descriptions of sample containers and labels; sample preservation procedures; and sample handling and transportation procedures, including use of chain-of-custody forms.

C. Laboratory analyses to be performed for each sample; analysis methods to be used; and descriptions of sample preparation (including compositing), calibration, and other laboratory quality control procedures. Identification of commercial laboratories providing analytical services, if appropriate. Documentation that the analytical methods for MW are EPA-approved methods.

D. Interpretation of analytical data.

3.1.2 Characterization by Process Knowledge

The focus of the characterization activities is on balancing the requirements for definitive chemical and physical characterization of wastes streams containing both hazardous and radioactive constituents with the relative chemical hazard and the need to protect personnel from radiation exposure. There are circumstances where sampling and analysis are not feasible or necessary for characterization of hazardous constituents (see Title 40 CFR

262.11, "Hazardous Waste Determination"). Under these circumstances, techniques that rely primarily on knowledge of raw materials, processes, and materials balance can be employed to characterize the wastes. Such techniques may be employed when at least one of the following conditions are met.

A. Waste stream is difficult to sample because of physical form. This primarily applies to pieces of metal (e.g., shielding) that contain hazardous constituents in their composition rather than as a residue that could be removed for testing or in a decontamination process.

B. Sampling and analysis of waste stream could result in unacceptable risks of radiation exposure (i.e., violate the ALARA precept of the DOE).

C. Waste is too variable to be characterized by one set of samples (e.g., drums containing contaminated protective clothing, rags, and absorbent).

For waste streams that cannot or will not be sampled and analyzed, the generator's waste analysis plan shall include the rationale for excluding waste streams from a sampling and analysis program and the method for collecting sufficient information to document compliance with the NTS WAC. Where sampling is not feasible, the generator shall prepare a detailed description, including concentration ranges of constituents of concern, of input streams to the processes that generate the waste, as well as a description of the waste generation process and any subsequent treatment and handling activities that affect the waste's chemical and physical characteristics.

3.1.3 Waste Stream Characterization Data

A copy of the characterization data for each waste stream is to be provided to DOE/NV as part of the generator's application to ship waste (Section 4.1). Periodically, DOE/NV (or contractor designees) may request the generator to split a representative sample of the waste stream for independent analysis to determine whether it is consistent with the waste analysis data provided by the generator. The data on the shipping manifests will be checked against the generator's waste analysis data. The generator will notify DOE/NV of any new waste streams, or change in the characteristics of old ones, and will provide a copy of the analysis of a representative sample (See Section 4.3.).

In addition to the detailed characterization data described above, a Waste Stream Characterization Data Sheet, shown as Figure 2, shall be submitted for each waste stream. This data sheet provides a characterization summary of the waste stream and identifies the waste stream with a unique identification number. This number will allow a history of waste streams to be maintained. When used in conjunction with the package identification number and the shipment number, NTS will be able to tie individual packages to valid waste streams. (Appendix B contains instructions for completing the Waste Stream Characterization Data Sheet.)

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

3.2 Waste Certification

DOE/NV requires that each waste generator certify that any waste to be sent to an NTS RWMS meets NVO-325 requirements. The elements of waste certification shall include a formal certification program and signed labels and statements certifying each waste package and shipment is in compliance with NVO-325.

3.2.1 Certification Program

Waste generators are required to develop a waste certification program to provide assurance that DOT, EPA, DOE, and NTS waste packaging, transport, and acceptance criteria are met. DOE/NV recognizes that each generator site has its own unique organization and program implementation methods. The waste certification program should fit within the generator's established site organizational structure.

The objective of the waste certification program is to ensure safe management of waste received at the NTS by:

A. requiring generators to properly identify and characterize the wastes;

B. providing a system for transmitting information about wastes to the NTS; and

C. providing an auditable system for verifying that the generators are properly characterizing their wastes.

Generator waste certification programs are subject to periodic technical audits and inspections by DOE/NV. These technical audits will verify implementation of the waste certification program and all other elements of waste operations considered necessary to waste certification. These technical audits are a part of the generator application and approval process that is described in Section 4 of this document.

The generator also shall prepare a plan for implementing the waste certification program. Generator waste certification program plan guidance is provided in Appendix C of this document. The guidance identifies items and activities that are critical to waste certification.

3.2.2 Certification Officials, Statements, and Labels

Each generator shall designate a Certification Official and one alternate who will be responsible for assuring that all waste packages and waste shipments comply with the requirements of this document. Generators that have 24-hour operations or produce large volumes of waste can request to have additional Certification Officials.

Requests for additional Certification Officials must include a detailed justification and be included in the generator's application to ship waste (see Section 4.1).

The Certification Official shall sign the generator's application certifying that the information is correct and that the waste stream(s) will meet the NTS WAC upon implementation of the certification program. In addition, the Certification Official shall sign an appropriate certification statement, to be included with the shipping papers for each waste shipment, indicating that the shipment meets DOT and EPA requirements (see Title 49 CFR 172.204, "Shipper's Certification," the generator's certification statement on the Uniform Hazardous Waste Manifest, and, for restricted waste, Title 40 CFR 268.7, "Waste Analysis"). The Certification Official's signature on this statement shall be deemed as certification that all NTS WAC are met.

To provide highly visible confirmation that waste is certified as meeting NTS WAC, DOE/NV requires that a signed "Packaging Certification" label (DOE/NV Form NV-211) (Figure 3), available from REECo DWMD, be affixed to each waste package offered for shipment. The NV-211 label contains the following certification statement: This certifies that this container and its contents are in acceptable condition for transportation and waste disposal according to DOT (49 CFR), EPA (40 CFR) and DOE/NV (NVO-325) requirements." Each NV-211 label shall be signed (legibly handwritten, not stamped) by a knowledgeable, responsible person who has been trained and qualified in accordance with the generator's waste certification program plan. This person certifies that the waste package meets NVO-325 requirements. The Certification Official shall be responsible for assuring that each package certifier is properly trained and qualified.

The generator shall provide DOE/NV and REECo DWMD written notification of the names of the Certification Official, alternate(s), and all qualified package certifiers. This list shall be reviewed and resubmitted annually or more frequently, if necessary.

PACKAGING CERTIFICATION

This certifies that this container and its contents are in acceptable condition for transportation and waste disposal according to DOT (49 CFR), EPA (40 CFR), and DOE/NV (NVO-325) requirements.

DATE: _____

CERTIFIED BY: _____

TITLE: _____

ORGANIZATION: _____

Figure 3. Example of NV-211 Form

SECTION 4

GENERATOR APPLICATION AND APPROVAL

All generators, from both on- and offsite, must receive the DOE/NV Manager's written approval for each waste stream prior to sending the waste to NTS waste management sites for storage or disposal. DOE/NV will consider requests from DOE field offices, DOE contractors, or other government agencies to ship DOE defense waste to the NTS, provided it meets the NTS WAC, characterization, and certification requirements. Requests for approval are made through a formal application and review process. DOE/NV will coordinate all applications and reviews and prepare responses.

Generators currently approved for shipping TRU waste and LLW shall submit a schedule for complying with the requirements of this document and a complete generator application as described in this section to DOE/NV and REECo DWMD within 90 days of issuance of this document.

4.1 Generator Application to Ship Waste

Any DOE defense waste generator desiring to send waste to NTS waste management sites must submit a complete application to both DOE/NV and REECo DWMD. The application consists of four main parts: generator information, waste certification program plan, waste stream information, and exemption requests. The application must follow the format outlined in Figure 4 and must be submitted as a complete package. Failure to follow these directions may lead to delays in processing the application.

The generator information section of the application includes information on the generating facility and personnel contacts in the DOE Field/Area Office and the generator's waste operations and certification organizations.

The generator must submit controlled versions of the waste certification program plan, identified in Section 3.2.1. Any supporting procedures essential to waste certification that are not included in the plan should also be submitted. Controlled revisions are required for the entire period of time a generator's approval to ship waste is to remain in effect. The plan shall include a detailed description, or references to procedures, indicating how each of the NTS WAC listed in Section 2 will be complied with.

The waste stream information section includes waste stream identification; justification for shipment to NTS; funding method; waste shipment forecast of waste volume, etc.; packaging and shipping information; special security or classification considerations; waste characterization plan and data; and a summary, signed by the Certification Official, certifying compliance with the NTS WAC. The certification summary shall address each criterion and state how each criterion is met by referencing specific procedures and testing or waste analysis results if applicable. Supporting information shall be organized so that it can be readily referenced to verify compliance with NTS WAC. For

APPLICATION TO SHIP WASTE

I. Generator Information

A. Generator/Facility Name and Location
B. EPA Identification Number (for mixed waste generators)
C. DOE Field/Area Office and Contacts
D. Contractor Name and Contacts

II. Waste Certification Program

A. Waste Certification Program Plan (controlled copy)
B. Certification-Related Procedures

III. Waste Stream Information

A. Waste Stream Identification
   1. Waste Stream Number
   2. Waste Type (i.e., TRU, LLW, MW)
   3. Description of Waste (including generation process, treatment, final form,and special handling or disposal requirements)
B. Justification for Shipment to NTS
C. Funding Method
D. Three-Year Waste Shipment Forecast
E. Packaging and Shipping Information (including DOT proper shipping name, hazard class, hazard identification number)
F. Security/Classification Information
G. Waste Characterization Program
   1. Waste Analysis Plan (see Section 3.1 for contents)
   2. Procedures (including documentation that EPA-approved methods were used for mixed waste analysis)
   3. Waste Stream Characterization Data Sheet
   4. Waste Analysis Results
H. Waste Acceptance Criteria Certification Summary
   1. General Regulatory Criteria for Packages (see Section 2.1.1)
   2. NTS Specific Package Criteria (see Section 2.1.2)
   3. General Waste Form Criteria (see Section 2.2.1)
   4. Additional Mixed Waste Form Criteria (see Section 2.2.2)

IV. Exemption Requests

A. Area of Noncompliance and Reason for Request
B. Requested Duration
C. Plan for Corrective Action

Figure 4. Outline of Generator Application to Ship Waste

addressing multiple waste streams, the information shall be organized by waste stream in separate subsections.

An exemption request is required for any envisioned noncompliance to NVO-325 requirements. The exemption request, which must accompany the application to ship waste, shall include the type of exemption requested and the present circumstances that prevent compliance with the criterion for which an exemption is being sought; the projected duration of the exemption or reason why the waste cannot be brought into compliance; and a plan and schedule for corrective action to bring the waste into compliance with all criteria. Exemptions identified after an application has been submitted may be requested separately as an application addendum.

4.2 Generator Approval Process

A generator can make a written or verbal request to DOE/NV for waste storage or disposal. In response, DOE/NV will transmit the latest version of NVO-325 and generators will prepare a complete application as required. The application will be reviewed by a team composed of DOE/NV and contractor personnel, and additional information will be requested if necessary.

Upon completion of the review, the DOE/NV team will conduct a technical audit of the generator's waste certification program and issue an audit report. Should there be significant findings, corrective action will be required. The DOE/NV team will review any corrective action responses and approve or reject them. A re-audit of the generator will be performed if necessary. After completion of the waste certification program technical audit, the final audit report and generator's complete application will be considered by DOE/NV for approval. The DOE/NV Manager will provide written notice of approval or rejection of the application.

Unannounced technical audits, surveillances, and inspections may be performed at the discretion of DOE/NV. Additional waste sampling, analysis, and characterization may be requested to assure generator compliance with the WAC and waste certification program. In addition, DOE/NV may also require that the generator supply representative samples for independent analysis.

Figure 4 depicts the waste generator application, technical audit, and approval process which is designed to assure compliance with NVO-325.

4.3 Generator Recertification

Whenever a significant change occurs to the generating or treatment processes of a waste stream, the generator must notify DOE/NV and REECo DWMD. The waste must be recharacterized and certified. In addition, the generator is required to file a semiannual recertification report for all waste streams. The report shall provide the following information.

A. Identification of waste by waste stream identification number.

B. Update of the three-year forecast provided in the application.

WASTE GENERATOR APPROVAL PROCESS

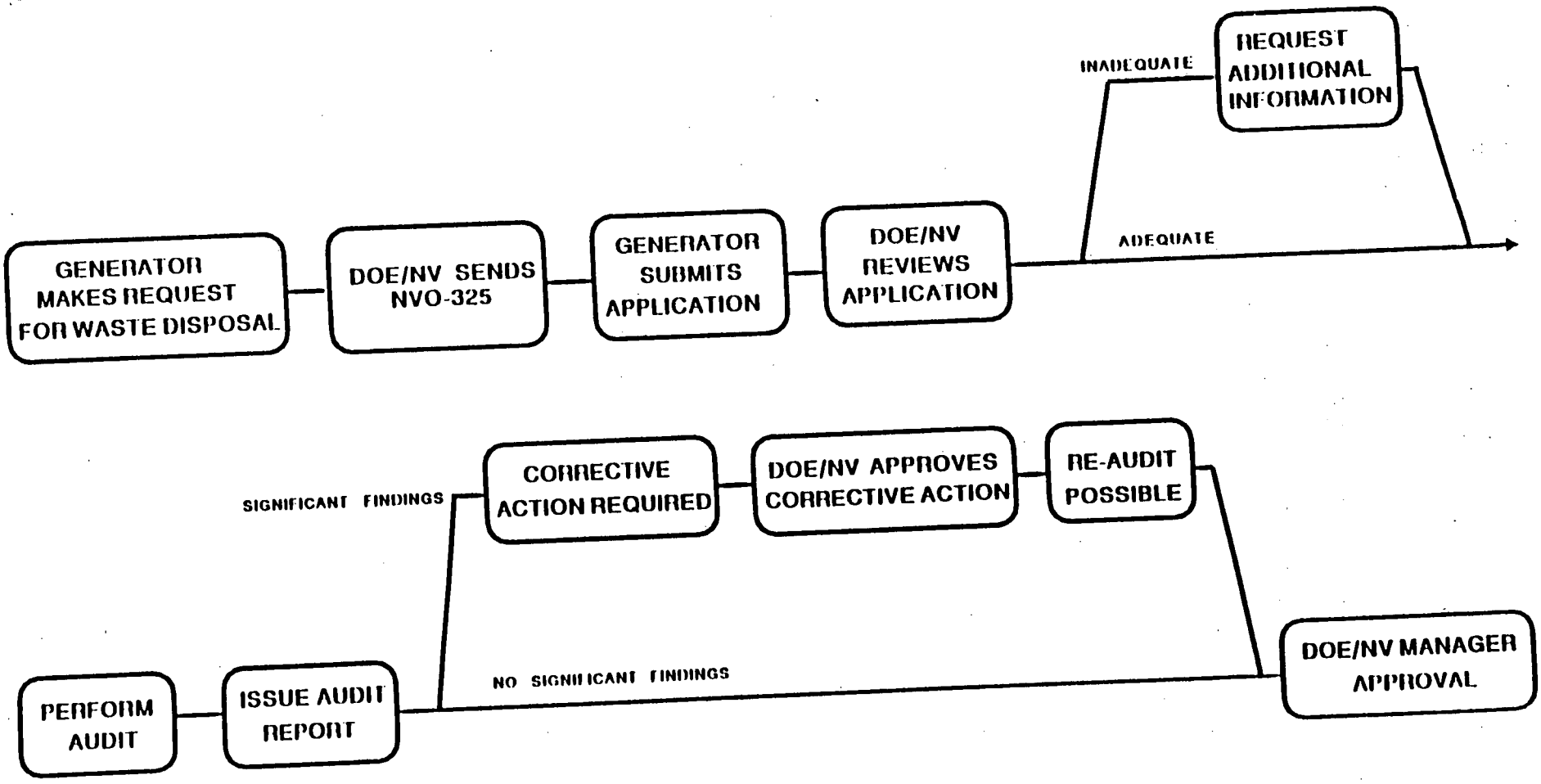

FIGURE 5. WASTE GENERATOR APPROVAL PROCESS

C. Assurance that the waste certification program plan is being followed and that the waste continues to meet NVO-325 requirements.

D. Results of additional waste characterization that is performed on a routine basis or because of a change in the waste process. If there have been no changes in the generating or treatment processes of the wastes, then the generator may provide a statement that the information in the original application is unchanged.

Where the initial application is accompanied by an exemption request, the recertification report must include an update of this request. If the schedule for corrective action has changed from that shown in the application or previous recertification report, then the reason for this change must be documented.

SECTION 5

WASTE TRANSFER

All waste shipments consigned to an NTS waste management site shall be made in accordance with applicable DOT, EPA, state, and local hazardous materials regulations and DOE/NV requirements contained herein. Also, all MW shipments shall be in accordance with Title 40 CFR 263, "Standards Applicable to Transporting of Hazardous Waste."

5.1 Shipping Arrangements

After a generator secures written approval from the DOE/NV Manager (see Section 4) to send defense waste to an NTS waste management site, the generator shall contact REECo DWMD to arrange for transfer of the waste and all accompanying records. REECo DWMD, Traffic, and Health Physics Departments will coordinate waste shipment transfers at NTS.

A. To expedite waste receipt and handling at NTS, offsite waste generators shall comply with the following procedure. (Past experience has proven this procedure to be an invaluable tool in preventing delays or problems for the generators, carriers, and NTS personnel.)

1. Before a waste shipment leaves its point of origin, the generator shall contact the REECo Traffic Section (Commercial: 702-295-6931 or 6307; FTS: 575-6931 or 6307) or for classified and special nuclear material shipments contact the DOE/NV Safeguards and NTS Security Branch (Commercial: 702-295-6780; FTS: 575-6780) and provide the following information:

   a. time of departure from shipping point and estimated arrival time at NTS;

   b. carrier and trailer numbers, and seal numbers where applicable:

   c. description of load (number of pieces, volume and weight);

   d. waste type (TRU, LLW, or MW); and

   e. any additional information deemed necessary (e.g., special handling requirements).

2. Address waste shipments to:

   ~~Defense Waste Management Department Manager~~
   ~~Reynolds Electrical & Engineering Co., Inc.~~
   ~~Nevada Test Site~~
   ~~Mercury, NV 89023~~

   Reynolds Electrical & Engineering Co., Inc.
   For the U.S. Department of Energy
   Defense Waste Management Department Manager
   Nevada Test Site, Zone 2
   Mercury, NV 89023

3. If shipments are delayed in transit for any reason, the generator shall contact REECo Traffic Section at the earliest opportunity and provide the new estimated time of arrival with pertinent information regarding the delay.

4. The hours for receiving are 0800 to 1430, Monday through Friday, except holidays. If a shipment arrives too late to off-load, the REECo Duty Officer will instruct the driver to park the load at the front gate until it can be inspected by REECo Radioactive Materials Control and be approved to proceed to an NTS RWMS. The trailer(s) may be left at the holding area outside the front gate while driver(s) attend to personal needs. Housing is usually available onsite and may be prearranged through the REECo Traffic Section. The Duty Officer can make accommodations available upon arrival after hours.

B. The waste generator also should contact REECo DWMD (Commercial: 702-295-6406; FTS: 575-6406) for determination of records requirements and to coordinate funding transfers. At a minimum the following records are required.

1. When accountable source and special nuclear materials from other than NTS sources are involved, a "Nuclear Material Transaction Report" (DOE/NRC Form 741) shall be completed and forwarded to the DOE/NV Safeguards and NTS Security Branch prior to shipment.

2. Properly completed shipping papers as required by Title 49 CFR 172 Subpart C, "Shipping Papers," must accompany each shipment from offsite. Paperwork accompanying intrasite shipments must meet the requirements of NVO-232.

   For MW, a "Uniform Hazardous Waste Manifest" (EPA Forms 8700-22 and 8700-22A), or equivalent state manifest, shall be used for both on- and offsite shipments. If the MW is regulated under Title 40 CFR 268, the manifest shall also be accompanied by the appropriate notice required by Title 40 CFR 268.7.

3. The original and one copy of completed "Radioactive Waste Management - Storage and Disposal" forms (RE-0167/0166), or equivalent, shall accompany each shipment. The information required on these forms includes identities, quantities, and concentrations of radionuclides and hazardous species in waste material by package. Each package in a shipment must be identified by a package identification number and a waste stream identification number. The information can be submitted on these printed forms or on computer printouts. In addition, a subset of this printed information shall be electronically transferred to REECo DWMD. (REECo DWMD will provide the forms and a copy of RWM-4, Radioactive Waste Information System User's Manual, which explains how to prepare these forms, and provides instructions for electronic data transfers. More information on electronic data transfers can be obtained by contacting REECo DWMD data management personnel (Commercial: 702-295-5870; FTS: 575-5870).)

C. Onsite transfer of bulk LLW to the Area 3 RWMS shall be coordinated through REECo DWMD. REECo DWMD shall assure that adequate precautions are taken to minimize personnel exposure and to prevent the spread of contamination.

5.2 Waste Receipt

Upon arrival at NTS, shipments may be subject to off-loading delays at any time due to NTS operational schedules.

A. At Mercury, the NTS base camp, each waste shipment from offsite will be inspected by REECo Radioactive Materials Control and Traffic personnel. Placarding will be inspected to assure it is in accordance with Title 49 CFR Subpart F.

B. Upon receipt of waste at an NTS RWMS, REECo DWMD personnel:

1. Receive the shipping papers and waste generator's records, and obtain other pertinent data. Verify that a signed certification statement accompanied the shipment and that all required information is supplied and is correct. Verify that the shipment is properly placarded. Onsite generators should follow the requirements of NVO-232.

2. Inspect the shipping vehicle and individual packages for integrity, external radiation levels, radioactive contamination and, for MW, hazardous material contamination.

3. Verify that waste packages, including marking and labeling, meet all applicable requirements of NVO-325.

4. Process compactible waste from onsite prior to disposal.

5. Assign waste to appropriate area of the RWMS for storage or disposal.

6. Record all actions taken regarding receipt and disposition of the received waste. Report any noncompliance to DOE/NV.

7. Enter waste data into the NTS defense waste database and verify and file records.

8. Return a copy of the "Uniform Hazardous Waste Manifest" for MW shipments to the generator.

5.3 Waste Records

Waste records include those required for shipping as well as those needed for the NTS defense waste database maintained by REECo DWMD. All hardcopy shipping records submitted must be legible (preferably typed) and clean to assure that they can be read by REECo personnel. Assurance of the accuracy of the waste data is necessary to guarantee the integrity and quality of the NTS defense waste database. At a minimum, the following records shall be included with each shipment.

A. DOT-required shipping papers, including a "Uniform Hazardous Waste Manifest" for MW shipments.

B. EPA-required notices for shipments of restricted MW (see Title 40 CFR 268.7).

C. RE-0167/0166 forms or equivalent.

APPENDIX A

SELECTED GLOSSARY

1. Bulk Waste Management Unit: Portion of the Area 3 Radioactive Waste Management Site (RWMS) used for disposal of bulk low-level waste (LLW).

2. Contact-Handled: Waste packaged such that the dose rate at the package surface is not greater than 200 millirem per hour.

3. Contamination: Removable radioactive contamination on the package surface or shipping vehicle that exceeds the contamination levels listed in Title 49 CFR 173.443, "Contamination Control." (See Title 49 CFR 173.443 for swiping techniques.)

4. Disposal: The emplacement of LLW or mixed waste (MW) in a manner which is considered permanent in that routine recovery is not provided for.

5. Free Liquid: The presence of liquids in quantities exceeding 0.5 percent by volume or, for MW, as determined using EPA Test Method 9095, "Paint Filter Liquids Test."

6. Generator: An organization which produces transuranic (TRU) waste, LLW or MW as a byproduct or which certifies the waste.

7. Greater Confinement Disposal: Disposal of high-specific-activity LLW and other wastes unsuitable for shallow land disposal in augered shafts at depths greater than 70 feet (21 m).

8. Hazardous Waste: Waste identified or listed in Title 40 CFR 261, or that otherwise meets the Resource Conservation and Recovery Act (RCRA) definition of hazardous, or waste identified by applicable state regulations. For the purposes of this document, "hazardous waste" does not have any radioactive components.

9. Incompatible Waste: A MW that might react adversely with its containment materials or another waste as defined in Title 40 CFR 260.10.

10. Low-Level Waste: All radioactive waste not classified as high-level waste, spent nuclear fuel, TRU waste, uranium mill tailings, or MW. Low-level waste can contain TRU nuclides in concentrations not greater than 100 nanocuries per gram.

11. LLW Management Unit: Portion of the Area 5 RWMS used for the disposal of packaged LLW.

12. Mixed Waste: Waste containing both radioactive and hazardous components as defined by the Atomic Energy Act and the RCRA, respectively.

13. MW Management Unit: Portion of the Area 5 RWMS used for disposal of MW.

14. Package: The packaging together with its contents.

15. Packaging: The assembly of components necessary to ensure compliance with U.S. Department of Transportation (DOT), U.S. Environmental Protection Agency (EPA), and U.S. Department of Energy Nevada Operations Office (DOE/NV) requirements (see Title 49 CFR 173.403(u)). It does not include radioactive or hazardous components of the waste.

16. Radioactive Waste: Generic name used herein for TRU waste, LLW (including limited quantity, low-specific-activity, and high-specific-activity) and MW resulting from DOE defense program activities.

17. Radioactive Waste Management Site: Designated NTS site where radioactive waste handling, storage, or disposal operations are conducted under REECo Defense Waste Management Department control. The only approved NTS waste management sites are the Area 5 RWMS for storage of packaged TRU waste and disposal of LLW and MW and the Area 3 RWMS for bulk LLW disposal.

18. Shallow Land Disposal: Disposal of LLW and MW in landfills to depths of about 30 feet (9 m).

19. Solid Waste: Waste material that is an essentially dry, solid form. Waste may include well-drained containers or liquids which have been entrapped or otherwise solidified so that they will retain their solid form without the presence of free liquids during handling, transportation, storage, or disposal. Viscous waste material is determined to be a solid by testing in accordance with American Society for Testing Materials Standard D 4359, "Standard Test Method for Determining Whether a Material is a Liquid or a Solid."

20. TRU Waste: Radioactive waste containing alpha-emitting radionuclides having an atomic number greater than 92 and half-lives greater than 20 years in concentrations greater than 100 nCi/g.

21. Treatment: Operations that benefit safety or economy by changing the waste characteristics. Five basic treatments are (a) volume reduction, (b) immobilization of radioactive/hazardous species, (c) change of composition, (d) removal of radioactive or hazardous species from the waste, and (e) solidification of liquids.

APPENDIX B

INSTRUCTIONS FOR THE WASTE STREAM CHARACTERIZATION DATA SHEET

1. Waste Stream Number: List two-part, thirteen-character alpha-numeric code which identifies generator and generator's waste stream code.

   Generator: Four-character alpha-numeric code used by the DOE Solid Waste Information Management System (SWIMS).

   Waste Stream: Nine-character, generator-assigned alpha-numeric code for a specific waste stream.

   Example: For a Rocky Flats waste stream, the waste stream number would be written as:

   ARIR-0000XXXXX

   where ARIR is the SWIMS designation for Rocky Flats and
   0000XXXXX is the Rocky Flats-assigned waste stream code.

2. Physical Characteristics: Provide the density, moisture and organic material content of the waste.

3. Radioactive Characteristics:

   a. Indicate whether waste would be classified as being greater than Class C as defined in Title 10 CFR 61.55, "Waste Classification."

   b. Nuclide Category: Identify SWIMS nuclide category number as follows: 1-TRU, 2-Uranium/Thorium, 3-Fission Product, 4-Induced Activity, 5-Tritium, 6-Beta-Gamma-TRU, 7-Alpha, 8-Other.

   c. Radioactive Constituents: List all nuclides which are a part of the waste. The activity levels are to be reported at the lowest level expected, as a mean, and at the highest level expected.

4. Hazardous Characteristics:

   a. Basis for Listing as Hazardous Waste: Identify decision-making process using criteria listed in Title 40 CFR 261, "Identification and Listing of Hazardous Waste."

   b. Indicate whether waste contains hazardous constituents restricted from land disposal under Title 40 CFR 268, Subpart C, "Prohibitions on Land Disposal."

c. Hazardous Constituents: List all constituents which are part of the waste and which are considered hazardous under Title 40 CFR 261. The constituents will be identified by their EPA waste code numbers. Above descriptions for activity declarations are applicable to concentration declarations.

APPENDIX C

GENERATOR WASTE CERTIFICATION PROGRAM PLAN GUIDANCE

PURPOSE

This guidance is provided to waste generators to assist in preparing waste certification plans. The guidance format is equivalent to the 18 elements of NUREG-1293, Quality Assurance Guidance for Low-Level Radioactive Waste Disposal Facility, but includes the essential elements from EPA-SW-846, Test Methods for Evaluating Solid Waste. The U.S. Department of Energy/Nevada Operations Office (DOE/NV) recognizes that each generator site has its own unique organization, management techniques, and quality assurance (QA) programs, and the waste certification program should fit within the established site organizational structure. The waste certification program plan must include enough specific information to describe the planned activities for compliance with the waste characterization and waste analysis requirements of NVO-325, Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements.

This guidance focuses on the substance and content of the waste certification program plan by identifying topics to be discussed in each of the 18 specific elements. These items and activities require preplanning and are critical to the waste certification effort. The certification plans will be reviewed and commented on by DOE/NV and REECo DWMD, and accepted or rejected by DOE/NV based on these elements. The specific elements will also provide major subject areas for technical audit checklist development.

SPECIFIC ELEMENTS FOR WASTE CERTIFICATION PROGRAM PLANS

1. ORGANIZATION

This section briefly describes the general management structure of the generator organization, the major tasks performed by the organization and, in more detail, identifies specific organizations in which transuranic (TRU) waste, low-level waste (LLW), and mixed waste (MW) are generated, processed, certified, and shipped.

A simplified organizational chart should be included, depicting the general management structure of the organization. Organizations which generate, characterize, certify, package, or ship wastes should be clearly identified. The chart should also include oversight and special service (e.g., QA, ES&H, analytical laboratories) organizations which play a part in waste certification at the generator site. A second, functional chart or diagram which depicts the flow of the waste generation and certification process, and the quality control interfaces, is useful and recommended. The Certification Official's relationships to others in the waste process should be identified. Descriptive paragraphs discussing the organization should be provided. The organization section should emphasize the generator's commitment to producing

waste which meets the requirements of NVO-325. A commitment to a training program for all activities and location of the training program within the organization should also be included.

2. QA PROGRAM

This section should describe an independent group committed to defining QA policy and providing independent oversight for activities which produce, package, characterize, certify, store, and ship defense waste. The oversight function is to review the operations as well as the controls imposed on them, all of which, when combined, lead to certification. A general statement on QA policy and independence should appear in this section of the certification plan. A functional chart depicting the organization for waste certification should be presented. A general statement of training, retraining, and qualifications of the QA staff for certification should be included.

3. DESIGN CONTROL

Certain facilities or processes to be designed and constructed to satisfy waste certification criteria, or confirm that certain wastes meet waste certification requirements, must have specific design controls imposed. For example, waste solidification is a process which requires specific controls to verify design parameters related to volume, proper mixture, hydration, sizing of equipment for proper throughput, and product specification. Design of process or laboratory facilities requires consideration of safety standards for nuclear facilities, or a permit for MW treatment and storage. Design of facilities related to MW certification must reflect the standards for treatment appearing in Title 40 CFR 268. Design of facilities for MW analysis must consider requirements for sampling analysis and data control required by EPA-SW-846.

The design of waste certification related equipment, processes, or systems should be reviewed by persons other than the primary designers. Reviewers are to be technically competent to perform meaningful review and must have organizational independence. Written comments on design issues provided by reviewers should be provided to task managers, studied, and resolved. The entire design and design review task should be subject to independent review by a QA organization.

4. PROCUREMENT DOCUMENT CONTROL

Certain items and services critical to the certification program should be procured under a controlled and documented system. Accepted documents should be used to prepare purchase requisitions and purchase orders. Provisions to review purchase requests from both cost and quality viewpoints should be included in the purchasing documents. The documents should include provisions for materials inspection, vendor/fabrication inspections, and receipt inspections, when deemed necessary.

Examples of items or services to be procured according to controlled procurement document procedures are Type A containers, analytical services for identifying and quantifying hazardous waste constituents of MW, and specific assay systems for radionuclides.

5. INSTRUCTIONS, PROCEDURES, DRAWINGS

Activities critical to certification require controlled system management. Certification activities are to be planned, and controlled by accepted implementing procedures. Certain processes or facilities require design drawings, which should be reviewed, kept current, and retained. Examples of important certification activities requiring procedures, instructions or drawings are: waste characterization, waste analysis, (includes both radionuclide and chemical constituents in MW), and compliance with EPA test protocols for characteristic and listed wastes. EPA protocols for MW sampling, sample identification, packaging, chain-of-custody, and data control should be used and carefully controlled.

Up-to-date drawings for facilities and processes related to certification should be prepared, reviewed independently, maintained and kept current. Specific instructions and procedures for those who perform the QA/QC tasks related to certification, including instructions for audits, reports, and resolution of nonconformances should also be prepared.

The system whereby instructions, procedures, and drawings are authorized, reviewed, accepted, distributed, used, and kept current should be reviewed by persons independent of the waste operations program. Those independent persons who inspect or observe certification activities, should determine by interview of workers that the instructions, procedures, and drawings are properly distributed, understood, and used by those conducting certification activities.

6. DOCUMENT CONTROL

The waste generator should have in place a system which controls authorization, preparation, review, acceptance, distribution, recall, and update of documents important to certification. NVO-325 should be handled as a controlled document because it is a major source of guidance for waste certification program requirements.

The plan should identify those organizations or persons responsible for the control of documents. The plan should be kept current, and DOE/NV should be notified of changes to the controlled documents.

7. CONTROL OF PURCHASED ITEMS AND SERVICES

Purchase of materials, items, or systems important to certification activities should be controlled by carefully prepared requisitions and purchase orders. Compliance with the written specifications must be verified upon receipt. Where necessary, vendor audits should be performed to observe manufacture or

assembly of the purchased products. Examples of items or services important to the certification process are containers (DOT Type A), analytical or assay services, and process equipment for production of acceptable waste forms.

Purchasing departments often perform vendor inspections. A specialist familiar with EPA sampling, chain-of-custody, analytical, and data control requirements should review, verify, and document these specific tasks for MW streams. Persons or organizations performing these tasks shall be identified in the plan.

8. IDENTIFICATION AND CONTROL OF MATERIALS, PARTS, AND COMPONENTS

Certain materials important to the certification processes should be carefully identified. Examples are waste packages with conforming waste materials, radiation detection instruments used for certification-related surveys, calibration sources for radiation detection instruments, acceptable waste containers and liners, cement or accepted solidifiers, and X-ray tubes.

Materials used for certification process purposes, purchased services such as sample collection and packaging for assay or analysis, components of measuring devices, or packages that require compliance with waste certification requirements should be properly identified, reviewed or inspected. Samples and data packages should be properly identified and carefully controlled. Materials, parts, samples, and components found to be out of specification, or not operable, should be handled as nonconforming items.

9. CONTROL OF PROCESSES

Certain processes, or series of activities important to waste certification, must have controls or verification steps identified as part of operating procedures. These processes and critical inspection points must be clearly identified and described in the waste certification program plan.

For MW, critical EPA requirements related to sample collection, packaging, analysis, verification and data handling must be described in detail sufficient to qualify as acceptable waste characterization/waste analysis plans for offsite disposal. Similar activities related to radiological assays should be controlled and carefully described. The entire waste certification process, which provides evidence of compliance with NVO-325, is a controlled process, with records, statements, labels, reports, and data being used by the Certification Official to sign a certification statement. The process of procuring, inspecting, storing, filling, closing, labeling, manifesting and shipping waste containers is also a controlled process.

Activities identified above should be performed under procedures prepared by the operating group, and reviewed by audits, inspections, or surveillances performed by persons not included in task performance, to provide oversight independence.

10. INSPECTION

Inspection and surveillance of activities are performed by the certification organizations for waste certification. The waste operations organization performs inspection for process control or verifying waste characterization activities. Inspections also can refer to program reviews performed by an independent entity within the waste generator organization. Inspections should include review of current implementing procedures, and evaluation for procedural compliance.

Inspection and surveillance activities should be scheduled, and performed on selected certification activities at a frequency to be determined by certification program management. Independent inspections by persons not part of the certification program should also be scheduled. Reports of inspection activities should be prepared, reviewed, supplemented when necessary, and distributed for resolution. Inspection reports should be centrally stored or archived to facilitate their review during DOE/NV technical audits.

11. TEST CONTROLS

Certain physical tests are necessary to substantiate waste certification, to resolve uncertainties, or verify quality. Proposed tests should be evaluated to ensure that the tests are designed to provide correct data. Examples of test controls are instrument calibration, spiked or split samples, replicate samples, blanks, background measurements, electronic calibrations, and calibration source traceability.

Test plans or protocols should be prepared by those who will perform tests, and reviewed by a second disinterested but technically competent individual. Independent individuals who inspect or audit the certification program should review the process by which tests are planned, controlled, and technically reviewed.

12. CONTROL OF MEASURING AND TEST EQUIPMENT

Test equipment and measuring devices should bear, by label, notation or some other means, evidence that they are currently calibrated or certified for current use. A sample sticker attached to a radiation survey meter indicating the last calibration date and the next due date is sufficient evidence that the survey meter is operable and calibrated, provided that the instrument calibration program is judged to be adequate. Environmental controls and measurements which determine temperature, humidity and dust concentrations in which certain test equipment should operate are other examples of controls for measuring and test equipment. Property tags also may serve as controls.

Users of test and measurement equipment should provide evidence of operational readiness for equipment under their purview. Review of the program should be by an independent entity.

13. HANDLING STORAGE AND SHIPPING

Wastes should be handled, stored, and shipped in a manner which will not alter the certification status. Handling and storage considerations should include provisions for security and fire protection. MW should comply with EPA requirements for storage (Title 40 CFR 264 Subpart I). Handling and storage of radioactive waste should comply with As Low As Reasonably Achievable (ALARA) precepts. Waste shipments are to comply with DOT (Title 49 CFR Parts 171-177), EPA (Title 40 CFR Parts 262 and 263) and NVO-325 requirements with respect to packaging, manifests, and labeling.

14. INSPECTION, TEST, AND OPERATIONAL STATUS

This item refers to the status of the waste certification program or certain processes or activities within the program. To certify waste, a waste certification program plan must be submitted to and accepted by DOE/NV. The certification plan is to be implemented by specific procedures, as demonstrated by internal inspection, independent inspection and DOE/NV technical audit. Waste certification authority will be granted if there are no significant findings at the conclusion of the technical audit. Findings of significant nature (items which could result in uncertifiable waste being certified) by any program review can result in loss of certification authority, or a recall of waste which had been "certified."

Initial certification authority is granted by the Manager of DOE/NV, by letter to the DOE organization at the generator site. Certification authority can be continued or revoked as a result of subsequent technical audits. Self inspections or inspections by independent entities within the waste generator organization could also result in a temporary loss of certification authority. More likely, significant findings by generator inspection might determine that uncertified waste has been shipped as certified. The waste generator, upon discovering the problem, must contact DOE/NV and REECo DWMD, and together, satisfactory resolution of the situation must be negotiated.

15. CONTROL OF NONCONFORMING ITEMS

Nonconforming items can be out-of-specification empty waste containers, nonconforming wastes, nonconforming test and measurement devices, or any out-of-specification or noncompliance item which could adversely affect waste certification. Such nonconformance must result in removal of the nonconforming item from operating status, or operational acceptance. Nonconforming objects, equipment, items, containers, or waste should be clearly identified by label, tag, segregation, or other mechanism to ensure removal from the certification process. Written documentation of nonconforming items and their resolutions is required.

Nonconformances can and should be identified by anyone associated with waste certification activities.

16. CORRECTIVE ACTIONS

Once identified, nonconforming items must be documented and tracked until successful resolution can be demonstrated. The corrective action should be performed to correct nonconformances resulting from:

a. inspections, surveillances, or audits;

b. failure of current processes to provide certified waste forms;

c. certification of waste based on assay system data or analytical processes found to be out of calibration or inoperable;

d. failure to properly perform activities critical to certification because of lack of or inadequate procedures;

e. improper packaging;

f. inadequate or erroneous manifests or data packages;

g. lack of waste certification statement on data packages, which relate to specific containers; or

i. inadequate waste analysis and/or failure to analyze a representative sample.

Identification and correction of nonconforming items is a key element of waste certification, which will be reviewed during all technical audits and quality program audits, either by onsite or offsite auditors.

Adequate corrective action for nonconforming items is the responsibility of each individual associated with waste certification activities including certifying officials, waste generators and operators, shipping management, support services management, and QA management.

17. QA RECORDS

17.1 Requirements

Records demonstrating compliance with certification criteria should be maintained for time periods equivalent to similar onsite records retention requirements. QA records important to certification include, but are not limited to: the waste certification program plan, organization charts, training records, letters/memos providing notification of planned technical or quality audits, inspections, audit report checklists, responses, and nonconformance findings with completed corrective actions. QA records related to waste certification should be stored in a single location properly secured and protected from fire.

18. AUDITS/SURVEILLANCES

Technical audits/surveillances are conducted to assess performance of the waste certification program with certification requirements of NVO-325. These audits are not quality program audits (i.e., audits of generator QA programs and plans). Technical audits and surveillances are performed to assess the adequacy of the waste certification program with respect to waste process controls, radiological assay, chemical analysis compliance, waste form compliance, records compliance, and container and shipping compliance. These technical audits are formal events, fully planned and documented, with written notifications, checklists, reports, and resolution all being part of the audit method.

Technical audit/surveillance activities at generator sites include self audits by certification program participants, independent inspections and surveillances by persons at the generator site not associated with waste certification, site contractor management, onsite DOE management, DOE/NV, or DOE Headquarters program management.

19. TRAINING

All persons associated with the defense waste certification program at generator sites must be trained in the requirements of their waste certification program plan and NVO-325. All persons who generate, package, certify, prepare data, perform related radiation surveys, or perform the associated quality functions, must have received training in the requirements and implementing procedures for those parts of the certification program in which they are involved. EPA regulations related to MW activities must also be included in the training program to ensure that waste analysis and characterization, sampling, and control of data are performed as required.

Personnel training courses in waste certification are prepared according to instructions provided and/or accepted by those responsible for the certification program. Personnel retraining is conducted on a specified frequency.

Records of training course content, exams, if any, and test results are to be maintained. A master list of trained individuals should be maintained and available for review by audit personnel. The organization responsible for the training program maintains training materials and records.

IV. EXEMPTION REQUESTS

1.2 The new NTS requirement for a waste package to be capable of supporting a uniformly distributed load of 4,000 lbs/ft^2 has not been tested on the FMPC waste packages. Waste packages, except drums, shall be tested according to this requirement. Results of the testing shall be complete in approximately 12 months from the date of DOE NV acceptance of this application. Depending upon the test results exemption may or may not be needed on WMCO waste packages. The semiannual NTS recertification report shall contain these findings and exemption requests outlined, if necessary.

1.3 The Waste Certification Program Plan (WCPP) does not address mixed waste. A revision of the WCPP to include mixed waste criteria is scheduled for completion prior to FY-90. WMCO has projected shipments of mixed waste by FY-90.

1.4 Sampling procedures require an update to reflect NVO-325 requirements. Completion of this update is planned for August 1989.

1.5 Waste Certification procedures require an update to provide guidance to certify that waste meets NVO-325 requirements. Completion of this update is scheduled for July 1989.

1.6 Waste Operations personnel, generators, certification personnel, transportation personnel need to be trained to the NVO-325 criteria. Completion of this requirement is scheduled for August 1989.

1.7 The FMPC requests that REECo Traffic Section be notified the same day after the shipment leaves the site rather than before as required in NVO-325 Section 5.1.A.1 The time zone difference between Ohio and Nevada makes morning notification impossible.

1.8 The sea/land shipment containers (8′ x 8′ x 20′) and the baled trash packages shipped from the FMPC to NTS and disposed of at Area 3 are requested to be exempted from the 4,000 lbs./ft.^{2} strength requirement as stated in NVO-325 Section 2.1.2.B.

1.9 The FMPC requests that the DOE NRC Form 741 be sent to NTS within 24 hours <u>after</u> the shipment and not prior as requested by NVO-325 Section 5.1.B.1.

FEED MATERIALS PRODUCTION CENTER

APPLICATION TO SHIP WASTE TO THE NEVADA TEST SITE

MAY 1989

Revision 3 May 1991

Prepared by
WESTINGHOUSE MATERIALS COMPANY OF OHIO
P. O. BOX 398704
CINCINNATI, OHIO 45239-8704

Prepared for
U.S. DEPARTMENT OF ENERGY
OAK RIDGE OPERATIONS OFFICE
Contract DE-AC05-86OR21600

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

T. J. Walsh
Manager, OU3 Compliance

J. E. Clementz
Prime Certification Officer

C. W. Bower for D. I. Dunmyre
Manager, Materials
Control & Accountability

James P. McGuigan
Manager, Traffic

Timothy M. Hay for F. L. Gardner
Manager, Facilities and
Warehousing

A. L. Gumaer
Manager, Waste Management

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RECORD OF REVISIONS

Revision No.	Date
0	5/89
1	8/90
2	11/90
3	5/91

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APPLICATION TO SHIP WASTE

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D. Contractor Name and Contacts

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I. GENERATOR INFORMATION

A. GENERATOR/FACILITY NAME AND LOCATION:

Shipping Address:

Feed Materials Production Center (FMPC)
7400 Willey Road
Fernald, Ohio 45030

Mailing Address:

Feed Materials Production Center
P. O. Box 398704
Cincinnati, Ohio 45239-8704

B. EPA IDENTIFICATION NUMBER:

OH6890008976

C. DOE FIELD/AREA OFFICE CONTACTS:

Primary:

Gerald W. Westerbeck
Fernald Site Manager
U.S. Department of Energy
P. O. Box 398705
Cincinnati, Ohio 45239-8705
(513) 738-6357
FTS 774-6357
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Alternates:

Raymond J. Hansen
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P. O. Box 398705
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David M. Rast
U.S. Department of Energy
P. O. Box 398705
Cincinnati, Ohio 45239-8705
(513) 738-6322
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D. CONTRACTOR NAME AND CONTACTS:

Westinghouse Materials Company of Ohio (WMCO)
P. O. Box 398704
Cincinnati, Ohio 45239-8704

Primary contacts:

Joseph T. Grumski (Manager, Waste Management)
Westinghouse Materials Company of Ohio
P.O. Box 398704
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Facsimile Number (513) 738-8651

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Cincinnati, Ohio 45239-8704
(513) 738-6462 FTS 774-6462

Alternate contacts:

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(513) 738-6001 FTS 774-6001
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Steve D. Brown (Assistant Project Engineer, Waste Management)
Westinghouse Materials Company of Ohio
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(513) 738-8654 FTS 774-8654
Facsimile Number (513) 738-8944

Robert L. Gardner (Manager, Facilities & Warehousing)
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(513) 738-6244 FTS 774-6244
Facsimile Number (513) 738-6245

II. WASTE CERTIFICATION PROGRAM

A. WASTE CERTIFICATION PROGRAM PLAN (See Appendix I)

II. WASTE CERTIFICATION PROGRAM

B. CERTIFICATION RELATED PROCEDURES (See Appendix I)

III. WASTE STREAM INFORMATION

A. WASTE STREAM IDENTIFICATION

1. WASTE STREAM NUMBER:

The FMPC has categorized five (5) low level radioactive waste streams for the purpose of characterization as required by NVO-325. The waste streams include the following:

Low Level Wastes:

ONLO-000000001	Contaminated Process Area Wastes
ONLO-000000002	Contaminated Construction Wastes
ONLO-000000003	Low Grade Residues
ONLO-000000004	High Grade Residues
ONLO-000000005	Thorium Wastes

2. WASTE TYPE:

Low Level Waste

3. DESCRIPTION OF WASTE

(Including generation process, treatment, final form, and special handling or disposal requirements.)

III. WASTE STREAM INFORMATION

3.1 Waste Stream ONLO-000000001, Process Area Wastes

Numerous contaminated process area wastes are generated at the FMPC in conjunction with normal production related activities. These wastes have all been prepared and shipped to the Nevada Test Site in the past and include the following:

- Trash (plastic, cardboard, paper, etc.)
- Incinerator ash
- Scrap salts (high fluoride)
- Asphalt
- Floor sweepings - including the compound for floor cleaning
- Scrap drums
- Refuse metal
- Scrap filters
- Pallets, scrap wood
- Ceramics, glass
- Dust collector bags
- Furnace cleanings (Rockwell)

A toxicity characteristic leaching procedure (TCLP) laboratory test shall be performed on all asphalt plus others where applicable to determine measurement of benzene present in material. These results shall be submitted to NTS as required for material disposal.

These wastes may be packaged into drums, metal boxes, and sea/land containers.

3.2 Waste Stream ONLO-000000002, Construction Wastes

Contaminated construction wastes are generated at the FMPC in the demolition or excavation phase of a construction or maintenance project. Construction wastes which are currently shipped to NTS may include the following:

- Soil
- Rocks, gravel
- Concrete
- Metal
- Wood
- Trash (plastic, cardboard, paper, etc.)
- Asphalt
- Glass

Construction wastes may be packaged into drums, metal boxes, and sea/land containers.

III. WASTE STREAM INFORMATION

3.3 Waste Stream ONLO-000000003, Low Grade Residues

Low grade residues were generated and are stored at the FMPC as a result of the production processes within the various plants or other DOE facilities.

Low grade residues generally contain between 1% to 20% U-238 by weight and 0.2% to 2.0% U-235 relative to U-238.

One of the major uranium residues include magnesium fluoride (MgF_2). MgF_2 was produced during the reduction process of uranium tetrafluoride with magnesium in electrical resistance furnaces to uranium derby metal. The MgF_2 waste was then repackaged in 48-gallon drums using 55-gallon drums as overpacks.

Slurries and residues from Plant 8 are processed through various equipment due to their wet/dry consistencies. Some of the dry uranium waste materials are miscellaneous residues including scrap uranium tetrafluoride (UF_4) and black oxide (U_3O_8) which are packaged using the Rotex without a screen. Raffinate cake, sump cake, and slag leach filter cake are dried in the Rotary Kiln or Primary Calciner and packaged from there. All of these are processed in Plant 8 and packaged into 48-gallon drums with 55-gallon drum overpacks.

Low Grade Uranium Residues:

- Discard process residues
- Trailer cakes
- Waste slurries (dried)
- Raffinate
- Sump cake
- Dust collector residues
- Filter cakes
- MgF_2

III. WASTE STREAM INFORMATION

3.4 Waste Stream ONLO-000000004, High Grade Residues

High grade residues are also generated or stored at the FMPC as a result of the production processes within the various plants or other DOE facilities. High grade residues generally contain between 20% to 100% U-238 by weight and 0.2% to 2.0% U-235 relative to U-238.

Many of the high grade residues are intermediate products in the uranium metal production process which do not meet the quality or economic discard limit criteria and, therefore, are classified as low level waste.

High Grade Uranium Residues:

- UF_4 (off-spec)
- Scrap U_3O_8
- Reject UO_3

3.5 Waste Stream ONLO-000000005, Thorium Wastes

Since 1972, the FMPC has served as the U.S. DOE storage repository for thorium. Approximately two-thirds of the thorium inventory was processed at the FMPC with the remaining portion originating at other DOE facilities. The thorium at the FMPC is in the form of thorium metal, oxides, and residues.

The principal thorium residues consist of thorium oxides produced from unpurified thorium nitrate via the thoria gel process, thorium oxide powder used as refinery feed, and dry thorium hydroxide. Thorium oxides produced from FMPC processing of Hanford thorium nitrate contain trace quantities (about 20 ppm) of the isotope U-233 as a contaminant. This amounts to about 10% of the thorium residues. The metal consists primarily of clad thorium metals and partially oxidized metals.

All thorium materials will be overpacked into individual drum overpack containers, drums overpacked in metal boxes or into multiple container overpacks such as strong tight containers, to meet NTS waste acceptance criteria.

Thorium Wastes:

- ThF_4
- Scrap thorium metal
- Thorium oxides
- Thorium ores and residues
- Oxalates and hydroxides

III. WASTE STREAM INFORMATION

B. JUSTIFICATION FOR SHIPMENT TO NTS

The FMPC proposes to ship waste streams consistent with those listed in Section III, Part A-3.1 through III, Part A-3.3 of this application. The waste streams will be processed if necessary, packaged, transported and buried at the Nevada Test Site for disposal.

Since 1986, the FMPC has not been permitted by the U.S. EPA to dispose of any low level waste on-site. As a result, a backlog of low level waste streams, equaling approximately 814,000 $ft.^3$, was inventoried by the end of 1986 as requiring permanent disposal. This backlog waste is currently stored outdoors in deteriorating drums or on 30 plus year old concrete pads with marginal capability to control contaminated runoff. In addition to the backlog waste, the FMPC continues to generate low level waste from ongoing production activities and construction projects. Current production activities generate approximately 260,000 $ft.^3$ of low level waste per year. The construction projects expect to generate approximately 950,000 $ft.^3$ of low level waste between 1987 and 1992.

Based upon the relatively small size of the Feed Materials Production Center (1,050 acres), its close proximity to densely populated areas, and its location over a major sole source aquifer, off-site disposal of the low level waste at NTS is essential to continued FMPC operations.

III. WASTE STREAM INFORMATION

C. FUNDING METHOD

Funding shall be set up to prepay FMPC estimated waste volumes by at least a fiscal quarter in advance. Purchase orders shall be prepared and addressed to REECo, based upon a minimum of two quarters estimated waste volume and consistent with the forecasts identified above and the prevalent disposal charge per cubic foot. Separate purchase orders shall be provided for each waste type. Upon receipt of bill from REECo, payment shall be expedited. WMCO shall adjust any quarterly forecast prior to the initiation of billing by REECo for that quarter.

III. WASTE STREAM INFORMATION

D. THREE YEAR WASTE SHIPMENT FORECAST

The three tables in this section contain FMPC waste forecasts for Fiscal Years 1991 through 1993. Waste streams numbered 001 through 004 are currently approved and being shipped to the Nevada Test Site (NTS) for disposal.

THREE-YEAR WASTE SHIPMENT FORECAST

GENERATOR: Feed Materials Production Company PREPARED BY: J. T. Grumski DATE: 04/01/91

FORECAST PERIOD	WASTE STREAM NUMBER	WASTE TYPE	CONTAINER			NUMBER OF SHIPMENTS	TOTAL VOLUME CUBIC FEET
			TYPE	SIZE	NUMBER		
FY-1991	001	Process	Sea/Land	8'x8'x20'	25	25	33,725
04/01-06/30	002	Construction	Sea/Land	8'x8'x20'	15	15	20,235
	002	Construction	Metal Box	4'x4'x7'	20	2	2,040
	001	Process	Sea/Land	8'x8'x20'	25	25	33,725
07/01-09/30	002	Construction	Sea/Land	8'x8'x20'	35	35	47,215
	002	Construction	Metal Box	4'x4'x7'	80	8	8,160
	005*	Thorium	Drums	48/55-gal.	1,760	22	14,080
					TOTALS	132	159,180

*To be shipped upon approval by NTS

THREE-YEAR WASTE SHIPMENT FORECAST

GENERATOR: Feed Materials Production Company

PREPARED BY: J. T. Grumski

DATE: 04/01/91

FORECAST PERIOD	WASTE STREAM NUMBER	WASTE TYPE	CONTAINER			NUMBER OF SHIPMENTS	TOTAL VOLUME CUBIC FEET
			TYPE	SIZE	NUMBER		
FY-1992	001	Process	Sea/Land	8'x8'x20'	36	36	48,564
	001	Process	Metal Box	4'x4'x7'	972	108	99,144
	002	Construction	Sea/Land	8'x8'x20'	99	99	133,551
	002	Construction	Metal Box	4'x4'x7'	576	64	58,752
	003	Low Grade Residues	Drum	48/55-gal.	13,500	142	108,000
	004	High Grade Residues	Drum	55/83-gal.	900	15	10,865
	005*	Thorium	Metal Box	4'x4'x7'	783	87	79,866
					TOTALS	551	538,742

*To be shipped upon approval by NTS

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THREE-YEAR WASTE SHIPMENT FORECAST

GENERATOR: Feed Materials Production Company

PREPARED BY: J. T. Grumski

DATE: 04/01/91

FORECAST PERIOD	WASTE STREAM NUMBER	WASTE TYPE	CONTAINER			NUMBER OF SHIPMENTS	TOTAL VOLUME CUBIC FEET
			TYPE	SIZE	NUMBER		
FY-1993	001	Process	Sea/Land	8'x8'x20'	61	61	82,289
	001	Process	Metal Box	4'x4'x7'	135	135	123,930
	002	Construction	Sea/Land	8'x8'x20'	99	99	133,551
	002	Construction	Metal Box	4'x4'x7'	576	64	58,752
	003	Low Grade Residues	Drum	48/55-gal.	13,500	142	108,000
	004	High Grade Residues	Drum	55/83-gal.	900	15	10,865
	005*	Thorium	Metal Box	4'x4'x7'	819	91	83,538
					TOTALS	607	600,925

*To be shipped upon approval by NTS

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III. WASTE STREAM INFORMATION

E. PACKAGING AND SHIPPING INFORMATION

1. Proper shipping name per 172.101, 49CFR

   Radioactive material: low specific activity (or) LSA, n.o.s.
   Hazard class: Radioactive material
   Identification number: UN-2912

   Radioactive material: limited quantity, n.o.s.
   Hazard class: Radioactive material
   Identification number: UN-2910

   Depending on the contents of the above descriptions may be shipped as a "Hazardous" or "Reportable Quantity (RQ)" material in compliance with 172.101, Appendix, 49 CFR.

2. Packaging

   All low level waste will be packaged in strong tight containers as defined in 49 CFR 173.24 and 173.425.

   Packages will be designated as "Industrial" for radioactive material and residues and "Bulk" for articles contaminated with radioactive material.

F. SECURITY/CLASSIFICATION INFORMATION

This section is not applicable to the FMPC since no classified waste is shipped for disposal at NTS.

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III. WASTE STREAM INFORMATION

G. WASTE CHARACTERIZATION PROGRAM

1. Procedures (See Appendix I)

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III. WASTE STREAM INFORMATION

G. WASTE CHARACTERIZATION PROGRAM

2. Waste Stream Characterization Data Sheet(s)

Waste Stream Characterization Data Sheet

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1. Waste Stream No.: O N L O - 0 0 0 0 0 0 0 1
   Process wastes less than 1% uranium by weight

2. Physical Characteristics:

   a. Density: 10-40 lb./cu.ft. (bulk density as packaged)

   b. Moisture Content: no free liquids (generally less than 1% water)

   c. Organic Material Content: none

3. Radioactive Characteristics:

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

   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) U-238 (0.10% to 1.0% U)		0.3330E-06		Curies/gram U-238
(2) U-235 (0.2% to 3.99% U-235)		0.2140E-05		Curies/gram U-235
(3) U-234 (0.001% to 0.01% U-234 on a U basis)		0.3360E-06		Curies/gram Total U
(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.)

4228

Waste Stream Characterization Data Sheet

1. Waste Stream No.: O N L O - 0 0 0 0 0 0 0 2
   Construction wastes

2. Physical Characteristics:

   a. Density: 20-50 lb./cu.ft. (bulk density as packaged)

   b. Moisture Content: no free liquids (generally less than 25% water)

   c. Organic Material Content: none

3. Radioactive Characteristics:

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

   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) U-238 (0.1% to 10% U)		0.3330E-06		Curies/gram U-238
(2) U-235 (0.2% to 1.0% U-235)		0.2140E-05		Curies/gram U-235
(3) U-234 (0.001% to 0.01% U-234 on a U basis)		0.3360E-06		Curies/gram Tot
(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.)

Waste Stream Characterization Data Sheet

4228

1. Waste Stream No.: O N L O - 0 0 0 0 0 0 0 0 3
   Low U residues 1-20% U by weight

2. Physical Characteristics:

   a. Density: 20-150 lb./cu.ft. (bulk density as packaged)

   b. Moisture Content: no free liquids (generally less than 1% water)

   c. Organic Material Content: none

3. Radioactive Characteristics:

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

   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) U-238 (1% to 20% U)		0.3330E-06		Curies/gram U-238
(2) U-235 (0.2% to 2.0% U-235)		0.2140E-05		Curies/gram U-235
(3) U-234 (0.001% to 0.01% U-234 on a U basis)		0.3360E-06		Curies/gram Total U
(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)					

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(Attach additional sheets if necessary.)

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Waste Stream Characterization Data Sheet

1. Waste Stream No.: O N L O - 0 0 0 0 0 0 0 4
   20%-100% U by weight

2. Physical Characteristics:

   a. Density: 50-150 lb./cu.ft. (bulk density as packaged)

   b. Moisture Content: no free liquids (generally less than 1% water)

   c. Organic Material Content: none

3. Radioactive Characteristics:

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

   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)	U-238 (1% to 20% U)		0.3330E-06		Curies/gram U-238
(2)	U-235 (0.2% to 2.0% U-235)		0.2140E-05		Curies/gram U-235
(3)	U-234 (0.001% to 0.01% U-234 on a U basis)		0.3360E-06		Curies/gram Tot
(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.)

Waste Stream Characterization Data Sheet

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1. Waste Stream No.: O N L O - 0 0 0 0 0 0 0 0 5
   1-100% Thorium by weight

2. Physical Characteristics:

   a. Density: 50-150 lb./cu.ft. (bulk density as packaged)

   b. Moisture Content: no free liquids (generally less than 1% water)

   c. Organic Material Content: none

3. Radioactive Characteristics:

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

   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) Th-232 (.1% to 100% Th)		0.1090E-06		Curies/gram Th
(2) Th-228 (natural %)		0.1096E-06		Curies/gram Th
(3) U-233 (13 ppm on a Th basis)		0.1232E-06		Curies/gram Th
(4) Th-230 (natural %)		0.1100E-07		Curies/gram Th

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.)

AR4PSR2 — FEED MATERIAL: PRODUCTION CENTER — RESIDUES SPECIAL REPORT REQUEST — PAGE

11/15/90

ACTIVITY DA. 10/01/87 thru 01/10/90

METHOD CODES:

%U	U-235		TRANSURANICS
A - VOLUMETRIC	E - VOLUMETRIC	R - GAMMA	A - URANIUM
B - GRAVIMETRIC	F - FACTOR ASSAY	S - GAS MASS SPEC.	B - SAMPLE
C - COLORIMETRIC	* - TWO OR MORE	T - THERMAL MASS SPEC.	C - U-235
			D - ANU

LOT IDENTIFICATION	LAB NO.	#CON	NET WT SE	%U	U-235	U-238
093 100 D011 0328	90412019	40	26699.0 OR	A)2.230	T).410	
093 100 D011 A328	90412018	40	26183 0 OR	A)1 000	T).710	
093 100 D011 B328	90414001	40	22214.0 OR	A).980	T).430	
093 100 D011 C328	90414002	6	3039.0 OR	C).150	T).530	
690 510 D011 0314	80314043	3	841.0 OR	C).20	T).230	
093 510 D011 0311	71216028	2	255.0 OR	C).03	T).250	
690 530 D011 0312	80209053	9	3154.0 OR	C).08	T).280	
093 530 D011 0309	71107213	21	8862.0 OR	C)2.27	T).2270	
082 732 D011 0309	71013053	4	181.0 OR	C)2.68	T).1950	
082 732 D011 0311	71107212	5	123.0 OR	C)2.98	R).2000	
082 732 D011 0312	80112047	3	84.0 OR	A)3.22	R).20	
082 732 D011 0313	80218003	4	123.0 OR	C)2.40	T).228	
082 732 D011 0314	80318048	6	149.0 OR	C)2.96	T).206	
082 732 D011 0315	80330058	2	42.0 OR	C)3.09	S).1995	
082 732 D017 0309	71013052	3	95.0 OR	A)15.66	R).2000	
082 732 D017 0311	71202049	2	29 0 OR	A)42.12	R).20	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
093 130 D021 0327	90411018	4	1321 0 OR	A).640	T).600	
020 142 D021 0318	80623024		0 OR	C)1.900	T).605	
690 510 D021 0313	80226021	5	1925.0 OR	A).78	T).274	
690 510 D021 0315	80415025	7	2966.0 OR	A)41.69	R).20	
093 510 D021 0299	71204067	5	2053.0 OR	A)2.44	T).239	
093 510 D021 0301	71013056	7	4421.0 OR	A)2.25	R).2000	
093 510 D021 0303	71013057	1	706 0 OR	C).05	T).2900	
093 510 D021 0305	71013058	1	934.0 OR	C).06	T).3000	
093 510 D021 0310	71119016	5	2863 0 OR	A)1.65	T).233	
66 510 D021 A311	80119055	8	5260.0 OR	C)1.81	T).651	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	0 OR	A)50.330	T).62[illegible]	3500
[illegible]	90924006			[illegible]	T).209	

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-Jul-90

PC LOT MARK	SAMPLE CODE	CONCENTRATION OF EP TOXICITY ELEMENTS IN mg/l (ppm) FROM IT CORP							
		ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	SILVER	MERCURY
93-516-D017-0282	12-31	<0.2	0.755	0.002	<0.02	<0.05	<0.2	0.02	<0.0002
93-658-D069-0293	37-32	1.1	0.494	0.020	0.04	<0.5	<0.2	0.42	<0.0002
22-FTA-D068-6443	15-33	<0.2	0.819	0.012	0.06	<0.5	<0.2	0.31	<0.0002
93-530-D065-0267	3-34	2.2	0.629	0.037	0.06	1.1	<0.2	0.81	<0.0002
93-827-D058-0269	31-105	<0.2	0.28	<0.005	0.06	<0.05	<0.2	<0.01	<0.0002
92-440-D082-0301	3-106	1.5	0.27	0.02	0.23	<0.05	<0.2	0.55	<0.0002
24-400-D082-0303	1-107	1.4	0.18	0.017	<0.02	<0.05	<0.2	0.44	<0.0002
23-518-D077-0275	4-108	0.7	0.03	0.006	<0.02	<0.05	<0.2	0.148	<0.0002
23-510-D020-0273	3-109	<0.2	0.36	0.044	0.04	<0.05	<0.2	<0.01	<0.0002
20-100-D157-0280	1-110	<0.2	0.14	0.09	0.07	0.06	<0.2	1.15	<0.0002
59-FYC-D018-0116	11-63	<0.2	147	<0.005	<0.02	<0.05	<0.2	0.14	0.0985
0-240-D033-0266	25-66	<0.2	2.50	0.020	<0.02	<0.05	<0.2	<0.01	<0.0002
8-112-D163-0202	63-67	0.4	2.18	<0.005	0.33	<0.05	<0.3	0.06	<0.0002
-643-D042-0286	9-53	0.36	0.747	0.008	<0.02	<0.05	<0.2	0.20	<0.0002

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Jul-90

'C LOT MARK	SAMPLE CODE	CONCENTRATION OF EP TOXICITY ELEMENTS IN mg/l (ppm) FROM IT CORP							
		ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	SILVER	MERCURY
8-731-D065-0285	1-83	<0.2	0.04	0.025	0.03	1.78	<0.2	0.41	<0.0002
2-440-D065-6897	30-73	1.6	16.4	<0.005	0.04	<0.05	<0.2	0.63	<0.0002
7 OR ? UNK 9-FYC-D065-0116	13-74	0.2	1.13	0.373	1.31	<0.05	<0.2	<0.01	<0.0002
4-735-D068-0266	13-75	0.9	0.30	0.399	0.24	0.24	<0.2	0.19	<0.0002
0-FYC-D069-0116	22-76	<0.2	0.25	0.158	0.21	<0.05	<0.2	<0.01	<0.0002
0-732-D047-0285	4-77	<0.2	0.75	0.240	0.285	0.13	<0.2	2.70	<0.0002
3-642-D044-0275	7-59	<0.2	2.36	0.022	1.58	<0.05	<0.2	0.20	<0.0002
3-642-D060-0262	11-60	<0.2	3.24	0.024	0.52	0.18	<0.2	0.51	0.0004
0-611-D060-0184	10-61	1.0	12900	<0.005	<0.02	0.32	0.2	<0.01	<0.0002
1-322-D062-0280	4-62	<0.2	0.299	0.006	0.14	<0.05	<0.2	0.59	<0.0002
7-112-D031-0375	66-64	<0.2	7.1	0.041	0.13	1.18	<0.2	<0.01	0.0004
5-112-D033-3145	11-65	<0.2	0.377	0.048	0.17	<0.05	<0.2	<0.01	<0.0002
1-240-D033-0253	21-68	0.3	1.65	0.139	3.38	0.26	<0.2	0.03	<0.0002
0-FYC-D018-0116	11-69	<0.2	0.20	<0.005	<0.02	<0.05	<0.2	<0.01	0.0005

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Jul-90

FROM IT CORP

C LOT MARK	SAMPLE CODE	CONCENTRATION OF EP TOXICITY ELEMENTS IN mg/l (ppm)							
		ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	SILVER	MERCURY
0-240-D033-0272	37-70	<0.2	0.17	<0.005	1.50	<0.05	<0.02	<0.01	<0.0002
6-FYA-D033-3315	1-71	0.9	0.48	0.122	0.31	5.22	<0.2	0.24	<0.0002
2-732-D047-0266	3-72	<0.2	0.23	0.23	0.10	0.14	<0.2	0.79	<0.0002
3-510-D046-0301	3-114	<0.2	0.003	<0.005	0.033	<0.05	<0.2	<0.01	<0.0002
4-440-D082-5974	37-111	2.7	0.09	0.040	0.05	<0.05	<0.2	1.03	<0.0002
3-533-D135-0272	3-35	0.5	0.417	0.008	<0.02	<0.5	<0.2	0.22	<0.0002
0-240-D033-0277	45-39	<0.2	0.531	<0.002	0.07	<0.05	<0.2	<0.01	<0.0002
7-825-D154-5152	61-101	<0.2	1.41	0.044	0.09	0.08	<0.2	1.028	<0.0002
3-FTA-D067-6392	4-78	0.8	22.4	0.031	0.15	0.64	<0.2	0.24	<0.0002
3-965-D069-0194	21-80	<0.2	<0.2	<0.005	<0.02	<0.05	<0.2	<0.01	<0.0002
5-221-D022-0275	4-81	0.4	0.77	<0.005	<0.02	<0.05	<0.2	0.09	<0.0002
5-520-D058-0285	5-98	<0.2	0.33	<0.005	<0.02	<0.05	<0.2	<0.01	<0.0002
5-518-D057-0292	4-99	<0.2	0.28	0.008	0.09	<0.05	<0.2	1.84	<0.0002
5-516-D070-0294	23-102	<0.2	0.30	0.009	2.46	<0.05	<0.2	2.25	<0.0002

ACTIVITY DATE: 10/01/87 thru 01/10/90

METHOD CODES: XU

A - VOLUMETRIC
B - GRAVIMETRIC
C - COLORIMETRIC
E - VOLUMETRIC
F - FACTOR ASSAY
* - TWO OR MORE

U-235
R - GAMMA
S - GAS MASS SPEC.
T - THERMAL MASS SPEC.

TRANSURANICS
A - URANIUM
B - SAMPLE
C - U-235
D - ANU

OT	IDENTIFICATION	LAB NO	ACON	NET WT	SE	XU	U-235	U-238
003	811 V002	W001	71103051	60	18274.0	OR 4.22	T1.2820	99.7180
003	811 V002	W002	71103052	60	18125.0	OR .28	T1.3700	99.6200
003	811 V002	W003	71103053	60	17415.0	OR .34	T1.4700	99.5000
003	811 V002	W004	71106058	60	18149.0	OR .18	T1.6300	99.3400
003	811 V002	W005	71109045	60	18478.0	OR .19	T1.6400	99.3300
003	811 V002	W006	71109046		.0	OR .22	T1.8000	99.1600
003	811 V002	W007	71112049		.0	OR C1.19	T1.7990	99.1600
003	811 V002	W008	71117001		.0	OR C1.68	T1.8690	99.0800
003	811 V002	W009	71117002		.0	OR C1.32	T1.8990	99.0500
003	811 V002	W010	71123114		.0	OR C1.23	T1.8330	99.1200
003	811 V002	W011	71123115		.0	OR C1.16	T1.8500	99.1100
003	811 V002	W012	71123116		.0	OR C1.07	T1.7600	99.2100
003	811 V002	W013	71203112		.0	OR C1.20	T1.6900	99.2800
003	811 V002	W014	71203113		.0	OR C1.17	T1.8300	99.1200
003	811 V002	W015	71208057		.0	OR C1.15	T1.9100	99.0500
003	811 V002	W016	80123317		.0	OR C1.28	T1.860	99.1100
003	811 V002	W017	71215001		.0	OR C1.30	T1.8700	99.0800
003	811 V002	W018	71215002		.0	OR C1.29	T1.8800	99.0800
003	811 V002	W019	71215003		.0	OR C1.30	T1.8600	99.0900
003	811 V002	W020	80123318	60	12619.0	OR C1.20	T1.870	99.1000
003	811 V002	W021	80123319		.0	OR C1.30	T1.850	99.1200
003	811 V002	W022	80123320		.0	OR C1.76	T1.820	99.1500
003	811 V002	W023	80123321		.0	OR C1.21	T1.880	99.0900
003	811 V002	W024	80308053		.0	OR C1.27	T11.000	98.9600
003	811 V002	W025	80112006		.0	OR C1.07	T1.900	99.0500
003	811 V002	W026	80112007		.0	OR C1.25	T1.980	98.9800
003	811 V002	W027	80308054		.0	OR C1.30	T11.030	98.9300
003	811 V002	W028	80308055		.0	OR C1.72	T1.960	99.0000
03	811 V002	W029	80120002		.0	OR C1.67	T11.030	98.9300
03	811 V002	W030	80123322		.0	OR C1.66	T1.880	99.0800
03	811 V002	W031	80125081		.0	OR C11.01	T1.910	99.0500
03	811 V002	W032	80203039		.0	OR C1.90	T1.890	99.0800
03	811 V002	W033	80203040		.0	OR C11.16	T1.820	99.1500
03	811 V002	W034	80210002		.0	OR C1.61	T1.840	99.1300
03	811 V002	W036	80222028		.0	OR C1.98	T1.850	99.1300
03	811 V002	W037	80222029		.0	OR C1.71	T11.000	98.9500
03	811 V002	W038	80227040		.0	OR C1.44	T1.800	99.1700
03	811 V002	W039	80307035		.0	OR C1.19	T1.850	99.1100
03	811 V002	W040	80307036		.0	OR C1.15	T1.820	99.1500
03	811 V002	W041	80307037		.0	OR C1.30	T1.910	99.0500
03	811 V[illegible]	W042	80315018		.0	OR C1.25	T11.060	99.9000
03	811 V[illegible]	043	80314046		.0	OR C1.03	T1.880	99.0800
03	811 W	044	80321001		.0	OR C1.13	T1.940	[illegible].0200
03	811 W	045	80322002		.0	OR C1.11	T11.01[illegible]	[illegible].9400
					.0	OR C1.06	T1.97[illegible]	[illegible].9900

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009

METHOD CODES: %U
A - VOLUMETRIC
B - GRAVIMETRIC
C - COLORIMETRIC
E - VOLUMETRIC
F - FACTOR ASSAY
* - TWO OR MORE

U-235
R - GAMMA
S - GAS MASS SPEC.
T - THERMAL MASS SPEC.

TRANSURANICS
A - URANIUM
B - SAMPLE
C - U-235
D - ANU

LOT IDENTIFICATION	LAB NO.	ACON	NET WT	SE	%U	U-235	U-238
N003 811 V002 W051	80328033		.0	OR	C).05	T)1.030	98.9300
N003 811 V002 W052	80330068		.0	OR	C).04	T)1.000	98.9500
N003 811 V002 W053	80403002		.0	OR	C).04	T).980	98.9800
N003 811 V002 W054	80403003		.0	OR	C).06	T).950	99.0100
N003 811 V002 W055	80405021		.0	OR	C).05	T)1.060	98.8900
N003 811 V002 W056	80407020		.0	OR	C).08	T).950	99.0100
N003 811 V002 W057	80409002		.0	OR	C).16	T).910	99.0400
N003 811 V002 W058	80411001		.0	OR	C).16	T).940	99.0100
N003 811 V002 W059	80413020		.0	OR	C).98	T).960	98.9900
N003 811 V002 W060	80415070		.0	OR	C)1.13	T).940	99.0100
N003 811 V002 W061	80417038		.0	OR	C)1.70	T).950	99.0000
N003 811 V002 W062	80420072		.0	OR	C).45	T).690	99.2900
N003 811 V002 W063	80421003		.0	OR	C).50	T).740	99.2500
N003 811 V002 W064	80509025	61	19357.0	OR	C).34	T).880	99.0700
N003 811 V002 W065	80425084		.0	OR	C).30	T).860	99.1000
N003 811 V002 W066	80427068		.0	OR	C).27	T).900	99.0600
N003 811 V002 W067	80502025		.0	OR	C).24	T).920	99.0300
N003 811 V002 W068	80504015		.0	OR	C).21	T).930	99.0300
N003 811 V002 W069	80506054		.0	OR	C).63	T).870	99.0900
N003 811 V002 W070	80508001		.0	OR	C).14	T).860	99.0900
N003 811 V002 W071	80511032		.0	OR	C).52	T).850	99.1100
N003 811 V002 W072	80512002		.0	OR	C).26	T).890	99.0700
N003 811 V002 W073	80516025		.0	OR	C).10	T).900	99.0500
N003 811 V002 W074	80516026		.0	OR	C).16	T).890	99.0700
N003 811 V002 W075	80518004		.0	OR	C).07	T).910	99.0500
N003 811 V002 W076	80606001		.0	OR	C).20	T).920	99.0300
N003 811 V002 W077	80523002		.0	OR	.09	T).900	99.0600
N003 811 V002 W078	80524002		.0	OR	C).06	T).950	99.0100
N003 811 V002 W079	80527004		.0	OR	C).07	T).950	99.0000
N003 811 V002 W080	80529002		.0	OR	C).12	T).910	99.0400
N003 811 V002 W081	80531002		.0	OR	C).06	T).960	99.0000
N003 811 V002 W082	80601019		.0	OR	C).07	T).950	99.0000
N003 811 V002 W083	80604107		.0	OR	C).05	T)1.040	98.9100
N003 811 V002 W084	80606002		.0	OR	C).09	T)1.140	98.8100
N003 811 V002 W085	80608010		.0	OR	C).08	T)1.150	98.8000
N003 811 V002 W087	80617002		.0	OR	C).047	T)1.070	98.8800
N003 811 V002 W088	80624001		.0	OR	C).570	T).310	99.6700
N003 811 V002 W089	80627001		.0	OR	C).400	T).390	99.5900
N003 811 V002 W090	80628038		.0	OR	C).083	T).940	99.0200
N003 811 V002 W091	80630028		.0	OR	C).110	T).850	99.1100
N003 811 V002 W092	80705002		.0	OR	C)1.080	T).480	99.5100
N003 811 V002 W093	80706001		.0	OR	C).110	T).700	99.2700
N003 811 V002 W094	80708001		.0	OR	C).430	T).970	98.9900
N003 811 V002 W095	80710002		.0	OR	C).310	T).950	99.0000
N003 811 V002 W096	80712002		.0	OR	C).220	T)1.000	98.9600
N003 811 V002 W097	80714001		.0	OR	C).270	T).860	99.1100
N003 811 V002 W098	80721002		.0	OR	C).400	T).920	99.0500
[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	T).700	99.1800

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90

METHOD CODES: XU

A - VOLUMETRIC
B - GRAVIMETRIC
C - COLORIMETRIC
E - VOLUMETRIC
F - FACTOR ASSAY
* - TWO OR MORE

U-235

R - GAMMA
S - GAS MASS SPEC
T - THERMAL MASS SPEC.

TRANSURANICS

A - URANIUM
B - SAMPLE
C - U-235
D - AMU

LOT IDENTIFICATION	LAB NO.	%CON	NET UT	SE	XU	U-235	U-238
N003 811 V002 W100	80808003			.0 OR	C).430	T).790	99.1900
N003 811 V002 W101	80808002			.0 OR	C).300	T).790	99.1800
N003 811 V002 W102	80815001			.0 OR	C).170	T).950	99.0100
N003 811 V002 W103	80816001			.0 OR	C).089	T).980	98.9800
N003 811 V002 W104	80817002			.0 OR	C).092	T).920	99.0300
N003 811 V002 W105	80823032			.0 OR	C).290	T).940	98.9900
N003 811 V002 W106	80823002			.0 OR	C).100	T).950	98.9900
N003 811 V002 W107	80823033			.0 OR	C).100	T)1.000	98.9500
N003 811 V002 W108	80829021			.0 OR	C).120	T).970	98.9700
N003 811 V002 W110	80829022			.0 OR	C).080	T).620	99.3500
N003 811 V002 W111	80830060			.0 OR	C).210	T).640	99.3400
N003 811 V002 W112	80913030			.0 OR	C).140	T).980	98.9700
N003 811 V002 W113	80906034			.0 OR	C).160	T)1.000	98.9600
N003 811 V002 W114	80906035			.0 OR	C).100	T)1.070	98.8800
N003 811 V002 W115	81006003			.0 OR	C).170	T).890	99.0600
N003 811 V002 W116	90213001			.0 OR	C).350	T).810	99.1500
N003 811 V002 W117	90213002			.0 OR	C).430	T).820	99.1400
N003 811 V002 W118	90215046			.0 OR	C).590	T).730	99.2300
N003 811 V002 W119	90223001			.0 OR	C).560	T).810	99.1500
N003 811 V002 W120	90224001			.0 OR	C).150	T).940	99.0100
N003 811 V002 W121	90303050			.0 OR	C).120	T).860	99.0900
N003 811 V002 W122	90307064			.0 OR	C).060	T)1.050	98.9000
N003 811 V002 W123	90310001			.0 OR	C).080	T).910	99.0400
N003 811 V002 W124	90313050			.0 OR	C).190	T).790	99.1800
N003 811 V002 W125	90313051			.0 OR	C).160	T).840	99.1200
N003 811 V002 W126	90316001			.0 OR	C).350	T)1.010	98.9300
N003 811 V002 W127	90317001			.0 OR	C).800	T)1.010	98.9400
N003 811 V002 W128	90320001			.0 OR	C).390	T)1.000	98.9500
N003 811 V002 W129	90411001			.0 OR	C).560	T).960	98.9900
N003 811 V002 W130	90413001			.0 OR	C).490	T)1.020	98.9300
N003 811 V002 W131	90417002			.0 OR	C).250	T)1.020	98.9200
N003 811 V002 W132	90421003			.0 OR	C).110	T)1.020	98.9300
N003 815 V002 W001	91003001			.0 OR	C).040	T).910	99.0400
N003 817 V002 W001	90825001			.0 OR	C).100	T).600	99.3700
N003 817 V002 W002	90829001			.0 OR	C14.690	T).970	98.9800
N003 817 V002 W033	91018002			.0 OR	C)1.500	T).910	99.0300
N002 826 V002 W018	71106059			.0 OR	.06	T).9800	98.9600
N002 826 V002 W019	71106060			.0 OR	.25	T).9000	99.0600
N003 826 V002 W009	71028054	60	13987	.0 OR	.47	T).4600	99.5200
N003 826 V002 W010	71026075	60	15908	.0 OR	.36	T).9500	99.0000
N003 826 V002 W011	71026076	60	13771	.0 OR	.38	T).7500	99.2200
N003 826 V002 W012	71026077	60	17183	.0 OR	.65	T).6800	99.2900
N003 826 V002 W013	71026078	60	14325	.0 OR	.18	T).7200	99.2500
N003 826 V002 W014	71028055	60	14310	.0 OR	.44	T).96[illegible]	98.9900
N003 826 V002 W015	71028056	60	14472	.0 OR	.14	T).79[illegible]	99.1700
[illegible]	[illegible]	[illegible]	[illegible]	.0 OR	.056	T).92[illegible]	99.0200

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CTIVITY DATE: 10/01/87 thru 01/10/90

ETHOD CODES: %U

A - VOLUMETRIC
B - GRAVIMETRIC
C - COLORIMETRIC
E - VOLUMETRIC
F - FACTOR ASSAY
* - TWO OR MORE

U-235
R - GAMMA
S - GAS MASS SPEC.
T - THERMAL MASS SPEC.

TRANSURANICS
A - URANIUM
B - SAMPLE
C - U-235
D - ANU

OT	IDENTIFICATION	LAB NO	#CON	NET WT	SE	%U	U-235	U-238
003	826 V002 W021	71110091			0 OR	C).12	T).9700	98.9700
003	826 V002 W022	71112048			.0 OR	C).31	T)1.0100	98.9300
003	826 V002 W023	71113050			0 OR	C).54	T)1.0500	98.8900
003	826 V002 W024	71123109			.0 OR	C).30	T).9070	99.0400
003	826 V002 W025	71123110			0 OR	C).24	T).9040	99.0400
003	826 V002 W026	71123111			.0 OR	C).20	T).9550	98.9900
003	826 V002 W027	71123112			0 OR	C).21	T).9760	98.9700
003	826 V002 W028	71123113			.0 OR	C).09	T).960	98.9800
003	826 V002 W029	71125006			0 OR	C).15	T).9600	98.9900
003	826 V002 W030	71203111			.0 OR	C).39	T).9600	98.9900
003	826 V002 W031	71209064			0 OR	C).12	T).9900	98.9600
003	826 V002 W032	71209065			.0 OR	C).28	T).9500	99.0000
003	826 V002 W033	71210064			.0 OR	C).14	T).9500	98.9900
003	826 V002 W034	71215004			.0 OR	C).23	T).8300	99.1300
003	826 V002 W035	71215005			0 OR	C).09	T)1.0000	98.9500
003	826 V002 W036	71216027	60	13158	.0 OR	C)1.37	T).7000	99.2600
003	826 V002 W037	71221003	60	13899	0 OR	C).22	T).8500	99.1000
003	826 V002 W038	71221004			.0 OR	C).22	T).9600	98.9800
003	826 V002 W039	80107046			0 OR	C).19	T).970	98.9800
003	826 V002 W040	80106002			.0 OR	C).32	T).940	99.0000
003	826 V002 W041	80108056			0 OR	C).09	T).920	99.0200
003	826 V002 W042	80111057			.0 OR	C).28	T).770	99.2100
003	826 V002 W043	80112005			0 OR	C).40	T).940	99.0100
003	826 V002 W044	80114001			.0 OR	C).30	T)1.040	98.9100
003	826 V002 W045	80118057			0 OR	C).13	T)1.030	98.9300
03	826 V002 W046	80118058			.0 OR	C).06	T).940	99.0200
03	826 V002 W047	80123323			0 OR	C).42	T).930	99.0300
03	826 V002 W048	80122001			.0 OR	C).22	T).920	99.0400
03	826 V002 W049	80125080			0 OR	C).21	T).850	99.1100
03	826 V002 W050	80125097			.0 OR	C).42	T).890	99.0800
03	826 V002 W050	80225075			0 RE			99.0800
03	826 V002 W051	80203041			.0 OR	C).70	T).910	99.0600
03	826 V002 W052	80202037			0 OR	C).44	T).940	99.0200
03	826 V002 W053	80204038			.0 OR	C).52	T).930	99.0300
03	826 V002 W054	80209033			0 OR	C)1.12	T).820	99.1600
03	826 V002 W055	80209034			.0 OR	C).76	T).960	99.0000
03	826 V002 W056	80212031			0 OR	C).57	T).940	99.0200
03	826 V002 W057	80212032			.0 OR	C).68	T).840	99.1400
03	826 V002 W058	80308052			0 OR	C)1.02	T).820	99.1500
03	826 V002 W059	80322023			.0 OR	C).53	T).800	99.1700
03	826 V002 W060	80327002			0 OR	C).16	T).930	99.0300
03	826 V002 W061	80328034			.0 OR	C).03	T)1.020	98.9300
03	826 V002 W062	80330001			0 OR	C).03	T)1.060	98.8900
03	826 V002 W063	80403001			.0 OR	C).04	T).950	99.0000
03	826 V002 W064	80404002			0 OR	C).08	T).910	99.0500
03	826 V002 W065	80406094			.0 OR	C).04	T)1.080	99.8600
[illegible]	[illegible] W066	80409001			0 OR	C).20	T).950	99.0000
[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	T).910	99.0500

FEED MATERIALS PRODUCTION CENTER
RESIDUES SPECIAL REPORT REQUEST

METHOD CODES: XU

A - VOLUMETRIC
B - GRAVIMETRIC
C - COLORIMETRIC
E - VOLUMETRIC
F - FACTOR ASSAY
* - TWO OR MORE

U-235

R - GAMMA
S - GAS MASS SPEC.
T - THERMAL MASS SPEC.

TRANSURANICS

A - URANIUM
B - SAMPLE
C - U-235
D - ANU

LOT IDENTIFICATION	LAB NO.	SCOM	NET WT	SE	XU	U-235	U-238
003 826 V002 W068	80412020		.0	OR	C).99	T).920	99.0300
003 826 V002 W069	80504025	62	12152.0	OR	C).48	T).720	99.2600
003 826 V002 W070	80418018		.0	OR	C).75	T).860	99.1000
003 826 V002 W071	80418019		.0	OR	C).16	T).740	99.2400
003 826 V002 W072	80608001		.0	OR	C).84	T).770	99.2100
003 826 V002 W073	80612001		.0	OR	C).10	T).910	99.0400
003 826 V002 W074	80627002		.0	OR	C).054	T)1.010	98.9300
003 826 V002 W075	80627003		.0	OR	C).220	T).970	98.9800
003 826 V002 W076	80628002		.0	OR	C).180	T)1.130	98.7700
003 826 V002 W077	80703018		.0	OR	C).085	T)1.120	98.8200
003 826 V002 W078	80705001		.0	OR	C).050	T).870	99.0800
003 826 V002 W079	80707001		.0	OR	C).150	T).990	98.9500
003 826 V002 W080	80710001		.0	OR	C).320	T)1.080	98.9400
003 826 V002 W081	80710003		.0	OR	C).140	T).980	98.9800
003 826 V002 W082	80712001		.0	OR	C).080	T)1.000	98.9600
003 826 V002 W083	80714002		.0	OR	C).050	T)1.070	98.8700
003 826 V002 W084	80720001		.0	OR	C).080	T)1.070	98.8700
003 826 V002 W085	80721001		.0	OR	C).130	T).910	99.0500
003 826 V002 W086	80726001		.0	OR	C).220	T).870	99.0900
003 826 V002 W087	80727001		.0	OR	C).530	T).770	99.2100
003 826 V002 W088	80728001		.0	OR	C).120	T).810	99.1500
003 826 V002 W089	80803013		.0	OR	C).480	T).920	99.0300
003 826 V002 W090	80808004		.0	OR	C).710	T).740	99.2400
003 826 V002 W091	80808005		.0	OR	C).130	T)1.160	98.7800
003 826 V002 W093	80823031		.0	OR	C).050	T)1.060	98.8900
003 826 V002 W094	80812001		.0	OR	C).120	T).980	98.9700
003 826 V002 W095	80815002		.0	OR	C).080	T)1.180	98.7600
003 826 V002 W096	80817003		.0	OR	C).032	T)1.060	98.8900
003 826 V002 W097	80820083		.0	OR	C).080	T).980	98.9700
003 826 V002 W098	80821001		.0	OR	C).040	T)1.050	98.8900
003 826 V002 W100	90308001		.0	OR	C).210	T).880	99.1500
003 826 V002 W101	90530001		.0	OR	C).190	T).980	98.9700
003 826 V002 W102	90530002		.0	OR	C).180	T)1.010	98.9400
003 826 V002 W103	90605001		.0	OR	C).340	T)1.000	98.9500
003 826 V002 W104	90608001		.0	OR	C).060	T).480	99.5100
003 826 V002 W105	90619002		.0	OR	C).130	T).990	98.9600
003 826 V002 W106	90619003		.0	OR	C).080	T).880	99.0800
003 826 V002 W107	90622007		.0	OR	C).070	T).920	99.0300
003 826 V002 W108	90622008		.0	OR	C).050	T).940	99.0200
003 826 V002 W109	90627001		.0	OR	C).080	T)1.040	98.9100
003 826 V002 W110	91018001		.0	OR	C).442	T)1.000	98.9500
003 826 V003 W020	71109047		.0	OR	.42	T).8000	99.1500

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LAR4P!
01/15/
ACTIVITY DATE 10/01/87 thru 01/10/90

FEED MATERI DDUCTION CENTER
RESIDUES SPE REPORT REQUEST

METHOD CODES: %U
A - VOLUMETRIC
B - GRAVIMETRIC
C - COLORIMETRIC
E - VOLUMETRIC
F - FACTOR ASSAY
* - TWO OR MORE

U-235
R - GAMMA
S - GAS MASS SPEC
T - THERMAL MASS SPEC.

TRANSURANICS
A - URANIUM
B - SAMPLE
C - U-235
D - ANU

LOT IDENTIFICATION	LAB NO	BCON	NET WT SE		%U	U-235	U-238
U050 100 P003 A036 90112013				0 OR	C)3.500		
U050 100 P003 A041 90112018				0 OR	C).040		
U050 742 P003 5325 90410033	16		11506	0 OR	C).030	T).540	99.4500
U050 742 P003 5327 90410034	12		8315	0 OR	C).020	T).530	99.4600

********** END-OF-REPORT **********

ACTIVITY DATE: 10/01/87 THRU 01/10/90

METHOD CODES: XU

A - VOLUMETRIC
B - GRAVIMETRIC
C - COLORIMETRIC
E - VOLUMETRIC
F - FACTOR ASSAY
* - TWO OR MORE

U-235
R - GAMMA
S - GAS MASS SPEC.
T - THERMAL MASS SPEC.

TRANSURANICS
A - URANIUM
B - SAMPLE
C - U-235
D - ANU

LOT IDENTIFICATION	LAB NO	BCON	NET WT	SE	XU	U-235	U-238
N003 811 V069 U001	90419001			0 OR	C)4.290	T).810	99.1500
N003 811 V069 U002	90421001			0 OR	C)3.440	T).810	99.1400
N003 811 V069 U003	90425001			0 OR	C)1.600	T).670	99.2900
N003 811 V069 U004	90505001			0 OR	C)2.100	T).680	99.2800
N003 811 V069 U005	90502001			0 OR	C)5.100	T).970	98.9900
N003 811 V069 U006	90504001			0 OR	C)7.430	T)1.030	98.9200
N003 811 V069 U007	90505002			0 OR	C)5.080	T)1.060	98.8800
N003 811 V069 U008	90510002			0 OR	C)3.110	T).700	99.2600
N003 817 V069 U001	80802017			0 OR	C)2.210	T).940	99.0000
N003 817 V069 U002	80802018	61	18137.	0 OR	C)1.280	T).870	99.0800
N003 817 V069 U003	80802019			0 OR	C).380	T).859	99.0900
N003 817 V069 U007	80809001			0 OR	C).240	T).990	98.9500
N003 817 V069 U008	80823004			0 OR	C)1.020	T).961	98.9800
N003 817 V069 U009	80913031			0 OR	C).250	T).810	99.1500
N003 817 V069 U010	80913032			0 OR	C).300	T).820	99.1400
N003 817 V069 U011	80920001			0 OR	C).380	T).770	99.1900
N003 817 V069 U012	80927001			0 OR	C)1.000	T).859	99.0910
N003 817 V069 U013	81006002			0 OR	C)1.340	T).910	99.0400
N003 817 V069 U014	81012001			0 OR	C).680	T).850	99.1020
N003 817 V069 U015	81110001			0 OR	C).210	T).790	99.1700
N003 817 V069 U016	81104001			0 OR	C).050	T).770	99.1900
N003 817 V069 U020	90221001			0 OR	C).620	T).750	99.2100
N003 817 V069 U021	90308002			0 OR	C).520	T).930	99.0100
N003 817 V069 U022	90329001			0 OR	C).580	T).930	99.0200
N003 817 V069 U023	90410001			0 OR	C)1.000	T).910	99.0600
N003 817 V069 U024	90421002			0 OR	C)3.130	T).980	98.9700
N003 817 V069 U025	90510003			0 OR	C).590	T).950	99.0000
N003 817 V069 U026	90530003			0 OR	C).690	T).970	98.9700
N003 817 V069 U027	90619001	60	16284.	0 OR	C).560	T).930	99.0200
N003 817 V069 U027	90622006	60	16284.	0 RE	C).570	T).930	99.0200
N003 817 V069 U028	90710001			0 OR	C).350	T)1.000	98.9500
N003 817 V069 U029	90804001			0 OR	C)1.130	T)1.030	98.9100
N003 817 V069 U030	90826003			0 OR	C).290	T).810	99.0400
N003 817 V069 U031	90908001			0 OR	C).330	T).960	98.9900
N003 817 V069 U032	90928002			0 OR	C)1.460	T)1.000	98.9400
N003 817 V069 U034	91116001			0 OR	C)1.300	T).960	98.9800
N003 817 V069 U035	91205001			0 OR	C).740	T).920	99.0300
N003 817 V069 U036	00103001			0 OR	C)1.910	M	M

********** END-OF-REPORT **********

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METHOD CODES %U
A - VOLUMETRIC
B - GRAVIMETRIC
C - COLORIMETRIC

E - VOLUMETRIC
F - FACTOR ASSAY
* - TWO OR MORE

U-235
R - GAMMA
S - GAS MASS SPEC
T - THERMAL MASS SPEC

TRANSURANICS
A - URANIUM
B - SAMPLE
C - U-235
D - ANU

LOT	IDENTIFICATION	LAB NO.	#CON	NET	UT	SE	%U	U-235	U-238
D690	510	D034 A314	80315004	28	21426	0 OR	C)1.95	T)1.203	
D690	510	D034 A315	80415032	21	15707	0 OR	*)1.84	T)1.203	
H093	510	D034 A309	71017054	38	28649	0 OR	C)1.79	2070	
H093	510	D034 A310	71124051	25	19346	0 OR	C)2.20	T)1.2050	
H093	510	D034 A311	71216030	28	19675	0 OR	C)1.54	T)1.2040	
S057	510	D034 A308	71021074	10	6757	0 OR	C)1.97	T)1.5680	
S060	510	D034 A310	71116124	5	2919	0 OR	C)1.79	T)1.6050	
S062	510	D034 A311	80106045	18	12415	0 OR	C)1.81	T)1.621	
S060	510	D034 A307	71023035	8	3665	0 OR	C)1.42	T)1.6020	
D690	513	D034 A312	71229050	41	13190	0 OR	C)1.75	T)1.208	
D690	513	D034 A313	80310102	41	14029	0 OR	C)2.02	T)1.239	
D690	513	D034 A314	80227042	41	14143	0 OR	C)2.39	T)1.211	
D690	513	D034 A315	80330060	41	14519	0 OR	C)2.38	T)1.204	
D690	513	D034 B312	80112051	27	9002	0 OR	C)2.05	T)1.233	
D690	513	D034 B313	80220092	33	11586	0 OR	C)2.18	T)1.208	
D690	513	D034 B314	80315003	25	7953	0 OR	C)2.63	R)1.34	
D690	513	D034 B315	80411021	13	3838	0 OR	C)2.88	T)1.205	
H093	513	D034 A310	71110059	40	13949	0 OR	C)2.49	T)1.2120	
H093	513	D034 A311	71216031	41	13517	0 OR	C)1.68	T)1.2070	
H093	513	D034 B309	71013064	12	3907	0 OR	C)1.65	T)1.215	
H093	513	D034 B309	71011013	32	9739	0 OR	C)2.09	T)1.214	
H093	513	D034 B310	71119032	15	4719	0 OR	C)1.81	T)1.2050	
H093	513	D034 B311	71216032	9	2614	0 OR	C)1.85	T)1.2060	
S044	513	D034 A307	71016066	15	5033	0 OR	C)2.68	T)1.4430	
S055	513	D034 A311	80106046	16	5717	0 OR	C)2.14	T)1.554	
S057	513	D034 B297	71116126	36	18468	0 OR	C)2.77	T)1.5730	
H003	822	D034 W001	80321002			0 OR	C)2.27	T)1.204	99.7900
H003	822	D034 W002	80322001			0 OR	C)1.25	T)1.202	99.8000
H003	822	D034 W003	80323016			0 OR	C)2.48	T)1.206	99.7900
H003	822	D034 W004	80326001			0 OR	C)3.49	T)1.261	99.7300
H003	822	D034 W005	80421002			0 OR	C)2.45	T)1.214	99.7800
H003	822	D034 W006	80423009			0 OR	C)2.80	T)1.218	99.7800
H003	822	D034 W007	80425001			0 OR	C)2.25	T)1.275	99.7200
H003	822	D034 W008	80509026			0 OR	C)1.91	T)1.242	99.7500
H003	822	D034 W009	80502023			0 OR	C)2.25	T)1.330	99.6500
H003	822	D034 W010	80502024			0 OR	C)2.73	T)1.250	99.7400
H003	822	D034 W011	80504014			0 OR	C)2.48	T)1.263	99.7300
H003	822	D034 W012	80506053			0 OR	C)2.47	T)1.205	99.7900
H003	822	D034 W013	80509024			0 OR	C)1.85	T)1.277	99.7100
H003	822	D034 W014	80511033			0 OR	C)1.80	T)1.294	99.7100
H003	822	D034 W015	80512049			0 OR	C)1.73	T)1.293	99.7000
H003	822	D034 W016	80516023			0 OR	C)2.15	T)1.405	99.5800
H003	822	D034 W017	80516024			0 OR	C)1.82	T)1.218	99.7800
H003	822	D034 W018	80520017			0 OR	C)2.26	T)1.205	99.7900
H003	822	D034 W019	80523001			0 OR	C)1.69	T)1.224	99.7700
H003	822	D034 W020	80525002			0 OR	C)3.36	T)1.214	99.7800
H003	822	D034 W021	80527003			0 OR	C)1.75	T)1.393	99.6600
								T)1.218	99.7800

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.AR4PSR2 FEED MATERIAL PRODUCTION CENTER
01/15/90 RESIDUES SPEC REPORT REQUEST
ACTIVITY 10/01/87 thru 01/10/90

METHOD CODES: ZU
A - VOLUMETRIC E - VOLUMETRIC
B - GRAVIMETRIC F - FACTOR ASSAY
C - COLORIMETRIC * - TWO OR MORE

U-235
R - GAMMA
S - GAS MASS SPEC
T - THERMAL MASS SPEC

TRANSURANICS
A - URANIUM
B - SAMPLE
C - U-235
D - ANU

LOT IDENTIFICATION	LAB NO	#CON	NET WT	SE	ZU	U-235	U-238
1003 822 D034 U023	80531001		0	OR	C12.43	T1.280	99.7000
1003 922 D034 U024	90602001		0	OR	C11.86	T1.239	99.7500
1003 822 D034 U025	80604106		0	OR	C11.83	T1.254	99.7400
1003 822 D034 U026	80624002		0	OR	C11.940	T1.386	99.5900
1003 822 D034 U027	80721003		0	OR	C12.000	T1.200	99.8000
1003 822 D034 U028	80702005		0	OR	C11.760	T1.584	99.3900
1003 822 D034 U029	80622012		0	OR	C12.600	T1.210	99.7300
[redacted]							
[redacted]			0.	OR	C11.57	T1.2010	
393 518 D057 A309	71017051				A15.32	R1.28	
590 518 D057 0313	80226023	6	3303.0	OR	C13.18	R1.26	
393 518 D057 0239	71202050	5	2223.0	OR	C13.24	T1.2040	
393 518 D057 0308	71019050	2	1300.0	OR	A13.97	R1.20	
393 518 D057 0309	71222003		0.	OR	A146.72	R1.21	
182 660 D061 0236	71208062	4	804.0	OR	A157.70	R1.20	
182 660 D061 0237	71204062	2	250.0	OR	A156.24	R1.21	
182 660 D061 0238	71208063	3	865.0	OR	A137.42	R1.20	
182 660 D061 0300	71208064	5	1066.0	OR	A140.97	R1.20	
182 660 D061 0301	71208065	13	2689.0	OR	A140.36	R1.21	
182 660 D061 0302	71210043	8	1601.0	OR	A143.39	R1.20	
182 660 D061 0303	71223001	7	1604.0	OR	A144.28	R1.20	
92 660 D0[illegible] 0304	71210045	6	1293.0	OR	A139.43	R1.20	
92 660 D[illegible] 0305	71210044	5	1195.0	OR	A140.33	R1.[illegible]	
82 660 [illegible] 0306	71204063	3	431.0	OR	A150.33	R1.[illegible]	
[illegible]	71210046	3	532.0	OR	[illegible]	R1.[illegible]	

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FEED MATERIALS PRODUCTION CENTER
RESIDUES SPEC REPORT REQUEST

10/01/87 thru 01/10/90

METHOD CODES %U
A - VOLUMETRIC
B - GRAVIMETRIC
C - COLORIMETRIC
E - VOLUMETRIC
F - FACTOR ASSAY
* - TWO OR MORE

U-235
R - GAMMA
S - GAS MASS SPEC.
T - THERMAL MASS SPEC

TRANSURANICS
A - URANIUM
B - SAMPLE
C - U-235
D - ANU

LOT IDENTIFICATION	LAB NO.	#CON	NET WT SE		%U	U-235	U-238
0690 913 D061	0318 80119053	17	6126.0	OR	A129.66	R1.20	
0690 913 D061	0313 80218033	27	9267.0	OR	A155.30	R1.20	
0690 913 D061	0314 80314045	13	4541.0	OR	A144.46	R1.20	
0690 913 D061	0315 80414005	23	7409.0	OR	A12.68	S1.2051	
0690 913 D061	0316 90411008	16	5418.0	OR	A134.900	R1.20	
0690 913 D061	0317 90411009	13	5319.0	OR	A129.580	R1.20	
0690 913 D061	0318 90411010	20	7189.0	OR	A132.860	R1.20	
0690 913 D061	0319 90411011	3	827.0	OR	A125.620	R1.20	
1082 913 D061	0309 71107014	27	7496.3	OR	A145.06	R1.2000	
1082 913 D061	0310 71112052	25	7594.0	OR	A126.38	R1.2000	
1082 913 D061	0311 71323008	23	8027.0	OR	A145.27	R1.20	
1082 913 D061	A304 71014001	10	4026.0	RE	A133.49		
1948 100 D062	0310 71108055	3	174.0	OR	A136.36	R1.2600	
5070 117 D062	0315 80315046	3	92.0	OR	*18.62	R1.70	
1120 314 D062	0313 80115052	2	151.0	OR	A175.66	R1.34	
1120 314 D062	0308 71001001		0	OR	A174.37	R1.25	
1120 314 D062	0309 71013071		0	OR	A173.12	T1.328	
1120 314 D062	0311 71216035	3	1076.0	OR	A174.63	R1.2500	
1120 314 D062	0312 80115053	3	533.0	OR	A170.78	R1.24	
1120 314 D062	0313 80224043	3	296.0	OR	A174.46	R1.23	
1120 314 D062	0314 80315047	2	787.0	OR	A173.45	R1.22	
1120 314 D062	0315 80407048	2	399.0	OR	A172.17	R1.23	
1120 314 D062	0318 90919005	2	1318.0	OR	A175.520	M	M
1120 314 D062	0319 90919006	4	963.0	OR	A175.170	M	M
1120 314 D062	0320 90919007	2	806.0	OR	A175.760	M	M
1120 314 D062	0321 90919008	1	938.0	OR	A175.540	M	M
1093 332 D062	0327 81008004	8	837.0	OR	C11.290	T1.260	99.7300
1093 333 D062	0309 71013074		0	OR	*11.53	2000	
1093 333 D062	0310 71112053	7	3125.0	OR	A11.48	T1.2010	
1093 333 D062	0311 71216037	6	2493.0	OR	*12.56	R1.3200	
1093 333 D062	0312 80115056	6	2710.0	OR	C1.91	T1.202	
1093 333 D062	0313 80224041	9	4182.0	OR	*11.29	T1.202	
1093 333 D062	0314 80315009	11	5839.0	OR	C1.92	T1.201	
1093 333 D062	0315 80407045	11	4533.0	OR	A11.56	R1.27	
1093 333 D062	0316 90830001	3	1764.0	OR	C1.900	T1.230	99.7700
1093 333 D062	0317 90830002	8	4432.0	OR	C1.440	T1.220	99.7800
1093 333 D062	0318 90830003	5	2677.0	OR	C11.330	T1.200	99.7900
1093 333 D062	0319 90830004	2	1008.0	OR	C11.710	T1.200	99.7900
1093 333 D062	0320 90830005	3	1305.0	OR	C11.310	T1.210	99.7800
1093 333 D062	0321 90830006	4	1563.0	OR	C1.920	T1.200	99.7900
1093 333 D062	0326 90831001	6	3051.0	OR	C11.270	T1.290	99.7100
1093 333 D062	0327 90831002	4	2076.0	OR	C11.970	T1.230	99.7600
1093 333 D062	0328 90831003	1	559.0	OR	C11.490	T1.210	99.7900
1093 333 D062	0329 90831004	3	1311.0	OR	C11.740	T1.200	99.8000
1093 333 D062	0330 90831005	3	1493.0	OR	C11.340	T1.200	99.7900
1093 333 D062	0332 91013003	2	380.0	OR	A16.710	T1.210	99.7900
1093 346 D062	0309 71013069		.0	OR	C1.18	.3900	
[illegible]	0313 80227046	2	426.0	OR	C1.28	T1.590	

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CTIVITY 10/01/87 thru 01/10/90

ETHOD CODES: %U
A - VOLUMETRIC
B - GRAVIMETRIC
C - COLORIMETRIC

E - VOLUMETRIC
F - FACTOR ASSAY
* - TWO OR MORE

U-235
R - GAMMA
S - GAS MASS SPEC.
T - THERMAL MASS SPEC.

TRANSURANICS
A - URANIUM
B - SAMPLE
C - U-235
D - ANU

OT	IDENTIFICATION	LAB NO	RCON	NET WT	SE		%U	U-235	U-238
093	346 D062	0315	80407047	2	427	0 OR	C1.16	T1.480	
093	346 D062	0317	91002001	1	287	0 OR	C1.300	T1.410	99.5900
093	346 D062	0319	91002002	1	447	0 OR	C12.810	T1.210	99.7800
093	346 D062	0321	91002003	1	176	0 OR	C1.310	T1.340	99.6600
093	346 D062	0330	91002006	1	343	0 OR	C1.420	T1.510	99.4900
093	347 D062	0309	71013073			0 OR	A120.23	R1.20	
093	347 D062	0310	71112055	2	299	0 OR	A15.40	T1.3490	
093	347 D062	0315	80409120	2	402	0 OR	A19.38	R1.22	
093	347 D062	0329	91002005	1	287	0 OR	A14.740	T1.330	99.6700
590	512 D062	A312	80112050	30	14309	0 OR	A127.70	R1.20	
590	512 D062	A313	80224040	28	13882	0 OR	A134.62	R1.20	
590	512 D062	A314	80315008	27	12568	0 OR	A125.45	R1.21	
590	512 D062	A315	80411020	26	12239	0 OR	A124.48	R1.20	
093	512 D062	A304	71020137			0 OR	A130.02	R1.20	
093	512 D062	A309	71004001			0 OR	A157.92	R1.20	
093	512 D062	A310	71119031	33	16552	0 OR	A145.19	R1.2000	
093	512 D062	A311	71216034	33	16662	0 OR	A131.37	R1.2000	
093	512 D062	B309	71013069			0 OR	A116.96	R1.21	
154	512 D062	A297	71118040	5	1644	0 OR	A135.98	R1.5400	
169	512 D062	0296	71113053	3	765	0 OR	A145.13	R1.6900	
171	512 D062	A299	71002001			0 OR	A137.79	R1.71	
90	519 D062	A312	71229051	41	12391	0 OR	C12.66	R1.34	
90	519 D062	A313	80210103	41	13266	0 OR	C13.11	R1.26	
90	519 D062	A314	80224038	41	13147	0 OR	C13.11	T1.203	
90	519 D062	A315	80330061	41	12684	0 OR	C13.50	R1.25	
90	519 D062	A316	80426073	41	12725	0 OR	A13.27	T1.203	
90	519 D062	B312	80111003	41	13045	0 OR	C12.78	T1.210	
90	519 D062	B313	80220081	41	12782	0 OR	C12.95	R1.24	
90	519 D062	B314	80315001	41	13747	0 OR	C13.49	R1.26	
90	519 D062	B315	80411022	26	8203	0 OR	C13.50	R1.30	
90	519 D062	C312	80111004	11	2949	0 OR	C12.99	T1.208	
90	519 D062	C313	80227043	6	1521	0 OR	C13.26	R1.23	
90	519 D062	C314	80315002	10	2880	0 OR	C13.66	R1.39	
93	519 D062	A310	71110056	41	12726	0 OR	C13.04	R1.2800	
93	519 D062	A311	71124052	41	12604	0 OR	C12.95	R1.4100	
93	519 D062	B309	71004004			0 OR	C12.67	T1.209	
93	519 D062	B310	71110057	41	12585	0 OR	C13.10	R1.2500	
93	519 D062	B311	71223003	41	13100	0 OR	C12.85	T1.211	
93	519 D062	C309	71010002			0 OR	A16.37	R1.22	
93	519 D062	C310	71119033	11	3207	0 OR	C13.32	R1.6800	
93	519 D062	C311	80111005	4	767	0 OR	C13.95	R1.26	
90	520 D062	A312	80112052	9	2944	0 OR	C12.67	R1.37	
90	520 D062	A313	80227044	2	396	0 OR	C12.44	T1.259	
90	520 D062	A315	80411023	18	6397	0 OR	C13.10	R1.30	
93	520 D062	A307	71019045	4	183	0 OR	A111.31	R1.6[illegible]	
93	520 D062	A310	71119034	3	155	0 OR	C12.64	T1.450	
93	520 D062	[illegible]	[illegible]	[illegible]	[illegible]	0 OR	C12.21	T1.299	

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METHOD CODES: XU

A - VOLUMETRIC
B - GRAVIMETRIC
C - COLORIMETRIC
E - VOLUMETRIC
F - FACTOR ASSAY
* - TWO OR MORE

U-235
R - GAMMA
S - GAS MASS SPEC
T - THERMAL MASS SPEC

TRANSURANICS
A - URANIUM
B - SAMPLE
C - U-235
D - ANU

OT	IDENTIFICATION	LAB NO.	ACON	NET WT	SE	XU	U-235	U-238
050	520 D062	A297	71118041	10	2664.0	OR	C14.42	T1.4980
055	520 D062	A307	71023036	13	3131.0	OR	C12.23	T1.5520
056	520 D062	A313	80210105	6	1860.0	OR	C12.96	R1.56
062	520 D062	A299	71206008	14	4522.0	OR	C12.28	T1.6190
066	520 D062	A311	80106047	18	6299.0	OR	C13.73	T1.657
066	520 D062	A312	80114090	9	3027.0	OR	C12.14	T1.660
068	520 D062	A298	71002003		.0	OR	C12.22	T1.676
069	520 D062	A308	71016064		.0	OR	C12.74	T1.6870
140	520 D062	A314	80315005	16	5036.0	OR	C12.96	R1.55
140	520 D062	A315	80330062	7	1707.0	OR	*14.07	R1.54
190	523 D062	A312	80111006	2	668.0	OR	*12.40	T1.209
190	523 D062	A313	80227045	3	1545.0	OR	*12.52	R1.22
190	523 D062	A314	80314044	2	738.0	OR	C12.89	S1.2065
190	523 D062	A315	80415033	5	2845.0	OR	*13.00	R1.26
193	523 D062	A307	71013065		.0	OR	C11.13	T1.201
193	523 D062	A308	71013066		.0	OR	*11.01	T1.210
193	523 D062	A309	71013067		.0	OR	A12.32	R1.51
193	523 D062	A310	71119035	2	667.0	OR	*11.85	T1.2250
193	523 D062	A311	80115055	3	1284.0	OR	*12.30	R1.21
197	523 D062	0296	71118042	2	818.0	OR	*13.26	T1.4700
129	524 D062	A310	71118044	4	1415.0	OR	A118.08	R1.2900
103	822 D062	W001	80902001		0	OR	C12.480	T1.210	99.7900
103	822 D062	W002	80906036		0	OR	C12.930	T1.213	99.7830
103	822 D062	W003	90124001		0	OR	C13.440	T1.206	99.7890
103	822 D062	W004	90214056		0	OR	C12.080	T1.200	99.8000
103	822 D062	W005	90202001		0	OR	C12.230	T1.203	99.7700
103	822 D062	W006	90208001		0	OR	C13.380	T1.216	99.7800
103	822 D062	W007	90216054		0	OR	C12.160	T1.200	99.8000
103	822 D062	W008	90328005		0	OR	C19.740	T1.253	99.7400
193	100 D065	0313	81130001	40	13228.0	OR	M	R1.28
193	100 D065	0314	81130002	8	2814.0	OR	M	R1.29
20	310 D065	0309	71013070		0	OR	A174.92	R1.25
20	314 D065	0312	80115064	2	205.0	OR	A169.89	R1.24
20	314 D065	0313	80224042	2	90.0	OR	A171.78	R1.21
20	314 D065	0316	90919009	1	262.0	OR	A174.600	M	M
20	314 D065	0317	90919010	1	386.0	OR	A171.920	M	M
82	400 D065	A308	71029042		.0	OR	A176.04	R1.2100
82	400 D065	A310	71208067	44	41477.0	OR	B175.40	R1.20
82	400 D065	A312	80203035	44	36281.0	OR	A175.90	R1.20
82	400 D065	A315	80411024	14	12479.0	OR	B175.67	R1.20	99.8000
14	400 D065	A317	81013001	12	12417.0	OR	B175.160	T1.145	99.8510
16	400 D065	A316	80531011	29	24002.0	OR	B175.80	R1.15
82	420 D065	0310	71112051	2	417.0	OR	A175.22	R1.2000
82	429 D065	0307	71019047	2	356.0	OR	A173.34	R1.19
82	420 D065	0308	71019048	3	804.0	OR	A174.46	R1.21
82	429 D065	0309	71117041	2	360.0	OR	A174.09	R1.2200
		A310	71112054	2	365.0	OR	A167.20	R1.3600
							[illegible]	R1.3500

)1/15/90 — ECO. MATERIALS PRODUCTION CENTER
ACTIVITY — RESIDUES SPEC REPORT REQUEST

10/01/87 thru 01/10/90

METHOD CODES: XU

A - VOLUMETRIC	E - VOLUMETRIC	U-235	TRANSURANICS
B - GRAVIMETRIC	F - FACTOR ASSAY	R - GAMMA	A - URANIUM
C - COLORIMETRIC	* - TWO OR MORE	S - GAS MASS SPEC.	B - SAMPLE
		T - THERMAL MASS SPEC.	C - U-235
			D - ANU

OT	IDENTIFICATION	LAB NO	ACON	MET	UT	SE	XU	U-235	U-238
1082	429 D065	0312	80112049	2	515	0 OR	A172.83	R1.30	
1082	429 D065	0313	80321040	4	1040.0	OR	A172.44	R1.21	
1082	429 D065	0314	80321041	3	642	0 OR	A172.06	R1.67	
1082	429 D065	0315	80407046	2	698.0	OR	A165.94	R1.22	
1093	530 D065	0296	71210049	2	406	0 OR	A114.34	R1.27	
093	530 D065	0297	71204059	4	1256	0 OR	A13.05	R1.30	
093	530 D065	0301	71210050	4	1282	0 OR	A121.73	R1.21	
093	530 D065	0303	71204060	3	363.0	OR	A111.53	R1.21	
083	530 D065	0305	71204061	2	190	0 OR	A1.89	T1.250	
003	822 D065	W023	80808006			0 OR	B175.750	T1.217	99.7790
083	822 D065	W027	80107047			0 OR	B175.70	T1.296	99.7000
083	822 D065	W028	80107048			0 OR	B175.83	T1.448	99.5300
083	822 D065	W029	80107049			0 OR	B175.98	T1.510	99.4700
003	822 D065	W030	80701003			0 OR	B175.580	T1.225	99.7700
083	822 D065	W033	80816002			0 OR	C13.390	T1.664	99.3300
003	822 D065	W034	80819001			0 OR	C13.330	T1.261	99.7320
083	822 D065	W035	80929001			0 OR	B175.620	T1.208	99.7950
026	610 D066	0303	71116002	2	287.0	OR	A132.66	T1.2600	
017	FTA D068	2027	90417004	5	1570	0 OR	A169.55	R1.30	
019	FTA D068	7066	90314045	3	1019	0 OR	A118.460	R1.28	
020	FTA D068	7053	90411017	6	1496	0 OR	A11.200	T1.320	
021	FTA D068	7054	90412020	3	891	0 OR	A161.310	R1.21	
021	FTA D068	7083	90411019	2	580	0 OR	A153.370	R1.20	
022	FTA D068	7091	90320007	6	1709.0	OR	A12.720	T1.391	99.5930
022	FTA D068	2091	90717015	6	1709.0	RE	A11.010	T1.233	99.7600
023	FTA D068	7078	90410039	6	1631	0 OR	A110.630	R1.27	
025	FTA D068	7062	90317002	8	1244	0 OR	A1.500	T1.280	
026	FTA D068	7063	90317003	4	725.0	OR	A19.530	R1.27	
026	FTA D068	7090	90317004	3	724	0 OR	A14.390	R1.61	
028	FTA D068	7080	90320005			0 OR	A1.310	T1.730	99.2600
028	FTA D068	7084	90320006	6	1029.0	OR	A113.560	R1.28	99.7200
029	FTA D068	7109	90403002	4	1331	0 OR	A18.510	R1.31	
030	FTA D068	7086	90410038	[illegible]	3681	0 OR	A110.040	R1.28	
30	FTA D068	7108	90411016	1	332	0 OR	A118.660	R1.30	
31	FTA D068	2092	90315076	1	345.0	OR	A17.350	R1.34	
32	FTA D068	7064	90317006	5	1103.0	OR	A111.230	R1.23	
35	FTA D068	7102	90315077	1	125	0 OR	A15.390	R1.35	
35	FTA D068	7104	90331003	4	1305	0 OR	A11.110	T1.510	
36	FTA D068	7096	90315078	2	5700	0 OR	A15.080	R1.52	
37	FTA D068	7097	90315079	3	1083.0	OR	A115.990	R1.40	
38	FTA D068	7072	90314047	6	2600.0	OR	A12.020	T1.322	
38	FTA D068	7074	90317007	7	1596.0	OR	C1.100	T1.360	
39	FTA D068	7089	90410041	7	2377.0	OR	A1.940	T1.390	
39	FTA D068	7101	90315081	1	361	0 OR	A1.310	T1.560	
41	FTA D068	2099	90320055	4	1770	0 OR	A1.540	T1.428	99.5530
43	FTA D068	7068	90317008	8	1609	0 OR	C1.610	T1.46[illegible]	
[illegible]	FTA D068	7106	90331005			0 OR	A1.660	T1.[illegible]	
							A1.280	T1.4[illegible]	

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R4PSR8
/15/90
TIVITY

FEED MATERIALS
RESIDUES SPECI

ION CENTER
RT REQUEST

10/01/87 thru 01/10/90

THOD CODES: XU
A - VOLUMETRIC
B - GRAVIMETRIC
C - COLORIMETRIC

U-235
E - VOLUMETRIC
F - FACTOR ASSAY
* - TWO OR MORE

R - GAMMA
S - GAS MASS SPEC.
T - THERMAL MASS SPEC.

TRANSURANICS
A - URANIUM
B - SAMPLE
C - U-235
D - ANU

T	IDENTIFICATION	LAB NO.	SCON	NET WT	SE	XU	U-235	U-238
93	658 D069 0309	71124059	58	23818.0	OR	A129.28	R1.2000	
93	658 D069 0310	71204069	39	16796.0	OR	A120.49	R1.21	
93	658 D069 0311	71210053	37	14689.0	OR	A136.15	R1.20	
93	658 D069 0312	80112046	39	17351.0	OR	A127.06	R1.20	
82	7[illegible]2 D069 0319	80120042		0	OR			
90	965 D069 0247	71222004	22	7727.0	OR	A18.72	R1.20	
90	965 D069 0248	80112044	22	7310.0	OR	A114.24	R1.20	
90	965 D069 0249	80112045	22	7764.0	OR	A14.54	R1.20	
90	965 D069 0250	80121029	22	8107.0	OR	A129.39	R1.20	
90	965 D069 0251	80218004	22	7917.0	OR	A14.50	R1.20	
90	965 D069 0252	80225071	22	8070.0	OR	A118.34	R1.24	
90	965 D069 0253	80314042	22	8338.0	OR	A112.39	R1.20	
90	965 D069 0254	80407044	22	8210.0	OR	A112.90	R1.20	
90	965 D069 0255	80414004	22	8447.0	OR	A17.30	R1.20	
90	965 D069 0256	80504024	22	8277.0	OR	A19.63	R1.20	
90	965 D069 0257	90411012	21	8286.0	OR	A116.020	R1.20	
90	965 D069 0258	90411013	21	7614.0	OR	A114.440	R1.23	
90	965 D069 0259	90411014	21	8143.0	OR	A111.310	R1.20	
90	965 D069 0260	90411015	21	7418.0	OR	A19.840	R1.21	
90	965 D069 0261	71109048	22	7456.0	OR	A113.45	R1.20	
82	965 D069 0241	71109049	22	8401.0	OR	A120.24	R1.2300	
82	965 D069 0242	71109050	22	8329.0	OR	A117.66	R1.2100	
82	965 D069 0243	71208068	22	7843.0	OR	A116.87	R1.20	
82	965 D069 0244	71208069	22	7451.0	OR	A17.36	R1.20	
82	965 D069 0245	71222002	15	5021.0	OR	C1.83	T1.226	
82	965 D069 0246	80209006	15	4723.0	OR	A115.82	R1.20	
20	965 D069 0252	80121031	16	4930.0	OR	C11.91	T1.649	
65	965 D069 0240	80302031	2	0	OR	A117.36	R1.34	
20	FTA D069 1229	80302032	2	0	OR	A119.34	R1.34	
20	FTA D069 1230	90331001	9	1801.0	OR	A121.710	R1.19	
20	FTA D069 7052	90314048	4	791.0	OR	A119.140	R1.19	
20	FTA D069 7065	90320054	2	295.0	OR	A18.170	T1.243	99.7490
22	FTA D069 7073	90320059		0	OR	A123.030	T1.241	99.7510
25	FTA D069 7061	90717014	5	1229.0	OR	A116.920	T1.277	99.7200
26	FTA D069 7061	90314052	11	6899.0	OR	A1.360	T1.290	
33	FTA D069 7077	90314050	1	41.0	OR	A110.610	R1.41	
40	FTA D069 7067	90328004	14	8501.0	OR	C1.010	T1.280	
47	FTA D069 7078	90314046	6	3936.0	OR	A11.310	T1.391	
52	FTA D069 7073	90315080		0	OR	A1.130	T1.980	
57	FTA D069 7097	80702001	4	350.0	OR	A15.010	T1.660	
59	FTA D069 7030	90328001		0	OR	C1.180	T1.830	
65	FTA D069 7090	80407042	2	0	OR	A120.32	R1.31	
18	FTA D069 1236	90717011		0	OR	A1.110	T1.870	99.9800
18	FTA D069 1326	80111001	4	2040.0	OR	A150.35	R1.20	
10	516 D071 0312	80226022	2	509.0	OR	A134.46	R1.20	
10	516 D071 0313	80415026	5	2748.0	OR	A12.18	T1.580	
10	516 D071 0315		[illegible]	3873.0	OR	C161.93	R1.26	

AR4PSR
1/15/9
CTIVITY DATE 10/01/87 thru 01/10/90

FEED MATERIAL PRODUCTION CENTER
RESIDUES SPEC REPORT REQUEST

METHOD CODES: %U
A - VOLUMETRIC
B - GRAVIMETRIC
C - COLORIMETRIC
E - VOLUMETRIC
F - FACTOR ASSAY
* - TWO OR MORE

U-235
R - GAMMA
S - GAS MASS SPEC
T - THERMAL MASS SPEC

TRANSURANICS
A - URANIUM
B - SAMPLE
C - U-235
D - ANU

LOT IDENTIFICATION	LAB NO	#CON	NET WT	SE	%U	U-235	U-238
1093 516 D071 0300	71204058	2	134.0	OR	A)1.26	T)1.357	
1093 516 D071 0301	71010005		.0	OR	A)26.73	R)1.23	
1093 516 D071 0303	71018002		.0	OR	A)28.93	R)1.2000	
1093 516 D071 0304	71013054		.0	OR	A)8.38	R)1.4800	
1093 516 D071 0305	71017052		.0	OR	A)25.36	R)1.2000	
1093 516 D071 0308	71017053		.0	OR	A)45.42	R)1.2000	
1093 516 D071 0309	71013055		.0	OR	A)27.56	R)1.3300	
1093 516 D071 0310	71119017	5	1963.0	OR	A)39.20	R)1.21	
1093 516 D071 0311	71216029	3	1324.0	OR	A)37.34	R)1.20	
1093 516 D071 A299	71210051	6	2220.0	OR	A)11.79	R)1.28	
1082 913 D071 0297	71109056	2	85.0	OR	A)1.60	T)1.2100	
1690 518 D077 0313	80226024	11	5841.0	OR	A)19.94	R)1.20	
1093 518 D077 0299	71124010	17	12088.0	OR	C)3.76	R)1.2100	
1093 518 D077 0300	71204064	3	1179.0	OR	A)4.75	T)1.207	
1093 518 D077 0302	71017049		.0	OR	A)6.08	R)1.2000	
1093 518 D077 0307	71017050		.0	OR	C)3.09	T)1.2070	
1093 518 D077 0310	71119018	18	10985.0	OR	A)2.[illegible]	T)1.204	
1093 518 D077 A308	71011014		.0	OR	*)[illegible].03	R)1.22	
.071 518 D077 A308	71109053	4	2275.0	OR	C)1.96	T)1.7070	
1690 514 D079 A312	80111002	17	17494.0	OR	A)38.66	R)1.20	
1690 514 D079 A313	80323023	17	17494.0	RE	A)43.08	R)1.20	
1690 514 D079 A313	80227047	18	20052.0	OR	A)54.55	R)1.20	
1690 514 D079 A314	80115006	13	13432.0	OR	A)49.18	R)1.20	
1690 514 D079 A315	80401121	10	9893.0	OR	A)48.70	R)1.19	
1082 514 D079 A304	71011011		.0	OR	A)37.23	R)1.20	
1082 514 D079 A308	71011012		.0	OR	A)48.65	R)1.19	
1093 514 D079 A296	71124003	29	32256.0	OR	A)47.31	R)1.2000	
1093 514 D079 A297	71202055	3	41636.0	OR	A)61.84	R)1.2200	
1093 514 D079 A298	71124004	41	48864.0	OR	A)48.51	R)1.2000	
1093 514 D079 A299	71206003	27	26437.0	OR	A)52.81	R)1.3200	
1093 514 D079 A300	71124005	41	46[illegible]8.0	OR	A)54.63	R)1.2100	
1093 514 D079 A301	71124001	41	4530[illegible].0	OR	A)56.72	R)1.2000	
1093 514 D079 A302	71004002		.0	OR	A)52.63	R)1.20	
1093 514 D079 A305	71004003		.0	OR	A)51.77	R)1.20	
1093 514 D079 A307	71017055		.0	OR	A)57.87	R)1.19	
1093 514 D079 A309	71018001		.0	OR	A)52.22	R)1.20	
1093 514 D079 A310	71124006	18	17255.0	OR	A)37.30	R)1.2000	
1093 514 D079 A311	71216036	15	15088.0	OR	A)48.41	R)1.2000	
1093 514 D079 B297	71202056	9	5791.0	OR	A)47.[illegible]	R)1.2000	
1093 514 D079 B298	71124007	7	5984.0	OR	A)34.88	R)1.2000	
1093 514 D079 B301	71022038	31	31214.0	OR	A)48.22	R)1.2000	
1048 514 [illegible]	0297 71112057	4	1267.0	OR	A)55.80	R)1.4800	
0[illegible] 514 [illegible]	0296 71112056	7	6563.0	OR	A)37.91	R)1.6[illegible]	
070 514 [illegible]	A299 71112058	3	1543.0	OR	A)11.66	R)1.7[illegible]	
[illegible]	0309 71019046	2	1346.0	OR	A)74.14	R)	
			.0	OR	A)75.02	R)	

1/15/90
CTIVITY

FEED MATERIALS PRODUCTION CENTER
RESIDUES SPECIAL REPORT REQUEST

0/01/87 thru 01/10/90

METHOD CODES: %U
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* - TWO OR MORE

U-235
R - GAMMA
S - GAS MASS SPEC.
T - THERMAL MASS SPEC.

TRANSURANICS
A - URANIUM
B - SAMPLE
C - U-235
D - ANU

DT	IDENTIFICATION	LAB NO.	#CON	NET	UT	SE	%U	U-235	U-238
082	440 D082 5734	71011002			0	OR	B)75.79	R).24	
082	440 D082 5735	71007063			0	OR	A)75.96	R).20	
082	440 D082 5773	71011003			0	OR	B)75.74	R).20	
082	440 D082 5932	71011016			0	OR	B)75.74	R).20	
082	440 D082 5935	71011004			0	OR	B)75.77	R).20	
082	440 D082 6129	71011005			0	OR	B)75.77	R).20	
082	440 D082 6132	71011006			0	OR	B)75.54	R).20	
082	440 D082 6160	71007061			0	OR	A)75.56	R).19	
082	440 D082 6181	71011015			0	OR	B)75.69	R).20	
082	440 D082 6203	71007065			0	OR	A)75.52	R).20	
082	440 D082 6215	71007062			0	OR	A)75.88	R).20	
082	440 D082 6233	71008058			0	OR	A)72.45	R).20	
082	440 D082 6240	71008059			0	OR	A)71.84	R).19	
082	440 D082 6243	71008060			0	OR	A)71.41	R).20	
16	440 D082 5310	71008055			0	OR	A)75.84	R).14	
16	440 D082 5311	71008056			0	OR	A)75.49	R).15	
16	440 D082 5371	71008057			0	OR	A)75.82	R).15	
24	440 D082 5921	71013072			0	OR	A)75.70	R).25	
24	440 D082 5944	71011009			0	OR	B)75.79	R).24	
24	440 D082 5974	71011010			0	OR	B)75.79	R).24	
~~05~~	~~OCC D100 W004~~	~~80503022~~			~~0~~	~~OR~~	~~A)93.12~~	~~R).26~~	
~~05~~	~~OCC D100 W002~~	~~80503023~~			~~0~~	~~OR~~	~~A)11.01~~	~~T).002~~	
~~05~~	~~OCC D100 W003~~	~~80503031~~			~~0~~	~~OR~~	~~A)55.76~~	~~T).470~~	~~S9.5600~~
~~05~~	~~OCC D100 W004~~	~~80503024~~			~~0~~	~~OR~~	~~A)54.46~~	~~R).00~~	
90	534 D101 A312	80423010	13	5809.0	OR		A)91.27	R).20	
90	534 D101 A313	80423011	24	10287.0	OR		A)81.52	R).20	
90	534 D101 A314	80423012	9	3124.0	OR		A)73.37	R).20	
90	534 D101 A315	80423013	15	5663.0	OR		A)57.52	R).20	
93	534 D101 A304	71214024	6	2289.0	OR		A)76.53	R).2000	
93	534 D101 A305	71208066	29	12749.0	OR		A)72.97	R).20	
93	534 D101 A310	71204070	12	4959.0	OR		A)80.82	R).20	
93	534 D101 A311	80423015	18	8377.0	OR		A)81.09	R).20	
93	534 D101 W309	71110060			0	OR	A)70.38	R).2100	
20	FTA D101 7076	90314051	1	137	0	OR	A)2.880	R).31	
28	FTA D101 7085	90410040			0	OR	A)1.560	T).830	
11	FTA D101 7075	90317005			0	OR	C).060	T).120	
19	FTA D101 7069	90317009	2	456	0	OR	A)1.620	T).470	
23	FTA D101 7094	90320057	6	1243	0	OR	A)5.000	T).370	S9.6200
23	FTA D101 7107	90403001	1	135	0	OR	C).030	T).630	
18	FTA D101 1381	90717012			0	OR	C).020	T).300	S9.6900
8	FTA D101 1385	90712013			0	OR	A)52.820	T).240	S9.7600
8	FTA D101 1390	91002009			0	OR	C).050	M	M

********** END-OF-REPORT **********

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FMPC LOT MARK	LAB CODE	UNITS	CONCENTRATION OF EP TOXICITY ELEMENTS						FROM WMCO	
			As ARSENIC	Ba BARIUM	Cd CADMIUM	Cr CHROMIUM	Pb LEAD	Se SELENIUM	Ag SILVER	Hg MERCURY
N003-826-V002-W051	80203041	mg/l	0.039	2.03	<0.001	0.994	0.052	0.061	0.011	<0.100
N003-826-V002-W059	80322023	mg/l	0.055	2.46	0.001	2.06	0.046	0.208	0.010	<0.1
N082-400-D065-A315	80411024	mg/l	0.002	0.038	0.001	0.006	0.014	<0.001	0.001	<0.1
N003-822-D100-W003	80503021	mg/l	0.044	0.103	0.006	0.006	0.003	0.014	<0.001	<0.1
N093-530-D071-0311	12-0184	mg/l	0.007	0.108	<0.001	<0.001	<0.001	0.002	<0.001	<0.1
N003-811-V002-W061	80417038	mg/l	0.074	0.339	0.002	0.657	0.077	0.224	0.014	<0.1
N003-811-V002-W041	80307037	mg/l	0.043	6.41	<0.001	0.134	0.049	0.061	0.014	<0.1
N003-564-P034-0289	80307038	mg/l	0.006	0.066	<0.001	0.010	0.007	0.015	<0.001	<0.1
N003-564-P034-0309	80525068	mg/l	0.006	0.024	<0.001	0.010	0.007	0.014	<0.001	<0.1
N003-811-V002-W101	80808002	mg/l	0.030	5.54	0.004	0.081	<0.001	0.060	0.032	<0.100
N003-826-V002-W079	80707001	mg/l	0.010	0.725	0.004	0.007	0.011	0.031	<0.001	<0.100
N003-817-V069-W006	80808001	ug/l	11.6	1600	13.0	<40.0	8.9	89.7	3.9	<100
N003-817-V069-W007	80809001	ug/l	11.0	877	<10.0	<40.0	11.6	75.2	3.1	<100
N003-817-V069-W004	80802020	ug/l	12.2	1500	<10.0	<40.0	7.8	99.2	4.2	<100

Jul-90

FMPC LOT MARK	LAB CODE	UNITS	CONCENTRATI		EP TOXICITY ELEMENTS				FROM WMCO	
			As ARSENIC	Ba BARIUM	Cd CADMIUM	Cr CHROMIUM	Pb LEAD	Se SELENIUM	Ag SILVER	Hg MERCURY
N003-817-V069-W005	80802021	ug/l	12.2	629	<10.0	59.6	1.3	89.2	3.8	<100
N093-534-D101-A303	12-9611	mg/l	<1.0	<25			<1.0	<0.1	<1.0	
N082-913-D061-0303	12-9312	mg/l	<1.0	<25			<1.0	<0.1	<1.0	
N082-913-D061-0275	12-9313	mg/l	<1.0	<25			<1.0	<0.1	<1.0	
N082-917-D061-0275	12-9314	mg/l	<1.0	<25			<1.0	<0.1	<1.0	
N082-916-D061-0269	12-9315	mg/l	<1.0	<25			<1.0	<0.1	<1.0	
N093-530-D030-0272	12-9316	mg/l	<1.0	<25			<1.0	<0.1	<1.0	
X948-742-D042-0303	12-9317	mg/l	<1.0	<25			3.8	<0.1	<1.0	
N082-916-D061-0300	12-9318	mg/l	<1.0	<25			<1.0	<0.1	<1.0	
N082-913-D061-0299	12-9319	mg/l	<1.0	<25			<1.0	0.12	<1.0	
S059-FTA-D041-6651	12-9320	mg/l	<1.0	83			105	<0.1	<1.0	
S053-FTA-D069-6395	12-9321	mg/l	<1.0	<25			<1.0	<0.1	<1.0	
N120-310-D062-0295	12-9322	mg/l	<1.0	<25			<1.0	<0.1	<1.0	

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FMPC LOT MARK	LAB CODE	UNITS	CONCENTRATION OF EP TOXICITY ELEMENTS FROM UNCO							
			As ARSENIC	Ba BARIUM	Cd CADMIUM	Cr CHROMIUM	Pb LEAD	Se SELENIUM	Ag SILVER	Hg MERCURY
H082-916-D061-0291	12-9323	mg/l	<1.0	<25			<1.0	0.18	<1.0	
H093-534-D101-A303	12-9311	mg/l	0.002	0.62			0.010	0.002	0.001	
H082-913-D061-0303	12-9312	mg/l	0.024	0.70			0.076	0.072	0.009	
H082-913-D061-0275	12-9313	mg/l	0.044	1.40			0.094	0.098	0.008	
H082-917-D061-0275	12-9314	mg/l	0.031	1.96			0.067	0.076	0.010	
H082-916-D061-0269	12-9315	mg/l	0.052	0.18			0.089	0.090	0.014	
H093-530-D030-0272	12-9316	mg/l	0.014	0.32			0.024	0.009	<0.001	
X948-742-D042-0303	12-9317	mg/l	0.037	4.96			3.84	0.022	0.003	
H082-916-D061-0300	12-9318	mg/l	0.058	0.06			0.095	0.092	0.018	
H082-913-D061-0299	12-9319	mg/l	0.051	0.74			0.089	0.125	0.014	
S059-FTA-D041-6651	12-9320	mg/l	0.013	82.6			105	0.018	<0.001	
S053-FTA-D069-6395	12-9321	mg/l	0.033	0.70			0.093	0.039	0.003	
N120-310-D062-0295	12-9322	mg/l	0.022	0.42			0.025	0.054	0.002	
H082-916-D061-0291	12-9323	mg/l	0.157	0.56			0.088	0.183	0.016	

C LOT MARK	SAMPLE CODE	CONCENTRATION OF EP TOXICITY ELEMENTS IN mg/l (ppm)						FROM IT CORP	
		ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	SILVER	MERCURY
7-642-D041-0259	4-54	3.3	0.467	0.02	0.32	2.47	<0.2	1.13	<0.0002
3-643-D066-0282	1-55	0.8	0.602	0.053	0.11	0.54	<0.2	0.33	<0.0002
;-643-D044-0274	5-57	1.2	0.905	0.016	1.33	<0.05	<0.2	0.14	<0.0002
2-913-D061-0303	41-23	3.5	0.542	0.043	0.312	<2.0	0.52	1.31	<0.0002
9-FTA-D041-6651	4-25	0.4	66.4	0.038	0.09	20.25	<0.2	0.15	<0.0002
2-400-D065-0279	13-29	0.010	0.796	0.018	0.03	0.007	0.035	0.42	<0.0002
2-429-D065-0277	4-30	0.050	0.732	0.239	0.50	0.019	0.068	<0.01	<0.0002
1-534-D101-A303	24-36	0.015	0.713	0.031	<0.02	<1.0	0.113	1.3	<0.0002
3-535-D132-0274	10-37	0.055	0.514	0.027	0.1	<1.0	0.114	1.25	<0.0002
3-FTA-D101-6945	3-38	0.012	36.6	0.011	0.72	<0.5	<0.2	0.37	<0.0002
5-FTA-D069-6395	11-45	0.043	0.478	0.017	0.17	<2.0		1.37	<0.0002
1-FYC-D069-0116	22-48	1.5	0.388	0.039	0.06	<0.5	<0.2	0.59	<0.0002
1-FTA-D069-6397	5-79	<0.2	0.45	0.023	0.27	2.62	<0.2	<0.01	<0.0002
1-FTA-D044-6294	1-82	0.5	14100	0.022	1.28	<0.05	<0.2	0.14	<0.0002

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PC LOT MARK	SAMPLE CODE	CONCENTRATION OF EP TOXICITY ELEMENTS IN mg/l (ppm)						FROM IT CORP	
		ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	SILVER	MERCURY
93-510-D023-0273	1-103	<0.2	0.36	<0.005	<0.02	<0.05	<0.2	<0.01	<0.0002
82-916-D061-0300	23-4	0.108	0.879	0.041	0.06	0.18	0.017	1.11	<0.0002
82-913-D061-0299	19-5	0.053	0.831	0.109	0.11	0.014		2.99	<0.0002
20-310-D062-0295	3-6	0.015	0.819	0.013	0.18	<1.0	0.061	1.16	<0.0002
82-916-D061-0291	9-8	0.046	1.78	0.028	0.05	<1.0		1.53	<0.0002
48-742-D042-0303	4-9	0.058	0.088	0.030	0.09	<1.0	<0.2	1.12	<0.0002
93-530-D030-0272	4-11	0.5	8150	0.009	0.11	<0.2	<0.4	0.12	<0.0002
82-913-D061-0275	10-13	0.045	0.789	0.175	0.15	0.019		<0.01	<0.0002
82-917-D061-0275	4-15	0.092	0.424	0.140	0.15	0.012	<0.3	<0.01	<0.0002
82-916-D061-0269	15-16	0.072	0.397	0.142	0.16	0.007	<0.2	<0.01	<0.0002
93-530-D030-0285	7-7	<0.2	1.14	<0.002	<0.02	<0.05	<0.2	<0.01	0.0012
48-FYC-D065-0451	7-47	<0.2	0.713	<0.002	0.05	<0.05	<0.2	<0.01	0.0003
32-550-D070-0296	29-104	2.8	0.25	0.006	0.04	<0.05	<0.2	1.01	<0.0002
93-514-D079-0258	4-100	1.0	0.232	0.007	<0.4	<0.5	<0.2	0.27	<0.0002

620

4228

Jul-90

'C LOT MARK	SAMPLE CODE	CONCENTRATION OF EP TOXICITY ELEMENTS IN mg/l (ppm)						FROM IT CORP	
		ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	SILVER	MERCURY
12-400-D082-5569	11-112	1.0	0.25	0.014	0.02	<0.05	<0.2	0.42	<0.0002
3-511-D082-0285	1-113	<0.2	0.03	<0.005	<0.02	<0.05	<0.2	<0.01	<0.0002
3-518-D084-0289	1-115	<0.2	0.68	<0.005	<0.02	<0.05	<0.2	0.03	<0.0002
0-311-D082-0307	1-116	1.2	0.29	0.013	<0.02	<0.05	<0.2	0.34	<0.0002
3-530-D030-0282	6-1	<0.2	1.12	0.003	<0.02	<0.05	<0.2	<0.01	0.0002
3-FIA-D060-6903	8-10	<0.2	0.863	0.002	<0.02	<0.05	<0.2	<0.01	<0.0002
2-660-D061-0267	3-12	0.2	2.75	0.013	0.03	<0.05	<0.2	0.07	<0.0002
3-512-D062-A302	32-18	<0.2	0.007	<0.002	<0.02	<0.05	<0.2	0.04	<0.0002
3-520-D062-A302	41-19	0.2	0.662	0.006	<0.02	<0.05	<0.2	0.18	<0.0002
3-519-D062-A302	17-20	<0.2	0.637	0.003	<0.02	<0.05	<0.2	0.09	<0.0002
3-523-D062-A300	3-21	<0.2	0.732	0.004	<0.02	<0.05	<0.2	0.11	<0.0002
2-520-D062-0272	22-22	<0.2	0.830	0.004	<0.02	<0.05	<0.2	0.04	<0.0002
3-510-D065-0301	11-24	0.2	1.10	0.032	0.052	<0.05	<0.2	0.03	<0.0002
3-620-D044-0294	4-26	<0.2	0.019	<0.002	<0.02	0.11	<0.2	<0.01	<0.0002

#2238

92

ul-90

LOT MARK	SAMPLE CODE	CONCENTRATION OF EP TOXICITY ELEMENTS IN mg/l (ppm)						FROM IT CORP	
		ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	SILVER	MERCURY
·620-D045-0294	5-27	0.2	3.64	0.031	0.253	<0.05	<0.4	0.48	<0.0002
·536-D132-0280	10-28	0.4	0.844	0.040	0.02	<0.2	<0.4	0.19	<0.0002
·240-D033-0281	35-40	<0.2	1.26	<0.002	0.96	<0.05	<0.2	<0.01	<0.0002
·920-D044-0249	5-41	0.2	0.862	0.003	0.04	<0.05	<0.2	0.63	<0.0002
·520-D058-0285	5-42	<0.2	0.685	<0.002	<0.02	<0.05	<0.2	<0.01	<0.0002
642-D060-0288	6-43	<0.2	9.10	<0.002	<0.02	<0.05	<0.2	<0.01	<0.0002
643-D060-0277	25-44	<0.2	0.603	<0.002	<0.02	<0.05	<0.2	<0.01	<0.0002
762-D033-0221	3-49	0.5	0.29	<0.005	<0.02	<0.05	<0.2	<0.01	<0.0002
762-D033-0240	9-50	0.2	1.10	<0.005	0.16	<0.05	<0.2	<0.01	<0.0002
240-D033-0288	93-51	<0.2	0.38	<0.005	1.29	<0.05	<0.2	<0.01	<0.0002
805-D042-0287	4-52	<0.2	0.21	<0.005	<0.02	<0.05	<0.2	<0.01	<0.0002
900-D042-0276	7-56	<0.2	1.16	<0.005	<0.02	<0.05	<0.2	<0.01	<0.0002
827-D058-0269	20-58	<0.2	0.32	<0.005	<0.02	<0.05	<0.2	<0.01	<0.0002
965-D069-0194	21-46	<0.2	0.569	<0.002	<0.02	<0.05	<0.2	0.03	<0.0002

C LOT MARK	SAMPLE CODE	CONCENTRATION OF EP TOXICITY ELEMENTS IN mg/l (ppm)						FROM IT CORP	
		ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	SILVER	MERCURY
3-827-D058-0269	31-105	<0.2	0.28	<0.005	0.06	<0.05	<0.2	<0.01	<0.0002
2-732-D011-0299	N2-2	<0.2	1.43	0.038	0.24	<0.05	<0.2	<0.01	<0.0002
3-530-D030-0289	6-3	<0.2	0.238	0.003	<0.02	<0.05	<0.2	<0.01	<0.0002

0.95% ENR

FMPC
REPORT OF CHEMICAL ANALYSES
(NOTE: Write Firmly — Part 4 must be legible.)

FMPC-1-208 (REV. 5/86)

Lab. Nos. 5P-2851

Lot No. X500-564-V034-1001

Analyses Requested % Uranium
E.P. Toxicity, Free Metal

MATERIAL: MgF_2

ACCOUNT NO.: ~~[illegible]~~ PHS SD

DATE SAMPLED: 6/23/89

SUBMITTED BY: LEE FREDERICK

REMARKS: Sampling Study
Composite Sample
"Pipe"
5P00-89-078 (Ag)
5P00-89-079 (Se)
5P00-89-080 (Hg)

LAB. NO.	IDENTIFICATION
	L-8

ANALYTICAL DATA

Total % U		% Free metal as U
1.72		1.64
	OK SCM 6-26-89	

EP TOXICITY mg/L

As	Ba	Cd	Cr
<1.0 ✓	<25 ✓	<0.2 ✓	<1.0 ✓
Pb	**Hg**	**Se**	**Ag**
<1.0 ✓	<0.1 ✓	<0.1 ✓	<1.0 ✓

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3	Quality Assurance
4	Analytical (RECORD COPY)

Approved By A. Wolesky Date of Report 8/8/89

NLO, Inc.

A SUBSIDIARY OF NL INDUSTRIES, INC.
CINCINNATI, OHIO 45239

June 19, 1985

SUBJECT WASTE MANAGEMENT RESIDUES - EXTRACTION PROCEDURE TOXICITY (40 CFR 261.24)

TO J. R. Prall

FROM A. F. Volesky, A. L. Brueneman

REFERENCE

1. "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," United States Environmental Protection Agency, Office of Water and Waste Management, Washington, DC, 1980.
2. "Rules and Regulations," Federal Register, Vol. 45, No. 98, May, 1980.
3. "Methods for Analysis of Water and Wastes," Environmental Monitoring and Support Laboratory, Office of Research and Development, United States Environmental Protection Agency, Cincinnati, Ohio (EPA-600/4-79-020, March 1983).

A. J. Potter of the Waste Management Department recently submitted five residue type materials to be submitted to the Extraction Procedure Toxicity (EP Toxicity) test. The samples were identified as follows:

Lab No.	Identification
8-3641	H093-513-D-034-0276 Depleted MgF_2
8-3642	VVB-001 Slag Leach Filter Cake - Neutralized
14-1291	H093-564-D-034-0276 Depleted MgF_2
14-1293	VVB-001 Slag Leach Filter Cake - Neutralized
14-1294	VVB-002 Copper Contaminated Raffinate Cake - Neutralized

The procedure used for the test is given in References 1 and 2. For each of the samples, a 100 g subsample was used. The solid material was extracted for 24 hours in deionized water whose pH was maintained at 5.0 ± 0.2 using 0.5N acetic acid. The pH was maintained manually. The container used for the extraction was a 1 gallon glass jar containing the sample with 16 times its weight of deionized water. The UO_3 tumbler in the Sample Lab was used to provide sufficient agitation to the mixture. The amount of added 0.5N acetic acid did not exceed the maximum of 4 mL per gram of sample. After extraction, the liquid:solid ratio was adjusted to 20:1 (2000 mL), and the mixture of solid and extraction liquid was separated by filtration through a 0.45 micron membrane filter.

Each of the sample extracts was then analyzed for arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver by procedures given in Reference 3. Given in Tables I through VIII are the results obtained from the analyses of each of these elements.

In addition to the results reported, the following observation was noted. For sample number 14-1294, the maximum allowable amount of 0.5N acetic acid was used during the pH adjustment procedure. The final pH of the solution was 12.5.

A F Volesky /RP
A. F. Volesky

A. L. Brueneman
A. L. Brueneman

AFV/ALB/jac
Encl.
cc: C. E. Pepper
M. L. Russell
J. F. Werdmann

TABLE I

EP TOXICITY - ARSENIC

Lab No.	Concentration, mgL^{-1}		Reported Value, mgL^{-1}
8-3641	0.022	0.023	<1.0
	0.025	0.028	
	0.025	0.013	
	0.024	0.023	
	Average	0.023	(5-20-85)
8-3642	0.30	0.23	<1.0
	0.28	0.21	
	0.32	0.20	
	0.23		(5-20-85)
	Average	0.25	
14-1291	<0.001	<0.001	<1.0
	<0.001	<0.001	
	Average	<0.001	(5-25-85)
14-1293	0.013	0.011	<1.0
	0.015	0.014	
	0.010		
	Average	0.013	(6-19-85)
14-1294	0.084	0.091	<1.0
	0.087	0.091	
	Average	0.088	(5-25-85)

Method: 206.2 (Graphite Furnace Technique)

TABLE II

EP TOXICITY - BARIUM

Lab No.	Concentration, mgL^{-1}		Reported Value, mgL^{-1}
8-3641	0.67	0.59	<25
	0.58	0.56	
	Average	0.60	(5-13-85)
8-3642	0.33	0.26	<25
	0.29	0.36	
	Average	0.31	(5-13-85)
14-1291	0.084	0.088	<25
	0.094	0.083	
	Average	0.087	(5-22-85)
14-1293	1.16	1.24	<25
	1.33	1.35	
	Average	1.27	(5-23-85)
14-1294	6.14	6.02	<25
	6.40	5.99	
	Average	6.14	(5-25-85)

Method: 208.2 (Graphite Furnace Technique)

TABLE III

EP TOXICITY - CADMIUM

Lab No.	Concentration, mgL^{-1}		Reported Value, mgL^{-1}
8-3641	0.017	0.008*	<0.2
	0.010	0.030*	
	0.021	0.008*	
	0.022		(4-17-85)
	Average	0.017	(4-23-85)
8-3642	0.032	0.020*	<0.2
	0.043	0.034*	
	0.034	0.016*	
	0.044		(4-17-85)
	Average	0.032	(4-23-85)
14-1291	0.016	0.006	<0.2
	0.010	0.005	(4-17-85)
	Average	0.009	(4-23-85)
14-1293	0.029	0.019	<0.2
	0.023	0.016	(4-17-85)
	Average	0.022	(4-23-85)
14-1294	0.116	0.110	<0.2
	0.116	0.109	(4-17-85)
	Average	0.113	(4-23-85)

Method: 213.1 (Flame Atomic Absorption, direct aspiration)

*Values determined by standard addition.

TABLE IV

EP TOXICITY - CHROMIUM

Lab No.	Concentration, mgL^{-1}		Reported Value, mgL^{-1}
8-3641	0.001	0.008	<1.0
	0.006	0.006	
	0.006	0.008	
	0.007	0.007	
	0.008	0.004	(4-17-85)
	0.004	0.010*	(4-18-85)
	Average	0.006	(4-26-85)
8-3642	0.019	0.028	<1.0
	0.024	0.024	
	0.029	0.022	
	0.029	0.025	
	0.027	0.022	(4-17-85)
	0.020		(4-18-85)
	Average	0.024	(4-26-85)
14-1291	0.011	0.009	<1.0
	0.015	0.014	
	Average	0.012	(5-28-85)
14-1293	0.018	0.020	<1.0
	0.015	0.023	
	Average	0.019	(5-28-85)
14-1294	0.030	0.032	<1.0
	0.028	0.029	
	Average	0.030	(5-28-85)

Method: 218.1 (Flame Atomic Absorption, direct aspiration)

*Value determined by standard addition.

TABLE V

EP TOXICITY - LEAD

Lab No.	Concentration, mgL^{-1}		Reported Value, mgL^{-1}
8-3641	0.011	0.015*	<1.0
	0.011	0.014*	
	0.011	0.013*	
	Average	0.012	(6-20-85)
8-3642	0.008	0.008	<1.0
	0.008		
	Average	0.008	(6-20-85)
14-1291	0.068	0.058	<1.0
	Average	0.063	(6-1-85)
14-1293	0.024	0.015	<1.0
	0.036	0.032	
	0.027*		
	Average	0.027	(6-1-85)
14-1294	0.411	0.326	<1.0
	0.382	0.297	
	Average	0.354	(6-1-85)

Method: 239.2 (Graphite Furnace Technique)

*Value determined by standard addition.

TABLE VI

EP TOXICITY - MERCURY

Lab No.	Concentration, mgL^{-1}	Reported Value, mgL^{-1}
8-3641	<0.001 <0.001 <0.001 Average <0.001	<0.1 (6-13-85)
8-3642	<0.001 <0.001 Average <0.001	<0.1 (6-13-85)
14-1291	<0.001 <0.001 Average <0.001	<0.1 (6-13-85)
14-1293	<0.001 0.001 0.001* Average 0.001	<0.1 (6-13-85)
14-1294	<0.001 <0.001 Average <0.001.	<0.1 (6-13-85)

Method 245.1 (Hydride Generation, Manual Cold Vapor Technique)

*Value determined by standard addition.

TABLE VII

EP TOXICITY - SELENIUM

Lab No.	Concentration, mgL^{-1}		Reported Value, mgL^{-1}
8-3641	0.003	0.004	<0.1
	0.004	0.004	
	Average	0.004	(5-16-85)
8-3642	0.060	0.057	<0.1
	0.058	0.046	
	Average	0.055	(5-16-85)
14-1291	0.010	0.009	<0.1
	0.012	0.010	
	Average	0.010	(5-25-85)
14-1293	0.004	0.006	<0.1
	0.004	0.008	
	Average	0.006	(5-25-85)
14-1294	0.062	0.072	<0.1
	0.069	0.065	
	Average	0.067	(5-25-85)

Method: 270.2 (Graphite Furnace Technique)

TABLE VIII

EP TOXICITY - SILVER

Lab No.	Concentration, mgL^{-1}		Reported Value, mgL^{-1}
8-3641	0.004	0.003	<1.0
	0.006	0.006*	
	0.002	0.002*	
	0.004	0.012*	
	<0.001	0.008*	
	0.006		(4-17-85)
	Average	0.005	(4-24-85)
8-3642	0.014	0.028	<1.0
	0.028	0.030*	
	0.028	0.028*	
	0.015	0.026*	
	0.032	0.018*	(4-17-85)
	Average	0.025	(4-24-85)
14-1291	0.008	0.009	<1.0
	0.009	0.009	
	Average	0.009	(5-28-85)
14-1293	0.012	0.011	<1.0
	0.009	0.015	
	Average	0.012	(5-28-85)
14-1294	0.054	0.053	<1.0
	0.053	0.054	
	Average	0.054	(5-28-85)

Method: 272.1 (Flame Atomic Absorption, direct aspiration)

*Values determined by standard addition.

NLO, Inc.

A SUBSIDIARY OF NL INDUSTRIES, INC.

P. O. BOX 39158 CINCINNATI, OHIO 45239

PHONE: AREA CODE: 513-738-6200

4228

JUN 21 1985

Mr. R. C. Sleeman
Radioactive Waste Management Program
Department of Energy
Oak Ridge Operations
P. O. Box E
Oak Ridge, TN 37831

Dear Mr. Sleeman:

EP TOXICITY TEST RESULTS - LLW

Reference: Telecom, R. C. Sleeman to S. A. Castle, June 5, 1985, "Documentation of LLW EP Toxicity Results"

Attached are the results of Extraction Procedure (EP) Toxicity Tests performed by the FMPC Analytical Laboratory on samples of three (3) different FMPC low-level waste materials identified for shipment to the Nevada Test Site (NTS). The results show that FMPC samples of slag leach cake (VVB-001), neutralized raffinate (VVB-002) and magnesium fluoride are less than levels specified in 40 CFR 261.24 and, therefore, are not considered to be hazardous wastes.

We hope this information will be adequate for documentation of EP toxicity testing for these materials. If you have questions pertaining to this submittal, or if you need additional information, please contact D. E. Diehl (FTS 774-6459) or S. A. Castle (FTS 774-6394).

Sincerely yours,
Original Signed By
R. M. SPENCELEY
Manager

R. M. Spenceley
Manager

SAC/lar
Att.
cc w/att:

G. R. Blank	R. C. Kispert
S. A. Castle	N. R. Leist
A. R. Diehl	C. E. Pepper
D. E. Diehl	A. J. Potter
D. L. Dunaway	J. R. Prall
R. L. Gardner	A. F. Volesky
B. Gessiness	R. B. Weidner
J. H. Harrison	R. H. Cross ORO
D. B. Katz	J. A. Reafsnyder ORO

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EP TOXICITY TESTS - LLW MATERIAL

Material	Arsenic mg/l	Barium mg/l	Cadmium mg/l	Chromium mg/l	Lead mg/l	Mercury mg/l	Selenium mg/l	Silver mg/l
Slag Leach VVB-001	<1.0	<25.0	<0.2	<1.0	<1.0	<1.0	<0.1	<1.0
Neutral-ized Raffinate Cake VVB-002	<1.0	<25.0	<0.2	<1.0	<1.0	<1.0	<0.1	<1.0
Magnesium Fluoride Slag	<1.0	<25.0	<0.2	<1.0	<1.0	<1.0	<0.1	<1.0

4228

From: A. F. Volesky (6521)

WMCO:CG:87-015

Date: February 29, 1988

Subject: RCRA WASTES - EP TOXICITY EXTRACTIONS

To : J. R. Prall

The FMPC Analytical Laboratories became involved with the analysis of the Environmental Safety and Health (ES&H) Department's Resource Conservation and Recovery Act (RCRA) waste on February 5, 1988. WMCO's ES&H Department has contracted International Technology Corporation (IT) of Oak Ridge, TN to perform toxicity testing on waste materials suitable for shipment and disposal at the Nevada Test Site (NTS).

As a result of an IT preliminary analysis report, J. W. Neyer requested that we perform toxicity testing on 16 of 48 wastes that failed the Toxicity Characteristic Leaching Procedure (TCLP) at IT. Prior to Neyer's request, conversations with J. M. Carr revealed concerns with the preliminary results being reported by IT. Limits for the eight elements cited as being toxic are given in Attachment A.

The Analytical Department agreed to analyze EP Toxicity extracts on these 16 samples on an EXPEDITE basis. Only five of the eight elements were to be studied. These include arsenic, barium, lead, selenium, and silver.

Originally, plans were made to return the same samples to the FMPC that were sent to IT for analysis. However, since IT had not yet completed their work and due to the urgency of the matter, new samples were taken in the plant. Of the 16 samples that IT had preliminarily identified as toxic, 13 were available for resample. The remaining lots in question were either consumed in operation or combined with other lots and were unavailable for resampling. These thirteen resamples were taken on 2-8-88 by plant personnel. The Environmental Compliance Chain of Custody transfer was recorded by J. R. Prall on 2-8-88 at 5:00 pm.

The following day, FMPC Report of Chemical Analysis forms were prepared. The samples were then logged in by Sample Laboratory personnel and sent to the Special Samples Laboratory for EP Toxicity testing. Ten of the thirteen samples were subjected to a grinding, screening, and blending process to improve subsampling. A U.S. Standard Series No. 40 (35 mesh) stainless steel sieve and porcelain mortar and pestle were used to screen the samples. Three of the thirteen samples were wet and were finely divided and were treated as received.

Analytical work was completed on the EP Toxicity extracts on February 26, 1988. One of the thirteen samples has been identified as failing the test. The reported results are given in Attachment B while Attachment C lists the actual values determined. To obtain these values, graphite furnace standard addition techniques were employed for arsenic, selenium, lead, and silver. Barium was determined by high temperature flame AAS.

At the time of the original analytical request, Neyer requested that we also perform total metals analyses on the samples. At this time, the value of this study has been questioned, and this work has been suspended.

A. F. Volesky

A. F. Volesky

AFV/pje

Attachments

cc: B. S. Barnes
A. L. Brueneman
R. D. Ohlinger

Attachment A

MAXIMUM CONCENTRATION OF CONTAMINANTS FOR CHARACTERISTIC OF EP TOXICITY

EPA Waste Number	Contaminant	Concentration mgL^{-1}
D004	Arsenic	5.0
D005	Barium	100.0
D006	Cadmium	1.0
D007	Chromium	5.0
D008	Lead	5.0
D009	Mercury	0.2
D010	Selenium	1.0
D011	Silver	5.0

Reference: 40 CFR 261.24(b), Table I.

mg/l = mgL^{-1} = ppm

Attachment B

4228

RCRA Wastes - EP Toxicity Results
(Reported results - mgL^{-1})

Lab No./ID No.	As	Se	Ag	Pb	Ba
12-9311 (H093-534-D101-A303)	<1.0	<0.1	<1.0	<1.0	<25
12-9312 (H082-913-D061-0303)	<1.0	<0.1	<1.0	<1.0	<25
12-9313 (H082-913-D061-0275)	<1.0	<0.1	<1.0	<1.0	<25
12-9314 (H082-917-D061-0275)	<1.0	<0.1	<1.0	<1.0	<25
12-9315 (H082-916-D061-0269)	<1.0	<0.1	<1.0	<1.0	<25
12-9316 (H093-530-D030-0272)	<1.0	<0.1	<1.0	<1.0	<25
12-9317 (X948-742-D042-0303)	<1.0	<0.1	<1.0	3.8	<25
12-9318 (H082-916-D061-0300)	<1.0	<0.1	<1.0	<1.0	<25
12-9319 (H082-913-D061-0299)	<1.0	0.12	<1.0	<1.0	<25
12-9320* (S059-FTA-D041-6651)	<1.0	<0.1	<1.0	105	83
12-9321 (S053-FTA-D069-6395)	<1.0	<0.1	<1.0	<1.0	<25
12-9322 (H120-310-D062-0295)	<1.0	<0.1	<1.0	<1.0	<25
12-9323 (H082-916-D061-0291)	<1.0	0.18	<1.0	<1.0	<25

*Fails EP Toxicity for Lead.

Attachment C

RCRA Wastes - EP Toxicity Results
(Actual results - mgL^{-1})

Lab No./ID No.	As	Se	Ag	Pb	Ba
12-9311 (H093-534-D101-A303)	0.002	0.002	0.001	0.010	0.62
12-9312 (H082-913-D061-0303)	0.024	0.072	0.009	0.076	0.70
12-9313 (H082-913-D061-0275)	0.044	0.098	0.008	0.094	1.40
12-9314 (H082-917-D061-0275)	0.031	0.076	0.010	0.067	1.96
12-9315 (H082-916-D061-0269)	0.052	0.090	0.014	0.089	0.18
12-9316 (H093-530-D030-0272)	0.014	0.009	<0.001	0.024	0.32
12-9317 (X948-742-D042-0303)	0.037	0.022	0.003	3.84	4.96
12-9318 (H082-916-D061-0300)	0.058	0.092	0.018	0.095	0.06
12-9319 (H082-913-D061-0299)	0.051	0.125	0.014	0.089	0.74
12-9320* (S059-FTA-D041-6651)	0.013	0.018	<0.001	105	82.6
12-9321 (S053-FTA-D069-6395)	0.033	0.039	0.003	0.093	0.70
12-9322 (H120-310-D062-0295)	0.022	0.054	0.002	0.025	0.42
12-9323 (H082-916-D061-0291)	0.157	0.183	0.016	0.088	0.56

*Fails EP Toxicity for Lead.

The work on the total metals analysis was reactivated on 3-1-88 at the request of J. W. Neyer (L. C. Bogar). The work was completed and reported on 3-31-88. A copy of the results is given in Attachment D.

Attachment D

RCRA Wastes - EP Toxicity Total Metals Results
(Reported results - wt. %)

Lab No./ID No.	As	Se	Ag	Pb	Ba
12-9311 (H093-534-D101-A303)	0.0001	0.0002	0.00005	0.022	0.0017
12-9312 (H082-913-D061-0303)	0.0005	0.0017	0.00022	0.016	0.0017
12-9313 (H082-913-D061-0275)	0.0006	0.0022	0.00024	0.016	0.0014
12-9314 (H082-917-D061-0275)	0.0014	0.0020	0.00020	0.016	0.0038
12-9315 (H082-916-D061-0269)	0.0017	0.0005	0.00028	0.017	0.0037
12-9316 (H093-530-D030-0272)	0.0005	0.0018	0.00009	0.022	0.0047
12-9317 (X948-742-D042-0303)	0.0035	0.0023	0.0019	0.17	0.268
12-9318 (H082-916-D061-0300)	0.0010	0.0006	0.00032	0.007	0.0046
12-9319 (H082-913-D061-0299)	0.0011	0.0005	0.00046	0.008	0.0043
12-9320 (S059-FTA-D041-6651)	0.0034	0.0011	0.00024	0.24	3.37
12-9321 (S053-FTA-D069-6395)	0.0006	0.0011	0.00017	0.011	0.028
12-9322 (H120-310-D062-0295)	0.0003	0.0002	0.00011	0.006	0.014
12-9323 (H082-916-D061-0291)	0.0012	0.0015	0.00072	0.009	0.0079

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III. WASTE STREAM INFORMATION

G. WASTE CHARACTERIZATION PROGRAM

3. Waste Analysis Results

SUMMARY SHEET OF RADIOACTIVE/HAZARDOUS CONSTITUENTS

CONSTITUENT HAZARDOUS/RADIOACTIVE	CONCENTRATION LOW/MEAN/HIGH
Waste Stream No.: ONLO-000000001	
Uranium 238 (0.10% to 1.0% U)	0.3330E-06 curies/gram U-238
Uranium 235 (0.2% to 3.99% U-235)	0.2140E-05 curies/gram U-235
Uranium 234 (0.001% to 0.01% U-324 on a U basis)	0.3360E-06 curies/gram Total U
Waste Stream No.: ONLO-000000002	
Uranium 238 (0.1% to 10% U)	0.3330E-06 curies/gram U-238
Uranium 235 (0.2% to 1.0% U-235)	0.2140E-05 curies/gram U-235
Uranium 234 (0.001% to 0.01% U-324 on a U basis)	0.3360E-06 curies/gram Total U
Waste Stream No.: ONLO-000000003	
Uranium 238 (1% to 20% U)	0.3330E-06 curies/gram U-238
Uranium 235 (0.2% to 2.0% U-235)	0.2140E-05 curies/gram U-235
Uranium 234 (0.001% to 0.01% U-324 on a U basis)	0.3360E-06 curies/gram Total U
Waste Stream No.: ONLO-000000004	
Uranium 238 (1% to 20% U)	0.3330E-06 curies/gram U-238
Uranium 235 (0.2% to 2.0% U-235)	0.2140E-05 curies/gram U-235
Uranium 234 (0.001% to 0.01% U-324 on a U basis)	0.3360E-06 curies/gram Total U
Waste Stream No.: ONLO-000000005	
Thorium 232 (1% to 100% Th)	0.1090E-06 curies/gram Th
Thorium 228 (natural %)	0.1096E-06 curies/gram Th
Uranium 233 (13 ppm on a Th basis)	0.1232E-06 curies/gram Th
Thorium 230 (natural %)	0.1100E-07 curies/gram Th

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III. WASTE STREAM INFORMATION

H. WASTE ACCEPTANCE CRITERIA CERTIFICATION SUMMARY

1. General Regulatory Criteria for Packages

Waste packaging criteria for low level waste shipped to the NTS for disposal shall meet DOT regulations, 49 CFR 173, Subpart I. Standard operating procedures listed in Table 1 concerning storage and off-site shipments shall be used to assure that all shipments meet DOT requirements.

1.1 In compliance with 49 CFR 173.451, Fissile Materials, process residues are routinely sampled by process lot and analyzed for percent uranium and percent uranium-235. Standard operating procedures (SOP) (Table 1, Appendix I) detail the frequency and specific analysis to be performed on each container of material.

External radiation levels of each waste package are measured using calibrated instruments for determination of compliance, and calculation of the transport index when required by 49 CFR 173.455.

Analysis has shown that MgF_2 waste material from the depleted or natural uranium metal production lines contains approximately 1 to 5% uranium. The filter cake produced by leaching and filtering MgF_2 from the enriched uranium line contains approximately 0.1% uranium. Calculations using these values indicated that the normal or depleted material would contain 0.003 g/kg of uranium. The depleted or normal containers do not pose any danger of criticality even with 0.050 g/kg of normal or depleted uranium, and the 0.003 g/kg of the enriched uranium is insufficient material for criticality even at optimum configuration. Standard operating procedures (Table 1, Appendix I) detail the frequency and specific analysis to be performed on each container of material.

1.2 In compliance with 49 CFR 173.442, Thermal Limitations, the heat generated by the quantity of ^{235}U in any one of the containers (max 0.4 kg) is far less than 0.1 W. This calculation is based on 2.15×10^{-6} Ci/g and a heat output of 0.027 W/Ci. For the ^{238}U the Ci/g value is 3.34×10^{-7}; therefore, even 0.050 g/kg of uranium would still produce <0.1 W.

1.3 In compliance with 49 CFR 173.441, Radiation Levels, the radiation exposure rate at the surface and at 1 m of each package shall be measured and recorded in the data package. Packages that exceed 200 millirem/hr on contact and/or 10 millirem/hr at 1 m shall not be shipped to NTS.

III. WASTE STREAM INFORMATION

H. WASTE ACCEPTANCE CRITERIA CERTIFICATION SUMMARY

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

1.5 In compliance with 49 CFR 173.423, shipments of limited quantities (LQ) of radioactive materials, the quantity of radioactivity in any one package shall be less than the limits for low specific activity (LSA) material shipped under exclusive use transport (49 CFR 173.421 and 173.422 criteria). Shipments of LSA shall meet the specifications of 49 CFR 173.425. Each waste material package labeled LQ meets the specifications of 49 CFR 173.421.

In compliance with Title 49 CFR 173.421 and 173.425, strong, tight containers used for shipping limited quantities of low level waste (LLW) and LSA shall be constructed so that it will not leak during normal transportation and handling conditions. Any bulk LLW shall be shipped in closed transport vehicles unless an exception has been approved by NTS in accordance with Title 49 CFR 425(c). Containment of bulk waste shall be such that off-loading personnel can unload the waste without contaminating personnel or equipment.

1.6 The FMPC shall package all waste for shipment to NTS in containers meeting DOT specifications (e.g., 17H 55-gallon drums or other NTS approved containers). All containers shall be shipped to meet DOT requirements for interstate travel and shall meet the requirements of 49 CFR 173.411, 173.425, and 173.412.

1.7 Waste shipped to the NTS shall be marked and labeled as required in Title 49 CFR 172, Subparts D and E [with exceptions noted in Title 173.425 (b) and (c)]. Also each waste container shall be marked with a unique container identification number and shipment number so that the container can be identified from another container within the shipment or from another set of containers. Marking and labeling of the waste packages shall be for radioactive material.

1.8 Waste shall be packaged according to the level of hazard as defined in Title 49 CFR 173.2, "Classification of Material Having More Than One Hazard."

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III. WASTE STREAM INFORMATION

H. WASTE ACCEPTANCE CRITERIA CERTIFICATION SUMMARY

2. NTS Specific Package Criteria

2.1 All package closures shall be sturdy enough that it will not be breached under normal handling conditions and will not serve as a weak point for package failure.

2.2 Except for waste packaged in steel drums, the waste container (packaging and contents) shall be capable of supporting a uniformly distributed load of 4,000 lbs/ft^2.

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

2.4 WMCO shall use the recommended 4 x 4 x 7 ft. and 4 x 2 x 7 ft. boxes. In addition, 55-gallon drums shall be used. Additional containers WMCO would like to use upon DOE NV approval are listed in Section IV, Part A.

2.5 In addition to the weight limits set for specific packaging designs, a 9,000 lbs. limit per box and a 1,200 lbs. limit per 55-gallon drum shall be maintained. Containers exceeding the 9,000 lbs. limit shall be shipped in removable-top trailers.

2.6 Waste containers shall be loaded to ensure that the interior volume is as efficiently and compactly loaded as practical.

2.7 Containers conforming to DOT Specification 7A requirements comply with the lesser "strong, tight," requirement. When the Type 7A containers are used as "strong, tight," evaluation of the container under the DOE Type A Certification Program is not required, nor is a safety analysis of the containment and packaging system.

2.8 Every FMPC waste package shall be prepared for shipment so as to minimize damage during transit. The preshipment storage environment shall be controlled to avoid adverse influence from weather or other factors on the containment capability of the waste packaging during handling, storage, and transport. WMCO shall take all responsibility for preshipment storage and take all reasonable precautions to preclude the accumulation of moisture on or in packages prior to their arrival to the NTS.

III. WASTE STREAM INFORMATION

H. WASTE ACCEPTANCE CRITERIA CERTIFICATION SUMMARY

3. General Waste Form Criteria

3.1 Material intended for shipment to NTS will be basically in the forms listed in Section 1.4.1 of the Waste Certification Program Plan (Appendix I). The chemical composition of all the process waste forms consists of inorganic salts and, is not combustible.

3.2 Explosive materials shall be converted to nonreactive forms. Compressed gases, including unpunctured aerosol cans, shall not be sent to NTS for disposal.

The waste forms as described in Section 1.4.1 of the Waste Certification Program Plan (Appendix I) apply here and, again, the material is both nonpyrophoric and nonexplosive as contained in the containers. Supervisory control, the use of SOPs, and checklists shall ensure that all material shall have gone through the processes and shall have met the criteria.

3.3 All waste shall be controlled to prevent any free liquids. Waste streams such as slurries and residues which have wet consistencies are processed in the Rotary Kiln and/or Calciner to remove excess liquid before packaging. These materials are not hygroscopic and remain as prepared. The MgF_2 slag leach slurry is filtered through a bed of diatomaceous earth and dried under vacuum. This waste is then kiln dried or calcined to ensure that it does not contain any free liquid. Remaining waste streams that could contain free liquids are treated by adding absorbent during the packaging process.

3.4 Fine particulate waste shall be immobilized so that the waste package contains no more than one weight percent of less-than-10-micrometer-diameter, or 15 weight percent of less-than-200-micrometer-diameter particles with radioactive contamination. Permission has been obtained from NTS to double package all material as an alternative means of minimizing any potential release of fine particulates (NVO-325 Section 2.2.1.0). Any other material falling into this category shall be treated in the same manner and permission obtained from NTS as needed.

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III. WASTE STREAM INFORMATION

H. WASTE ACCEPTANCE CRITERIA CERTIFICATION SUMMARY

3.5 Waste contained in the packages shall contain no radioactive waste mixed with hazardous waste as identified in 40 CFR-261. The SOPs detail the addition of all chemicals, and the checklists verify the addition of each. Tests on representative samples have shown no hazardous materials present.

3.6 The five principle wastes as described in Section 1.4.1 of the Waste Certification Program Plan (Appendix I) are nonreactive with the shipping containers. Other waste components are uncalcined diatomaceous earth or materials that have been oxidized in air.

All waste is segregated by waste stream type and compatibility at the FMPC at the point of generation. The FMPC-REST-3236 form [see Figure 5 of the Waste Certification Program Plan (Appendix I)] signed and completed for each waste container serves as a documented check. Containers and/or dumpsters, if possible, are closed and/or locked while unattended.

3.7 Low level radioactive waste analysis shall verify all wastes destined to the NTS for disposal shall have a transuranic (TRU) nuclide concentration less than 222,000 dpm per gram (100 nanocuries per gram).

3.8 LLW containing pathogens, infectious wastes, or other etiologic agents as defined in Title 49 CFR 173.386 is segregated at the point of generation for incineration and will not be sent to the NTS for disposal.

3.9 Bulk LLW shall be solid and meet the requirements of Title 49 CFR 173.425 (c)(1).

IV. EXEMPTION REQUESTS

A. Area of Noncompliance, Reason for Request, Requested Duration, and Plan for Corrective Action.

Areas of Noncompliance are as follows:

1.1 The following list of containers is presently being used by WMCO for shipment of waste to the NTS. All containers shall meet the NTS package strength requirement for disposal at Area 5 RWMS, except for sea/land containers and drums. The drums are exempted from the 4,000 pound per square foot requirement under Section 2.1.2b of NVO-325. WMCO has an approved exemption for the sea/land container because they are disposed of in Area 3 at NTS. WMCO would like to continue to use the waste containers which do not meet the package strength criteria until present stock (-458) is depleted (metal shipping container, drawing number 30A-5500-M-00059-0).

CONTAINERS	DRAWING NUMBERS
Metal Shipping Container (Sealloc Closer - As supplies last)	30A-5500-M-00059-0
Metal Shipping Container (7A, Type A positive closer bolt)	C 01-542-2-01
Metal Shipping Container (Clip style retainer)	D 89DW000800 8 (3 set drawing)
Sea/land Container	N/A

NOTE: Actual drawings contained in the above list appear after Section IV.

1.2 The FMPC requests that the DOE NRC Form 741 be sent to NTS within 24 hours <u>after</u> the shipment and not prior as requested by NVO-325 Section 5.1, Part B-1. (Form 741 must be on file in Nevada prior to shipment arrival.)

1.3 The FMPC requests that REECo Traffic Section be notified the same day after the shipment leaves the site rather than before as required in NVO-325 Section 5.1, Part A-1. The time zone difference between Ohio and Nevada makes morning notification impossible.

Control #: _____ WO1 4228

FMPC
Waste Application
To Ship Waste
To The
Nevada Test Site
APPENDIX I

FEED MATERIALS PRODUCTION CENTER

Westinghouse Materials Company of Ohio
P. O. BOX 398704
CINCINNATI, OHIO 45239-8704

PREPARED FOR THE

U.S. Department of Energy
OAK RIDGE OPERATIONS OFFICE
UNDER CONTRACT DE-AC05-860R21600

651

QA87001
Revision No. 5

4228

WASTE CERTIFICATION PROGRAM PLAN

FOR

THE MANAGEMENT OF WASTE

BY

K. J. DUNBAR

WESTINGHOUSE MATERIALS COMPANY OF OHIO

P. O. Box 398704

Cincinnati, Ohio 45239

Revision No. 5 6-30-90

Prepared for:

U. S. Department of Energy
Weapons Division of Oak Ridge Operations
Contract DE-AC05-86OR21600

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RECORD OF REVISIONS

REVISION NO.	DATE
0	10/1/87
1	9/19/88
2	1/24/89
3	4/06/89
4	6/28/89
5	6/30/90

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WASTE CERTIFICATION PROGRAM PLAN

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EXECUTIVE SUMMARY

This waste certification program plan describes the procedures which are used by the Feed Materials Production Center (FMPC), Fernald, Ohio, to ensure that the low-level radioactive waste shipped to the Nevada Test Site (NTS) for disposal conforms with all pertinent federal, state, and local regulations. The FMPC is managed by Westinghouse Materials Company of Ohio (WMCO), for the U.S. Department of Energy (DOE). The FMPC serves an important role in DOE defense programs by employing a variety of chemical and metallurgical processes.

The production processes at the FMPC generate solid and liquid low-level radioactive wastes. The primary waste forms to be packaged and shipped are waste process residues, scrap wood & pallets, refuse metal, miscellaneous trash and construction rubble. The uranium content of these waste streams range from about 0.0005 to 0.87 g U/g of solids. The uranium content of solid uranium metal that may be shipped in the future can be as high as 1.00 g U/g of solids. The U235 isotopic content normally is 0.2% to 1.25%. The specific activity content of the wastes allows them to be classified as Limited Quantity (LQ), Reportable Quantity (RQ) or as Low Specific Activity (LSA) subject to the shipping regulations made in exclusive use vehicles.

This Waste Certification Program Plan (WCPP) plan is based primarily on the waste acceptance criteria established by NTS (NVO-325) and on the ANSI/ASME-NQA-1 national standard for QA programs to be applied to nuclear facilities. In addition, adherence to the QA program ensures compliance with applicable U.S. Department of Transportation (DOT), U.S. Nuclear Regulatory Commission (NRC), U.S. Environmental Protection Agency (EPA), and DOE regulations and orders. The document presents a brief description of the FMPC operations, waste generation, and applicable standards, regulations, and guidelines, and the QA measures concerning each of the 18 NQA-1 elements.

Nearly, all sections and departments at the FMPC are involved in the successful shipment of low-level radioactive waste (L-LRW). Waste Certifying Officials have been designated by the DOE Site Manager in an official letter. The L-LRW Certifying Official certifies that each waste container meets all applicable criteria and is accompanied by all necessary documentation before leaving the FMPC site. The FMPC contracts with approved carriers for shipment of the waste containers to NTS in accordance with DOE Order 1540.

The following is a summary of the NTS waste acceptance criteria to be met by FMPC. These criteria are discussed in more detail in Section 3.0.

Waste Form Criteria

1. Pyrophoric materials must be converted to a nonreactive form.

2. Explosive materials must be converted to a nonreactive form; no compressed gases, including unpunctured aerosol cans, will be accepted.

3. Free liquids will not be accepted.

4. Fine particulate radioactive waste shall be immobilized or double containerized; no more than 1 wt % of < 10 microns or 15 wt % of < 200 microns will be allowed.

5. Reportable quantities as defined in 40 CFR, hazardous wastes shall not be accepted.

6. Low Level Radioactive Waste shall have a Transuranic (TRU) nuclide concentration less than 222,000 dpm per gram (100 nanocuries per gram).

Waste Package Criteria

7. Quantity of fissile materials shall ensure that packages remain subcritical.

8. Quantity of radioactive materials should be limited so that effects of nuclear decay heat will not adversely affect physical or chemical stability of the package or its contents.

9. Radiation levels shall not exceed 200 millirem/hr on contact and 10 millirem/hr at 3 ft (1 m) during handling, shipment, and disposal.

10. Packages shall be contamination free (as per levels listed in 49 CFR 173.443) upon receipt at NTS.

11. Radioactivity limits in any one package shall conform to applicable regulations of Title 49 CFR 173.421 for LQ or 172.101 appendix 1 for RQ.

12. LSA requirements [49 CFR 173.425 (b)(1)] of strong tight containers shall be used to package the wastes, and shipments shall be made in exclusive-use vehicles. Bulk LLW shall be shipped in closed transport vehicles in accordance with Title 49 CFR 425 (c).

WASTE CERTIFICATION PROGRAM PLAN

1.0 ORGANIZATION

1.1 FMPC Management Organization

The Feed Materials Production Center (FMPC) is managed by the Westinghouse Materials Company of Ohio (WMCO) under contract to the Department of Energy (DOE). The certification, packaging and shipping of low-level radioactive waste at the FMPC involves numerous organizations. An overall WMCO organizational chart appears in Figure 1.

1.2 Specific Waste Management Organization

Responsibility for specific operations for low-level radioactive waste generation rests with Waste Management, Transportation, Materials Control & Accountability, Analytical Laboratories, Solid Waste Compliance, Radiological Safety and Quality Assurance. Figure 2 shows the waste processing interface and Figure 2a shows waste certification. Authorization to store or dispose of radioactive defense waste has been obtained by written approval from DOE-Nevada.

An FMPC waste generator initiates the waste disposal process by filling a Waste Management approved waste container. Once the container has been filled a sample is drawn. Analytical Laboratories then analyzes the sample for major radionuclide content and TCLP, as required. Solid Waste Compliance makes all RCRA determinations for waste based upon chemical analysis and/or process knowledge. Once analysis is complete and a RCRA determination has been made the waste container is prepared for final shipment by Waste Management. Radiological Safety monitors each waste container and the transport vehicle prior to shipment. Transportation prepares the vehicle for loading and loads the waste containers. Material Control & Accountability prepares the shipping order and the DOE-741 Nuclear Material Transfer form. Traffic of the Transportation Department prepares the Bill of Lading and makes all shipping arrangements. Waste Certification of the Quality Assurance Department monitors and evaluates each step of the waste process.

1.3 Waste Certification Organization

There are two certification groups. The Waste Packaging Quality Assurance Group has direct responsibility overview of waste packaging operations and package certification. Normally there are five certification personnel qualified to sign NV-211 labels. The QA Certification Group has overview responsibility for waste packaging certification, and is responsible for certification of each shipment. Within this group is a prime certification

official and normally three alternate certification officials, who are authorized to sign certification statements to certify shipments, and who can also certify waste packages by signing the NV-211 labels. The QA Certification Manager's overview of both groups ensures that only qualified and certified personnel approved by NV are utilized for certification.

Responsibility for specific operations for low level radioactive waste generation and processing rests with the Waste Generator, Waste Management, Transportation, Analytical, Materials Control & Accountability, Solid Waste Compliance and Quality Assurance. Waste Management manages waste generation, characterization, sampling, packaging and prepares waste shipments for disposal. Transportation moves waste at the FMPC, loads vehicles for shipment, inspects vehicles for shipment, completes and authorizes the waste manifest. Analytical performs all analysis at the FMPC, maintains documentation of analyses and controls activities with outside analytical laboratories as needed. Materials Control & Accountability prepares the shipping orders, DOE 741, factor assay, and controls process material flow documentation and nuclear accountability of FMPC material. Solid Waste Compliance performs mixed waste determination of FMPC waste. Quality Assurance overviews the waste process, performs surveillance of the waste process, maintains shipping/certification records, overviews shipping documentation and loading activities, and certifies waste for shipment for disposal at NTS. The Waste Certification organization chart appears in Figure 2a.

1.4 Waste Management Program Description

The waste process begins when the waste generator contacts the Waste Management Department for a waste container. Transportation supplies the waste container(s) to Waste Management for distribution to the waste generator who then packages their waste in accordance with applicable procedures.

After the waste is packaged and sampled, the waste generator notifies Transportation to transport the packaged waste to Waste Management. At Plant 1, Waste Management receives the waste, interim stores and prepares the containers for shipment. Containers are separated into individual shipments and temporarily stored on the Plant 1 pad awaiting shipping documentation. When documentation is complete, shipments are moved to the staging area where final shipment preparation and container certification documentation takes place. A waste processing flow chart appears in Figures 3 and 4.

1.4.1 Waste Generation, Processing & Packaging

There are 4 waste streams identified for disposal at NTS in compliance with NVO-325. The waste streams are as follows:

1. Process area wastes contaminated with less than 1% of uranium.

2. Construction wastes slightly contaminated with uranium.
3. Low grade nonrecoverable uranium residues equal to or greater than 1% and less than 20% of uranium.
4. High grade nonrecoverable uranium residues equal to or greater than 20% and up to 100% of uranium.

Numerous process area wastes contaminated with uranium are generated at the FMPC in conjunction with normal production related activities. These wastes have all been prepared and shipped to the Nevada Test Site in the past and include the following:

- Trash (plastic, cardboard, paper, etc.)
- Incinerator Ash
- Scrap Salts (high fluoride)
- Asphalt
- Floor Sweepings
- Scrap Drums
- Asbestos
- Refuse Metal
- Scrap Filters
- Pallets, Scrap Wood
- Ceramics, Glass
- Dust Collector Bags
- Furnace Cleanings (Rockwell)

These wastes may be packaged into drums, boxes (wood/metal), sea/land containers or nylon reinforced bags (baled trash).

Construction wastes slightly contaminated with uranium are generated at the FMPC in the demolition or excavation phase of a construction or maintenance project. Construction wastes may include the following:

- Soil
- Rocks, Gravel
- Metal
- Wood
- Asbestos
- Trash (plastic, cardboard, paper, etc.)
- Asphalt
- Glass

Construction wastes may be packaged into drums, boxes (wood/metal) and cargo containers.

Low grade and high grade nonrecoverable uranium residues are generated at the FMPC as a result of the production processes within the various plants. The difference between low grade residues and high grade residues is that the low grade residues generally contain less than 1% uranium by weight. Both low grade and high grade uranium residues are

classified as nonrecoverable or waste, if the total uranium and assay of the material falls below the FMPC economic discard curve for recovery.

One of the major nonrecoverable uranium residues is magnesium fluoride (MgF_2). MgF_2 is produced during the reduction process of uranium tetrafluoride with magnesium to uranium derby metal. The MgF_2 waste is packaged in 48-gallon drums using 55-gallon drums as overpacks. Due to declining uranium metal production requirements, however, the generation of this waste will be much lower in the future.

Slurries and residues from Plant 8 are processed through various equipment due to their wet/dry consistencies. Some of the dry waste materials are miscellaneous residues including scrap uranium tetrafluoride (UF_4) and black oxide (U_3O_8) which are packaged using the Rotex without a screen. Raffinate cake, sump cake and slag leach filter cake are dried in the Rotary Kiln or Primary Calciner and packaged from there. All of these are processed in Plant 8 and packaged into 48-gallon drums with 55-gallon drum overpacks. Various dust collector units at the FMPC, due to physical constraints, utilize a 24-gallon drum that is overpacked into a 30-gallon drum for double containment. In addition, 55-gallon drums of various dry low level waste residues are

overpacked directly into 83-gallon drums for shipment. In summary low and high grade uranium residues include the following:

Low Grade Uranium Residues:

- Discard process residues
- Incinerator Ash
- Scrap Salts (high fluoride)
- Trailer cakes
- Waste slurries (dried)
- Raffinate
- Sump cake
- Dust collector residues
- Filter cakes
- MgF_2

High Grade Uranium Residues:

- UF_4 (off-specification)
- Scrap U_3O_8
- Reject UO_3

No thorium residue waste streams have been approved for disposal at NTS to date. However, the FMPC has served as the DOE interim storage site for thorium contaminated materials since the 1970's. The thorium contaminated low level wastes are currently stored in the following:

- 48-55 gallon overpack drums
- 13,500 containers in warehouse buildings
- 241 containers overpacked in six-packs stored in Building 64
- some containers stored in quonset hut
- contaminated equipment at various site locations

Thorium contaminated low level wastes previously contained in the silo and bins have been repackaged into approximately 1600, 48-55 gallon overpack drums to meet double containment criteria and are ready for disposal at an approved DOE waste management facility. This material is presently stored in the quonset hut.

The drummed thorium contaminated low level waste in warehouse buildings is scheduled to be classified and overpacked into six-pack metal containers and foamed in place.

The transportation of these materials shall be conducted under the FMPC "Environmental Assessment of the Proposed Low Level Waste Processing and Shipment System." An Addendum to the "Environmental Assessment of the Proposed Low Level Waste Processing & Shipping System" has been developed to allow for the addition of shipments of low level waste containing thorium materials as the primary radionuclide.

A "Waste Stream Characterization Data Sheet" shall be completed and submitted to NTS for any waste streams initiated after the issuance of the NVO-325. This information shall be in accordance with 40 CFR 264.13 (a), "General Waste Analysis." Forecasts of waste volume, radioactive species, total curie content, copy of the analysis of a representative sample, number and type of packages, and number of shipments shall be provided to NTS and DOE/NV based upon the waste stream numbers to aid in planning for future waste shipments.

Any significant changes which occur to the generating or treatment processes of a waste stream shall be documented and DOE/NV and Reynolds Electrical & Engineering Co., Inc. (REECo) Defense Waste Management Department (DWMD) notified. The waste shall be recharacterized and certified. In addition, a semiannual recertification report for all waste streams shall be prepared. This report shall include:

- identification of waste by waste stream identification number

- update of the three-year forecast

- assurance that the Waste Certification Program Plan is presently followed and waste continues to meet NVO-325 requirements

- results of additional waste characterization performed on a routine basis or as a result of a change in the waste process. If there were no changes during a six month period then a statement to that effect shall be included.

All samples taken are drawn using U.S. EPA SW-846 methods. Uranium residues are sampled using open scoop, a slotted pipe and a sheathed or closed auger depending on the nature of the material. A sample is taken from each container of a lot and a bulk composite is then made per lot. The composite bulk sample obtained from each lot of material requires sample preparation, which may include drying, milling, blending, screening, pulverizing, and subsampling. The prepared sample is then submitted to the FMPC laboratory for percent uranium (or thorium) analysis and U-235 isotopic evaluation. Before a given sampling device or procedure can be finally accepted for sampling purposes, it is necessary

to evaluate the accuracy and precision of the method as it is used to sample a specific type of material. It is also desirable to provide periodic and/or continuous checks on the various sampling techniques. These evaluations may be accomplished in a number of ways.

Sampling of uranium (or thorium) solutions is accomplished by taking dip samples or removing a sample from a well-agitated storage tank using a liquid sampler. However, bulk solids sampling presents the greatest difficulty. Some of the various methods for evaluating sampling procedures are:

1) Duplicate sampling by identical procedures.

2) Dual sampling, using at least two different samplers.

3) Dilution of inert material with a known amount of standard oxide, and blending the mixture.

4) Process evaluation in which samples of questionable materials not amenable to sampling in their original state may be evaluated by comparison with samples taken of the processed or oxidized product once it is in a form suitable for sampling.

In all cases, analytical variance statistical techniques are used in determining the significance of differences between sampling tests.

Some materials, such as contaminated baled paper and solid metal, cannot be representatively sampled for percent uranium. These types of materials are assigned factor assays. These factor assays are based upon recovery campaigns, special studies, or process knowledge estimates.

Tentative assay values are used for materials routinely produced, until individual lot assays are performed by the NMC Analytical Laboratory. A complete factor and tentative assay list is issued as needed by MC&A for general use.

Any exemption requests which may have been included in the initial waste disposal application to NTS shall also be included in the recertification report. Changes or revisions to those initial exemption requests shall also be included if corrective action has occurred.

1.4.2 Waste Shipping

Waste containers are prepared for final shipment by Waste Management. Waste Management and Waste Certification visually check each container for significant damage such as dents, rust, holes, cracks, and defects. Rejected

containers are moved to designated areas for repair and/or repackaging. Final container closure such as nailing, banding or pinning occurs at the Waste Management designated staging area. A shipment number and a container identification number are assigned to each container which can be cross referenced to the FMPC "Lot Code and Color Marking System" for FMPC internal verification. Containers are closed for off-site shipment, radiological smear and survey tests are performed and documented prior to loading. All containers are visually inspected by Waste Certification and radiological smears and surveys reviewed for compliance by Waste Management and Waste Certification before the shipment is released for loading.

Special requirements for handling, storage, and shipping are detailed in Standard Operating Procedures (SOP's), department procedures, manufacturing specifications, and the Transportation Manual (see Table 1). The Transportation Section assigns personnel trained in the safe operation of fork lifts and transport vehicles for transfer of waste containers from packaging stations to temporary storage and also for loading trucks for shipment.

Containers (except cargo containers) are transferred from the storage area to the staging area. Waste containers shall be constructed so that they can be handled by fork lift. Containers are loaded and shored in a manner to

prevent shifting and to meet legal weight restrictions. Also, containers are loaded in such a way as to ensure that radiation exposure to the driver and the public conform with present Department of Transportation (DOT) regulations.

Some of the material designated as low-level radioactive waste and destined for NTS is classified as Low Specific Activity (LSA) as defined in 49 CFR 173.425 and is subject to the regulations thereof. Wastes also are classified as Limited Quantity (LQ) or Reportable Quantity (RQ). FMPC packaging of hazardous materials for shipment shall be in compliance with regulations contained in 49 CFR. However, DOT specification packages are not required for (LSA) waste shipped by exclusive vehicle excepted by 49 CFR 173.423, 173.424, and 173.425. These materials shall be packaged in strong, tight packages that will not leak during normal transportation and handling conditions.

For packages not meeting the standard DOT requirements, WMCO shall submit to DOE/NV drawings and/or safety analyses for their review and approval prior to use. Package design shall include all requirements detailed in the NVO-325.

Only properly evaluated and DOE-approved carriers are used for low level radioactive waste shipments to the Nevada Test Site (NTS) in compliance with DOE order 1540.1 "Materials Transportation and Traffic Management." The carrier will

comply with routing instructions and guidelines as specified in Title 49 CFR. A carrier/driver instruction packet is given to each driver prior to departure. This packet contains carrier/driver instructions for radioactive shipments, instructions regarding controls for radioactive shipments consigned as exclusive use, suggested routing through Las Vegas area, 49 CFR 171.15 and 171.16 notification procedures, DOE regional coordinating offices for radiological assistance and geographical areas of responsibility and a permit for the transportation of radioactive waste in Nevada.

1.5 Training of Packaging & Shipping Personnel

In compliance with NQA-1, NVO-325, 49 CFR Section 173.1(b), and DOE Order 5480.1A Chapter V, formal training of all personnel directly involved in the preparation of waste shipments shall be conducted. The training shall be documented, updated bi-annual, and available for inspection by any auditing official. The training program shall be designed as a number of performance based modules. Each module contains learning objectives, conditions, and an evaluation to measure the trainee's competence in performing required tasks. Certified instructors from applicable departments shall provide instruction to packaging and shipping personnel, maintain training records, and conduct an

bi-annual evaluation of the effectiveness of the training program. Permanent training records are maintained by the FMPC Development Section of the Human Resources Department.

The FMPC Transportation Section has an important part of the overall low level radioactive waste disposal training program. The Training Manual & Training Program (Training Source No. 2219-00000-8801) is used for personnel directly involved with off-site shipments. Also, a training program for operators exists for the safe operation of powered industrial trucks. This program is administered by a Traffic Section supervisor utilizing classroom instructions, demonstrations, and on-the-job training. The program consists of four phases: familiarization, operation, qualifications (written examination and performance tests), and nuclear safety.

2.0 WASTE CERTIFICATION PROGRAM PLAN

2.1 Quality Assurance Policy Statement - Responsibilities

This Waste Certification Program Plan and associated implementing procedures incorporate the WMCO policies for achieving or exceeding the required levels of quality for the packaging and shipment of waste to the Nevada Test Site (NTS) for disposal. These documents define a program which satisfies the requirements of DOE, DOT, and NTS.

The authority and responsibilities for the overall quality of the program rests with the President of WMCO. The responsibility for establishing, executing and evaluating the overall quality and waste certification program is assigned to the Vice President, Quality. Members of the President's staff are responsible for implementing the program in their organizations. Each employee is responsible for compliance with the requirements of this Waste Certification Program Plan and the implementing procedures as it applies to his/her work assignments. The organizational chart is shown in Figures 1, 2 and 2a.

2.2 Statement of Independence - Interface Control

All waste prior to shipment, is labeled with a NTS NV-211 sticker. The NV-211 is signed by a knowledgeable, responsible person who has been trained and qualified in accordance with the WCPP. This person certifies that the waste container and contents meet NVO-325 requirements. The Certification Official is responsible for assuring that each package certifier is properly trained and qualified. The Certification Official and certifiers are not involved in the actual packaging of waste. The Certification Official and certifiers are part of the Quality Department. The Vice President of Quality reports directly to the President, WMCO.

Waste packages and shipments are certified by trained and qualified personnel within the Quality Department, which is organizationally independent from groups directly involved in the

actual packaging and shipment of waste (see Appendix I, Section B for specific training requirements). In accordance with the WCPP, and FMPC Procedures QAP-6.11 and 6.12, the Manager of Site Quality Engineering, Quality Department, certifies that personnel are properly trained and qualified to certify waste packages, and shipments.

There are two certification groups. The Waste Packaging Quality Assurance Group has direct responsibility overview of waste packaging operations and package certification. Normally there are five certification personnel qualified to sign NV-211 labels. The QA Certification Group has overview responsibility for waste packaging certification, and is responsible for certification of each shipment. Within this group is a prime certification official and normally three alternate certification officials, who are authorized to sign certification statements to certify shipments, and who can also certify waste packages by signing the NV-211 labels. The QA Certification Manager's overview of both groups ensures that only qualified and certified personnel approved by NV are utilized for certification.

2.3 Waste Certification Program Description

The Waste Certification Program provides verification and documentation that waste packages, the materials contained therein, and all package labels and markings thereon comply with DOE, DOT, and NTS requirements as specified by NVO-325, latest revision, prior to shipment to the Nevada Test Site. Specific requirements regarding disposal of waste are issued by the WMCO Regulatory Compliance Section and are used by Waste Certification personnel as an additional control. Also, the loading and placarding of vehicles used in transport is verified to be in compliance with DOT regulations prior to release of any shipments.

Competent and trained individuals are employed in the packaging, marking, labeling, verification and certification process to provide and collect physical evidence of compliance. Trained and qualified certifiers are responsible for verifying that all waste packages are in compliance with all applicable requirements. The Certifier will be responsible for certifying each package for shipment to the NTS. The program empowers the Certification Official as an independent overview to withhold approval of shipment, and provides a means to address questions regarding disposition and corrective action via the use of Disposition and Corrective Action Reports.

2.4 Qualification of Waste Certification Personnel

Personnel performing certification work are selected and assigned work based upon work experience and training. Formal training includes attending Transportation, Waste Management, Solid Waste Compliance, and Quality procedures training courses that are offered by WMCO. Based upon need and application to work performed, attendance at selected training seminars is required.

2.5 Qualification of Waste Certification Official(s)

Waste certification officials are required to have a working knowledge of applicable regulations and procedures, and to be familiar with prohibited and nonprohibited waste materials, and their chemical constituents. Experience and ongoing training in environmental compliance and DOT regulations is required. This training is accomplished through attendance at DOE sponsored courses as well as other agency courses.

3.0 DESIGN CONTROL

3.1 Design of Waste Certification Process

At the present time, no actual design work relating to the waste certification process is in progress. However, when a design change is required, a revision conforming to the FMPC-2139, WMCO/FMPC QA Plan, Section 3, "Design Control" will be followed.

To assure waste determination each generator must initiate an "Low Level Waste Container Data Sheet FMPC-REST-3236 (see Figure 5). This form verifies the container is empty before filling and that the container is filled with only the waste so specified. When the container is filled the form is completed and signed by the generator. The signed form is sent to QA Waste Certification as a permanent record.

Processes that directly affect the certification of the waste material shall be performed in accordance with written procedures or instructions (see Table 1). Assurance that current SOP's are being followed shall be ensured by internal audits and surveillances. Data from analyses and sample results offer a secondary assurance of conformance and shall be collected and kept for recorded evidence of verification of the processes.

A performance-based in-house training program shall be utilized to train personnel involved in waste processing. This will ensure that supervision and operating staff have the necessary skills to prepare waste for shipment.

3.1.1 Waste materials shall not be mixed with other waste or materials which could cause any harmful effects such as heat or pressure, fire or explosion, toxic dusts, fumes, or gases or flammable fumes or gases. (40 CFR 265 Appendix V) Compatibility determinations are based on analytical data and/or process knowledge. The type of waste container

selected to hold any waste is compatible with the respective waste and approved by the Department of Transportation (49 CFR 172.101).

3.2 Waste Form Processing For Compliance

The Operational Defense Waste Management Plan for the Nevada Test Site, NVO-325 and DOE Order 5700.6B establishes procedures and criteria for the safe shipping, receiving, processing, disposal, and storage of radioactive defense waste at NTS. These criteria are based on current low level radioactive waste management practices and guidelines (DOE Order 5820.2A). The quality assurance guidelines of DOE Order 5700.6A and ANSI/ASME NQA-1 have also been incorporated in to the Site Quality Assurance Plan, FMPC-2139. All work is performed in accordance with this plan. The NTS waste acceptance criteria and how the FMPC plans to ensure that the waste containers meet these criteria are detailed in the following subsections.

3.2.1 Material intended for shipment to NTS will be basically in the forms listed in Section 1.4.1. The chemical composition of all the process waste forms consists of inorganic salts and, is not combustible.

3.2.2 Explosive materials shall be converted to nonreactive forms. Compressed gases, including unpunctured aerosol cans, shall not be sent to NTS for disposal.

The waste forms as described in Section 1.4.1 apply here and, again, the material is both nonpyrophoric and nonexplosive as contained in the containers. Supervisory control, the use of SOP's, and checklists shall ensure that all material shall have gone through the processes and shall have met the criteria.

3.2.3 All waste shall be controlled to prevent any free liquids. Waste streams such as slurries and residues which have wet consistencies are processed in the Rotary Kiln and/or Calciner to remove excess liquid before packaging. These materials are not hygroscopic and remain as prepared. The MgF_2 slag leach slurry is filtered through a bed of diatomaceous earth and dried under vacuum. This waste is then kiln dried or calcined to ensure that it does not contain any free liquid. Remaining waste streams that could contain free liquids are treated by adding absorbent during the packaging process.

3.2.4 Fine particulate waste shall be immobilized so that the waste package contains no more than one weight percent of less-than-10-micrometer-diameter, or 15 weight percent of less-than-200-micrometer-diameter particles with radioactive contamination. Any waste in this category shall be routinely treated with a dust suppressant during packaging to prevent dispersal of fine powder in the event of a breached container.

One waste, MgF_2, can not have a dust suppressant added due to a reaction with water in the dust suppressant causing hydrogen generation. Permission has been obtained from NTS to double package this material as an alternative means of minimizing any potential release of fine particulates. Any other material falling into this category shall be treated in the same manner and permission obtained from NTS as needed.

3.2.5 Waste contained in the low level radioactive waste packages shall contain no radioactive waste mixed with hazardous waste as identified in 40 CFR-261. The SOP's detail the addition of all chemicals, and the checklists verify the addition of each. Tests on representative samples have shown no hazardous materials present.

3.2.6 The four principle wastes as described in Section 1.4.1 are nonreactive with the shipping containers. Other waste components are uncalcined diatomaceous earth or materials that have been oxidized in air.

All waste is segregated by material type and compatibility at the FMPC at the point of generation. The new FMPC-REST-3236 form (see Figure 5) signed and completed for each waste container serves as a documented check. It

shall be implemented by late 1990. Containers and/or dumpsters, if possible, are closed and/or locked while unattended.

3.2.7 Low Level Radioactive waste analysis shall verify all wastes destined to the NTS for disposal shall have a Transuranic (TRU) nuclide concentration less than 222,000 dpm per gram (100 nanocuries per gram).

3.2.8 LLW containing pathogens, infectious wastes, or other etiologic agents as defined in Title 49 CFR 173.386 is segregated at the point of generation for incineration and will not be sent to the NTS for disposal (Table 1).

3.2.9 Bulk LLW shall be solid and meet the requirements of Title 49 CFR 173.425 (c)(1). (Table 1).

Old, stored waste forms will be handled in much the same manner as newly generated waste except that these wastes are controlled and handled only by Waste Management. A waste characterization shall be performed to determine major radionuclide content and a RCRA determination, if not previously done. After characterization is complete and the waste form meets NVO-325 requirements as stated above, the waste shall be repackaged or overpacked for shipment and disposal to meet NVO-325 packaging requirements and DOT transport regulations.

3.3 Waste Packaging Processing for Compliance

Waste packaging criteria for low-level waste shipped to the NTS for disposal shall meet DOT regulations, 49 CFR 173, Subpart I. Standard operating procedures listed in Table 1 concerning storage and off-site shipments shall be used to assure that all shipments meet DOT requirements.

3.3.1 In compliance with 49 CFR 173.451, Fissile Materials, process residues are routinely sampled by process lot and analyzed for percent uranium and percent uranium-235. Standard Operating Procedures (Table 1) detail the frequency and specific analysis to be performed on each container of material.

External radiation levels of each waste package are measured using calibrated instruments for determination of compliance, and calculation of the transport index when required by 49 CFR 173.455.

Analysis has shown that MgF_2 waste material from the depleted or natural uranium metal production lines contains approximately 1 to 5% uranium. The filter cake produced by leaching and filtering MgF_2 from the enriched uranium line contains approximately 0.1% uranium. Calculations using these values indicated that the normal or depleted material would contain 0.003 g/kg of uranium. The depleted or normal

containers do not pose any danger of criticality even with 0.050 g/kg of normal or depleted uranium, and the 0.003 g/kg of the enriched uranium is insufficient material for criticality even at optimum configuration. Standard operating procedures (Table 1) detail the frequency and specific analysis to be performed on each container of material.

3.3.2 In compliance with 49 CFR 173.442, Thermal Limitations, the heat generated by the quantity of ^{235}U in any one of the containers (max 0.4 kg) is far less than 0.1 W. This calculation is based on 2.15×10^{-6} Ci/g and a heat output of 0.027 W/Ci. For the ^{238}U the Ci/g value is 3.34×10^{-7}; therefore, even 0.050 g/kg of uranium would still produce <0.1 W.

3.3.3 In compliance with 49 CFR 173.441, Radiation Levels, the radiation exposure rate at the surface and at 1 m of each package shall be measured and recorded in the data package. Packages that exceed 200 millirem/hr on contact and/or 10 millirem/hr at 1 m shall not be shipped to NTS.

3.3.4 In compliance with 49 CFR 173.443, the surface contamination of each container shall be measured using instruments calibrated by the OS&H Dosimetry & Instrumentation Section and recorded in the data package. If these instruments indicate that the limits of 49 CFR 173.443 are exceeded,

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

3.3.5 In compliance with 49 CFR 173.423, shipments of limited quantities (LQ) of radioactive materials, the quantity of radioactivity in any one package shall be less than the limits for Low Specific Activity (LSA) material shipped under exclusive use transport (49 CFR 173.421 and 173.422 criteria). Shipments of LSA shall meet the specifications of 49 CFR 173.425. Each waste material package labeled LQ meets the specifications of 49 CFR 173.421.

In compliance with Title 49 CFR 173.421 and 173.425, strong, tight containers used for shipping limited quantities of Low Level Waste (LLW) and LSA shall be constructed so that it will not leak during normal transportation and handling conditions. Any bulk LLW shall be shipped in closed transport vehicles unless an exception has been approved by NTS in accordance with Title 49 CFR 425(c). Containment of bulk waste shall be such that offloading personnel can unload the waste without contaminating personnel or equipment.

3.3.6 The FMPC shall package all waste for shipment to NTS in containers meeting DOT specifications (e.g., 17H 55-gallon drums or other NTS approved containers). All containers shall be shipped to meet DOT requirements for interstate travel and shall meet the requirements of 49 CFR 173.411, 173.425 and 173.412. (FMPC SOP TRF-46C-110, Table 1).

3.3.7 Waste shipped to the NTS shall be marked and labeled as required in Title 49 CFR 172, Subparts D and E [with exceptions noted in Title 173.425 (b) and (c)]. Also each waste container shall be marked with a unique container identification number and shipment number so that the container can be identified from another container within the shipment or from another set of containers.

4.0 PROCUREMENT DOCUMENT CONTROL

The Procurement Document package is prepared by requisitioners/users and includes drawings, specifications, and quality requirements for suppliers of critical items, such as waste shipping containers. The document packages are reviewed by Quality, Safety and Procurement Departments to assure that specifications are complete, appropriate Quality Level assignments are made, and that quality requirements are included that correspond to the Quality Level assigned for the procurement.

Quality provides Procurement with recommended supplier lists that are generated based on Quality Assurance supplier surveillance activity and performance on prior contracts.

Critical characteristics for inspection are identified during Quality review of the specification documents with a cognizant engineer representing the requisitioner/user of the items being procured, and an Inspection Plan is prepared. The Inspection Plan is used by Quality during surveillance activity conducted at supplier's facilities in the fabrication of the items being procured. Surveillance activity at supplier's facilities is used to verify compliance with the Procurement Contract requirements and eliminate receipt and isolation of non-conforming items at the FMPC. Receiving Inspection for waste shipping containers is performed by Operations Quality. The prearranged Inspection Plan is used for this function. Acceptable items are released for use. Non-conforming items, identified during FMPC Receiving Inspection, are isolated, red-tagged and dispositioned based on approved Deviation/Corrective Action reports.

Traceability is maintained for the Procurement Document Control activities for the critical items listed in Table 6.

5.0 INSTRUCTIONS, PROCEDURES & DRAWINGS

5.1 Procedures for Waste Generation, Segregation, Packaging & Shipping

When a waste operation process is in the development state, qualification of the new or revised process shall be achieved in accordance with the documented "Plant Test Authorization," (FMPC 720, Site Procedure). Results of the development and a record of the changes to the process will be documented by the Test Coordinator in a "Plant Test Authorization" completion report.

The implementation of production procedures after development, for waste generation, segregation, packaging, and shipping must be routed and approved by all departments involved in the process. Procedures are approved by the applicable department managers. The approvals verify that particular control requirements applicable to the procedure have been satisfied and that the designated individual certifies that the procedure is acceptable for its intended use. Understanding and acceptance are indicated by the signature(s) and the date(s) on the procedure.

The release and distribution of procedures and changes thereto are controlled by the Procedure Documentation & Integration Control (PD&IC) Group. The PD&IC Group is also responsible for directing the user to dispose of applicable procedures.

Some procedures are routed and controlled within each individual department (e.g., Quality and Radiological Safety). These procedures are approved by the responsible department manager, and are controlled and released by the applicable department.

5.2 Analytical Procedures

All samples taken are drawn using U.S. EPA SW-846 methods. Uranium residues are sampled using open scoop, a slotted pipe and a sheathed or closed auger depending on the nature of the material. A sample is taken from each container of a lot and a bulk composite is then made per lot. The composite bulk sample obtained from each lot of material requires sample preparation, which may include drying, milling, blending, screening, pulverizing, and subsampling. The prepared sample is then submitted to the FMPC laboratory for percent uranium (or thorium) analysis and U-235 isotopic evaluation. Before a given sampling device or procedure can be finally accepted for sampling purposes, it is necessary to evaluate the accuracy and precision of the method as it is used to sample a specific type of material. It is also desirable to provide periodic and/or continuous checks on the various sampling techniques. These evaluations may be accomplished in a number of ways.

Sampling of uranium (or thorium) solutions is accomplished by taking dip samples or removing a sample from a well-agitated storage tank using a liquid sampler. However, bulk solids sampling presents the greatest difficulty. Some of the various methods for evaluating sampling procedures are:

1) Duplicate sampling by identical procedures.

2) Dual sampling, using at least two different samplers.

3) Dilution of inert material with a known amount of standard oxide, and blending the mixture.

4) Process evaluation in which samples of questionable materials not amenable to sampling in their original state may be evaluated by comparison with samples taken of the processed or oxidized product once it is in a form suitable for sampling.

In all cases, analytical variance statistical techniques are used in determining the significance of differences between sampling tests. Sample results are tabulated and sent to the Material Control & Accountability (MC&A) Section and the requester.

Some materials, such as contaminated baled paper and solid metal, cannot be representatively sampled for percent uranium. These types of materials are assigned factor assays. These factor assays are based upon recovery campaigns, special studies, or process knowledge estimates.

Tentative assay values are used for materials routinely produced, until individual lot assays are performed by the NMC Analytical Laboratory. A complete factor and tentative assay list is issued as needed by MC&A for general use.

FMPC performs radiological chemical assay on uranium bearing materials. Uranium does not generate significant quantities of thermal energy therefore thermal energy requirements do not apply to FMPC materials. The MC&A Section calculates element and isotopic content by weight and activity (curies). The necessary release documentation for off-site shipment is then prepared. All process residues prepared for off-site disposal are sampled and analysis performed in accordance with approved Analytical Laboratory methods. Waste materials not amenable to representative sampling are assigned factor assays based on recovery campaigns performed periodically.

In order to determine if a reportable quantity of hazardous waste is contained therein the FMPC analyzes all waste streams. The FMPC has characterized on-site waste streams, pursuant to the requirements set forth in 40 CFR 262.11(c)(2) and OAC 3745-52-11(D), by applying knowledge of the hazard characteristic of the waste in light of the materials or the processes used. Further characterization has been conducted on the majority of FMPC waste streams through confirmatory sampling and analyses.

Solids (cakes or sludges) wastes were sampled for hazardous waste determination according to the U.S. EPA method as described in "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods" (SW-846), and according to the FMPC procedure ESH-P-52-019, entitled "SOP-Sampling Methodology of Waste Materials for RCRA Constituents."

The hazardous waste determination performed on FMPC waste follows a strict chain-of-custody protocol for collected samples. Chain-of-custody accounts for the transfer of each sample from collection through delivery to the laboratory. Following collection of the samples for hazardous determination, the lids on the containers shall be securely fastened, and proper chain-of-custody documentation prepared (See Figures 8 & 9).

5.3 Sample Custody

Routine samples of process waste collected while packaging are accompanied by an "Analytical Laboratory Sample Seal," "Analytical Laboratory Sample Label," and a "Chain of Custody Record," FMPC-PRO-3112, (Figures 6 , 7 and 9). These forms are completed by the requester, who retains a copy and forwards the form and samples to the analytical lab. Tests for TCLP are run on waste samples as requested and at every 50th lot sample as an on-going verification. Results are sent to the Solid Waste Compliance and Materials Control & Accountability Sections and the requester. Sample materials are identified in Table 4.

Wet/dry residue samples for percent uranium are returned to the waste steam for disposal. The Chain of Custody Record is kept for three years by the sample receiving laboratory. The Communications Services Group/Records maintains the Chain of Custody Record and analyses reports for an indefinite period of time. Figure 3 shows flow chart of analysis reports and samples.

Sample determinations for hazardous materials following EPA (SW-846) protocols require chain-of-custody documentation to accompany the samples. Figure 8 and 9 shows these FMPC forms.

5.4 Drawings - Facilities, Process Equipment, & Forms Control

Documents (plans, drawings, specification, procedures, instructions) that establish the waste process and the integrity of the waste container and its contents shall be controlled and maintained for a period of 20 years. Changes to these documents are initiated, reviewed, and approved by the same department/section that originated and approved the controlled documents. Table 2 and 3 identifies the documents to be controlled.

Each process or waste lot or batch is accounted for by item number, net weight, element weight and isotopic weight, which are the result of actual measurements. The movement of material from one location is strictly controlled by MC&A and must be authorized in advance. Physical inventory is taken and recorded annually. All accounting records are maintained in computer data bases. Also, composite samples are taken per lot during the waste and production processes to verify isotopic and percent Uranium, radiological and/or EP toxicity. At the end of each shift Production Activity forms are given to the supervisor who transfers the forms to Materials Control & Accountability(MC&A) personnel.

5.5 Inspection & Certification Procedures

Inspection and certification activities shall be identified on documents traceable to the items, inspected or certified. Table 1 lists the procedure in which receiving inspection activities are documented. (WMCO-QAP-14.01 Receiving, Inspection)

Certification procedures are listed in Table 1 under the Quality Assurance section.

5.6 Procedures For Keeping Pertinent Regulations Up-To-Date

Compliance documents, federal and state regulations are ordered annually by subscription through the Technical library with approval by DOE. [Procedure for Obtaining New Library Materials (TS:RHG:88-003)]. Current regulations are maintained in the library and the Code of Federal Regulations are maintained in the Legal library. Other WMCO departments must request copies of regulatory documents through the Technical library. A list of waste processing specifications appear in Table 7.

All procedures and manuals (including this document) are reviewed by the responsible departments on a periodic basis and revised as required.

Solid Waste Compliance initiates and routes new regulatory requirements to Waste Management and other generators in a Solid Waste Compliance document titled "Regulatory Compliance Guide" and/or management notification by memorandum.

6.0 DOCUMENT CONTROL

6.1 Waste Certification Program Plan

The Waste Certification Program Plan (WCPP) shall be controlled with unique numbers and can be identified on a controlled master list (maintained by Waste Management) so that the number designating the current issue can be quickly and easily checked to ensure that the most up-to-date version of a document is used. This list is updated on a periodic basis as the document(s) are changed and reissued. DOE/NV and REECo shall be issued a control copy of the WCPP and revisions when issued shall be submitted to DOE/NV and REECo for review.

6.2 Document Preparation, Review, Approval & Issuance

Document preparation, review, approval and issuance is controlled by the Procedure Documentation & Integration Control of the Quality Department. Initial document preparation is handled by a designated "Production Technical Representative" (PTR) responsible for the technical content of a specific area who evaluates and prepares all "Changes in Operation" (CIO's) and procedures. The

responsible "PTR" follows the document through the review cycle to issuance. A document is submitted to the PD&IC Group by the PTR accompanied by a procedure/CIO request form. The document undergoes review cycles by applicable department managers. Issuance of a document occurs when the initiating department manager authorizes it by signature. An issued document is controlled and distributed to all applicable departments by the PD&IC Group.

Some non-production departmental procedures (e.g., Quality and Radiological Safety) are prepared, reviewed, approved and issued by the responsible department(s). Document preparation is handled by a designated individual who is responsible for the technical content. This individual is also responsible for any changes required by the review cycle.

The controlled documents are maintained as stated in 6.1. Table 2 identifies the documents to be controlled.

7.0 CONTROL OF PURCHASED ITEMS & SERVICES

7.1 Receipt Inspection

All shipping containers are initially reviewed upon receipt at WMCO for visible damage and completeness of the shipping order. The Quality Department is responsible to perform receipt inspection of items as required. All inspections are documented on an inspection form which contains the acceptance requirements. All items found to be acceptable are so tagged and released for use. (Figures 10, 11, and 12). Items found to be nonconforming are tagged as such and a nonconformance report issued (see section 15.0). In addition, containers are reviewed by QA at the supplier facility prior to shipment to WMCO.

7.2 Contract Review

Review of contract and supplier submittal is performed by Quality Assurance, the requisitioner and Procurement & Contracts Sections. In addition, Quality conducts periodic supplier surveillances, as applicable, of their fabrication, inspection, test activities, and shipping based on the importance and complexity of the item and is imposed in the purchase order as a WMCO option. Also during the course of the procurement process the documents generated by the supplier are developed and submitted for approval by WMCO. The

requisitioner, Procurement & Contracts and Quality may witness supplier activities, if deemed necessary. Controlled items are listed in Table 6.

7.3 Purchase Requisitions, Purchase Orders & Invoices

A purchase requisition package is initiated by requisitioners/users of the items to be procured which includes drawings, written specification and quality requirements for FMPC suppliers. The requisitioner/user applies a quality level numerical indicator to the requisition package and the package is reviewed and approved by Quality Assurance and Safety prior to receipt by Procurement for processing.

The FMPC Quality Assurance Program provides a grade level system to indicate the appropriate management system controls to be imposed in order to assure conformance to applicable quality requirements. Quality levels are defined and guidelines are provided for matching quality requirements to quality levels in Site Procedure FMPC-711. Quality levels are assigned, based on a risk assessment of the consequence and probability of a failure. Instructions for performing a risk assessment and a matrix for determining the appropriate quality level assignment are provided in Site Procedure FMPC-712.

The approved requisition package is Procurement's authority to initiate the procurement process. Procurement evaluates and selects suppliers based on suggested suppliers identified on the requisition by the requisitioning party, recommended suppliers lists from Quality Assurance, and evaluations made from bid/proposal responses solicited from potential suppliers. Based on these evaluations, Procurement issues a purchase order to the selected supplier. The purchase order is the contract agreement between FMPC Procurement and the supplier.

Procurement maintains a database for purchase order information. Receiving information is entered into the Procurement purchase order database direct by FMPC Receiving people. Receiving people can access the database for entry of receiving information or pricing. Critical items, as listed in Table 6, are then moved into the Receiving Inspection area for inspection by Operations Quality.

7.4 Source Inspections

Supplier inspection of containers, assay systems, and instruments is witnessed by Quality and Procurement Contracts Sections. Surveillance of suppliers is planned and performed during material processing to assure the supplier satisfactorily performs the fabrication, inspection, and testing prior to shipping according to purchase order requirements. Surveillance activities including supplier discrepancies and audit results are documented.

8.0 IDENTIFICATION & CONTROL OF MATERIALS, PARTS & COMPONENTS

8.1 Containers

All containers used for shipment to NTS shall be properly designed to reduce the chance of radiological or occupational safety occurrences during transportation, handling, and disposal operations. The size and load of each container shall be controlled to ensure the minimization of the number of waste shipments to NTS and the space required for disposal (Table 1).

8.1.1 Container closure shall be sturdy enough that it will not be breached under normal conditions and will not serve as a weak point for container failure.

8.1.2 Except for waste packaged in steel drums, the waste container and contents shall be capable of supporting a uniformly distributed load of 4,000 lbs/ft^2 (19500 kg/m^2). This is required to support other waste containers and earth cover without crushing during stacking and covering operations at the NTS. Exceptions to this shall be outlined as specified in NVO-325.

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

8.1.4 All waste containers shall be sized to allow optimum stacking efficiency for disposal at NTS. Any exceptions to the NTS specified container dimensions shall be submitted to DOE/NV for written approval.

8.1.5 In addition to the weight limits set for specific packaging designs, boxes shall be limited to 9,000 pounds and 55-gallon drums shall be limited to 1,200 pounds. Containers exceeding 9,000 pounds approved for shipment to NTS shall be shipped in removable-top trailers for easy crane removal.

8.1.6 Waste containers shall be loaded to ensure that the interior volume is as efficiently and compactly loaded as practical.

8.1.7 All waste containers shall meet the requirements of Title 40 CFR 264, Subpart I, "Use and Management of Container." Each container shall be prepared for shipment so as to minimize damage during transit. Preshipment storage areas shall be controlled to avoid adverse influence from weather or other factors on the containment capability of the waste during handling, storage, and transport. All reasonable precautions shall be taken to preclude the accumulation of moisture on or in containers prior to their arrival at the NTS.

8.2 Package Materials

Package materials are maintained and controlled in FMPC Stores area (stock room). Each item is numbered and cataloged. Daily computer print outs show maximum/minimum levels of items for reorder as necessary. Economic Order Quantity (EOQ) calculations to determine annual usage are performed on items which are not needed as often.

Filled waste containers are marked in accordance with the FMPC "Lot Code & Color Marking System." This code system identifies the waste material and the source. The system utilizes a 15-digit number consisting of production order number, originating source, enrichment code, material description, and sequence number.

The production number is "W" followed by 3-digits indicating the on-site generating plant's estimate of the highest enrichment associated with non-recoverable contaminated waste materials. The source is a 3-digit code representing the generating plant and/or area where the material was generated. The enrichment code is 1-digit, the letter "P" is used for depleted waste (≤ 0.7.10% U-235), the letter "V" is used for enriched uranium (≥ 0.712% U-235) and the letter "N" for normal uranium which is considered 0.7.11% U-235. Material description is 3-digits (003) for non-recoverable waste. The sequence number is 4-digits which includes the product lot number (October 1985 = 286) preceded by a numeric code that represents the category of waste material.

8.3 Analytical Calibration Standards

Primary reference standards are obtained from the National Bureau of Standards or other reliable sources. Secondary reference standards are traceable to primary standard or compared to a primary standard within the FMPC Analytical Laboratories, if available. If not, a standardized production material must be used. The Analytical Laboratories standardizes a production

material by analyzing it using a method of higher precision and accuracy than the method to be monitored. Another way the Analytical Lab standardizes a production material is to analyze it by more than one method. In either case, multiple measurements are taken over a period of time. A reliable average value of the material is established by analyzing it a minimum of 25 times on successive days. Preparation of secondary standards within the Analytical Lab are per approved documented procedures. Documentation of the preparation of secondary standards is complete and accurate.

9.0 CONTROL OF PROCESS

9.1 Sample For Waste Analysis

Process waste samples are collected twice per day by Transportation and delivered to the Analytical laboratory. Samples of soil are taken and delivered to the lab for analyses as approved by the Solid Waste Compliance Section. Materials Control & Accountability calculates a factor assay to estimate percent uranium on some waste for which representative samples can not be obtained, such as contaminated concrete and wood.

A chain of custody for laboratory samples is presently being used (Figure 9). Figure 3 shows the flow chart of samples and analysis reports.

9.2 Sample Selection & Collection

Waste acceptance criteria are incorporated by each department (e.g. Waste Management, Quality, Radiological Safety, Transportation etc.) into established procedures for the safe processing of radioactive defense wastes based upon current low level waste practices and guidelines (DOE Order 5820.2). Quality assurance guidelines of DOE Order 5700.6A and ANSI/NQA-1 are incorporated into the FMPC waste processing system. Specific NTS waste acceptance criteria and how FMPC meets the criteria is addressed in Section 3.2 and Figure 3 of this plan.

All low level radioactive waste destined for off-site disposal at NTS shall meet DOT regulations (49 CFR 173, Subpart I). Standard operating procedures listed in Table 1 concerning storage and off-site shipments shall be used to assure that all shipments meet DOT requirements. Packaging shall be consistent with 49 CFR requirements and NVO-325.

9.2.1 Nuclear Safety

The quantity of fissile materials within a package shall be limited so that an infinite array of such packages will remain subcritical, even with close water reflection on all sides. This quantity shall be determined on the basis of a specific nuclear safety analysis, considering credible accident situations, and taking into account the actual materials in the waste (49 CFR 173.451, Section 3.3.1).

9.3 Certification Process

9.3.1 The certification process is designed to "certify" that each waste package meets all applicable criteria and is accompanied by all necessary documentation before leaving the FMPC site. Figure 3 shows a flow chart of record keeping activities. Waste certification begins with the generator, who is responsible for the waste until the container is transferred to Waste Management. The generator's signature on an FMPC-ES&H-1945-XX forms provides documented verification that the waste is as described and contains no prohibited materials. A portion of this form will be replaced prior to January 1, 1991, by FMPC-REST-3236 (Figure 5) which will provide better documentation of the verification checks and controls used to certify each waste package.

Both forms require completion and signature of the person packaging, or observing the packaging of waste, which can be an hourly or salaried person. The approval of the form shall always be a responsible salaried person. Certification personnel from the Certification Group, or designees from the Quality Department periodically witness the container filling. Each container is given a lot code number, container identification and shipment number by

Waste Management. Transportation Department transfers the containers to Waste Management for final shipment preparation.

The Project Quality Assurance Group, Quality Department, provides routine verification of packaging of construction rubble generated by subcontractors on site. Each container generated from whatever source has a unique identification to provide traceability.

Waste Management, who is also a generator, prepares packages for shipment, collects information on the packages in each shipment and presents this to the Waste Packaging Quality Assurance for review. This paperwork package includes the Storage & Disposal Data Report and Tally Sheet that is forwarded to NTS with each shipment. The waste packages for the respective shipments are then staged by Waste Management for examination and certification. During subsequent loading by Transportation, they are re-examined by Waste Packaging Quality Assurance to ensure that no damage occurs between certification and shipment. Transport vehicles are examined by Waste Packaging Quality Assurance prior to and after loading. Transportation also checks the vehicles and the loading of the shipments.

The QA Certification Group provides the Waste Packaging Certification Group direction and information relative to the certification process based on information obtained from various sources. Within WMCO, considerable reliance is placed on Solid Waste Compliance for proper characterization of waste; Analytical for analytical results of materials characterized and shipped; and Materials Control & Accountability for material control and product information, and for formulation of factor assay analyses. The certification process utilizes the expertise of all pertinent organizations to the extent necessary to provide an authoritative basis for certification. All information obtained is related to the wastes of concern by a suitable reference identification and other source information such as material descriptions are utilized as needed.

The QA Certification Manager, who is also a qualified certification official, exercises authority over all certification officials who are authorized to certify waste packages and shipments. Certification officials overview waste packaging and shipment activities, and either directly or indirectly verify the adequacy and authenticity of documentation of certification. Based on their evaluation, certification is made or withheld. Re-evaluation and changes in decisions are possible based on additional information providing there is valid technical justification for change. Deviation and Corrective Action Reports

document disposition of nonconformances and technical justification of acceptance. This provided disposition requires evaluation by a Quality Assurance evaluator, and nonconformances that do not meet requirements for shipment are unacceptable.

QA Certification provides control of materials shipped through an approval and certification process. The approval of a Certification Official is required for the Storage & Disposal Date Report that is required for each shipment. The Shipping Order and certification statement require approval signatures of a Certification Official before a shipment is released. Once this approval is complete, Traffic is responsible for final release and arrangement for transport of the waste shipments. They provide notification to NTS of estimated arrival times, change in schedules, and other Traffic related matters.

9.3.2 The completed NV-211 certification label shall be affixed (by certification personnel) to each acceptable container designated for shipment to the NTS. This label signed (legibly handwritten not stamped) by a trained and qualified certifier certifies that the package is in accordance with U.S. DOT and DOE/NV requirements.

9.4 Shipping Process- Manifest, Labeling, Placarding, Weighing, and Loading

All radioactive waste shipments consigned to NTS shall be made in accordance with applicable DOT hazardous materials regulations and DOE/NV requirements. Placarding shall be in compliance with 49 CFR 172, Subpart F.

WMCO shall recommend that the driver refrain from unnecessary stops, such as yard layovers, until the waste shipment is delivered to NTS. Special requirements for the manifest, labeling, placarding, weighing and loading are detailed in SOP-TRF-46-C-110 and the FMPC-2089 Topical Manual.

10.0 INSPECTION

10.1 In-Process Inspections

In-process inspections/reviews of identified waste operations processes are met through procedures and checklists. FMPC acceptance standards are:

- No damage of containers during in-plant transfer
- Proper labeling on exterior of container (NV-211 & Radioactive LSA/LQ/RQ labels)
- Proper markings on exterior of containers, including gross weight (49 CFR 172.310a), shipment number and "FMPC"

- Integrity of container liner
- Waste material sufficiently dry
- Proper seating & tightening of container lid & closure to specifications
- Contamination readings on exterior of drum
- Radiation reading at specified points
- Collection of data sheets & availability for shipping.

Inspection of the equipment (e.g., high level probes, pH probes, temperature gauges, temperature controllers and gas valves) used in the waste filling stations shall be on a weekly, monthly, quarterly and yearly basis dependent upon usage, past equipment problems, severity of equipment and what the equipment controls. FMPC supervisors in the production areas have control over setting or changing the inspection timetable. Inspections are documented as to date, part inspected, items inspected and method of inspection, acceptance criteria, results, and the signature of the inspector. Analytical results shall be performed to verify that the chemical and isotopic composition of the waste is within the limits specified for shipment to NTS.

10.2 Define Waste Certifying Function

The QA Waste Certification function is to certify that wastes shipped to the Nevada Test Site meet NVO-325, DOE, and DOT requirements. In accordance with procedures, regulations and official directives, developed by Operations, Waste Management, Quality, Radiological Safety, Environmental Engineering and Waste Certification is responsible for verifying the acceptability of the labeling and marking, condition, and the content of each waste package, and use of approved packaging materials and techniques before wastes are loaded for shipment. Also, an overcheck is performed of the loading and placarding of each vehicle (to ensure compliance with DOT regulations) and review of shipping documentation (for accuracy and completeness) prior to final release for shipment. Included in the certification function is the collection, processing, documenting and distributing of information used to certify shipment of waste to the NTS. A responsibility also exists for monitoring in areas of waste generation.

11.0 TEST CONTROLS

11.1 Definition of Test

Tests that are required to verify and certify conformance to specification requirements shall be planned and executed. Characteristics to be tested and test methods to be employed shall

be specified. Test results shall be documented and their conformance with acceptable criteria shall be evaluated and included in the certification reports.

When a process is in the development state, qualification of the new or revised process shall be achieved in accordance with the documented "Plant Test Authorization" (PTA). Results of the development and a record of the changes to the process will be documented by the Test Coordinator in the PTA completion report. Applicable management review and approval is required to issue a PTA. Results of the PTA can be utilized to develop an SOP, verify manufacturing specifications, analysis for particle size, weight of package, labeling, exterior contamination, radiation levels at exterior surfaces, and chemical composition.

11.2 Analytical Test Controls

The Analytical Laboratories Quality Assurance section prepares and distributes quality control samples for the analytical lab. The individual laboratories analyze these quality control samples in the normal lab sample stream. Quality control samples make up approximately 10% of the total samples analyzed. The following Analytical Laboratory controls are:

An internal lab standard, reference standard, is used to analyze the measurement system to ensure it is "in control". The frequency of analysis of reference standards depends on the characteristics of the individual measurement system.

A blank sample is formulated in the lab or field in order to duplicate a routine sample excepting the absence of the analyte. Analysis of blank samples provides date for determining interferences due to contamination and for establishing lower limits of detection.

Two kinds of samples are used for replication of analyses, duplicate and recycle samples. Replicate analyses provide data for the evaluation of the precision of an analytical method.

Control samples are a sample of known concentration of either a primary standard or a standardized production material. These samples provide data for the evaluation of the accuracy and precision of an analytical method.

Finally, the Analytical Laboratory uses a spiked sample of a known amount of analyte. The percent recovery can be calculated from the difference between the measured concentrations of the spiked and routine samples. Analyses of the percent recovery from spiked samples is useful for determination of matrix and interference effects, determination of accuracy and precision and testing for changes in analytical quality.

11.3 Traceability of Calibration Sources

The analytical Laboratory Quality Assurance supervisor has responsibility to monitor the lab activities for strict adherence to calibration/standardization programs documented in approved Analytical Methods and or SOP's. The calibration/standardization of a given piece of equipment involves the following considerations:

- frequency
- range
- reference standards
- environmental conditions
- documentation

The calibration/standardization of each piece of equipment is documented in a log record, card, label, or other record as appropriate. This documentation permits monitoring of instrument or system status and traceability of results.

11.4 Operational Package Weight

Package weight is controlled with checklists and SOP's. Package weight limits are listed in SOP-20-C-601 and SOP-TRF-46-C-110. Most process waste is weighed and packaged at the point of generation except for Sea/Land containers which are weighed at the central truck scale. Transportation weighs construction waste to

verify and record non-process package weight prior to transfer to Waste Management. Packages found to exceed weight limits are returned to the waste generator. Weights are recorded on the FMPC-REST-3236 form as well as each individual container.

12.0 CONTROL OF MEASURING & TEST EQUIPMENT

12.1 Calibration Schedules & Stickers

Calibration control shall be achieved by following procedures that describe techniques and requirements for the frequency of calibration of the operating instruments. This control ensures that all instruments, gauges, and other measuring and test equipment are calibrated to the required accuracies. The scheduling, pickup, and/or recalibration of all field instruments is performed by the Quality Operations Section with procedures using standard techniques. All analytical instruments are calibrated using standards traceable to National Bureau of Standards. The QA inspection equipment is either checked internally or by a trained external vendor. The nuclear material scales are checked by the Maintenance Department. These departments are responsible for ensuring that such items are of the proper type, range, accuracy, and tolerance to accomplish the function of determining conformance to specified requirements. See Table 5 for all equipment under the calibration system.

All measuring and test equipment is categorized into one of three types:

1. "casual" devices & systems that are not to be calibrated in service,
2. "routine" devices and systems that are to be included in a calibration recall program on a regular cycle, and
3. "experimental" devices and systems that are to be calibrated by, or at the direction of, the user.

Items that fall in the first classification are rulers, tape measures, levels, and other such devices. Items that fall into the second category are the ones that are calibrated by the Quality Operations Section, and the applicable procedures are located in the Quality Department Procedures (Table 1). Hand-held radiation meters and counters are calibrated on a routine schedule and are on a recall program. The specific items requiring calibration and frequency of recalibration are listed in Table 5.

12.2 Environmental Controls For Measuring Equipment

The environmental conditions under which a piece of equipment is calibrated/standardized shall duplicate the environmental conditions under which the desired analyses will be performed. Control samples/standards are run to monitor the response of equipment.

13.0 HANDLING, STORAGE, & SHIPPING

13.1 Not Adverse To Certification

Waste containers destined for off-site disposal at NTS are maintained in such a way as to not alter the container certification. All containers are closed, closed and/or locked to prevent tampering. Containers awaiting shipment which must be placed in temporary storage. Immediately prior to loading, containers are rechecked per SOP's and checklists to verify the original certification. A complete new radiation smear is required if a container has been in storage more than 30 days. WMCO requires a smear test within 48 hours of shipment. A partial radiation smear is performed after 48 hours and before the 30 day period is obtained.

13.2 Security

FMPC Security & Safeguards Section conducts random mobile tours of the Waste and Operations areas during the first shift (8:00 AM - 4:30 PM). During the off-shifts and weekends some of the buildings are locked and 2-3 security foot patrols are conducted throughout the vicinity. Security must be notified to open the door of a locked building.

13.3 Fire Safety

Specific fire and safety controls are detailed in the SOP's of applicable operations/processes. Monthly fire and safety inspections are performed in the waste and process areas/buildings by the Fire & Safety Group. A report is completed and forwarded to the facility owner. Special work practices which may require additional monitoring by Fire & Safety Group can be arranged on an as need basis.

13.4 ALARA

The "As Low As Reasonable Achievable" ALARA principle is a requirement for waste processes to implement programs to assure that exposures to chemicals and physical stresses are maintained within the guidelines and standards provided in DOE/OR 5480.4. Additionally, the reduction of radiation exposure is maintained with the ALARA principle adherence to DOE/EV/1830-TS, 4-80. A dosimeter program is utilized for FMPC personnel and subcontractors. Employees are trained to work each job with the ALARA principle as a key practice. Also, each SOP is reviewed with ALARA goals effecting each new or revised work practice.

13.5 Compliance With Title 49 Of The CFR

Compliance with Title 49 of the CFR for handling, storage, and shipping are detailed in SOP-TRF-46-C-110. The Traffic Section of Transportation gives final authorization to release a shipment off-site after detailed inspection at loading, vehicle inspection and review of shipping documentation. This is to certify that the materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the DOT. Containers are checked at loading against the Tally Sheet for:

- correct container identification numbers
- shipment number
- quantities
- gross weights
- NV-211 labels attached
- LSA/LQ/RQ labels attached
- inspect for any container defect
- proper container closure

Transport vehicle inspection is performed for roadworthiness and recorded on FMPC-SAML-2495 form (Figure 13). Significant defects found will cause vehicle rejection and will be returned to the carrier unused. Containers will be loaded for proper weight distribution and shored. An additional contamination precaution

is used for baled trash packages by lining the trailer floor and approximately 3 feet up the sides and rear of vehicle. Final checklists are completed after vehicle is loaded.

A radiation survey is performed to assure contamination levels are in compliance with Title 49 CFR criteria levels and results recorded on FMPC-ES&H-1596-1 and FMPC-ES&H-1993-1 forms. The vehicle is weighed to ensure axle weights are within legal limits.

An envelope containing copies of the Tally Sheet, Curie List and REECo Waste Management Storage & Disposal Sheet are attached to the rear inside door, container or side panel or given to the driver in the case of Sea/Land containers. Radioactive placards are posted and trailer doors closed and a numbered tamper proof seal applied to the locking mechanism.

Shipping documents are prepared in compliance with Title 49 CFR. Carrier/driver instructions are issued to the driver, signed copy of bill of lading, Nevada Permit, Tally Sheet, envelope for consignee with Tally Sheet, Curie List and memo bill of lading are also issued to the driver. Each driver is instructed to call WMCO each day so that if a travel delay does occur WMCO can contact ReeCo with a new estimated arrival time.

14.0 INSPECTION, TEST & OPERATIONAL STATUS

14.1 Calibration Sources

The status of inspection and test activities shall be identified on documents traceable to the items tested or inspected. The status shall be maintained through indicators such as physical location and tags, markings, stamps, inspection records, or other suitable needs.

Calibration stickers are placed on measuring and test equipment (Table 5).

14.2 Preventive Maintenance

Preventive maintenance on measuring systems and instruments is provided by the Electronics Laboratory and QA. Personnel of the Electronics Lab have had manufacturers training courses for some of the equipment. Some complete service manuals and a limited stock of spare parts are available. The availability of these personnel and resources at FMPC provides a means of ensuring optimum performance and minimum downtime for instruments and measurement systems.

Vendor service contracts or contracts with service agencies are utilized to provide preventive maintenance for some major instrument systems to ensure performance and to minimize downtime. Production scales are maintained by the Maintenance Department.

15.0 CONTROL OF NON-CONFORMING ITEMS

15.1 Control & Disposition of Non-Conformances

Non-conformances of major significance meeting specified criteria are handled in accordance with Site Procedures FMPC-703, Unusual Occurrence Reporting System, and FMPC-704, Minor Event Reporting System. The handling of all other non-conformances, except of a minor nature (e.g., paperwork inconsistencies easily and quickly resolved), is governed by Site Procedure FMPC-706, "Deviation and Corrective Action Reporting," and Department Procedure WMCO-QAP-8.01, same title. The systems defined in the above include reporting, dispositioning, corrective action, tracking and closeout of non-conformances.

15.2 Special Tags & Labels

Non-conforming items are tagged for identification and control. The control of non-conforming items and use of tags are detailed in written site procedures. Two tags are utilized FMPC-QA-2708 (Figure 11) for nonconformances and FMPC-QA-2709 (Figure 12) for hold for inspection.

15.3 Segregation &/Or Removal From Operating Status

Non-conforming items are physically segregated to preclude inadvertent use. The condition is evaluated by cognizant personnel and disposition specified, performed, and verified as complete as a basis for formal close-out of the non-conformance.

15.4 Documentation

The non-conforming condition is documented on a Deviation & Corrective Action Report (DCAR) form and responsible supervision notified. Once the corrective action(s) are completed, physical corrective action verification is documented and physical controls are released.

16.0 CORRECTIVE ACTIONS

16.1 On Non-Conformance Items

Corrective actions on non-conforming items are part of the Deviation & Corrective Action Report (DCAR) system initiated by the Quality Department. Corrective action is to preclude recurrence. In response to the request for corrective action the applicable manager shall detail a reason for the deviation, action to be taken/proposed and action taken to prevent recurrence. Permanent corrective actions are required to preclude recurrence of significant problems.

16.2 Findings/Recommendations

Findings and recommendations from external audits and internal surveillances are responded to within the time period specified by the reviewing organization. A follow-up audit or surveillance with a written disposition per the DCAR system is completed by WMCO-QA.

16.3 Exceptions Approval From The DOE/NV Manager

Exceptions approval from the DOE/NV manager to the criteria specified in NVO-325 will be obtained as needed. A safety analysis will accompany the request for exception when the fissile loading is increased or when other compliance criteria is significantly affected. All exceptions will be requested by DOE/FMPC and approval received by the DOE/NV manager prior to shipment. A copy of the exception approval will be sent to the Radioactive Waste Management Project of REECo Environmental Sciences Department.

17.0 QA RECORDS

Records that furnish documentary evidence of quality shall be specified, prepared, and maintained. Records shall be legible, identifiable, and retrievable. Records shall be protected against damage, deterioration, and loss. Requirements, responsibilities for record transmittal, distribution, retention, maintenance, and disposition shall be established and documented. The waste processing records are identified in Table 3 and their retention period identified in DOE Order 1324.2.

18.0 AUDITS/WASTE CERTIFICATION

18.1 External - Company/Management and DOE/NV Manager

An audit by DOE/NV/REECO, of the WMCO waste operations, is conducted annually as defined in NVO-325. Currently there is no prescribed audit schedule by external organizations other than DOE/NV/REECO.

18.2 Internal - WMCO Quality Assurance

Internal overview activities of the waste shipment activities, in addition to the certification activities, are performed as surveillance or internal audits. Surveillances activities are outlined in the process flow diagram, Figure 4. Surveillances are conducted on a periodic basis of "real time" activities as described in standard operating procedures. These surveillances, conducted by Site Quality Engineering (SQE) in the Quality Department, are identified in a quarterly plan and results are documented on a surveillance report addressed to responsible management for resolution of observations and findings. All nonconformances are documented on a Deviation and Corrective Action Report. All accepted corrective actions responses (as agreed to by SQE) are verified to be complete by SQE prior to close out of the surveillance.

Internal audits are also conducted on at least an annual basis by a team of auditors, including at least one "lead auditor", qualified to NQA-1. The formal program includes establishing long term plans of function, systems, and activities to be audited, detailed plans regarding personnel, procedures, and scope for individual audits. All audits are conducted using written checklists. Results of all audits are documented in an audit report addressed to responsible management for written corrective action responses to identified observations and findings. All nonconformances are documented on a Deviation and Corrective Action Report. Verification of completion all accepted corrective responses are documented prior to close out of the audit.

Westinghouse Materials Company of Ohio

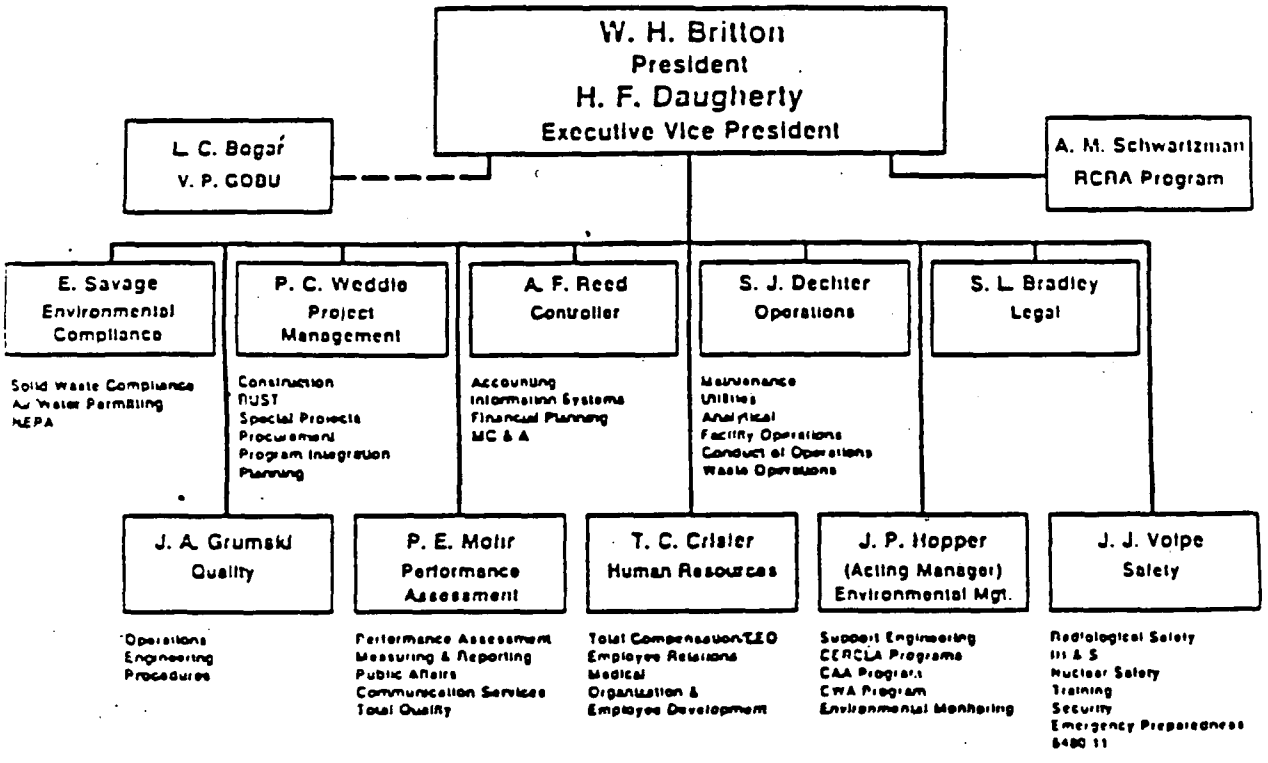


FIGURE 1

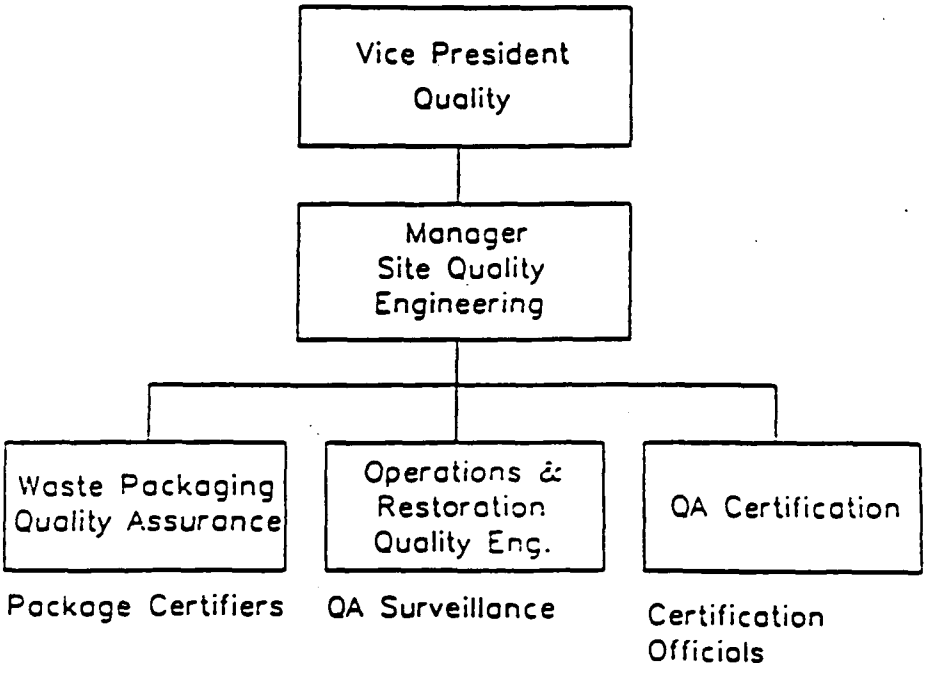


FIGURE 1A

Waste Processing Interface

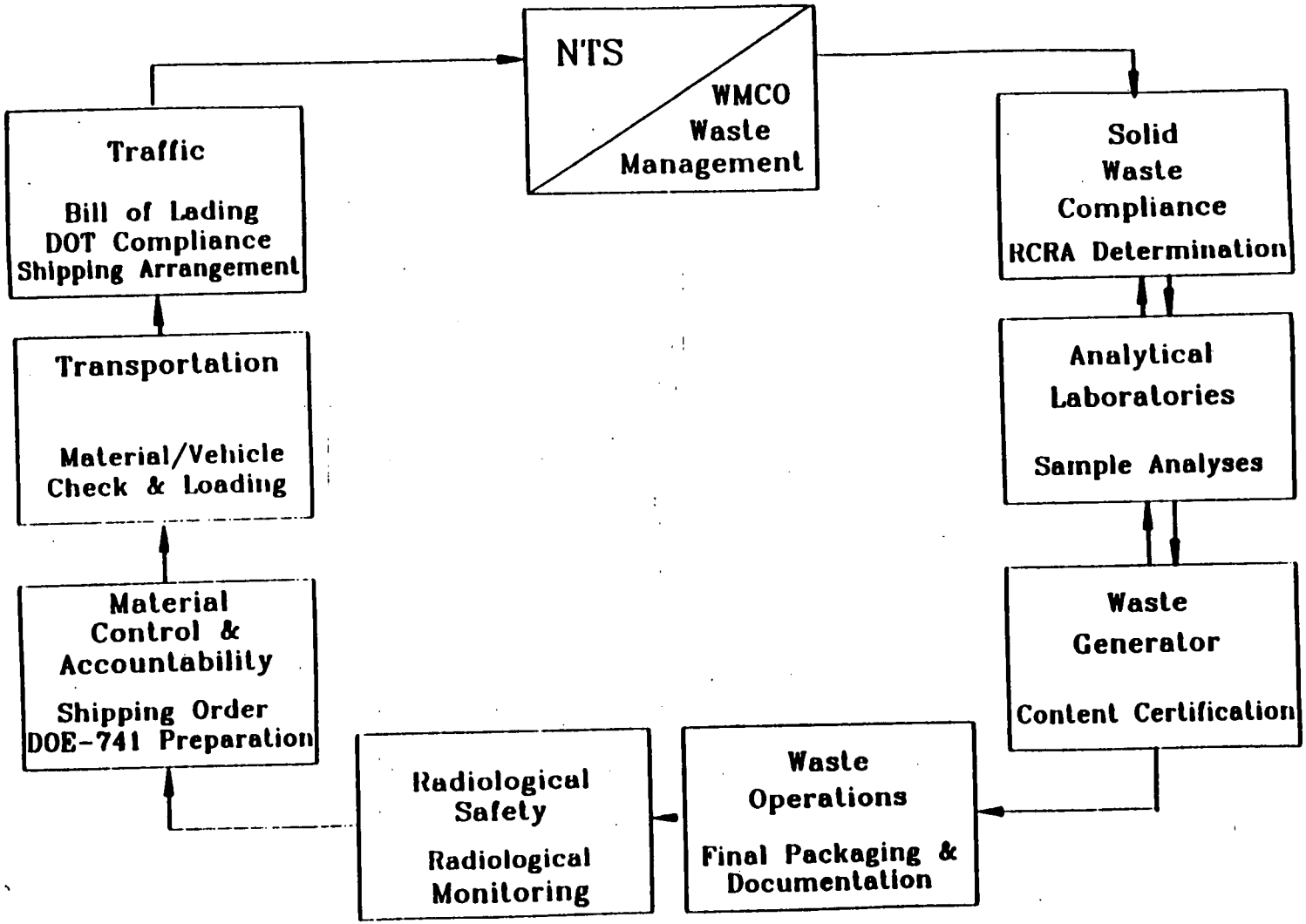
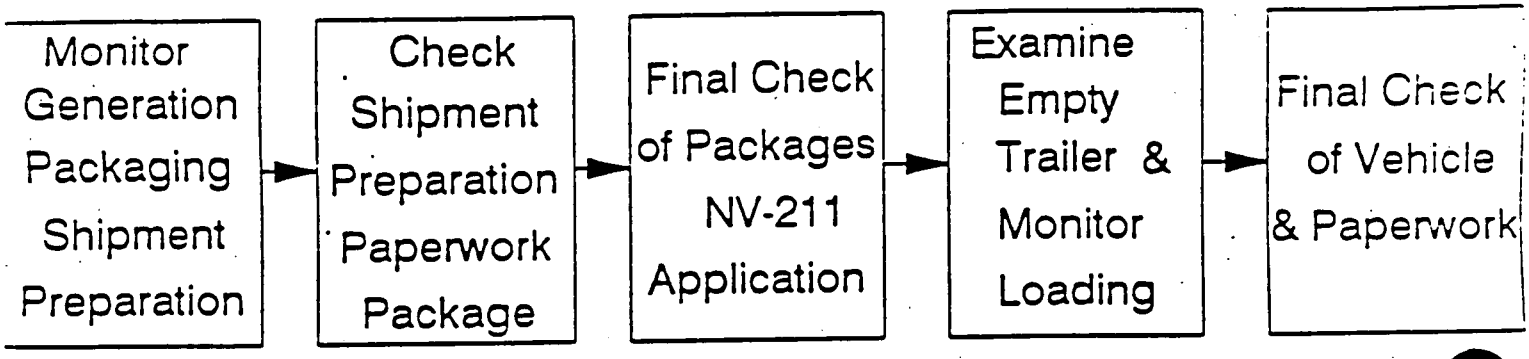


Figure 2

WASTE CERTIFICATION

Waste Packaging Quality Assurance



Quality Assurance Certification

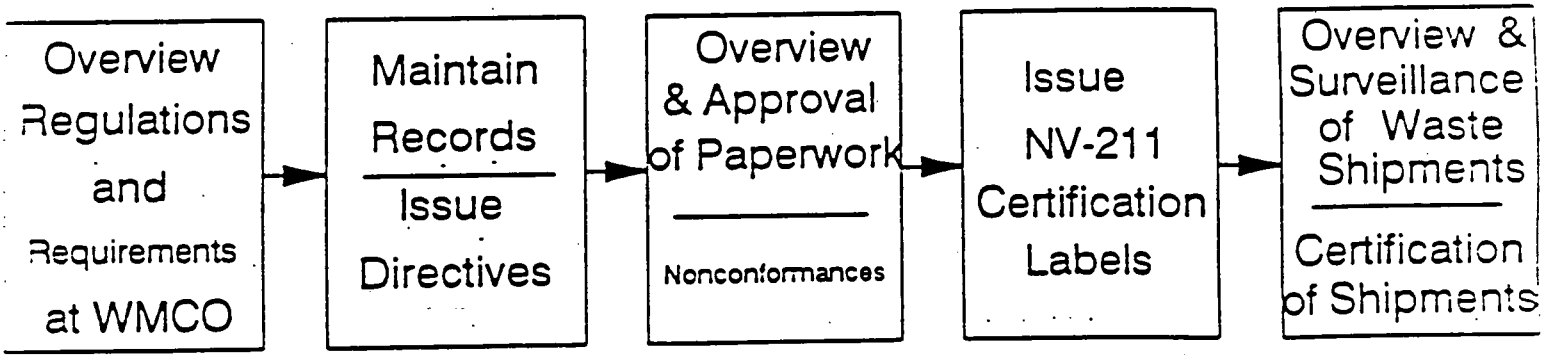


FIGURE 2a

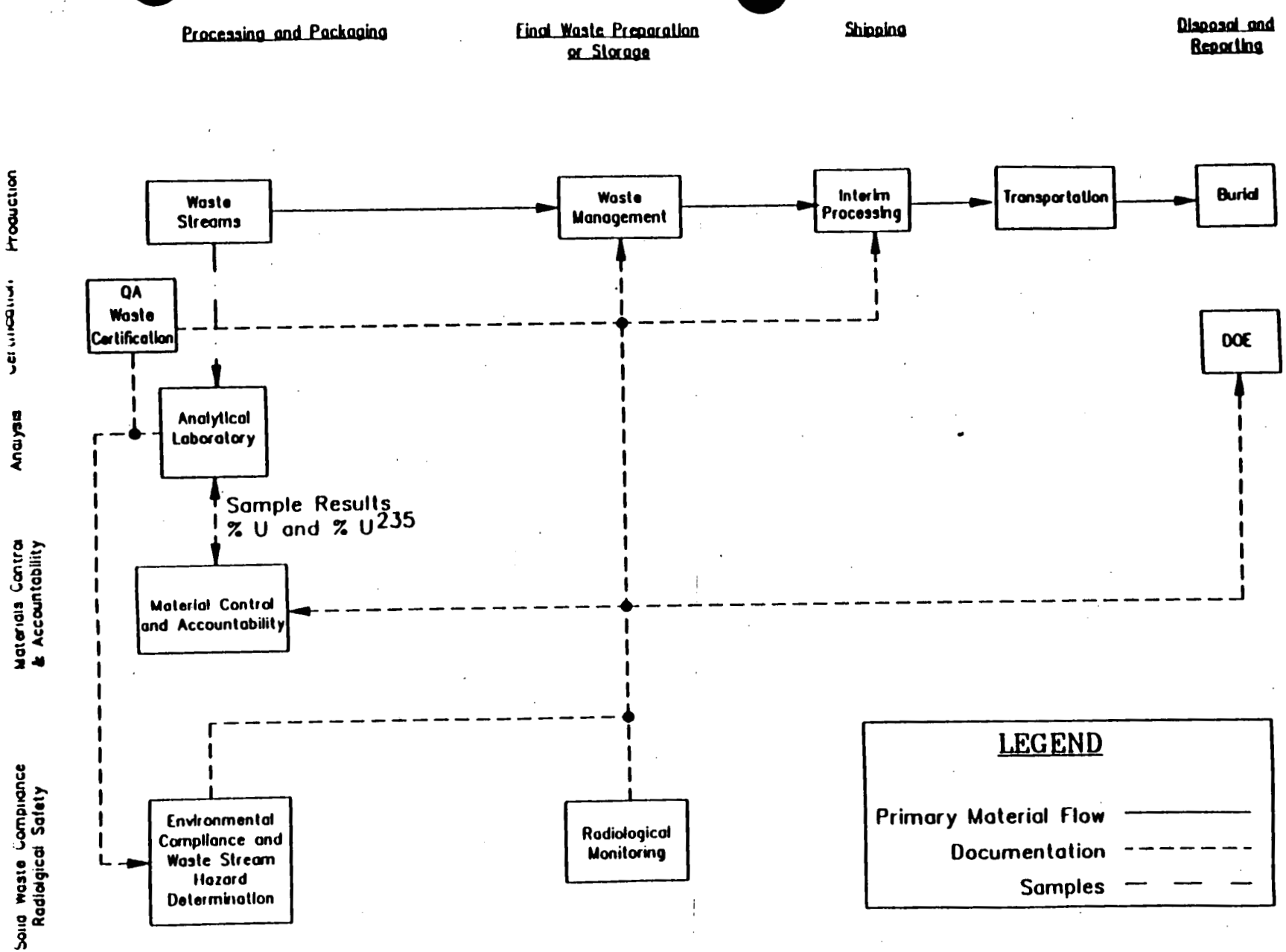


FIGURE 3. Waste Processing Flow Chart –
Primary Material Flow, Documentation, and Samples

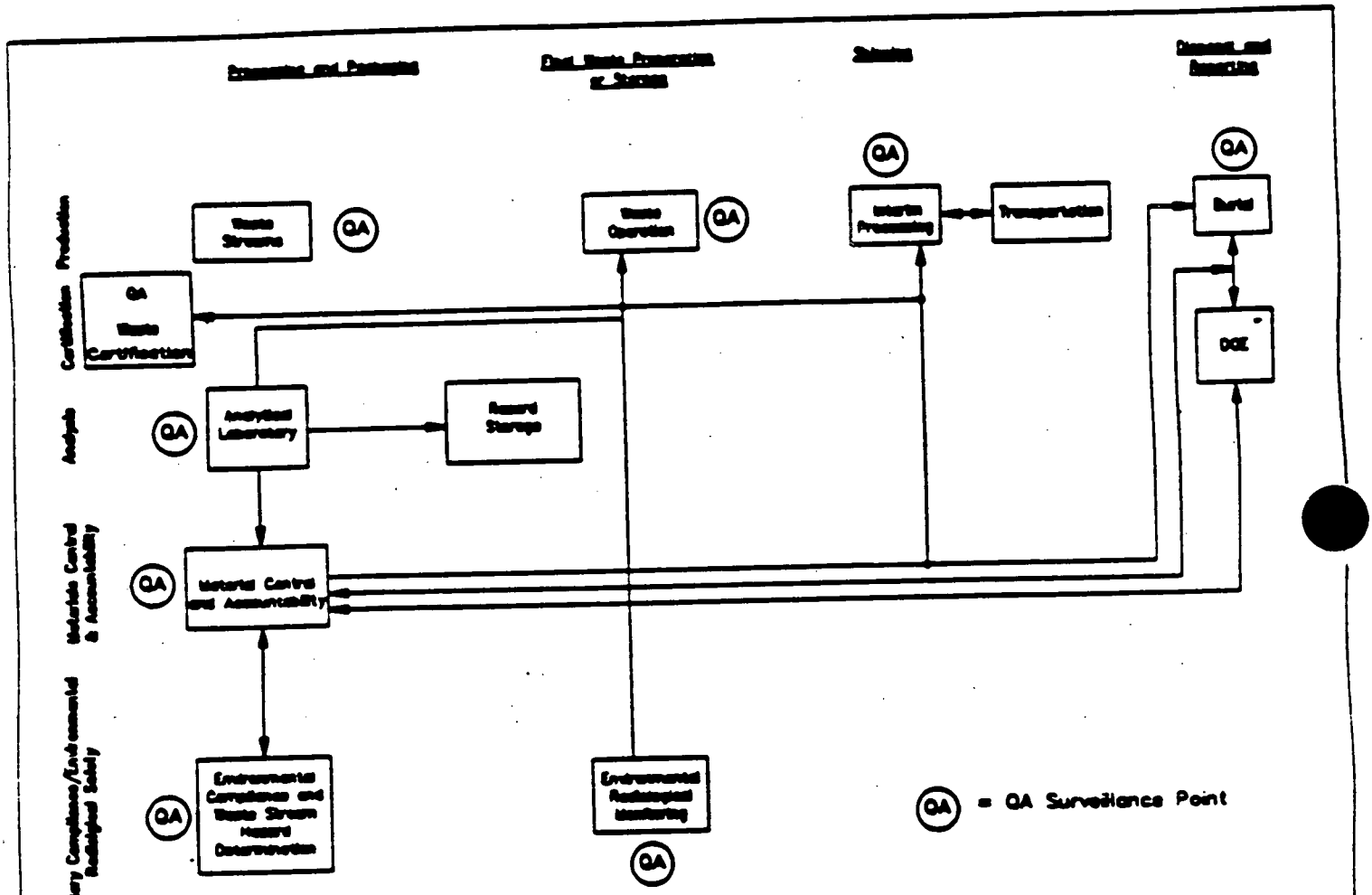


FIGURE 4. Waste Processing Flow Chart - Record Keeping and QA Surveillance

LLW CONTAINER DATA SHEET

Section I — EMPTY CONTAINER CERTIFICATION DATA

Serial # _____

Container No. _____

Container Type:
MB ☐ SL ☐
WB ☐ D ☐
B ☐

	YES	NO	N/A
Empty at Start			
Acceptable Condition			
Sealand Prep Complete			
Absorbent Added			
Liner Present			
Drain Plug Secure			

Pkg. Generator _____ Badge # _____ Date _____

Supervisor/PQA Signature _____ Badge # _____ Date _____

Section II — FULL CONTAINER CERTIFICATION DATA

Origin: _____

DCAR # _____ Date Closed _____

Ready for Interplant Transfer: _____ Date _____

Material Type: _____

	YES	NO	N/A
Material is as Coded			
Prohibited Materials			
Free Liquids in Container			

Pkg. Generator _____ Badge # _____ Date _____

Supervisor/PQA _____ Badge # _____ Date _____

Section III — FINAL PACKAGE CERTIFICATION DATA

	YES	NO	N/A		YES	NO	N/A
Max. Volume Utilization to Wt. Capacity				Pins/Bolts/Retainer Ring Secure			
Liquids or Excessive Moisture Present				Required Banding in Place			
Absorbent Added				Wood Box Lid in Place			
Liner Closed				Radiological Dose Rates			
Drain Plug Check (Red/Black Dot)				LSA/LQ/RQ Present			
Gaskets/Caulking in Place				Markings Acceptable			
Bolt Ring in Place/Torqued				Package Condition Acceptable			

Container Condition upon receipt: ☐ Acceptable ☐ Damaged

DCAR # _____ Date Closed _____

Package Dimensions _____

Material Added: _____ Date _____

Source _____
Description _____
Quantity _____

Prohibited Materials Inspection:
Yes ☐ No ☐

Gross _____ lbs.
Tare _____ lbs.
Net _____ lbs.

Waste Stream No. ONLO-0000000 __ __

Lot Number: _____ - _____ - _____ - _____

Container No. _____

Percent Combustible by Volume: _____

Shipment No. WML __ __ __ __ __

Above Sections Complete _____

Final Pkg. Generator Signature _____ Badge # _____ Date _____

Waste Mgmt. Shipping Supervisor _____ Badge # _____ Date _____

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FIGURE 5

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ANALYTICAL LABORATORY SAMPLE SEAL

Collector _____ (Signature)

Date Collected _____ ☐ AM ☐ PM

Time Collected _____

Customer Sample No. _____

Place Collected _____

FIGURE 6

ANALYTICAL LABORATORY SAMPLE LABEL

Collector _____ Sample No. _____

Place of Collection _____

Date Sampled _____ Time Sampled _____ ☐ AM ☐ PM

Field Information (Sample collection method, etc.) _____

ID Number _____
(Lab Use Only)

FIGURE 7

FMPC

ENVIRONMENT SAFETY & HEALTH - ENVIRONMENTAL COMPLIANCE

CUSTODY TRANSFER RECORD/LAB WORK REQUEST

RECEIVED BY	CLIENT	HLGA CONTACT
DATE	CLIENT CONTACT	DATE DUE
ASSIGNED TO	PHONE	PROJECT NUMBER

SAMPLE IDENTIFICATION						ANALYSES REQUESTED			
LOT NO./ DRUM NO.	SAMPLE NO.	DESCRIPTION	MATRIX	DATE COLLECTED	CONTAINER/ PRESERVATIVE				

MATRIX: S - SOIL DS - DRUM SOLIDS
W - WATER DL - DRUM LIQUIDS
O - OIL X - OTHER (Specify)

SPECIAL INSTRUCTIONS:

ITEM/REASON	RELINQUISHED BY	RECEIVED BY	DATE	TIME	ITEM/REASON	RELINQUISHED BY	RECEIVED BY	DATE

FIGURE 8

FMPC
PRODUCTION OPERATIONS
CHAIN-OF-CUSTODY RECORD

Request No _____

Company's Name and Address: _____ Phone No _____ Carrier Way Bill No.: _____ Lab Destination _____

Name of Sampler(s) _____ Phone No. _____ Badge No. _____

SAMPLE NUMBER	SAMPLE LOCATION AND DESCRIPTION (Waste Type)	SAMPLED		SAMPLE TYPE	CONTAINER TYPE	ANALYSES REQUESTED (please refer to test column)						SAMPLE COND ON RECEIPT	TYPES OF ANALYSES
		DATE	TIME										
													1 Corrosive Analysis
													2 Total U
													3 Total Th
													4 EP Toxicity
													5 [illegible]
													6 Th-230
													7 Th-232
													8 Ra-226
													9 UstCorg Samples U Concentration
													10 ThstCorg Samples Th Concentration
													11 _____
													12 _____
													13 _____
													14 _____
													15 _____

Field Information _____

Possible Sample Hazards _____

SIGNATURES

1 Relinquished By _____ SIGNATURE TITLE COMPANY INCLUSIVE DATES Received By _____

2 Relinquished By _____ SIGNATURE TITLE COMPANY INCLUSIVE DATES Received By _____

3 Relinquished By _____ SIGNATURE TITLE COMPANY INCLUSIVE DATES Received By _____

4 Relinquished By _____ SIGNATURE TITLE COMPANY INCLUSIVE DATES Received By _____

NO	DISTRIBUTION OF COPIES
1	To Accompany Samples
2	Field Copy

FMPC PRO-3112 (3/14/89)

FIGURE 9

Westinghouse Materials Company of Ohio

P. O. Number: _____
Receiving Report No.: _____
Inspection Report No.: _____
Date Inspected: _____
Badge No.: _____

QUALITY ACCEPTED

FIGURE 10

Westinghouse
Materials Company
of Ohio

DCAR No. _____
DATE _____

QUALITY NONCONFORMANCE

TO BE REMOVED BY AUTHORIZED PERSONNEL ONLY

FMPC-QAS-2708 (REV 12/13/89)

Side 1

QUALITY NONCONFORMANCE

P. O. /SHIPMENT/LOT/PACKAGE/CONTAINER I.D. No. _____

RECEIVING REPORT NO. _____ INSPECTION REPORT NO. _____

DESCRIPTION OF NONCONFORMANCE _____

_____

_____

NAME _____ BADGE No. _____ PHONE No. _____

TO BE REMOVED BY AUTHORIZED PERSONNEL ONLY

FMPC-QAS-2708 (REV 12/13/89)

Side 2

Westinghouse
Materials Company
of Ohio

QUALITY
HOLD FOR INSPECTION

TO BE REMOVED BY QUALITY PERSONNEL ONLY

FIGURE 12

FMPC
SECURITY, ACQUISITION & MATERIALS LOGISTICS DEPARTMENT - TRANSPORTATION SECTION

OFFSITE LOADING — TIE DOWN INSPECTION — VEHICLE INSPECTION

Date: _____

CARGO	TRAILER NO.	SEAL NO.
SS 1 25/DISPLETED BOX/SKID NO.	SS/1 25/DISPLETED BOX/SKID NO	SS/1 25/DISPLETED BOX/SKID NO.

Checked By: _____ SIGNATURE - CHECKER

TIE-DOWN INSPECTION AND CHECK-OFF SHEET

Wood shoring installed to prevent longitudinal or lateral movement ..... Yes ☐ No ☐

Steel strapping around the cargo securing as a single shipment ..... Yes ☐ No ☐

Containers divided into two units, one front and one rear of trailer not exceeding approximately 20,000 pounds each ..... Yes ☐ No ☐

"J" steel strapping utilized (5400 lbs. minimum tensile strength) ..... Yes ☐ No ☐

Six each anchor plates or "U" bolts fastened to underframe (three each side of unit) placed and secured for three transverse bands over unit ..... Yes ☐ No ☐

Four each breakaway plates or "U" bolts fastened to underframe (two for each band) placed under each unit and secured for two longitudinal bands, securing the breakaway plate one light unit, anchored to the floor of the trailer ..... Yes ☐ No ☐

Two Signode seals No. 107 crimped whenever two bands are used on an end over end tip point ..... Yes ☐ No ☐

Anchor and breakaway plates secured with eight each 3" nails ..... Yes ☐ No ☐

VEHICLE INSPECTION REPORT

Condition of Floor _____ Condition of Sides _____

Condition of Interior _____ Condition of Exterior _____

Condition of Roof _____ Condition of Rear Doors _____

Overall appearance _____ Detected Sabotage Devices _____ Yes ☐ No ☐

General Comments _____ Detected Evidence of Sabotage _____ Yes ☐ No ☐

Accepted _____ Rejected _____

Checked By: _____ SIGNATURE - TRANSPORTATION SUPERVISOR

NO.	DISTRIBUTION OF COPIES
1	Transportation Section (RECORD COPY)

FIGURE 13

FMPC-AAML-400 (REV. 1/92)

TABLE 1. Waste Processing - Master Procedures

Procedure Number	Procedure Title
FMPC-2054	WMCO Site Policies & Procedures Manual

Plant 4 - Chemical Plant

Procedure Number	Procedure Title
4-C-901	Operator Scale Checking in Plant 4
4-C-801	Conveying, Blending, and Packaging Green Salt
4-C-803	Packaging Depleted Green Salt
4-C-804	Mobile Hopper Discharge Station and Packaging (Depleted Green Salt)

Plant 8 - Wet Area

Procedure Number	Procedure Title
8-C-104	Makeup of Precoat Slurry and Precoating Rotary Vacuum Filters
8-C-114	Filtration of Raffinates
8-C-115	Filtration of Uranium Bearing Slops
8-C-113	Filtration of Slag Leach Filter Cake Slurry

Plant 8 - Dry Area

Procedure Number	Procedure Title
8-C-201	Rotex Screening
8-C-208	Rotary Kiln
8-C-209	Primary Calciner

Plant 8 - Miscellaneous

Procedure Number	Procedure Title
8-C-901	Drum Washer
8-C-905	Operator Scale Testing in Plant 8

TABLE 1. Continued

Plant 2/3

Procedure Number	Procedure Title
2-C-909	Operator Scale Checking in the Refinery
2-C-923	Trash Baler Operation
2-C-921	Redrumming of Waste Oil

Plant 1 - Waste Operations

Procedure Number	Procedure Title
01-104	Segregation of Wooden Pallets
1-C-603	Segregation and Disposal of Scrap Wood
1-C-608	Storage of Radioactive Material
1-C-602	Low-Level Radioactive Waste (L-LRW) Shipment Preparation
C-90-036	Completing the LLW Container Data Sheet
1-C-101	Sampling Miscellaneous Materials
PO-S-01-002	Internal Audit Program
PO-S-01-001	Storage and Handling of Empty L-LRW Containers
PO-S-01-003	Internal Inspection
PO-D-006	Calculation of Drum Equivalents for FMPC Waste Volumes
1-C-804	Overpacking Deteriorated Containers
20-C-601	Packaging L-LRW for Off-Site Disposal
1-C-904	Operator Scale Checking in Plant 1

Plant 5 - Metals

Procedure Number	Procedure Title
5-C-902	Operator Scale Checking in Plant 5
5-C-301	MgF_2 Liner Preparation and Distribution

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TABLE 1. Continued

Waste Technology

Procedure Number	Procedure Title
WT-A-111	Metals Management Program
FMPC-720	Control of Construction Waste

Project Engineering

Procedure Number	Procedure Title
PMP-425	Construction Waste Handling

Security, Acquisition & Materials Logistics

Procedure Number	Procedure Title
	WMCO Procurement Manual
	Inventory Control & Warehousing Section Manual
SOP-TRF-46-C-110	Preparation & Shipment of Radioactive Materials (Low-Level Wastes)
FMPC-2039	On-Site Transportation of Radioactive & Nonradioactive Hazardous Materials
FMPC-314	Packaging On-Site Movement & Off-Site Movement of Material
FMPC-302	Request of Purchase

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TABLE 1. Continued

Operations, Safety & Health

Procedure Number	Procedure Title
OSH-P30-004	Survey of Radioactive Materials Received & Shipped
	Dosimetry & Instrumentation Section Procedures

Controller's Organization

Procedure Number	Procedure Title
FMPC-2115, Rev.1	Materials Control & Accountability Plan
PC-MC&A-1	Quality Assurances Plan - Nuclear Materials Control
FMPC-307	Control & Accountability of Nuclear Materials

Technical Support

Procedure Number	Procedure Title
	Analytical Laboratories Procedures Manual
	Analytical Laboratories Quality Assurance Plan

Quality Assurance

Procedure Number	Procedure Title
WMCO-QAP-12.12	Certification of L-LRW Loading, Examination of Transport Vehicle/Trailer For Off-Site Shipment
WMCO-QAP-12.09	Package Examination, Sealing & Certification
WMCO-QAP-12.08	Determination Method For Fissile Material
WMCO-QAP-14.01	Receiving Inspection

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TABLE 2. Waste Processing - Archival Documents

Document Description

- Procedures in Table 1 and Specifications listed in Table 6
- Plant Test Authorizations and Reports
- Nuclear Materials Shipping Orders
- Uniform Hazardous Waste Manifest
- Bill of Lading
- QA Plans
- Tally Sheet
- Radiological Monitoring Records
- Waste Stream Characterization Data Sheet
- Loading Inspection and Tie-down Sheet
- Item Production/Cetification/Identification Card
- Laboratory Analysis Report
- Weight Tickets
- Item Production/Certification/Identification
- Waste Shipment Final Authorization Checklist
- Trailer/Vehicle checklists
- Nuclear Materials Transaction Report (DOE-741)

TABLE 3. Waste Processing - QA Records

Records Description

- Purchase Requisition and Purchase Order Documentation
- Receipt Inspection of Incoming Materials including Supplier Certification if Applicable
- Shipping Order for Nuclear Materials
- Vehicle and Shipment Radiation Monitoring Reports
- Personnel Training Records
- Smear Test Results for Shipping Container
- Audit Reports
- Waste Certification Program Plan
- Records of Serviceability/Calibration of Measuring Equipment
- Weight Tickets
- Surveillance Reports
- Bill of Lading for Shipments
- Uniform Hazardous Waste Manifest
- L-LRW Shipping Report
- Waste Stream Characterization Data Sheet
- Carrier/Driver Instructions for Radioactive Shipments and Exclusive Use
- Item Production/Certification/Identification
- Waste Shipment Final Authorization Checklist
- Vehicle Inspection Reports

Note: Retention periods are in accordance with DOE Order 1324.2

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TABLE 4. Waste Processing - Sample Material Identification and Control

Material Description

- MgF_2 Samples for Analysis
- Slag Leach Filter Cake Samples for Analysis
- Raffinate Cake Samples for Analysis
- Black Oxide Samples for Analysis
- Sump Cake Samples for Analysis
- Oversized Green Salt (UF_4) Samples for Analysis
- Miscellaneous Waste Residue Samples for Analysis
- Waste Samples for Analysis of Hazardous Waste Determination
- Identification of Packaged Waste (Plant to Plant and Offsite Shipment)
- Construction Waste and Rubble Samples and/or Material Identification

TABLE 5. Waste Processing - Measuring and Test Equipment Calibration

(Procedures indicate actions at a minimum.)

Items	Frequency
Electric Weighing Scales (net ship. wt.)	monthly
Scale No. 1-27 Plant 1 Bldg. 71	monthly
Scale No. 5-35 Plant 5 Bldg. 55	monthly
Scale No. 4-16 Plant 4 (UF_4 area)	annual
Scale No. 8-17 Plant 8 (Rotex area)	annual
Scale No. 8-16 Plant 8 (Kiln area)	semi-annual
Masstron 5000/016132 Transportation	semi-annual
Analytical Laboratory	semi-annual (Daily Efficiency Checks)
ES&H Radiological Monitoring Equipment	semi-annual
Eberline RO3C (Beta-Gamma)	semi-annual
Eberline PRM 6 (Alpha)	quarterly
Scintillation Alpha Counters (SAC)	annual (Daily Efficiency Checks)
Nilfisk Hepa Portable Vacuum	semi-annual
Torque Wrenches	quarterly

TABLE 6. Waste Operations – Material Requiring Procurement Control

Material Description	
o 48 Gallon Drums	WMCO 40X-5500-M-00012-1
o 55 Gallon Drums (17H)	49CFR178.118-2 and in accordance with DOE Eval. Document for DOT-7A Type A Pkg. MLM-3245 DP/00053-H1
o 83 Gallon Drums	16 gauge steel throughout 25 7/8" ID 38" IH
o Metal Shipping Container (Strap)	WMCO 30A-5500-M-00060-1
o 2' X 4' X 7' Wooden Boxes	WMCO 40A-5500-M-00009-7
o 4' X 4' X 7' Wooden Boxes	WMCO 40A-5500-M-00009-7
o 3.5' X 4.5' X 6.5' Metal Boxes	WMCO 40X-5500-M-00011-0 or an approved equal
o Metal Shipping Container (Strap)	WMCO 30A-5500-M-0061-0
o Metal Shipping Container (Clip)	WMCO 30A-5500-M-00059-0
o Lectro-Panel SBA Six-Drum Overpack Details & Widment	89DW000800 Revision 9
o Cargo Containers	

NOTE: This list is not all inclusive. However, any additional containers used will follow similar procurement controls.

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TABLE 7. Waste Processing - Specifications

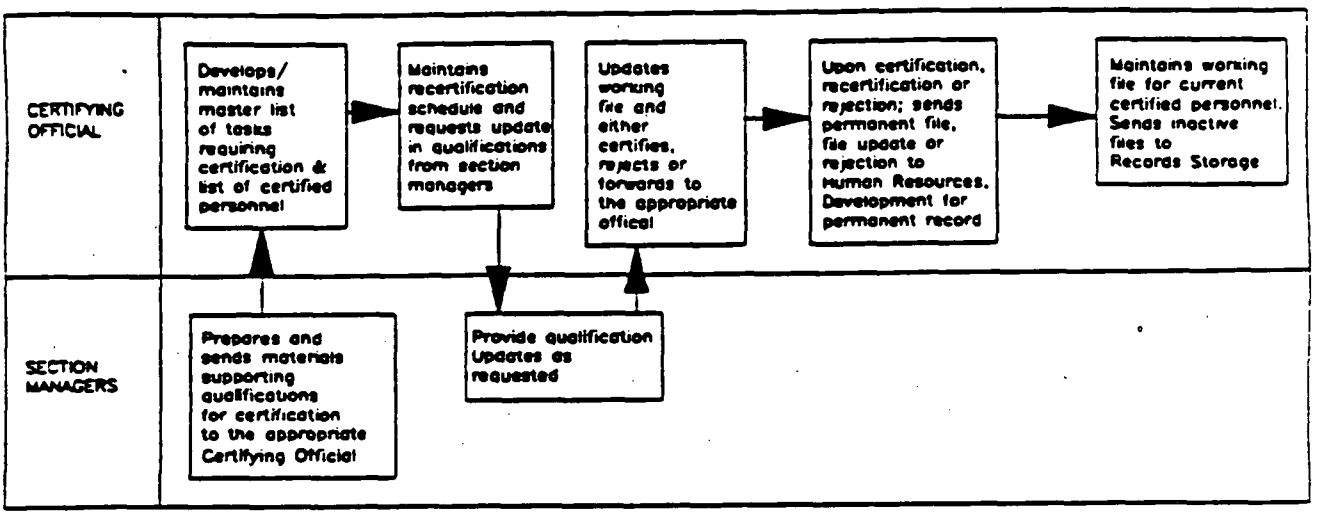
Specification Description

- U.S. Department of Energy Nevada Operations Office, "Operational Radioactive Defense Waste Management Plan for the Nevada Test Site," NVO-325
- U.S. Department of Energy, DOE 1540.1, "Materials Transportation and Traffic Management,"
- U.S. Environmental Protection Agency, "Code of Federal Regulations, Title 40, Part 261," Identification and Listing of Hazardous Waste.
- U.S. Department of Transportation, "Code of Federal Regulations, Title 10, Section 71, Packaging and Transportation of Radioactive Material,"
- U.S. Department of Energy, DOE 5480, "Safety Requirements for Packaging of Fissile and Other Radioactive Materials,"
- U.S. Department of Energy, ORO 5480.1A, Chapter XI, " Requirements for Radiation Safety,"
- U.S. Department of Energy, Draft DOE Order 5820.2A, "Radioactive Waste Management."
- U.S. Department of Transportation, "Code of Federal Regulations, Title 49, Transportation."
- ALARA - DOE 5480.11, "Requirements for Radiation Protection."

WESTINGHOUSE MATERIALS COMPANY OF OHIO - FMPC		Document Number: WMCO-QAP-6.09
QUALITY ASSURANCE DEPARTMENT PROCEDURE	Subject: ADMINISTRATION OF PERSONNEL CERTIFICATION RECORDS	Revision: 2
	Authorized: (Quality Assurance Manager) J.A. Zimmerli	Page 1 of 6
		Effective Date: 12/16/88

1.0 SCOPE

This procedure applies to the responsibilities and actions of the Quality Assurance Department to manage the documentation related to the certification of personnel as indicated in the following flowchart.



2.0 PROCEDURE

2.1 Development and Maintenance of Certification Records

Certifying Official:

2.1.1 Develops and maintains a list of Westinghouse Materials Company of Ohio (WMCO) (for additional abbreviations, acronyms, and definitions see WMCO-QAP-1.05) personnel who are certified to perform specific quality assurance tasks within the scope of their assigned responsibility.

2.1.2 Develops and maintains a permanent and a working training and certification file for each QAD employee and other WMCO employees certified by the individual in accordance with Attachment A.

2.1.3 Maintains the QAD recertification schedule (see WMCO-QAP-6.05 and WMCO-QAP-6.06) for those recertifications for which they are responsible.

2.2 Update of Records

Section Managers (will be requested of supervisors of other WMCO employees certified by the QAD):

2.2.1 Coordinate the completion of audit, inspection, examination and test participation records along with any other new information which supports certification and forward to the responsible Certifying Official.

Certifying Official:

2.2.2 Updates the certification and training files whenever there are annual evaluations, certification extensions, or changes in certification status in accordance with WMCO-QAPs-6.05 and 6.06.

2.2.3 Forwards permanent certification file, when initially completed and upon each update; to Human Resources, Development. Inactive certification and training files are to be put into site records storage in accordance with WMCO-QAP-9.01.

3.0 REFERENCES

3.1 WMCO-QAP-1.05, Abbreviations, Acronyms, and Definitions

3.2 WMCO-QAP-6.05, Certification of Audit Personnel

3.3 WMCO-QAP-6.06, Certification of Inspection, Examination and Test Personnel

3.4 WMCO-QAP-9.01, Identification, Classification, Preparation and Transfer of Quality Records

4.0 ATTACHMENTS

4.1 Attachment A - Development and Maintenance of Training and Certification Files

DEVELOPMENT AND MAINTENANCE OF TRAINING AND CERTIFICATION FILE

(1) Permanent File:

a. Obtain and file standard resumes for each QAD employee and other WMCO employees certified by QAD. Resumes should include the following information: (1) Title and Description of Specific Areas of Expertise; (2) Experience History Listing; (3) Education; (4) Certification and Licenses; (5) Professional Societies; (6) Technical Skills

b. Reference job descriptions and/or task qualification requirement documents for each QAD employee and other WMCO employees certified by the QAD and file in the individual's file. The Memorandum of Certification or Recertification are sufficient reference, for this requirement.

c. Reference existing documentation of training activities which support certification (See page 2 of the attachment for sample format).

d. Obtain and file existing documentation of participation in verification activities (See pages 3 and 4 of this attachment for sample format).

(2) Working File:

a. Create the working file by duplicating the contents of the permanent file.

b. Update with latest copy of documentation from permanent file.

c. Ensure that documentation of training activities which support certification is maintained in each individual's certification and training file.

d. Maintain audit, examination, testing and inspection participation records and other supporting documentation which are received throughout the year from the Section Managers and staffs or supervisors of other WMCO employees certified by the QAD.

e. Prior to each individual's initial certification or annual recertification, ensure that all documents (resumes, education, job description, etc.) are current and correct.

f. Initiate certification or recertification by sending permanent file plus updated documentation from working file to the certifying official.

g. Subsequent to each individual's initial certification or annual recertification, forward updated material to the permanent file.

No:	Rev:	Date:	Page:
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ATTACHMENT A
Page 2 of 4

FMPC
QUALITY ASSURANCE
TRAINING RECORD

Page ____ of ____

Name _____ SSN _____

Course No.	Course Title	Dates of Attendance

EXHIBIT

FMPC
QUALITY ASSURANCE
PARTICIPATION IN AUDIT PROCESS
(Other than as Team Member)

Section Mgr Approval _____ Date _____

Name _____

AUDIT NUMBER	AUDIT TITLE/SCOPE	LOCATION OF AUDIT	DATE(S) OF AUDIT	FUNCTION*

EXHIBIT

FMPC
QUALITY ASSURANCE
PARTICIPATION IN VERIFICATION ACTIVITIES

Name: _____ Section Mgr. Approval: _____ Date: _____

Verific. Activity Number	Verification Activity Title/Scope	Location	Date(s)	Function*

EXHIBIT

*e.g., Performer, Supervisor

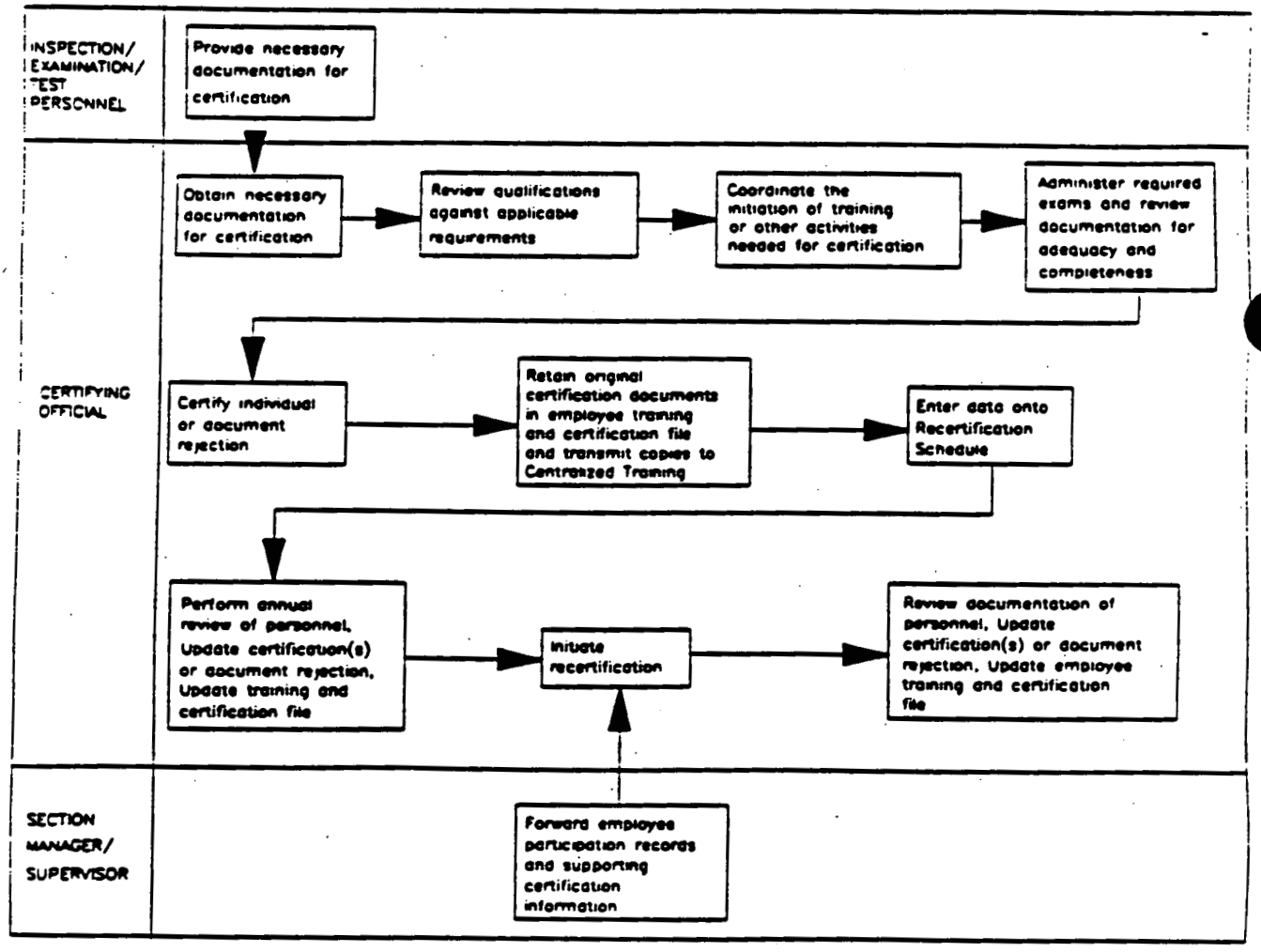
FMPC-QA-[illegible]

WESTINGHOUSE MATERIALS COMPANY OF OHIO - FMPC		DOCUMENT NUMBER: WMCO-QAP-6.0[illegible]
QUALITY ASSURANCE PROCEDURE	SUBJECT: CERTIFICATION OF INSPECTION, EXAMINATION AND TEST PERSONNEL	REVISION: 4
		Page 1 of 18
	AUTHORIZED: (Vice President, Quality) JAG	Effective Date: 07/31/90

COMPLETE REWRITE

1.0 SCOPE

This procedure applies to the qualification and certification of personnel who perform inspections, examinations, and tests such as product inspection, nondestructive examinations and concrete examinations.



2.0 PROCEDURE

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Each employee at Westinghouse Materials Company of Ohio (WMCO) (for abbreviations, acronyms, and definitions see WMCO-QAP-1.05) who perform inspections, examinations and tests for purposes of verification of conformance with specification requirement or for purposes of acceptance will be certified in accordance with the following procedure prior to being assigned responsibility for performing that task.

2.1 Evaluation of Personnel Qualifications

Inspection/Examination/Test Personnel:

2.1.1 Provides the necessary documentation for certification, or recertification, to the appropriate Certifying Official (refer to Attachment A).

Certifying Official:

2.1.2 Obtains the necessary documentation for certification or recertification including resumes, training records and appropriate forms.

2.1.3 Reviews individual qualifications against the applicable qualification requirements (Attachment B) and completes appropriate sections on the certification form (Attachment C) for experience, education and training.

2.2 Conduct of Training for Personnel Certification

Certifying Official:

2.2.1 Coordinates the initiation of training (with the Coordinator, Training and Certification) or other activities needed for certification or recertification.

NOTE: Training, indoctrination, and orientation shall be developed, scheduled, and conducted in accordance with WMCO-QAP-6.03 and FMPC-102.

2.2.2 Administers written examinations for certification or recertification, as required.

2.2.3 Assures that a copy of the training records are transmitted to Centralized Training.

2.3 Documentation of Personnel Certification

Certifying Official:

2.3.1 Reviews the completed certification documentation for adequacy and completeness.

2.3.2 Ensures all qualification requirements (i.e., written examinations, physical, practical) are complete and acceptable and signs the certification form (Attachment C).

2.3.3 Retains the original certification documentation in the employee's training and certification file.

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2.3.4 Enters the certification data on a Recertification Schedule, which shall include, as a minimum, the following information:

- o Identification of person certified
- o Certification expiration date
- o Eye examination due date
- o Certified method and any restrictions
- o Level of certification, as applicable
- o Annual evaluation due date

2.4 Annual Evaluation of Personnel

Certifying Official:

2.4.1 Reviews the original certification documentation and additional supporting documentation accumulated during the annual period and updates the certification form (Attachment C) for annual evaluation as outlined in Basic Qualification Requirements "Maintenance of Qualification" (Attachment B).

2.5 Recertification of Personnel

Certifying Official:

2.5.1 Performs recertification in accordance with the Basic Qualification Requirements "Maintenance of Qualification" (Attachment B) and documents recertification on the certification form (Attachment C).

2.6 Administration of Personnel Certification Records

Certifying Official:

2.6.1 Develops and maintains a list of WMCO personnel who are certified to perform specific quality assurance tasks within the scope of their assigned responsibility.

2.6.2 For each employee certified, develops and maintains a training and certification file in accordance with the following:

- o Obtain and file standard resumes. Resumes should include title and description of specific areas of expertise, experience history listing, education, certification and licenses, professional societies, and technical skills.
- o Reference job descriptions and/or task qualification requirement documents.
- o Reference existing documentation of training activities which support certification.

2.6.3 Updates the training and certification files whenever there are annual evaluations, certification extensions, or changes in certification status.

2.6.4 Inactive training and certification files are to be put into records storage in accordance with WMCO-QAP-9.01.

3.0 REFERENCES

3.1 WMCO-QAP-1.05, Abbreviations, Acronyms, and Definitions
3.2 WMCO-QAP-6.03, Development, Scheduling and Conduct of Quality Assurance Training/Indoctrination/Orientation
3.3 WMCO-QAP-9.01, Identification, Preparation, Storage and Maintenance of Quality Documents
3.4 FMPC-102, Training
3.5 ANSI/ASME NQA-1, Quality Assurance Program Requirements for Nuclear Facilities
3.6 ASNT/SNT-TC-1A, Personnel Qualification and Certification in Nondestructive Testing
3.7 B&PV Code, Appendix VII of Section III, Division 2. 1983 Edition, Qualifications of Concrete Inspection Personnel

4.0 ATTACHMENTS

4.1 Attachment A - Certifying Officials
4.2 Attachment B - Basic Qualification Requirements
4.3 Attachment C - Certification of Inspection, Examination, and Test Personnel
4.4 Attachment D - Record of Procedure Review
4.5 Attachment E - Personnel Training and Qualification

CERTIFYING OFFICIALS

The following identifies the certifying official for the three levels of inspection, examination, and test certification required:

INSPECTION, EXAMINATION, AND TEST CERTIFICATION	CERTIFYING OFFICIAL
Level III	VP Quality
Level II	Level III
Level I	Level III

CONCRETE EXAMINATION CERTIFICATION	CERTIFYING OFFICIAL
Certifying Official for Concrete Examiner	VP Quality
Concrete Examiner	Certifying Official for Concrete Examiner

PRODUCT INSPECTION CERTIFICATION	CERTIFYING OFFICIAL
Certifying Official for Product Inspectors	VP Quality
Product Inspectors	Certifying Official for Product Inspectors

BASIC QUALIFICATION REQUIREMENTS
INSPECTION, EXAMINATION AND TEST PERSONNEL

The qualification requirements common to all inspection, examination and testing functions are summarized below. The specific governing specification document, duties and responsibilities, and education and experience requirements for each of the inspection, examination and testing functions which require qualification are detailed in the specific qualification sheets for each method.

A. Duties and Responsibilities

Inspection, examination and test personnel verify implementation of requirements for product, purchased material, and construction and operation of facilities at the FMPC. A generic listing of duties and responsibilities is contained in Table 1.

B. Education and Experience

All inspection, examination and test personnel shall meet or exceed the minimum education and experience requirements listed for the area of certification. For Nondestructive Testing the requirements are listed in Table 2. Requirements for all other areas are listed in Table 3.

C. Training

1. Inspection, examination and test personnel shall have or shall be given appropriate training and orientation to develop their competence for performing required inspection, examination and tests. Competence of personnel for performance of the various inspection, examination and testing functions shall be developed through:

(a) Training in applicable codes, standards and regulations including ANSI/ASME NQA-1.

(b) Training in inspection, examination, and testing and on-the-job training under the direct supervision of a Level II or Level III inspection, examination and test technician or certifying official.

(c) Demonstrated knowledge of WMCO inspection, examination and test procedures.

2. The candidate shall complete and sign the Record of Procedure Review form (Attachment D) upon completion of review of assigned procedures. Concerns identified on the Record of Procedure Review shall be evaluated by supervision and the candidate and appropriate action taken. Upon completion of the review, the candidate shall complete a new copy of the Record of Procedure Review showing the resolution to the concerns.

BASIC QUALIFICATION REQUIREMENTS
INSPECTION, EXAMINATION AND TEST PERSONNEL
(Continued)

3. Formal classroom training will be conducted as required. When formal training is required, it shall be in accordance with WMCO-QAP-6.03 and FMPC-102.

D. Physical Requirements

1. Prior to initial certification and annually thereafter, inspection, examination and test personnel shall pass an eye examination as follows:

(a) The examination shall assure natural or corrected near-distance acuity in at least one eye such that the applicant is capable of reading a minimum of Jaeger Number 2 or equivalent type and size standard Jaeger test chart. The ability to perceive an Ortho-Rater minimum of 8 or similar test pattern is also acceptable.

(b) The examination shall demonstrate the capability of distinguishing and differentiating contrast between colors used in the method requiring certification. Demonstration of capability of distinguishing and differentiating contrast between colors shall be by color blind tests or actual workmanship samples. Examples of methods not requiring color vision are Dimensional Examinations, Ultrasonic Thickness Examinations, Radiographic Film Interpretation, Visual Weld Examination.

2. Individuals shall have necessary physique, stamina, range of motion, and dexterity needed to allow safe execution of assigned duties as demonstrated by the practical examination or test performance.

E. Examinations

1. Inspection, examination and test personnel shall pass any required written and/or practical examination as listed in the specific qualification requirements for each type of inspection, examination and test, prior to being certified.

2. Personnel who fail the written and/or practical examination shall wait, at least, thirty days or show evidence of having received suitable additional training as determined by the Certifying Official prior to re-examination.

BASIC QUALIFICATION REQUIREMENTS
INSPECTION, EXAMINATION AND TEST PERSONNEL
(Continued)

F. Certification Requirements

Inspection, examination and test personnel shall be certified as being qualified to conduct inspections, examinations and tests, and the certification records shall be established and maintained. In addition, the certification shall specifically identify which inspections, examinations and tests the individual is qualified to perform as well as any restrictions concerning the types of inspections, examinations and tests for which the certification shall be considered valid.

G. Maintenance of Qualifications

1. The job performance of inspection, examination and test personnel shall be reevaluated at periodic intervals not to exceed 3 years. Reevaluation shall be by evidence of continued satisfactory performance or redetermination of capability by an evaluation of the candidate's education, experience, training and either test results or capability demonstration. If during this evaluation or at any other time, it is determined by the responsible organization that the capabilities of an individual are not in accordance with the qualification requirements specified for the job, that person shall be removed from that activity until such time as the required capability has been demonstrated. Any person who has not performed inspection, examination or testing activities in his/her qualified area for a period of 1 year shall be reevaluated by a redetermination of required capability in accordance with the requirements stated above in order to maintain his/her certification.

2. Evidence of continuing satisfactory performance includes:

(a) Continuous performance in method certified

(b) Training in the method certified, either attending or instructing

(c) Practical demonstration of method

(d) Review of reports or records prepared, showing performance of applicable method

(e) Recertification by examination

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BASIC QUALIFICATION REQUIREMENTS
INSPECTION, EXAMINATION AND TEST PERSONNEL
(Continued)

TABLE 1

INSPECTION, EXAMINATION, AND TEST PERSONNEL DUTIES AND CAPABILITIES

	NDE LEVEL			PROD. INSP.		CONCRETE	
	III	II	I	*C.O.	INSP.	*C.O.	EXAM.
Inspect materials and incoming materials for conformance to specified requirements such as physical dimensions (length, diameter, contour, etc.) and for quality defects (seams, nicks, mars, etc.).	x	x	x	x	x	x	x
Checks gauges/instruments and other measuring devices to verify conformance with specified limits	x	x	x	x	x	x	x
Maintains appropriate inspection records.	x	x	x	x	x	x	x
Plans inspections, examinations and tests.	x	x		x	x	x	x
Sets up tests and examinations, including preparation and setup of related equipment.	x	x		x	x	x	x
Monitors the performance of construction, modification, or maintenance activities.	x	x		x	x	x	x
Supervises & conducts training of inspection, examination and test personnel.	x	x		x		x	
Supervises and certifies inspection, examination and test personnel.	x			x		x	
Evaluates the validity and acceptability of inspection, examination and test personnel.	x	x		x	x	x	x
Evaluates the adequacy of specific programs used to train and certify inspection, examination and test personnel.	x			x		x	
Establishes techniques, prepares procedures and interprets codes/standards.	x			x		x	

* C.O. means Certifying Official

SPECIFIC QUALIFICATION REQUIREMENTS

NDE PERSONNEL

A. Duties and Responsibilities

Nondestructive examination (NDE) personnel perform nondestructive examinations in the construction, modification, or maintenance of the FMPC. The NDE verification work is performed in compliance with the American Society for Nondestructive Testing (ASNT) Recommended Practice Number SNT-TC-1A, Personnel Qualification and Certification In Nondestructive Testing; and in accordance with applicable WMCO procedures. NDE personnel perform, or monitor, the performance of activities related to nondestructive examination. Activities dealing with personnel qualifications are covered in ASNT Recommended Practice Number SNT-TC-1A.

B. Education and Experience Requirements

Level III - Shall be appointed by the Vice President, Quality, based on qualification factors contained in SNT-TC-1A. When the individual is qualified by examination, up to 50% of the experience requirements in accordance with SNT-TC-1A may be replaced by experience as a certified NDE Level II in other methods listed in SNT-TC-1A.

Level II and I - The minimum requirements are contained in Table 2.

1. A candidate having graduated from a formal NDE training institute such as a military or vocational school or college, and the documentation does not provide a breakdown of training hours per NDE method, may receive credit for training hours required for qualification based upon the Level III's review of the training course(s).

2. The number of hours of training and the required experience, per Table 2, for NDE personnel who perform only one operation of a specific NDE method or perform NDE examinations of a limited scope may be reduced. Certifications of a limited scope shall be documented and filed in the individual's training and certification file.

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SPECIFIC QUALIFICATION REQUIREMENTS

NDE PERSONNEL
(Continued)

C. Examinations

1. Level III

Written examinations are not required for the appointment of a Level III candidate.

2. Level I and Level II

Prospective Level I and Level II NDE personnel shall pass a written examination which covers:

(a) Basic principles of the applicable method.

(b) Equipment, operating procedures, and test techniques that the applicant may encounter during specific assignments to the degree required by WMCO written practice.

(c) Specifications or codes and acceptance criteria used by WMCO in its nondestructive testing procedures.

3. Prospective Level I and Level II NDE personnel shall pass a practical examination which covers:

(a) The demonstration of familiarity with and the ability to operate the necessary test equipment, and record and analyze the resultant information to the degree required.

(b) At least one selected specimen should be tested and the results of the test analyzed by the candidate.

(c) The description of the specimen, the test procedure, including check points, and the results of the examination should be documented.

4. Examinations shall consist of three phases General, Specific and Practical. The designated minimum number of questions in SNT-TC-1A shall be used when applicable. Grading of examinations shall be weighted as follows:

- o General Score in % x .3
- o Specific Score in % x .3
- o Practical Score in % x .4

Final grade shall be the sum of the weighted scores.

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TABLE 2
TRAINING AND EXPERIENCE REQUIREMENTS
NDE

	Level I					Level II							
	Examination Method (hrs)					Examination Method (hrs)							
Education	RT	UT	PT	MT	LTBT	RT	UT	PT	MT	LTBT	PPVI	TE	UTT
Completion with a passing grade at least 2 yrs of engineering or science study in a university, college, or technical school	29	24	4	8	2	35	40	4	4	2	1	1	1
High school graduation or equivalent.	39	40	4	12	2	40	40	8	8	4	4	2	2
Grammar school graduation, or demonstrated proficiency, or additional training.	88	40	12	26	2	80	80	16	16	4	4	2	2
	Total Work Time Experience (Months)												
All education levels as listed above	3	3	1	1	2hrs	9	9	2	3	1/2	4hrs	2hrs	2hrs

LTBT = Leak Testing Bubble Test
PPVI = Pilot Plant Vessel Inspection
TE = Thread Engagement
UTT = Ultrasonic Thickness Measurements

NOTES

1. For Level II certification, the experience should consist of time at Level I or equivalent. If a person is being qualified directly to Level II with no time at Level I, the required experience should consist of the sum of the times required for Level I and Level II and the required training should consist of the sum of the hours for Level I and Level II.

2. Initial experience may be gained simultaneously in two or more methods if the candidate spends a minimum of 25% of their work time on each method for which certification is sought, and the remainder of their work time claimed as experience is spent in NDT related activities.

TABLE 3

All other inspection, examination and test personnel shall meet the following education and experience requirements:

1. Three years of satisfactory performance as an inspector trainee in corresponding inspection, examination or testing activities; or

2. High school graduate or General Equivalency Diploma (GED) equivalent plus two years of related experience in equivalent inspection, examination, or testing activities; or

3. Completion of college-level work leading to an Associate Degree in a related discipline plus one year of related experience in equivalent inspection, examination, or testing activities; or

4. Graduation from four-year college plus six months of related experience in equivalent inspection, examination, or testing activities; or

5. Graduate of a Vocational-Technical school or Military school in an inspection discipline and six months of work experience in the applicable inspection method.

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SPECIFIC QUALIFICATION REQUIREMENTS

CONCRETE INSPECTION PERSONNEL

A. Duties and Responsibilities

Concrete Inspection personnel verify implementation of requirements for construction or modification of facilities at the FMPC. The verification work is performed in accordance with applicable standards and codes, including ANSI/ASME NQA-1 and applicable WMCO procedures.

Concrete Examination personnel monitor the performing of constructor activities including construction modification and maintenance activities.

B. Education and Experience Requirements

The minimum education and experience requirements are listed in Table 3.

C. Examination

None Required

D. Certification

1. The Certifying Official shall perform an evaluation of the candidates education, experience and training for certification.

2. Upon satisfactory completion of the evaluation and eye examination, the Certifying Official shall document the certification on Attachment C and list any restrictions that apply for certification.

3. Certifying Official for Concrete Examiners shall be appointed by the Vice President, Quality based on qualification factors contained in Table 3.

4. If an individual cannot be certified a written justification for non-certification shall be prepared and forwarded to the individual.

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SPECIFIC QUALIFICATION REQUIREMENTS
PRODUCT INSPECTION PERSONNEL

A. Duties and Responsibilities

Product Inspection Personnel verify that product produced at the FMPC meets customer requirements. This is accomplished through the use of various specifications and procedures applicable to Quality Operations.

B. Education and Experience Requirements

The minimum education and experience requirements are listed in Table 3.

C. Examination

None Required

D. Certification

1. The Certifying Official shall perform an evaluation of the candidate's education, experience and training for certification. Deviation from the minimum requirements listed in Table 3 shall be as follows:

(a) For Product Inspection the requirement for experience may be waived after the candidate(s) has had specific training for the application being certified and demonstrated their skills to perform the inspection to written instructions. Documentation of the training and capability demonstration shall be on a Personnel Training and Qualification form (Attachment E).

2. Upon satisfactory completion of the evaluation and eye examination, the Certifying Official shall document the inspector's certification or Certifying Official for Product Inspectors, as applicable, on Attachment C and list any restrictions that apply for certification.

3. Certifying Official for Product Inspectors shall be appointed by the Vice President, Quality based on qualification factors contained in Table 3.

4. If an individual cannot be certified a written justification for non-certification shall be prepared and forwarded to the individual.

Attachment C
Page 1 of 1

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CERTIFICATION OF INSPECTION, EXAMINATION AND TEST PERSONNEL

WMCO

CERTIFICATION OF INSPECTION, EXAMINATION AND TEST PERSONNEL

NAME:	BADGE NO.:	DATE:
METHOD	☐ CERTIFICATION ☐ RECERTIFICATION	LEVEL (if applicable):
CERTIFICATION LIMITATIONS (if applicable):		

EDUCATION/EXPERIENCE/TRAINING

EDUCATION ☐ SEE ATTACHED INFORMATION/RESUME

SCHOOL	FROM	TO	MAJOR COURSE OF STUDY

EXPERIENCE ☐ SEE ATTACHED INFORMATION/RESUME

ORGANIZATION	FROM	TO	METHOD(S) & RELATED ACTIVITIES

TRAINING ☐ SEE ATTACHED INFORMATION/RESUME

EXAMINATIONS/EVALUATIONS

WRITTEN		PHYSICAL	
SCORE:	DATE:	TYPE:	DATE PASSED:

SIGNATURES/DATES

DATE CERT./RECERT.	DATE OF EXPIRATION:	CERTIFYING OFFICIAL:

ANNUAL EVALUATION

DATE OF SAT. COMPLETION:	CERTIFYING OFFICIAL:	DATE OF SAT. COMPLETION:	CERTIFYING OFFICIAL:

FMPC-QA-2987 (REV 7/15/88)

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FMPC

RECORD OF PROCEDURE REVIEW

NAME	BADGE NO	PROCEDURE NUMBER
	OPERATION	

I have read the above procedure on this date and fully understand it with the following exceptions that need to be clarified *(Check appropriate box)*:

☐ a. None

☐ b. Step _____ should be added/deleted.

Should read: _____

☐ c. Do not understand fully the following steps: _____

Signed: _____ Date: _____

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FMPC

PERSONNEL TRAINING AND QUALIFICATION

Training Subject: _____

Assigned Duties: _____

Name: _____

Department: _____

I have received the identified training and understand the requirements to perform the assigned duties for the specified activity.

Employee Signature: _____ Date: _____

The employee has exhibited the knowledge and technical skill to perform the assigned duties for the specified activity and is qualified with an expiration date of: _____

Qualification Area: _____

Manager: _____

Date: _____

FMPC-QA-2678 (REV 8/24/88)

UNCONTROLLED COPY

WESTINGHOUSE MATERIALS COMPANY OF OHIO - FMPC		DOCUMENT NUMBER: WMCO-QAP-12.09
QUALITY ASSURANCE PROCEDURE	SUBJECT: CERTIFICATION OF WASTE PACKAGE EXAMINATION AND SEALING FOR OFF-SITE SHIPMENT	REVISION: 3 Page 1 of 19
	AUTHORIZED: (Vice President, Quality)	Effective Date: 09/11/90

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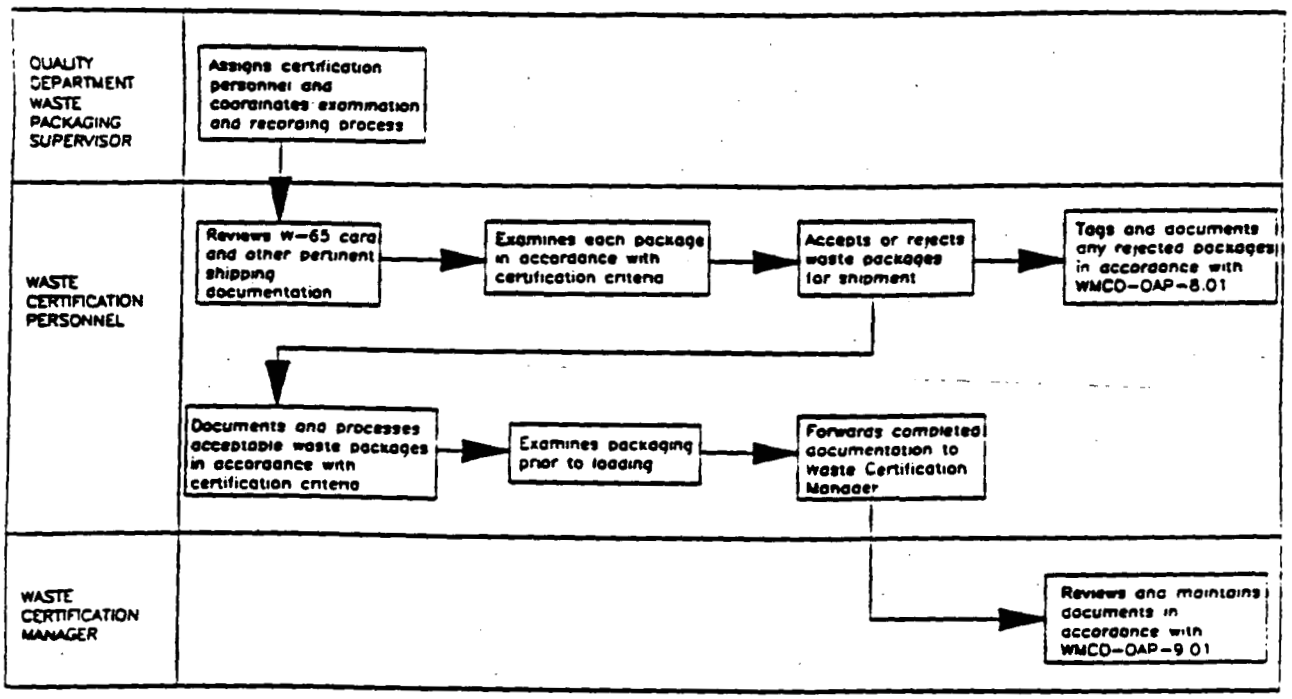
COMPLETE REWRITE

1.0 SCOPE

This procedure outlines the method for the certification of waste materials at the Feed Materials Production Center (FMPC) (for additional abbreviations, acronyms, and definitions refer to WMCO-QAP-1.05) prior to offsite shipment, and is applicable to Low-Level Radioactive Waste (L-LRW) only.



2.0 PROCEDURE

2.1 Industrial Health and Safety Requirements

2.1.1 Leather palm gloves shall be worn by when handling sharp-edged or abrasive materials, containers, lids, and banding materials.

2.1.2 Safety glasses shall be worn by all personnel at all times in the process area, except when another type of eye protection equipment is specified.

2.1.3 A half-mask respirator equipped with radionuclide (purple) cartridges as specified by the Radiological Safety (RS) Technician shall be available for each person working with waste material and shall be used at the direction of the RS Technician.

2.1.4 Any circumstances of event which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake RS for evaluation. The involved personnel shall report to Medical Services at the end of their shift or as directed to submit a urine sample and again report at the start of their next shift to submit another urine sample.

2.1.5 Spill incidents involving RCRA materials shall be reported to the Spill Reporting Advisor in Environmental Compliance in accordance with Site Procedure FMPC-503, "FMPC Spill Incident Reporting and Cleanup."

2.2 General Requirements for Packaging L-LRW

2.2.1 All certification personnel verifying packaging and shipment of L-LRW to the Nevada Test Site (NTS) be trained and qualified on this procedure, NVO-325, and the Waste Certification Program Plan in accordance with Quality Assurance Procedure WMCO-QAP-6.11, Qualification of Waste Package Certifiers, or on Quality Assurance Procedure WMCO-QAP-6.12, Qualification of Waste Certification Officials.

2.2.2 Materials prohibited by NVO-325 and listed on the Prohibited Materials List (Attachment A) shall not be packaged for shipment.

2.2.3 Only materials approved by the NTS, Solid Waste Compliance and Waste Management shall be shipped. The Waste Certification Manager is responsible for making this information available to all personnel performing verification and certification work.

2.2.4 Only container designs approved for shipment by the NTS that meet the requirements of NVO-325 shall be used. For the purpose of this procedure only those container types verified as acceptable by the Waste Certification Manager, or another Certification Official, are to be used.

2.2.5 All packaging shall be in strong, tight containers that do not leak under normal transport and handling conditions, and which meet the criteria of Title 49 CFR 173.431 and 173.425.

2.2.6 Marking and labeling shall be in accordance with Title 49 CFR 172, Subparts D & E, as follows:

a. Container Number
b. Shipment Number
c. Gross Weight
d. Radioactive markings
e. Other marking and labeling as required for the packaged material

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2.2.7 Packages certified and held for shipment must be secure and protected from weather and other adverse conditions having the potential to create an unacceptable condition. Covered or enclosed storage, which includes covering with plastic or tarpaulin are appropriate protective measures. If appropriate measures have not been taken, all packages concerned shall be reexamined by Certification personnel and recertified on the basis of the reexamination results.

2.3 Examination of Metal Drums Prior to Filling

Metal drum examination by Certification prior to filling is not a routine requirement, but may be performed on an audit basis as follows:
Physical Inspection - 50% of lot
W-65 Card comparison - 10% of lot
W-65 Card check for completeness and accuracy - 100% of lot
Results of examination shall be documented with an appropriate check list and signed by Certification personnel performing the examination.
Criteria for examination shall include as a minimum:

2.3.1. Except for light rust, drum must be clean and empty.

2.3.2. Examine all surfaces of the drum and lid and reject for any of the following conditions.

a. A breach (a hole, crack, gash, etc.)
b. A dent or bulge which has creased, gouged, or may have otherwise significantly weakened the metal.
c. A dent greater than 1" in depth or extending over 6" in any direction.
d. A significant dent in the bottom rim. A significant dent is one that compromises the integrity of the container.
e. A significant dent in a rolling hoop. Each deficiency is to be evaluated for affect on the integrity of the container.
f. Rust causing exfoliation (scale), sever pitting, or other conditions having a detrimental effect on the serviceability of the waste container. (Small areas of exposed base metal, minor to moderate scratches, and slightly rusted spots are acceptable.)
g. Any deformation or out-of-round condition affecting the integrity of the sealing surface.

2.4 Examination of Metal Drum Filling

The filling of drums with low level radioactive waste materials shall be monitored by Certification personnel. The results of examination shall be documented on the "Waste Certification Examination Report 'Drum Filling'", QAC-881115-5 (Attachment B), and signed by those performing the examination. As a minimum, the examination shall include:

2.4.1 Visual verification that the materials packaged conform in appearance to the materials listed on the waste generator's certification record (currently W-65 card, FMPC-CONT-1945-XX, Attachment C).

2.4.2 If material is a respirable fine, verify that double containment is used in packaging.

2.4.2.1 Plant 8 residues shall be packaged in 48-gallon jug head type lever lock drum, sealed with a sequentially numbered wire seal, and contained in a 55-gallon bolt closure type overpack drum.

2.4.2.2 Other miscellaneous materials may be overpacked with double containment, provided neither container will leak in normal handling and transport.

NOTE: As of the date this procedure is issued, approval has not been received to resume shipment of asbestos to the NTS. Also, there is no assurance that when and if shipment is resumed that asbestos in drums will be acceptable.

2.4.3 Verify that numbered seals are being used to secure inner containers.

2.4.4 Verify that bolt ring closure is used on outer drum, flange is in down position, and lid is secure. (If in doubt, grasp bolt ring with gloved hand and generate movement to determine if ring is loose.)

2.5 Examination of Metal Drums Prior to Loading Trailers For Transfer to Plant 1 (Waste Operations)

Examine packaged drums prior to loading on trailers for transfer to the Plant 1 Area. These drums are to be examined 100% on a best effort basis, and responsibility shall not be waived without the approval of the Quality Department Waste Packaging Supervisor who shall notify Operations and Waste Management supervision of Certification's inability to perform the examination.

2.5.1. Receives the "Item Production/Certification/Identification" card FMPC-CONT-1945-XX (W-65 Card, Attachment C)

2.5.2 The lid shall be properly seated on the drum and held in place by a bolt ring closure. If bolt and flanges are not lower than rest of ring, then ring is positioned upside down.

2.5.3 Examine all surfaces of the drum and lid and reject for any of the following conditions.

a. A breach (a hole, crack, gash, etc.)
b. A dent or bulge which has creased, gouged, or may have otherwise significantly weakened the metal.
c. A dent greater than 1" in depth or extending over 6" in any direction.
d. A significant dent in the bottom rim. A significant dent is one that compromises the integrity of the container.
e. A significant dent in a rolling hoop. Each deficiency is to be evaluated for affect on the integrity of the container.
f. Rust causing exfoliation (scale), sever pitting, or other conditions having a detrimental effect on the serviceability of the waste container. (Small areas of exposed base metal, minor to moderate scratches, and slightly rusted spots are acceptable.)
g. Any deformation or out-of-round condition affecting the integrity of the sealing surface.

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2.5.4 Complete "Waste Certification Examination Report 'Prior to Transfer'", QAC-881115-3 (Attachment D).

2.6 Examination of Wood Boxes Prior to Filling

On an occasional basis, wood boxes will be examined prior to filling to verify compliance. The examination shall be documented on a checklist, and shall include verification of the following:

2.6.1 The box design is approved for shipment to NTS.

2.6.2 The box is not damaged or seriously deteriorated (i.e. rot).

2.6.3 The box is free of holes, splits, or voids between plywood panels and framework.

2.6.4 The box is free of protruding fasteners.

2.6.5 The box is labeled, on opposite sides, with the manufacturer's name and shipping box serial number.

2.6.6 Lids, if in place, fit securely into the top recesses of the box and are free of severe warping, and voids.

2.6.7 Each box has three (four if the large 124 cu. ft. box) 1-1/4" width straps equidistant and horizontally around the perimeter.

2.6.8 Each box has a preformed plastic or 6-mil (0.006") sheet plastic liner. A preformed liner is required if box is to be filled with loose material such as scrap wood, metal, soil, or masonry.

2.6.9 Each box has a minimum of one 50 lb. bag of uncalcined diatomaceous earth (Dicalite) spread evenly in the bottom of the box, or an absorbent pad, covering the liner in the bottom of the box.

2.7 Monitoring of Wood Box Filling Prior to Closure

Wood box filling is to be monitored occasionally to verify compliance. Observance may include the filling process, or may only include observance after filling prior to closure. The results of the monitoring shall be documented on a checklist and shall verify the following:

2.7.1 A prohibited materials list is displayed in the loading area.

2.7.2 Box has a 6 mil (0.006") sheet plastic or a preformed plastic liner. A preformed liner is required if box is to be filled with loose material such as scrap wood, metal, soil, or masonry.

NOTE: A plastic liner is not required if box is being loaded with heavy metal items.

2.7.3 When loading with heavy items, floor seams and one foot up each corner are caulked.

2.7.4 Box contents agrees with documentation on FMPC-CONT-1945-XX (W-65 card, Attachment C).

2.7.5 No prohibited items are being or have been packaged.

NOTE: Depending on the contents, all materials in a filled package may not be visible. The examiner should view as much of the contents as possible by looking into the box from different angles, and making use of inspection equipment such as mirrors, boroscopes, etc. as available.

2.7.6 Verify that visible internal structure of box is undamaged.

2.7.7 Sheets of wet-strength polypropylene/pulp super absorbent fabric have been placed in the bottom of the box or that one 50 lb. bag of uncalcined diatomaceous earth has been added and spread evenly in the bottom of the box.

2.7.8 If the box contains soil, wet-strength polypropylene/pulp super absorbent fabric or one 50 lb. bag of uncalcined diatomaceous earth has been added in alternating layers accounting for moisture level of soil.

2.7.9 Complete "Waste Certification Wood Box Examination Filling," QAC-881206-1 (Attachment E).

2.8 Monitoring Wood Box Closure Activities

Wood box closure activities shall be monitored occasionally to verify compliance. Results of the monitoring shall be documented on a check list and shall verify the following:

2.8.1 Plastic is folded over contents of box.

2.8.2 Form FMPC-CONT-1945-XX, "Item Production/Certification/Identification" card (W-65 Card, Attachment C) is filled out properly.

2.8.3 No moisture is visible on either the inside or the outside of the box.

2.8.4 RTW Silicone Adhesive, or equivalent, has been applied in a continuous bead (1/4 inch minimum) between lid and box.

2.8.5 Box is banded vertically with three 1-1/4 inch metal bands, one band on each end of the box and one in the middle of the box.

2.8.6 Box lid shall be fastened using ten penny nails on 3 inch centers and two sixteen penny galvanized nails on each side panel into two inch by four inch on top panel (8 places) providing proper closure.

2.8.7 Box does not exceed 5000 pounds gross weight.

2.8.8 Check for damage to the box and lid. No holes, cracks, or deterioration (i.e. rot) which would permit leakage or lessen the structural integrity of the box are acceptable.

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2.8.9 Complete "Waste Certification Wood Box Examination Filled Box," QAC-881206-2 (Attachment F).

2.9 Examination of Metal Boxes Prior to Filling

2.9.1 Metal box examination by Certification prior to filling is not required but should be performed on a monitoring basis. Criteria for examination shall include as a minimum:

a. Metal box must be a light color, usually white for Uranium contaminated rubble, gray for Thorium contaminated rubble.
b. Containers must be clean and empty.
c. Each container shall be well constructed of steel with all seams adequately welded.
d. The containers shall be free of holes, severe gouges, and significant deformations causing structural weakness or improper sealing.
e. The containers shall be free of rust causing exfoliation (scale), severe pitting, or other conditions having a detrimental effect on the serviceability of the waste container.

2.9.2 For all box designs having drain plugs, verify that box has been checked for a drain plug, and if found the drain plug has been tightened.

a. A red dot on the lower left hand front of the box shall indicate that the plug has been tightened.
b. A black dot on the lower left hand front of the box shall indicate that there is no drain plug.
c. All metal boxes shall have either a red or black dot marked.

2.10 Examination of Metal Boxes at Closure After Filling

2.10.1 Metal box must be a light color, usually white for Uranium contaminated rubble, gray for Thorium contaminated rubble.

2.10.2 Containers must be clean.

2.10.3 Each container shall be well constructed of steel with all seams adequately welded.

2.10.4 The containers shall be free of holes, severe gouges, and significant deformations causing structural weakness or improper sealing.

2.10.5 The containers shall be free of rust causing exfoliation (scale), severe pitting, or other conditions having a detrimental effect on the serviceability of the waste container.

2.10.6 For all box designs having drain plugs, verify that box has been checked for a drain plug, and if found the drain plug has been tightened.

a. A red dot on the lower left hand front of the box shall indicate that the plug has been tightened.
b. A black dot on the lower left hand front of the box shall indicate that there is no drain plug.
c. All metal boxes shall have either a red or black dot marked.

2.10.7 If container has been observed during loading operation ensure that wet-strength polypropylene/pulp super absorbent fabric or uncalcined diatomaceous earth is properly placed in and around the container so that all moisture is absorbed and no free liquid is visible.

2.10.8 If steel boxes are used as overpack containers for previously inspected containers, no further inspection of the contents is required.

2.10.9 Examine container at closure as follows :

a. Verify form FMPC-CONT-1945-XX (W-65 Card, Attachment C) is completed accurately.
b. Verify that Radioactive material markings (2 sides) and FMPC container number markings are present and legible.
c. Verify that all unnecessary marking have been removed or covered.
d. Verify that gross weight does not exceed 6,000 pounds.
e. Verify marked gross weight value is consistent with shipment paperwork.
f. Verify that a foam rubber or similar type gasket is on the sealing surface of the lid, or the lid is sealed with a durable sealant.
g. Verify that lid is properly placed on the box.
h. Verify locking pins required for the container are in place with the locking notches below the straps and fully engaged to full thickness of strap over entire locked surface edge of notch.
i. If bolted retainer ring is on, verify all bolts are securely in place.
j. Verify the lid is secured with two 1-1/4" steel straps.

2.10.10 For boxes filled with construction rubble, complete the "Construction Rubble Examination Metal Boxes" checklist, QAC-881206-3 (Attachment G).

2.11 <u>Examination of Sea/Land Cargo Containers Prior to Filling</u>

2.11.1 Sea/Land container examination by Certification prior to filling is not required but should be performed on a monitoring basis. Criteria for examination shall include as a minimum:

2.11.1.1 Containers must be clean and empty.

2.11.1.2 Each container shall be well constructed of steel with all seams adequately welded.

2.11.1.3 The containers shall be free of holes, severe gouges, and significant deformations causing structural weakness or improper sealing.

2.11.1.4 The containers shall be free of rust causing exfoliation (scale), severe pitting, or other conditions having a detrimental effect on the serviceability of the waste container.

2.11.1.5 Verify a tare weight is marked on the container.

2.11.1.6 Verify that a 1/4" minimum continuous bead of RTW Silicone Adhesive Sealant, or equivalent, has been applied on all seams and corners of the container interior.

2.11.1.7 Verify that the container floors have been lined with wet-strength polypropylene/pulp super absorbent fabric, blotter paper, or uncalcined diatomaceous earth.

2.11.1.8 Verify that the absorbent fabric, blotter paper or uncalcined diatomaceous earth has been covered with a 0.006 mil thick plastic sheet that extends at least 36 inches up each side of the container.

2.11.1.9 Verify that plywood has been placed on the container floor and up to four feet in height on all sides. If container is top loading Sea/Land container, verify that the entire floor and sides are lined with plywood.

2.11.1.10 Verify that all container outside markings not related to the load have been removed.

2.11.1.11 Verify that a prohibited materials list has been attached to the container in a visible location.

2.11.1.12 After the container has been filled, verify that the back ledge of the container is clean.

2.11.1.13 Verify that the lid/door opening has been lined with 0.006 mil thick plastic or similar material to a height of 18 inches.

2.11.1.14 Verify that the load inside the container has been secured with plywood and 2" X 4" wood, or other similar type materials.

2.11.1.15 Verify that all doors and around all sealing surfaces have been caulked with RTW Silicone Adhesive Sealant, or the equivalent.

2.12 <u>Examination of Sea/Land Cargo Containers at Closure After Filling</u>

2.12.1 Each container shall be well constructed of steel with all seams adequately welded.

2.12.2 The containers shall be free of holes, severe gouges, and significant deformations causing structural weakness or improper sealing.

2.12.3 The containers shall be free of rust causing exfoliation (scale), severe pitting, or other conditions having a detrimental effect on the serviceability of the waste container.

2.12.4 If Sea/Land container has been observed during loading operation ensure that wet-strength polypropylene/pulp super absorbent fabric or uncalcined diatomaceous earth is properly placed in and around the container so that all moisture is absorbed and no free liquid is visible.

2.12.5 Examine Sea/Land containers at closure as follows :

a. Verify form FMPC-CONT-1945-XX (W-65 card, Attachment C) is completed accurately.
b. Verify that all unnecessary marking have been removed or covered.
c. Verify that caulking is around all doors and around all sealing surfaces, and that the metal doors are securely closed, and two metal bands secure the two door latches together.
d. If Sea/Land container is top loading, verify that a foam rubber or similar type gasket is on the sealing surface of the lid, or the lid is sealed with a durable sealant.
e. Verify that a prohibited materials list has been attached to the container in a visible location.

2.13 <u>Examination of Baled Trash</u>

2.13.1 Examine baled trash as follows:

a. Each bale shall have minimum of six (6) bands or straps for binding.
b. Free liquids are prohibited. Be watchful of liquids in pockets of water in a bags. Condensation in plastic bags is acceptable unless excessive.
c. Prohibited materials are not allowed in accordance with "Prohibited Materials List" (Attachment A).

<u>NOTE</u>: Reject bale if prohibited materials or suspicious items (i.e. asbestos) are present, and mark W-65 card accordingly.

d. "Bale Examination" checklist (Attachment H) is completed.
e. Using a barrel grab lift and turn the bale to check underside.
f. Ensure that form FMPC-CONT-1945-XX (W-65 card, Attachment C) is complete and accurate for each bale.
g. Initial and date the W-65 card after examining the card and bale.

<u>NOTE</u>: If bale is designated wet (to be sent to Plant 1 for drying) initial card but note that bale is wet (unacceptable for shipment). Wet bales will be recertified at Plant 1 prior to packaging for shipment.

h. Make entry in log book at the baler.
i. Enter bale inspection on computer in Waste Packaging Office.

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3.0 REFERENCES

3.1 NVO-325, Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements
3.2 FMPC-503, FMPC Spill Incident Reporting and Cleanup
3.3 FMPC-704, Minor Event Reporting System
3.4 WMCO-QAP-1.05, Abbreviations, Acronyms, and Definitions
3.5 WMCO-QAP-8.01, Deviation and Corrective Action Reporting
3.6 WMCO-QAP-9.01, Designation, Preparation, Storage and Maintenance of Quality Documents
3.7 WMCO-QAP-12.12, Certification of Loading and Shipment of Low-Level Radioactive Waste

4.0 ATTACHMENTS

4.1 Attachment A - Prohibited Materials List
4.2 Attachment B - Waste Certification Examination Report, "Drum Filling"
4.3 Attachment C - Item Production/Certification/Identification Card
4.4 Attachment D - Waste Certification Examination Report, "Prior to Transfer"
4.5 Attachment E - Waste Certification Wood Box Examination Filling
4.6 Attachment F - Waste Certification Wood Box Examination Filled Box
4.7 Attachment G - Construction Rubble Examination Metal Boxes
4.8 Attachment H - Bale Examination

PROHIBITED MATERIALS

Nonradioactive Material

Pressurized Vessels

Explosives

Radioactive Gases

High-Level Waste

Pyrophoric Materials

Toxic or Poisonous Materials

Liquid Metals

Flammable Substances

Alkaline Metals

Reactive Materials (could cause fire)

Liquid Organic Waste or Waste that contains any free liquid

Ashes, Dry Powders or Respirable Fines (unless immobilized or a double containment package is used)

If the Waste is Ionized or Immobilized the pH must be greater than 4

Attachment B
Page 1 of 1

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WASTE CERTIFICATION EXAMINATION REPORT
"DRUM FILLING"

WASTE CERTIFICATION
EXAMINATION REPORT
"DRUM FILLING"

DATE: _____ LOCATION: _____

CERTIFICATION SPECIALIST MATERIAL: _____

_____

LOT NO.: _____

DRUM #	INSIDE DRUM	OUTSIDE DRUM	NO LIQUIDS	I.S. LID	MTL. OK	SEAL OK .	W-65 COMP.	INITIAL ALL OK

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Attachment C
Page 1 of 1

ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION CARD

CARD XX ITEM PRODUCTION/CERTIFICATION/IDENTIFICATION 129702

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

SEAL NUMBER	SEAL DATE MONTH	DAY	YEAR

WASTE DESCRIPTION AND COMMENTS

PACKAGE TYPE

PACKAGE SIZE

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

PLANT	PROD. MBA

PLANT TO	MBA TO

GROSS WEIGHT

TARE WEIGHT

NET WEIGHT

GENERATOR SIGNATURE

SUPERVISOR SIGNATURE DATE

FMPC-CONT-1946-XX (REV. 12/19/88)

U.S. GPO: 1990-749-781

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Attachment D
Page 1 of 1

WASTE CERTIFICATION EXAMINATION REPORT "PRIOR TO TRANSFER"

WASTE CERTIFICATION
EXAMINATION REPORT
"PRIOR TO TRANSFER"

(Rev. 8/31/88)

DATE:_____ LOCATION:_____

CERTIFICATION SPECIALIST MATERIAL:_____

_____

LOT NO.:_____

DRUM #	O.S. DRUM	O.S. LID	BOLT	RING	DRUM I.D.	WTS. OK .	W-65 (10%)	ALL OK

Deviations Noted: Yes_____ No_____

Deviation Corrective Action Completed :

Production Supervisor: _____ Date:_____

Waste Certification Specialist:_____ Date:_____

QAC-881115-3, Rev. 1 (08/31/89)

Attachment E
Page 1 of 1

WASTE CERTIFICATION WOOD BOX EXAMINATION FILLING

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WASTE CERTIFICATION
WOOD BOX EXAMINATION
FILLING

INFORMATION

MIL. TYPE: _____ BOX S/N(): _____

REQUESTOR: _____ LOCATION : _____

EXAMINATION (Waste Certification)

DATE CHECKED	STATUS	INITIALS

CERTIFICATION (Waste Certification)

Deviation Reportable: YES_____ NO_____

Nonconformance Record Number:_____

Date Deviation Corrected:_____

I hereby certify the above woodbox has been examined to the best of my knowledge, as defined by the above criteria, requirements of this procedure, & SOP 20-C-601.

Signed:_____
(Waste Certification)

Date: _____

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WASTE CERTIFICATION WOOD BOX EXAMINATION
FILLED BOX

WASTE CERTIFICATION
WOOD BOX EXAMINATION
FILLED BOX

INFORMATION

MIL. TYPE: _____ BOX S/N(): _____

GENERATOR: _____ LOCATION : _____

EXAMINATION

	INITIALS
1. Check for damage to the box and lid. Verify no holes, cracks or defects which would permit leakage or lessen the structural integrity of the box.	_____
2. Verify clarity of shipment number and container number.	_____
3. Verify Gross Weight is marked on each box.	_____
4. Verify three metal bands are secure and located vertically with one in the center of the box and the remaining two equidistant from the center, one on each side, or verify that large boxes are secured with four evenly spaced bands.	_____
5. Verify no standing water on the box.	_____
6. Verify W-65 card information matches information marked on box.	_____
7. Verify the existence of the Low Specific Activity (LSA), Reportable Quantity (RQ), label identification, as applicable.	_____
8. Verify the existence of durable sealant compound between the lid and the box.	_____
9. Verify the existence of nails, attaching the lid to the box.	_____

CERTIFICATION (Waste Certification)

Deviation Reportable: YES_____ NO_____

Nonconformance Record Number:_____

Date Deviation Corrected:_____

I hereby certify the above woodbox has been examined to the best of my knowledge, as defined by the above criteria, requirements of this procedure, & SOP 20-C-601.

Signed:_____
(Waste Certification)

Date: _____

CONSTRUCTION RUBBLE EXAMINATION METAL BOXES

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CONSTRUCTION RUBBLE EXAMINATION METAL BOXES

RECORD :
Container S/N : _____ Date : _____

PRIOR TO LOADING:

1. Verify that the container has no holes, tears or creases. _____
2. Verify drain plug is installed, if applicable _____
3. Verify the container lid is not damaged (including the gasket). _____
4. Verify that one bag of Uncalcined diatomaceous earth or absorbent pad is placed on top of soil. _____
5. Only correct materials are placed in container. _____
6. No free liquids are visible in the container. _____
7. Verify only unsaturated wood is used as topping-off material. _____
8. Verify gross weight of container does not exceed 6000 lbs. _____
9. Verify caulking/gasket, banding (2) and pins are all in place. _____
10. Verify the data record (W-65) is filled out correctly. _____

Note : Any deviations from the checklist will require a deviation report to be issued and a Nonconformance tag placed on the container. The deviation must be resolved prior to removal of the Nonconformance tag.

Deviation Noted: Yes_____ NO_____

I hereby certify that the above checklist has been completed and witness that the above items are correct to the best of my knowledge.

Signed : _____ Date : _____
(Waste Certification)

QAC-881206-3, Rev. 1 (12/08/88)

BALE EXAMINATION

4228

BALE EXAMINATION

BALE NUMBER_____ DATE_____

EXAMINATION:

1. Verify correct materials are placed in bale where visible. _____

2. No visual evidence of free liquids or seepage from bale, nor is material in bale saturated to the extent that seepage could be expected during bundling, handling and transport. _____

3. Verify the data record (W-65) is filled out correctly. _____

NOTE: Any deviations from the checklist will require a deviation report to be issued and a Nonconformance tag placed on the container. The deviation must be resolved prior to removal of the Nonconformance tag.

Deviation Noted: Yes_____ No_____

I hereby certify that the above checklist has been completed and witness that the above items are correct to the best of my knowledge.

Signed:_____ Date:_____
(Waste Certification)

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UNCONTROLLED COPY

WESTINGHOUSE MATERIALS COMPANY OF OHIO - FMPC		DOCUMENT NUMBER: WMCO-QAP-12.12
QUALITY ASSURANCE PROCEDURE	SUBJECT: CERTIFICATION OF LOADING AND SHIPMENT OF LOW-LEVEL RADIOACTIVE WASTE	REVISION: 2 Page 1 of 40
	AUTHORIZED: (Vice President, Quality)	Effective Date: 09/11/90

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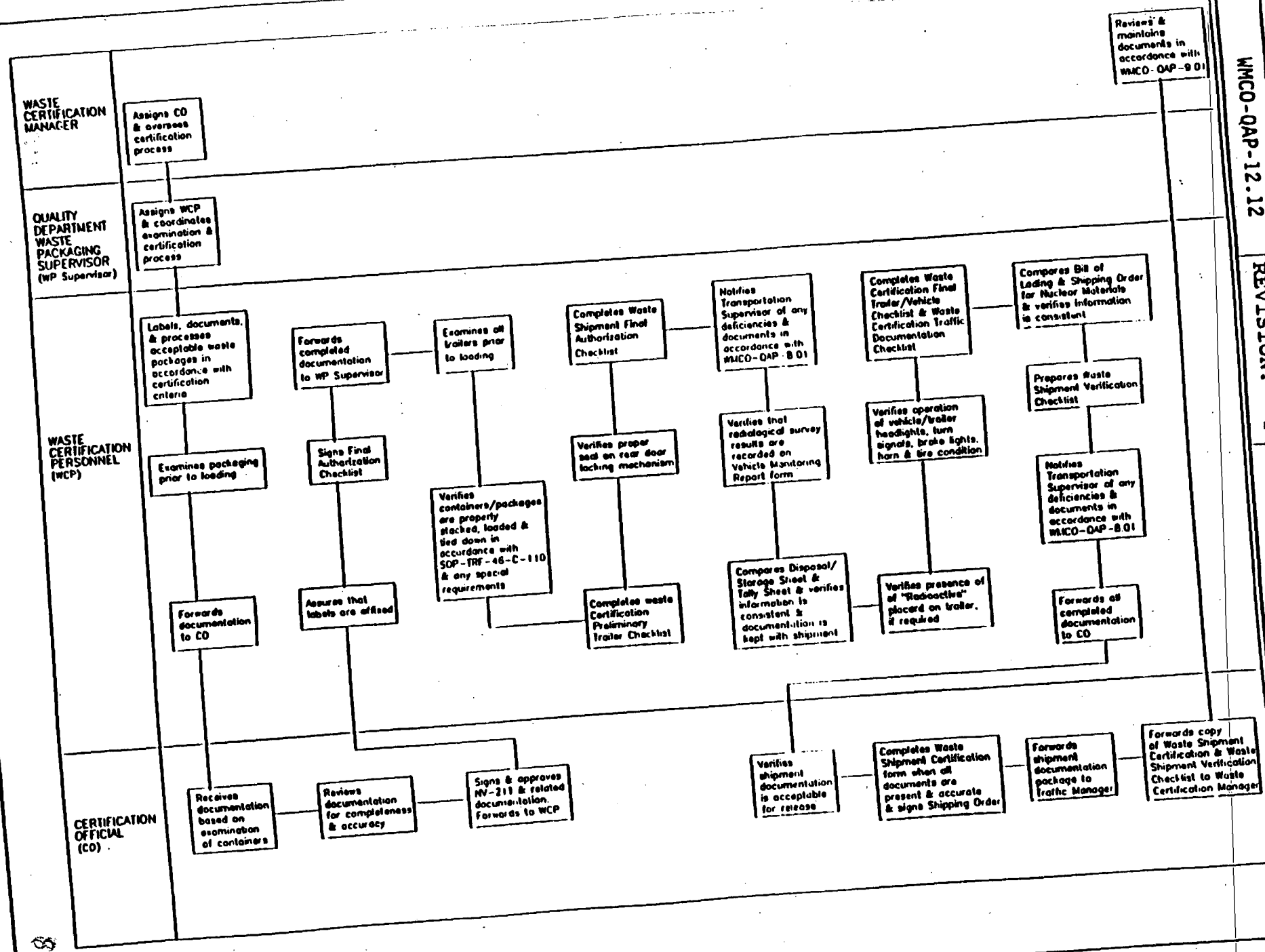
COMPLETE REWRITE

1.0 SCOPE

This procedure establishes a detailed method for the certification of Low-Level Radioactive Waste (L-LRW) packages (for additional abbreviations, acronyms, and definitions refer to WMCO-QAP-1.05), the loading of L-LRW materials and the examination of highway transport vehicles for exclusive use shipments only at the Feed Materials Production Center (FMPC) to ensure compliance with applicable federal regulations.


WASTE CERTIFICATION MANAGER
QUALITY DEPARTMENT WASTE PACKAGING SUPERVISOR (WP Supervisor)
WASTE CERTIFICATION PERSONNEL (WCP)
CERTIFICATION OFFICIAL (CO)
Assigns CO & oversees certification process
Assigns WCP & coordinates examination & certification process
Labels, documents, & processes acceptable waste packages in accordance with certification criteria
Examines packaging prior to loading
Forwards documentation to CO
Forwards completed documentation to WP Supervisor
Signs Final Authorization Checklist
Assures that labels are affixed
Examines all trailers prior to loading
Verifies containers/packages are properly stacked, loaded & tied down in accordance with SOP-TRF-46-C-110 & any special requirements
Completes Waste Shipment Final Authorization Checklist
Verifies proper seal on rear door locking mechanism
Completes waste Certification Preliminary Trailer Checklist
Notifies Transportation Supervisor of any deficiencies & documents in accordance with WMCO-QAP-8.01
Verifies that radiological survey results are recorded on Vehicle Monitoring Report form
Compares Disposal/ Storage Sheet & Tally Sheet & verifies information is consistent & documentation is kept with shipment
Completes Waste Certification Final Trailer/Vehicle Checklist & Waste Certification Traffic Documentation Checklist
Verifies operation of vehicle/trailer headlights, turn signals, brake lights, horn & tire condition
Verifies presence of of "Radioactive" placard on trailer, if required
Compares Bill of Lading & Shipping Order for Nuclear Materials & verifies information is consistent
Prepares Waste Shipment Verification Checklist
Notifies Transportation Supervisor of any deficiencies & documents in accordance with WMCO-QAP-8.01
Forwards all completed documentation to CO
Reviews & maintains documents in accordance with WMCO-QAP-9.01
Receives documentation based on examination of containers
Reviews documentation for completeness & accuracy
Signs & approves NV-211 & related documentation. Forwards to WCP
Verifies shipment documentation is acceptable for release
Completes Waste Shipment Certification form when all documents are present & accurate & signs Shipping Order
Forwards shipment documentation package to Traffic Manager
Forwards copy of Waste Shipment Certification & Waste Shipment Verification Checklist to Waste Certification Manager

2.0 PROCEDURE

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2.1 Event Notification and Reporting Requirements

2.1.1 All unplanned or unwanted events or incidents shall be immediately reported to supervision. In the supervisor's absence the Assistant Emergency Duty Officer (AEDO) shall be notified for proper notification and reporting in accordance with topical manual, FMPC-2182, "Emergency and Non-Routine Event Notification and Reporting."

2.1.2 Supervision shall evaluate all unplanned or unwanted events or incidents for determination of reportability as a Minor Event in accordance with site procedure, FMPC-704, Minor Event Reporting System.

2.1.3 Any circumstance of event which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to supervision. The supervisor shall immediately report the circumstance of possible radioactive materials intake to Radiological Safety (RS) for evaluation.

2.2 Industrial Health and Safety Requirements

2.2.1 Leather palm gloves shall be worn when handling sharp-edged or abrasive materials, containers, lids and banding materials.

2.2.2 Safety glasses shall be worn by all personnel at all times posted areas, except when another type of eye protection equipment is specified.

2.2.3 Supervisors shall be responsible for contacting Industrial Hygiene for chemical air contaminants, or RS for radioactive contaminants, to determine appropriate respiratory protection. Determination of requirements shall be made in accordance with topical manual, FMPC-2128, Industrial Hygiene and Safety Manual.

2.2.4 Respirators, as determined required per 2.2.3, shall be available by supervision for each person working with waste material and shall be used in accordance with topical manual, FMPC-2084, Radiation Control Manual.

2.2.5 Any personnel involved with circumstances of an event which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall report to Medical Services to submit a urine sample at the end of their shift, or as directed by their supervision, and again at the start of their next shift.

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2.3 General Requirements For Transporting L-LRW and LSA Waste

NOTE: WMCO-QAP-12.09 must be completed prior to implementation of this procedure.

2.3.1 All certification personnel verifying packaging and shipment of L-LRW to the Nevada Test Site (NTS) shall be trained and qualified on this procedure, WMCO-QAP-12.09, NVO-325, and the Waste Certification Program Plan in accordance with Quality Assurance Procedure WMCO-QAP-6.11, Qualification of Waste Package Certifiers, or on Quality Assurance Procedure WMCO-QAP-6.12, Qualification of Waste Certification Officials.

2.3.2 Materials prohibited by NVO-325 and/or listed on the "Prohibited Materials List" (Attachment A) shall not be packaged for shipment.

2.3.3 Only materials approved by NTS, Solid Waste Compliance and Waste Management shall be shipped. The Quality Department Waste Certification Manager is responsible for making this information available to all personnel performing verification and certification work.

2.3.4 Only container designs approved for shipment by the NTS that meet the requirements of NVO-325 and CFR 49 shall be used. For the purpose of this procedure only those container types verified as acceptable by the Waste Certification Manager, or another Certification Official, are to be used.

2.3.5 All packaging shall be in strong, tight containers that do not leak under normal transport and handling conditions, and which meet the criteria of Title 49 CFR 173.421 and 173.425.

2.3.6 White Metal box containers may not exceed 6000 lbs. maximum gross weight, wood box containers may not exceed 5000 lbs., 48 or 55 gallon drums may not exceed 1200 lbs. maximum gross weight, 85 gallon drums may not exceed 1000 lbs. maximum gross weight, 85 gallon overpacks may not exceed 1280 lbs. maximum gross weight, or as specified in WMCO-QAP-12.09.

2.3.7 Marking and labeling shall be in accordance with Title 49 CFR 172, Subparts D & E, as follows:

a. Container Number
b. Shipment Number
c. Gross Weight
d. Radioactive markings
e. Other marking and labeling as required for the packaged material

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2.3.8 Packages certified and held for shipment must be secure and protected from weather and other adverse conditions having the potential to create an unacceptable condition. Covered or enclosed storage, which includes covering with plastic or tarpaulin are appropriate protective measures. If appropriate measures have not been taken, all packages concerned shall be reexamined by Waste Certification Personnel and recertified on the basis of the reexamination results.

2.3.9 Beta/Gamma radiation levels shall not exceed 200 millirem/hour measured externally at the surface or 10 millirem/hour measured externally at one (1) meter in accordance with 49 CFR 173.441.

Alpha emitters	220 DPM/100 cm^2
Beta/Gamma emitters	2200 DPM/100 cm^2

2.3.10 No container leakage is permitted under normal transport conditions in accordance with 49 CFR 173.425.

2.4 Examination of Packages in Staging Area

This examination will be performed at the loading area by Waste Certification Personnel who have been properly trained in this procedure and NVO-325 prior to loading any packages into trailers for shipment to NTS. Results shall be documented on "Waste Shipment Final Authorization Checklist" (Attachment B).

2.4.1 Examination of Drums Prior to Loading

Examines sealed drums prior to loading on trailers for shipment to NTS. These drums are to be examined 100% by Waste Certification Personnel.

2.4.1.1 The lid shall be properly seated on the drum and held in place by a bolt ring closure. If bolt and flanges are not lower than rest of ring, then ring is positioned upside down.

2.4.1.2 Checks for red paint on ring bolt to indicate it has been tightened to 45 (± 5) ft-lbs. using torque wrench (Attachment B).

2.4.1.3 Checks for safety wire threaded through hole in with the bolt head or threaded portion of bolt and around threaded portion of bolt ring and fastened (Attachment C). Check that jam nut is locked to opposite side of bolt head or threaded with flat side against ring harness.

2.4.1.4 Examines all surfaces of the drum and lid and reject for any of the following conditions.

a. A breach (a hole, crack, gash, etc.)
b. A dent or bulge which has creased, gouged, or may have otherwise significantly weakened the metal.

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c. A dent greater than 1" in depth or extending over 6" in any direction.
d. A significant dent in the bottom rim. A significant dent is one that compromises the integrity of the container.
e. A significant dent in a rolling hoop which may affect the integrity of the container.
f. Rust causing exfoliation (scale), severe pitting, or other conditions having a detrimental effect on the serviceability of the waste container (small areas of exposed base metal, minor to moderate scratches, and slightly rusted spots are acceptable).
g. Any deformation or out-of-round condition affecting the integrity of the sealing surface.

2.4.1.5 Checks exterior of container for exposed bare metal requiring touch-up painting.

2.4.1.6 Checks exterior of drums for moisture.

2.4.1.7 Checks that the gross weight does not exceed 1200 lbs. and that it is marked in two inch (minimum) letters on each drum.

2.4.1.8 Checks labels and markings against "Storage & Disposal Data Sheet" (Attachment D), "Tally Sheet" (Attachment E) , and computer printout (Attachment F) "Circle Copy" for the particular shipment for weight and labels accuracy.

2.4.1.9 Notify Waste Operations Supervisor of any nonconformance found and checks that they are corrected prior to loading.

2.4.1.10 Apply "NV-211 Packaging Certification Label" to each package upon satisfactory examination (Attachment G).

2.4.2 <u>Examination of Wood Boxes Prior to Loading</u>

Examines wood boxes at the loading area prior to loading on trailers for shipment to NTS. These boxes are to be examined 100% by Waste Certification Personnel. Results shall be documented on "Waste Shipment Final Authorization Checklist" (Attachment B).

2.4.2.1 Checks for damage to the box and lid. No holes, cracks, or deterioration (i.e. rot) which would permit leakage or lessen the structural integrity of the box are acceptable.

2.4.2.2 No moisture is visible on either the inside or the outside of the box.

2.4.2.3 RTW Silicone Adhesive, or equivalent, has been applied in a continuous bead (1/4 inch minimum) between lid and box.

2.4.2.4 Box is banded vertically with three 1-1/4 inch metal bands, one band on each end of the box and one in the middle of the box.

2.4.2.5 Box lid shall be fastened using ten penny nails on 3 inch centers and two sixteen penny galvanized nails on each side panel into two inch by four inch on top panel (8 places) providing proper closure.

2.4.2.6 Box does not exceed 5000 pounds gross weight and that it is marked in two inch (minimum) letters on each box.

2.4.2.7 Checks labels and markings against "Storage & Disposal Data Sheet" (Attachment D), "Tally Sheet" (Attachment E), and computer printout (Attachment F) "Circle Copy" for the particular shipment for weight and labels accuracy.

2.4.2.8 Notifies Waste Operations Supervisor of any nonconformance found and checks that they are corrected prior to loading.

2.4.2.9 Apply "NV-211 Packaging Certification Label" to each package upon satisfactory examination (Attachment G).

2.4.3 Examination of Metal Boxes Prior to Loading

Examines metal boxes at the loading area prior to loading on trailers for shipment to NTS. These boxes are to be examined 100% by Waste Certification Personnel. Results shall be documented on "Waste Shipment Final Authorization Checklist" (Attachment B).

2.4.3.1 Metal box must be a light color, usually white for Uranium contaminated rubble, gray for Thorium contaminated rubble.

2.4.3.2 Containers must be clean.

2.4.3.3 Each container shall be well constructed of steel with all seams adequately welded.

2.4.3.4 The containers shall be free of holes, severe gouges, and significant deformations causing structural weakness or improper sealing.

2.4.3.5 The containers shall be free of rust causing exfoliation (scale), severe pitting, or other conditions having a detrimental effect on the serviceability of the waste container.

2.4.3.6 For all box designs having drain plugs, verify that box has been checked for a drain plug, and if found the drain plug has been tightened.

a. A red dot on the lower left hand front of the box shall indicate that the plug has been tightened.
b. A black dot on the lower left hand front of the box shall indicate that there is no drain plug.
c. All metal boxes shall have either a red or black dot marked.

2.4.3.7 Examines container for proper closure as follows :

a. Verifies that Radioactive material markings (2 sides) and FMPC container number markings are present and legible. Shipment number, log number and container identification number shall be clearly marked in one inch (minimum) letters using black waterproof ink.
b. Verify that all unnecessary marking have been removed or covered.
c. Verify that gross weight does not exceed 6,000 pounds and that it is marked in two inch (minimum) letters on each box.
d. Verify that a foam rubber or similar type gasket is on the sealing surface of the lid, or the lid is sealed with a durable sealant.
e. Verifies that lid is properly placed on the box.
f. Verifies locking pins required for the container are in place with the locking notches below the straps and fully engaged to full thickness of strap over entire locked surface edge of notch.
g. If the bolt type utilizes a bolted retainer ring, verify all bolts are securely in place.
h. Verifies the lid is secured with two 1-1/4" steel straps.

2.4.3.8 Checks labels and markings against "Storage & Disposal Data Sheet" (Attachment D), "Tally Sheet" (Attachment E), and computer printout (Attachment F) "Circle Copy" for the particular shipment for weight and labels accuracy.

2.4.3.9 Checks exterior of container for exposed bare metal requiring touch-up painting.

2.4.3.10 Notifies Waste Operations Supervisor of any nonconformance found and checks that they are corrected prior to loading.

2.4.3.11 Applies "NV-211 Packaging Certification Label" to each package upon satisfactory examination (Attachment G).

2.4.4 <u>Examination of Sea/Land Cargo Containers Prior to Loading</u>

Examines sea/land containers at the loading area prior to loading on trailers for shipment to NTS. These containers are to be examined 100% by Waste Certification Personnel. Results shall be documented on "Ready to Ship" Checklist (Attachment H).

2.4.4.1 Each container shall be well constructed of steel with all seams adequately welded.

2.4.4.2 The containers shall be free of holes, severe gouges, and significant deformations causing structural weakness or improper sealing.

2.4.4.3 The containers shall be free of rust causing exfoliation (scale), severe pitting, or other conditions having a detrimental effect on the serviceability of the waste container.

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2.4.4.4 Verifies that the exterior of the sea/land is in good condition.

a. Verifies that all unnecessary markings have been removed or covered.
b. Verifies that caulking is around all doors and around all sealing surfaces, and that the metal doors are securely closed, and two metal bands secure the two door latches together.
c. Verifies gross weight of sea/land and that it is marked in two inch (minimum) letters on each sea/land.
d. Verifies that Radioactive material markings (2 sides) and FMPC container number markings are present and legible. Shipment number, log number and container identification number shall be clearly marked in one inch (minimum) letters using black waterproof ink.
e. If Sea/Land container is top loading, verifies that a foam rubber or similar type gasket is on the sealing surface of the lid, or the lid is sealed with a durable sealant.
f. Verifies that the sea/land container has been painted.

2.4.4.5 Checks labels and markings against "Storage & Disposal Data Sheet" (Attachment D), "Tally Sheet" (Attachment E), and computer printout (Attachment F) "Circle Copy" for the particular shipment for weight and labels accuracy.

2.4.4.6 Apply "NV-211 Packaging Certification Label" to each package upon satisfactory examination. (Attachment G)

2.4.5 Examination of Bales Prior to Loading

Examines bales at the loading area prior to loading on trailers for shipment to NTS. Bales are to be examined 100% by Waste Certification Personnel. Results shall be documented on "Waste Shipment Final Authorization Checklist" (Attachment B).

2.4.5.1 Verifies that each bundle of trash is properly constructed:

a. Consists of two bales of trash covered with Flex-Iron Bulk Bags or equivalent.
b. Each bag covered bale is mounted on a wood pallet.
c. Two of these subparts are stacked one on top of each other and a third wood pallet is positioned on top.
d. Two 1-1/4 inch straps of banding are wrapped around to secure the bundle and tightened with banding clips.
e. Cardboard strips are positioned to keep the metal banding strips from cutting into the bales.
f. Checks baled trash package for holes, tears, water leaks, and defects.

2.4.5.2 Verifies the top wood pallet is labeled with the shipment number and bundle number in one inch letters.

2.4.5.3 Verifies that markings are legible and waterproof ink has been used.

2.4.5.4 Verifies that the gross weight is marked on the top wood pallet

2.4.5.5 Checks labels and markings against "Storage & Disposal Data Sheet" (Attachment D), "Tally Sheet" (Attachment E), and computer printout (Attachment F) "Circle Copy" for the particular shipment for weight and labels accuracy.

2.4.5.6 Notifies Waste Operations Supervisor of any nonconformance found and Checks that they are corrected prior to loading.

2.4.5.7 Applies "NV-211 Packaging Certification Label" to each package upon satisfactory examination (Attachment G).

2.5 Examination of Package Markings and Labels

Immediately prior to transport loading, Waste Certification Personnel verify that the required markings and labels are applied to containers and grouped together. Marking and labeling in accordance with Title 49 CFR 172 Subparts D & E, is required as follows:

a. Each acceptable package shall have a "Radioactive LSA" label as required, form FMPC-T-1623 (Attachment I), if the surface dose rate exceeds 0.5 mR/hr. or the U-235 content exceeds 15 grams.
b. Each acceptable package shall have a "RADIOACTIVE-LIMITED QUANTITY" Label, FMPC-REST-1623-1 (Attachment I) if the surface does rate is equal to or less than 0.5 mR/hr. and the U-235 content is less than or equal to 15 grams.
c. Each package which contains 0.1 Curries or greater of Uranium must be labeled "RQ" in conjunction with the requirements of sections 2.5.a. and 2.5.b. (Attachment I).
d. Each acceptable package will have the letters "WML" and the shipment number on the package exterior. This may be either stenciling in one inch block or legible letters using black waterproof ink on bar code label.
e. Each acceptable package shall have a separate package number on the exterior. This may be either stenciling in one inch block or legible letters using black waterproof ink on bar code label.
f. Each acceptable package shall have the gross weight marked on the exterior. This may be either stenciling in two inch block or legible letters on bar code label.
g. Each package certified as acceptable for NTS disposal shall have a required "NV-211 Packaging Certification Label," FMPC-Q&S-234 or FMPC-Q&S-234-1 (Attachment G), affixed after examination of the package and shortly before or during loading. The label shall be displayed on the side of the package in a group pattern with other labels and markings.

2.6 Documentation of Examination and Deviations

Immediately prior to transport loading, Waste Certification Personnel assure that all examinations are properly documented on the applicable checklist, as required; assures that nonconforming conditions are documented and processed as follows:

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2.6.1 Any deviations observed should be documented on the appropriate checklist.

2.6.2 Any waste package rejected due to non-acceptable or non-authorized contents or physical damage to the containers shall have a nonconformance tag attached to it as identification (See WMCO-QAP-8.01). Deviations shall be corrected prior to affixing "NV-211 Packaging Certification Label." Uncorrectable deviations or lack of prompt or appropriate action, or chronic and/or systematic errors must be documented on a Deviation and Corrective Action Report (DCAR) in accordance with WMCO-QAP-8.01.

2.6.3 Any waste packages rejected due to improper labeling or identification shall be corrected prior to affixing a "NV-211 Packaging Certification Label." If no acceptable solution can be defined, a nonconformance tag shall be attached and a DCAR shall be issued in accordance with WMCO-QAP-8.01.

2.6.4 Forwards appropriate forms and documentation to Certification Official for review, approval, and certification.

NOTE: Disposal of any rejected containers, lids, bolt rings, or lever rings shall be the responsibility of Waste Operations or the generator of the package.

2.7 Preliminary Certification

Waste Certification Personnel examine the transport trailer prior to loading and completes the appropriate checklist.

2.7.1 Examines the transport trailer/vehicle as follows:

2.7.1.1 Verifies that the RS Technician has surveyed each trailer/vehicle prior to loading and has recorded results on the "Vehicle Radiation Monitoring Report," form FMPC-ES&H-1596-1 (Attachment J), to ensure that radiation and contamination levels do not exceed the requirements listed in 49 CFR 173.441.

2.7.1.2 Determines the condition of the trailer/vehicle by examining the trailer/vehicle floor, interior, roof, roof interior, rear door, rear door gasket, and tires. Any of the following conditions shall be brought to the attention of the Traffic Manager:

a. holes or "soft" areas in floor or roof which would allow possible leakage and/or jeopardize the structural integrity of the trailer/vehicle
b. liquid or oily substances on interior surfaces
c. non-securing or poor sealing rear doors
d. tires
   1. insufficient tread (2/32" min. trailer, 4/32" min. tractor)
   2. separation of tread
   3. punctures
   4. bulges
   5. underinflated (use manufacturer's recommended pressure, cold)
   6. flats

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2.7.1.3 Examines the lining of trailer/vehicle for compacted baled trash and verifies that the floor and approximately three (3) feet up the side and rear walls are covered with plastic sheet, and that the floor is covered with single-faced cardboard or approved equivalent.

2.7.1.4 Completes the "Waste Certification Preliminary Trailer Checklist" (Attachment K) or the "Waste Certification Preliminary Trailer Checklist (Sea/Lands)" (Attachment L).

2.8 Examination of Drums

Waste Certification Personnel examine drums at loading and verifies that drums have been properly stacked, loaded and tied down in accordance with SOP-TRF-46-C-110 and that the following requirements have been met:

2.8.1 Drummed materials requiring proper weight distribution have been placed into the vehicle split into two groups:

a. the front unit is encircled with 1-1/4" steel strapping, connected with two clips, double-crimped, and 2 x 4 wood shoring nailed to the floor behind the unit.
b. the rear unit is placed so as the proper weight distribution is maintained and a wood picket brace is constructed at the front of the group. Drums behind the picket brace are encircled with 1-1/4" steel strapping connected with two clips, double-crimped, and providing no metal plate is directly behind the group, 2 x 4 wood shoring is nailed to the floor behind the group.

2.8.2 Double-decked drummed material has been loaded in a similar manner as paragraph 2.8.1, except for the following:

a. the floor is loaded solid,
b. a piece of plywood has been placed on the top of the first deck and the second deck of drums has been loaded from the front to the rear. Both rows of drums have been encircled with 1-1/4" steel strapping, with two clips, double-crimped,
c. two-by-four wood shoring has been nailed to the floor behind the first deck of drums, if no metal plate is directly behind the drums.

2.9 Examination of Metal Boxes

Waste Certification Personnel examine metal boxes at trailer loading and verifies they are not damaged, that metal boxes have been loaded and tied down in accordance with SOP-TRF-46-C-110 and that the following requirements have been met:

2.9.1 Metal Boxes have been placed into the vehicle correctly for proper weight distribution. Normally, these shipments contain either seven (7) to ten (10) containers. With seven (7) containers a split of three (3) in the front unit and four (4) in the rear unit is required. Ten (10) containers are to be loaded straight down the center of the vehicle floor. When the number of containers making up the shipment are not seven (7) or ten (10), they are to be loaded them in the same manner as for seven (7).

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2.9.2 Front Unit (2-5 boxes) has been shored using two sets of brakeman plates nailed to the floor of the vehicle (prior to loading) with 1-1/4" steel strapping threaded through each plate. Two of these units are used to encircle each load unit (2 bands) and shall be tightened and fastened with two clips, double-crimped. The bands have plastic protectors on the edges of the first and last container to keep the bands from breaking.

2.9.3 Rear Unit (2-5 boxes) has been shored using 2" X 4" brace in front of the containers. Use same method of steel banding as on the front unit.

2.9.4 The shoring of ten (10) metal boxes has been accomplished using the same steel banding method as used for seven (7). The first five (5) have been banded as one unit, and the last five (5) as one unit.

2.10 Examination of Wooden Boxes

Waste Certification Personnel examine wooden boxes at loading and verifies they are not damaged and that wooden boxes are properly stacked, loaded and tied down in accordance with SOP-TRF-46-C-110 and that the following requirements have been met:

2.10.1 Wooden boxes have been placed into the vehicle for proper weight distribution. Normally, these shipments consist of sufficient numbers to require partial double-decking. When double-decking is required the double stacks shall be banded together prior to loading.

2.10.2 Two sets of brakeman plates have been nailed to the floor (set on top of the plastic and cardboard) in the front and rear section of the vehicle with 1-1/4" steel strapping threaded through each plate.

2.10.3 Boxes have been loaded straight down the center of the vehicle floor.

2.10.4 Two (2) bands have been used to encircle the first six (6) boxes as one unit and the last five (5) as one unit.

2.11 Examination of Compacted Baled Trash

2.11.1 Waste Certification Personnel examine compacted baled trash at loading and verifies that compacted baled trash has been properly stacked, loaded and tied down in accordance with SOP-TRF-46-C-110 and that the following requirements have been met:

2.11.1.1 Compacted bales of trash placed for proper weight distribution have been double stacked and loaded straight down the center of the vehicle floor. Normally, these shipments consist of twenty-two (22) bales (11 packages) of compacted trash.

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2.11.1.2 Two sets of brakeman plates have been nailed to the floor (set on top of the plastic and cardboard) in the front and rear section of the vehicles with 1-1/4" steel strapping threaded through each plate. Six side cleats with 1-1/4" steel strapping have been nailed to the floor on both sides of the vehicle for cross banding of the bales.

2.11.1.3 After the first five double stacks of bales have been loaded, the front unit has been encircled with steel strapping and the bands tightened and fastened with two clips, double-crimped.

2.11.1.4 Cross bands have been placed over stack numbers one, three, and five. Single-faced cardboard has been folded for a minimum of 4-ply protection and placed under the bands of the top bales plastic enclosure. The bands have been tightened and fastened with two clips double-crimped.

2.11.1.5 The rear section has been banded in the same manner as the front section except that cross bands have been placed over bale numbers seven, nine and ten.

2.12 Examination of Sea/Land Cargo Containers

Waste Certification Personnel examine Sea/Land container at loading, checks the maximum gross weight on container with actual gross weight, and verifies that container has been loaded and tied down in accordance with SOP-TRF-46-C-110 and that the following requirements have been met:

2.12.1 Sea/Land containers have been placed onto a flat bed truck for proper axle-weight distribution. For a shipment consisting of one container, the doors of the container shall be facing the rear of the truck. For a shipment consisting of two containers the doors of the front unit shall be facing to the rear and the rear unit shall be facing the front of the truck.

2.12.2 If the container or shipment exceeds 42,000 gross pounds, a waiver must be approved by the Manager, Transportation Regulatory Compliance and Certification Official as to whether or not it may be shipped. A copy of the appropriate letter will be attached to the "Ready to Ship" Checklist when it is prepared during the check of incoming paperwork.

2.12.3 Containers have been secured to the flatbed truck with four (4) nylon straps over each unit secured to the frame of the trailer, chains have been placed and secured in front of and behind the bottom of each container fastened to the trailer bed, and a 2 x 4 has been nailed to the trailer floor at the rear of each unit.

2.13 General Examination Activities After Loading

Waste Certification Personnel shall conduct the following activities after the trailer has been loaded:

NOTE: Two (2) photographs of the packages shall be taken prior to closing the doors of the trailer. Photos are also required of flat bed loads. Include information on shots to be taken.

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2.13.1 Verifies that the trailer is locked or a numbered tamper-indicating seal is applied to the rear door locking mechanism whenever the trailer is unattended overnight or for any other extended period. If a seal or lock is not used prior to resumption of loading or closure of the van, an examination shall be made to verify that the packages previously loaded were not disturbed and no unauthorized packages or materials were placed in the shipment.

2.13.2 Completes the examination of the loaded trailers for NTS shipments and completes the "Waste Shipment Final Authorization Checklist" (Attachment B).

2.13.3 Reports, by copy of the appropriate checklist, any deficiencies to the Transportation Supervisor for correction. Checklists which include deficiencies are recorded and tracked on a deficiency log. Documents any repetitive or uncorrected deficiencies on a DCAR form in accordance with WMCO-QAP-8.01.

2.13.4 Forwards all completed documentation to the the individual who will be making the final inspection at Traffic prior to release of the trailer.

2.14 Final Trailer/Vehicle Examination

Waste Certification Personnel conduct a final examination of the vehicle/trailer after closure as follows:

2.14.1 Verifies that the shipment, associated paperwork and transport vehicle is acceptable for release.

2.14.2 Verifies that RS Technician has surveyed the trailer/vehicle and recorded the results on the "Vehicle Radiation Monitoring Report," form FMPC-ES&H-1596-1 (Attachment J), and that these results are within specification.

2.14.3 Compares the "Storage & Disposal Data Sheet" (Attachment D) with the "Bill of Lading" (Attachment M) to verify that the following information is correct:

a. Number and type of containers
b. Total curie content
c. Shipment gross and net weight
d. Shipment number

2.14.4 Verifies that an envelope containing copies of the "Tally Sheet," "Storage & Disposal Data Sheet" (refer to WMCO-QAP-12.09), and LSA/RQ, LQ (Limited Quantity) documentation of the shipment is fastened to the rear container when possible or stapled to the trailer wall inside of the trailer doors for NTS use upon opening the trailer at the destination. If the shipment is not in a closed van, verifies that the "Tally Sheet" and "Storage & Disposal Data Sheet" are in the envelope which is to be delivered by the driver.

2.14.5 Verifies the presence of "Radioactive" placard on both sides, front and rear of vehicle/trailer.

NOTE: A shipment containing limited quantity packages exclusively does not require these placards.

2.14.6 Verifies that the following are operational on the vehicle/trailer. Completes the "Waste Certification Final Trailer/Vehicle Checklist" (Attachment N).

a. Headlights
b. Turn signals
c. Brake lights
d. Horn
e. Tire condition, per section 2.7.1.2 of this procedure

2.14.7 Compares the "Bill of Lading" (Attachment M) and the "Shipping Order for Nuclear Material," form FMPC-CONT-558 (Attachment O), to verify the following:

a. Trailer Number
b. Shipment Number
c. Gross Wt. and Net Wt.
d. Bill of Lading Number
e. Shipping Order Number
f. Seal Number
g. Lot Number
h. Container Number (for Sea/Land containers)

2.14.8 Verifies that a seal has been placed on the trailer and that the trailer number and the seal number match the seal number recorded on the "Bill of Lading" (Attachment M), and reviews the "LLW Shipment Checklist" (Attachment Q), and the "Off-Site Loading Tie-Down Inspection-Vehicle Inspection" Form (Attachment S).

2.14.9 Completes the "Waste Certification Final Trailer/Vehicle Checklist" (Attachment N), and "Waste Certification Traffic Shipment Documentation Checklist" (Attachment P).

2.14.10 Verifies that the gross weight on all documentation is within 100 lbs. of actual.

2.14.11 When instructed, completes the "Waste Shipment Verification Checklist" (Attachment T), for the Certification Official by verifying the following information:

a. Radiation Monitoring Sheets
b. Off-Site Tie Down Inspection/Vehicle Inspection Form
c. Weight Ticket
d. Shipping Order
e. Bill of Lading
f. Disposal/Storage Sheet

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g. Tally Sheet
h. Radiological Survey Report
i. LLW Shipment Checklist
j. Sea/Land Container "Ready to Ship" (If applicable)
k. Waste Certification Preliminary Trailer Checklist
l. Waste Certification Traffic Shipment Documentation Checklist
m. Waste Certification Final Trailer/Vehicle Checklist
n. Item Production/Certification/Identification Card

2.14.12 Reports all deficiencies on the appropriate checklist. Repetitive or uncorrected deficiencies are documented on the DCAR form in accordance with WMCO-QAP-8.01.

NOTE: Uncorrected deviations must be resolved before Quality Department can provide a release of the shipment.

2.14.13 Notifies the Certification Official that shipment paperwork is complete and available for final review.

2.14.14 Forwards completed documentation to Waste Certification Manager who reviews and maintains documents in accordance with WMCO-QAP-9.01.

3.0 REFERENCES

3.1 NVO-325, Nevada Test Site Defense Waste Acceptance Criteria, Certification and Transfer Requirements
3.2 FMPC-503, FMPC Spill Incident Reporting and Cleanup
3.3 FMPC-704, Minor Event Reporting System
3.4 WMCO-QAP-1.05, Abbreviations, Acronyms, and Definitions
3.5 WMCO-QAP-6.11, Qualification of Waste Package Certifiers
3.6 WMCO-QAP-6.12, Qualification of Waste Certification Officials
3.7 WMCO-QAP-8.01, Deviation and Corrective Action Reporting
3.8 WMCO-QAP-9.01, Designation, Preparation, Storage and Maintenance of Quality Documents
3.9 WMCO-QAP-12.09, Certification of Waste Package Examination and Sealing for Off-Site Shipment
3.10 SOP-TRF-46-C-110, Preparation and Shipment of Radioactive Material (Low-Level Waste)
3.11 SOP 20-C-601, Packaging Low Level Radioactive Waste (L-LRW) for Offsite Disposal
3.12 SOP 1-C-602, Low Level Radioactive Waste (L-LRW) Shipment Preparations

4.0 ATTACHMENTS

4.1 Attachment A, Prohibited Materials List
4.2 Attachment B, Waste Shipment Final Authorization Checklist
4.3 Attachment C, Bolt Diagram
4.4 Attachment D, Storage & Disposal Data Sheet
4.5 Attachment E, Tally Sheet
4.6 Attachment F, Computer Printout - "Circle Copy"
4.7 Attachment G, NV-211 Packaging Certification Labels

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4.8 Attachment H, "Ready to Ship" Checklist (for Sea/Lands)
4.9 Attachment I, Radioactive-LSA, Radioactive-Limited Quantity, & "RQ" Labels
4.10 Attachment J, Vehicle Radiation Monitoring Report
4.11 Attachment K, Waste Certification Preliminary Trailer Checklist
4.12 Attachment L, Waste Certification Preliminary Trailer Checklist (Sea/Lands)
4.13 Attachment M, Bill of Lading
4.14 Attachment N, Waste Certification Final Trailer/Vehicle Checklist
4.15 Attachment O, Shipping Order for Nuclear Material
4.16 Attachment P, Waste Certification Traffic Shipment Documentation Checklist
4.17 Attachment Q, LLW Shipment Checklist
4.18 Attachment R, DELETED
4.19 Attachment S, Off-Site Loading Tie-Down Inspection-Vehicle Inspection Form
4.20 Attachment T, Waste Shipment Verification Checklist

PROHIBITED MATERIALS LIST

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Nonradioactive Material

Pressurized Vessels

Explosives

Radioactive Gases

High-Level Waste

Pyrophoric Materials

Toxic or Poisonous Materials

Liquid Materials

Flammable Substances

Alkaline Metals

Reactive Materials (could cause fire)

Liquid Organic Waste or Waste that contains any Free Liquid

Ashes, Dry Powders or Respirable Fines (unless immobilized or a double containment package is used)

If the Waste is Ionized or Immobilized the pH must be greater than 4

WASTE SHIPMENT FINAL AUTHORIZATION CHECKLIST

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WASTE SHIPMENT FINAL AUTHORIZATION CHECKLIST

SHIPMENT NUMBER: WML-_____

WASTE DESCRIPTION: _____

Waste Package Description:

Package Type _____

Number of Packages _____ Verified by (Initials) _____

VERIFICATION CRITERIA PER QAP 12.09

Verify the following:

1. Information on packages matches REECO Radioactive Waste Management - Storage & Disposal Sheet (Circle Copy) and no inappropriate information present on packages. _____
2. No unauthorized materials loaded. _____
3. No free liquids on or emitting from packages. _____
4. No significant package defects such as dents, rust, holes, cracks, or tears (baled trash). _____
5. Proper closure of container lid. _____
6. Packages are free of adhering or entrapped soil, debris, etc. _____

Verify the following where applicable:

Drums: Presence of safety wire on bolts. _____

Locking nut tightened (red paint on bolt). _____

Lid and ring are seated properly. _____

Wood boxes: Lid nailed and secure, adequate caulking, and three 1 1/4" metal bands present (one on each end and one in middle) and secure. _____

Holes drilled in false bottom, runners secure and no severly bowed sides or liquid seepage. _____

Metal boxes: Required number of wedge type locking pins are fully engaged catching lower edge of locking strap and are at least even with locking strap. _____

Two 1 1/4" metal bands are banded tightly with two banding clips on each band equidistant from center around package. _____

Presence of a red dot (drain plug exists) or a black dot (no drain plug). _____

WASTE SHIPMENT FINAL AUTHORIZATION CHECKLIST
(continued)

4228

Existance of gasket around lid when possible. _____

Open holes in runners. _____

Baled trash: Two 1 1/4" metal bands and two banding clips on each band strapped evenly and tightly completely around the outside of the closed sides of the top and bottom pallets. _____

Corrugated cardboard present on top of bale and under banding in area of band/pallet contact. _____

Shipment information located on the top pallet of each bundle. _____

Verify shipment number, FMPC, and package number are stenciled in 1-inch block letters located on top center and on the side of all packages except for baled trash (sides only). _____

LOADING INFORMATION

Verify presence of the following labels:
DOT Radiation Labels, Radioactive LSA and IQ/RQ as applicable. _____

Package containing asbestos require asbestos label, CRM-C. RQ should be stenciled next to CRM-C only when quantity of asbestos meets EPA and 49 CFR reportable quantity limits. _____

NV-211 label dated and signed by an authorized package certifier. _____

Verify the loading of the shipment concurs with the criteria established in SOP TFR-46-C-110, Section 6.1. _____

Shipment Number Loaded: _____ Time: _____ Date: _____

Trailer Number: _____ Seal Number: _____

I hereby certify that the above checklist has been completed and witness that the above items are correct to the best of my knowledge.

Signed: _____ Date: _____
QA Waste Packaging

Comments: _____

_____

Signed: _____ Date: _____
Waste Operations Supervisor

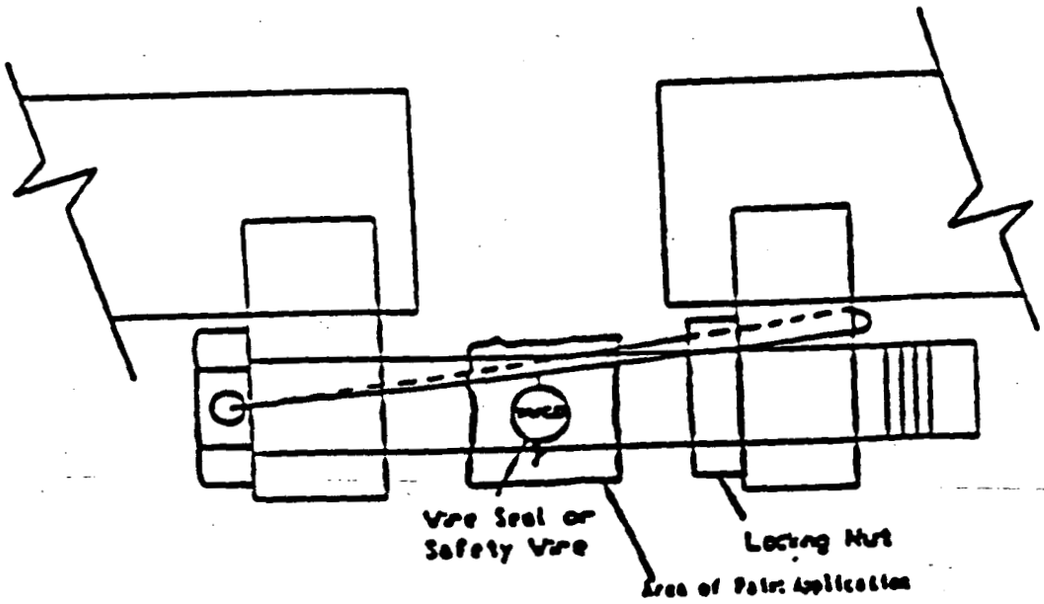
Copies to :Waste Certification Files
Waste Operations (original)

824

BOLT DIAGRAM

8251

4228



Attachment D
Page 1 of 1

STORAGE & DISPOSAL DATA SHEET

4228

WAL-90 091

02/27/90
14:50:10

Reynolds Electrical and Engineering Co., Inc.
Radioactive Waste Management-Storage & Disposal

DESCRIPTION: Construction Rubble
Reinforcement Rubble

Prepared by: [signature]
Date 2/27/90 Area Code/Phone FTS 776-8647

Approved: Responsible Personnel
[signature]
Date 2-27-90 Area Code/Phone FTS 776-8647

SECTION 1

CARD	SHIPMENT NUMBER	O	C	D	S	D	FT	YR	G	NUCLIDE CATEGORY	CURIE QUANTITY	C	GROSS VOLUME	F	GROSS WT(lbs)	P	OVERPACKS
	2 9	10	11	12	13	14	15	16	17	25 26 34		35	36 44	45	46 54	55	BOXES
																	10
2	WAL90091	D	B	L	O	B	9	0	2	2	2.7952E-04		1.0202E+03		2.4615E+04		DRUMS
											0.0002794		1020.00		24605.0		0
																	OTHER
																	0

SECTION 2

CARD	NUCLIDE DESCRIPTION	QUANTITY	C	S	COMMENTS
	2	15 16 24	25	26	27
3	U-238	2.7079E-04	C	1	810 GRAMS
3	U-235	6.7546E-06	C	2	4 GRAMS

SECTION 3

CARD	WASTE CODE	VOLUME CU.FT.	% CONS.	WEIGHT LBS.	S	COMMENTS
	25	6 12	13 14 16	17 25	26 27	28
4	80	8.1602E+02	P 0	1.8048E+04	P 1	835
4	80	2.0408E+02	P 0	6.5708E+03	P 2	861

SECTION 5

CARD	CONT NUMBER	ASSAY DATE	CLASS CODE	CONT/AT CODE	GROSS WEIGHT LBS	GROSS VOLUME CU.FT.	RADIATION AT SURF mrem/hr	RADIATION AT 3 FT mrem/hr	PRIMARY ELEMENT & ISOTOPIC	PRIMARY CURIE QUANTITY	SECONDARY ELEMENT & ISOTOPIC	SECONDARY CURIE QUANTITY	PRIMARY ISOTOPE WEIGHT GRAMS	SECONDARY ISOTOPE WEIGHT GRAMS
6/7	1	05/09/89	2122	8352122	1674.0	102.00	0.30	0.30	U-238	1.5039E-05	U-235	4.8630E-07	45	0.2
6/7	2	05/09/89	2122	8352122	1875.0	102.00	0.30	0.30	U-238	1.5039E-05	U-235	4.8630E-07	45	0.2
6/7	3	05/09/89	2122	8352122	1674.0	102.00	0.30	0.30	U-238	1.5039E-05	U-235	4.8630E-07	45	0.2
6/7	4	05/09/89	2122	8412122	2930.0	102.00	0.30	0.30	U-238	3.0079E-05	U-235	9.7270E-07	90	0.5
6/7	5	05/09/89	2122	8352122	4293.0	102.00	0.30	0.30	U-238	6.0158E-05	U-235	1.9454E-06	180	0.9
6/7	6	05/09/89	2122	8352122	1537.0	102.00	0.30	0.30	U-238	1.5039E-05	U-235	4.8630E-07	45	0.2
6/7	7	05/09/89	2122	8352122	2923.0	102.00	0.30	0.30	U-238	3.0079E-05	U-235	9.7270E-07	90	0.5
6/7	8	05/09/89	2122	8412122	3648.0	102.00	0.30	0.30	U-238	4.5118E-05	U-235	1.4590E-06	135	0.7
6/7	9	05/09/89	2122	8352122	1500.0	102.00	0.30	0.30	U-238	1.5039E-05	U-235	4.8630E-07	45	0.2
6/7	10	05/09/89	2122	8352122	2759.0	102.00	0.30	0.30	U-238	3.0079E-05	U-235	9.7270E-07	90	0.5

TALLY SHEET

4228

WAL-90 091

02/27/90
14:58:01

TO: Bechtel Electric and Engineering Co., Inc.
U.S. DOE, Nevada Test Site, Zone 2
Mercury, NV 89023
Attention: G. Cardell

NEVADA TEST SITE SHIPMENT
TALLY SHEET
LOT NUMBER U030-100-9023-9023
LOT NUMBER U030-100-9023-A334

FROM: Westinghouse Materials Company of Ohio
P. O. Box 398704
Cincinnati, OH 45239

LOT NUMBER	CONT. NO.	GROSS WT. (POUNDS)	TARE WT. (POUNDS)	NET WT. (POUNDS)	U ASSAY	PERCENT U-235	PERCENT U-238	U POUNDS	ELEMENT WT(gms)	U-235 ISOTOPE WT(gms)	U-238 ISOTOPE WT(gms)	U-235 Ci	U-238 Ci	VOLUME CU FT
A334	1	1674.0	630.0	1044.0	0.010	0.500	99.48	0.1	45	0.2	45	4.84300E-07	1.50390E-05	102.00
A334	2	1875.0	630.0	1245.0	0.010	0.500	99.48	0.1	45	0.2	45	4.84300E-07	1.50390E-05	102.00
A334	3	1674.0	630.0	1044.0	0.010	0.500	99.48	0.1	45	0.2	45	4.84300E-07	1.50390E-05	102.00
9023	4	2930.0	630.0	2300.0	0.010	0.500	99.48	0.2	91	0.5	90	9.72700E-07	3.00790E-05	102.00
A334	5	4293.0	630.0	3663.0	0.010	0.500	99.48	0.6	181	0.9	180	1.94540E-06	6.01580E-05	102.00
A334	6	1537.0	630.0	907.0	0.010	0.500	99.48	0.1	45	0.2	45	4.84300E-07	1.50390E-05	102.00
A334	7	2923.0	630.0	2293.0	0.010	0.500	99.48	0.2	91	0.5	90	9.72700E-07	3.00790E-05	102.00
9023	8	3640.0	630.0	3010.0	0.010	0.500	99.48	0.3	136	0.7	135	1.45900E-06	4.51180E-05	102.00
A334	9	1300.0	630.0	670.0	0.010	0.500	99.48	0.1	45	0.2	45	4.84300E-07	1.50390E-05	102.00
A334	10	2759.0	630.0	2129.0	0.010	0.500	99.48	0.2	91	0.5	90	9.72700E-07	3.00790E-05	102.00
TOTALS		24605.0	6300.0	18305.0				1.8	819	4.1	810	8.75400E-06	2.70710E-04	1020.00
					--- LOT TOTALS ---									
9023	2	6570.0	1260.0	5310.0				0.5	227	1.1	226	2.43170E-06	7.51970E-05	204.00
A334	8	18035.0	5040.0	12995.0				1.3	590	2.9	587	6.32230E-06	1.95910E-04	816.00

COMPUTER PRINTOUT - "CIRCLE COPY"

4228

WML-90 091

Reynolds Electrical and Engineering Co., Inc.
Radioactive Waste Management-Storage & Disposal

PACKAGE NO.	NET WT	TARE WT	GROSS WT	LSA	LQ	RQ
1	1044.00	630.00	1674.00	X		
2	1245.00	630.00	1875.00	X		
3	1044.00	630.00	1674.00	X		
4	2300.00	630.00	2930.00	X		
5	3663.00	630.00	4293.00	X		
6	907.00	630.00	1537.00	X		
7	2293.00	630.00	2923.00	X		
8	3010.00	630.00	3640.00	X		
9	670.00	630.00	1300.00	X		
10	2129.00	630.00	2759.00	X		

NV-211 PACKAGING CERTIFICATION LABELS

4228

NV-211 **PACKAGING CERTIFICATION**

This certifies that this container and its contents are in acceptable condition for transportation and waste disposal according to DOT (49 CFR), EPA (40 CFR), and DOE/NV (NVO-325) requirements.

DATE: _____

CERTIFIED BY: _____

TITLE: CERTIFICATION OFFICIAL

ORGANIZATION: FMPC

FMPC-O&S-234 (REV. 8/7/89)

NV-211 **PACKAGING CERTIFICATION**

This certifies that this container and its contents are in acceptable condition for transportation and waste disposal according to DOT (49 CFR), EPA (40 CFR), and DOE/NV (NVO-325) requirements.

DATE: _____

CERTIFIED BY: _____

TITLE: PACKAGE CERTIFIER

ORGANIZATION: FMPC

FMPC-O&S-234-1 (REV. 8/7/89)

Attachment H
Page 1 of 1

"READY TO SHIP" CHECKLIST (FOR SEA/LANDS)

4228

WASTE CERTIFICATION CHECKLIST
SEA LAND CONTAINER
"READY TO SHIP"

INFORMATION (Waste Operations)

DATE: _____ SHIPMENT NUMBER: _____

MIL. TYPE: _____ BOX ___ S/N: _____

MIL. TYPE: _____ ___ _____

LOCATION : _____ WEIGHTS: Gross _____ (BOX 1) _____ (BOX 2)

_____ Tare _____ _____

_____ Net _____ _____

EXAMINATION CRITERIA (Waste Certification)

Trailer No.: _____ Initials

0. Verify "Item Production/Certification/Identification" XX card is completed accurately. Form Number FMPC-ES&H-1945-XX. _____
1. Radioactive material markings present. (2 sides) _____
2. Container Number-FMPC marking present. _____
3. All unnecessary markings have been removed or covered. _____
4. Marking is complete as follows:
   Proper shipping label(s) identified (LSA, RQ, LQ) _____
   Gross weight identified _____
5. Marked weight values match above values. _____
6. The box door has been sealed by caulking and a metal band is attached to both door latches. _____
7. Seal number _____ affixed to container. _____

PLACE NV-211 ON DOOR OF CONTAINER WHEN ABOVE CRITERIA IS SATISFACTORILY MET.

CERTIFICATION (Waste Certification)

I hereby certify the above items have been examined and the above items are correct to the best of my knowledge.

Signed: _____
(Waste Certification)

Date: _____

CHANGE NOTICE

No.	Effective Date:	Page
QAP-12.12-02-01	09/13/90	1 of 1

AUTHORIZED: (Vice President, Quality)

Attachment I
Page 1 of 1

"Radioactive-LSA" Label is replaced by "Radioactive-LSA UN-2912" Label (FMPC-SA&ML-1623-3, 12/29/87).

RADIOACTIVE-LSA, RADIOACTIVE-LIMITED QUANTITY, & "RQ" LABELS

Radioactive-LSA
UN-2912

RADIOACTIVE-LIMITED QUANTITY

UN-2910

FROM: FMPC

This package conforms to the conditions and limitations specified in 49 CFR 173.421 for excepted radioactive material, limited quantity, n.o.s., UN-2910.

RQ

VEHICLE RADIATION MONITORING REPORT

4228

FMPC
ENVIRONMENT, SAFETY & HEALTH - ENVIRONMENTAL & RADIOLOGICAL MONITORING
VEHICLE RADIATION MONITORING REPORT

Date Monitored: _____ Monitored by: _____

Carrier Name: _____

Vehicle Type: Tractor-trailer ☐ Other motor vehicle ☐ Railcar ☐ Open flatbed ☐ Covered ☐

Other ☐ (explain) _____

License no., if motor vehicle: _____ State: _____

Trailer or railcar identification: _____

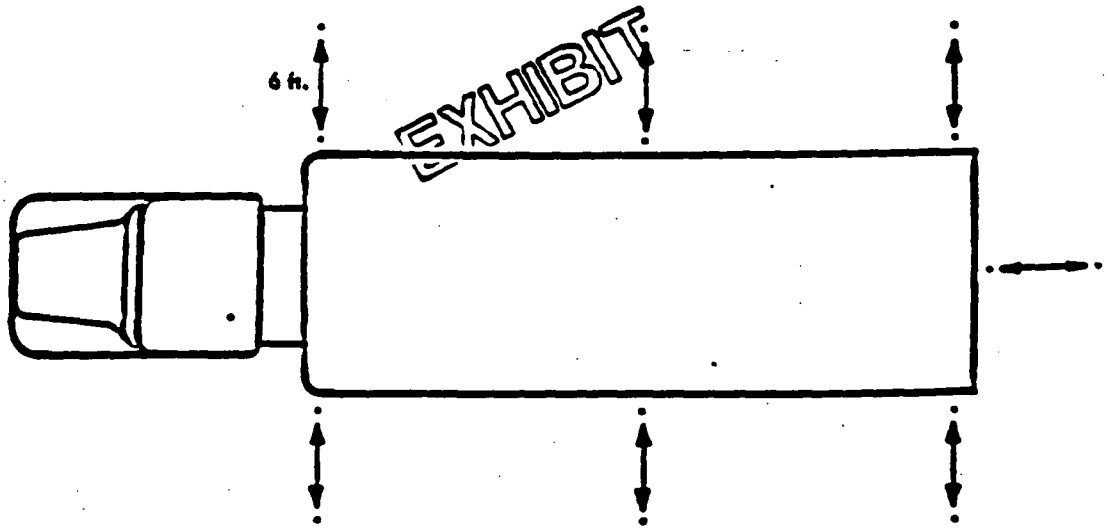
Is this an exclusive use vehicle? Yes ☐ No ☐

Vehicle Status: (a) Outgoing ☐ (b) Incoming ☐ (c) Outgoing empty, not "exclusive use" ☐ (d) Empty, before loading ☐

(e) Outgoing empty, "exclusive use" ☐ (f) If (e) is checked, is vehicle to remain "exclusive use"? Yes ☐ No ☐

Is visible contamination present? Yes ☐ No ☐ If "yes", show on diagram.

Dose rate shown by asterisks in mrem/hr. Surface alpha contamination, circled, in d/m/100cm².



(1) Same locations apply to van-type trucks. For railcars, disregard cab section but show dose rates found at each end.
(2) Measurements at 6-ft. not required if all readings at vehicle surface are not greater than 10 mrem/hr.

Survey Instruments Used
Alpha — Type or Model No _____ Serial No. _____

Beta-gamma — Type or Model No _____ Serial No. _____

Additional information attached? (E&RM copy only): Yes ☐ No ☐

NO.	DISTRIBUTION OF COPIES
1	Environmental & Radiological Monitoring record copy
2	Transportation supervisor

FMPC-EMM Form 4 REV 8/28/90

WASTE CERTIFICATION PRELIMINARY CHECKLIST

4228

WASTE CERTIFICATION PRELIMINARY TRAILER CHECKLIST

TRAILER NUMBER: _____

1. Verify the RST has surveyed trailer prior to loading and recorded results on form ES&H-1596-1 to assure the trailer is not contaminated. _____

2. Verify the condition of trailer floor, interior, roof, sides, exterior, rear doors and tires are acceptable. Any discrepancies must be reported immediately to the Transportation Supervisor. _____

Comments: _____

_____

3. Verify the trailer has been lined properly according to SOP-TRF-46-C-110 prior to loading. _____

4. Visually verify that the packages have been properly tied-down according to SOP-TRF-46-C-110. _____

   Shipment Number: _____

5. Visually verify that the loaded trailer rear doors are secured with a tamper indicating seal. _____

   Seal Number: _____

I hereby certify that the above checklist item have been verified and that all the above items are correct to the best of my knowledge.

Signed : _____
(Certification Personnel)

Date : _____

Signed : _____
(Transportation Supervisor)

Date : _____

Attachment L
Page 1 of 1

WASTE CERTIFICATION PRELIMINARY CHECKLIST (SEA/LANDS)

4228

WASTE CERTIFICATION PRELIMINARY TRAILER CHECKLIST
(SEALANDS)

Rev. 10/10/89

Trailer Number:_____ Shipment Number:_____

1. Verify the ERMT has surveyed trailer prior to loading and recorded results on form ES&H-1596-1 to assure the trailer is not contaminated . _____

2. Verify the trailer floor, exterior and tires are acceptable for loading . Any discrepancies must be reported immediately to the transportation supervisor . Any nonconfomances or outstanding DCAR must be resolved before shipment can be released . _____

Comments: _____

_____

3. Visually verify that the sealand containers have been properly tied down with, four straps on each container, chain and 2X4 on front and back of load . _____

4. Visually verify the sealand containers rear doors are secured with a tamper proof DOT approved seal . _____

Container #1:_____Seal number:_____Box #:_____
Container #2:_____Seal number:_____Box #:_____

I hereby certify that the above checklist has been completed and witness that all above information is correct to the best of my knowledge .

Signed :_____
(Certification Personnel)

Date :_____

Signed :_____
(Transportation Supervisor)

Date :_____

834

Attachment M
Page 1 of 1

BILL OF LADING

4228

STRAIGHT BILL OF LADING — SHORT FORM — ORIGINAL — NOT NEGOTIABLE

CARRIER	DATE	CARRIER'S I.D.	SHIPPER'S NO.

RECEIVED, subject to the classifications and tariffs in effect on the date of the issue of this contract by the carrier named in the contract, the property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown), marked, consigned, and destined as indicated below, which said carrier (the word carrier meaning any person or corporation in possession of the property under the contract) agrees to carry to the place of delivery at such destination if on its own road or its usual interchange, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all the terms and conditions of the Uniform Domestic Straight Bill of Lading set forth (1) in Official, Southern, Western and Illinois Freight Classifications in effect on the date hereof, if this is a rail or a rail-water shipment, or (2) in the applicable motor carrier classification or tariffs if this is a motor carrier shipment.

Shipper hereby certifies that he is familiar with all the terms and conditions of the said bill of lading, including those on the back thereof, set forth in the classification or tariffs which govern the transportation of this shipment, and the said terms and conditions are hereby agreed to by the shipper and accepted for himself and his assigns.

AT FERNALD, OHIO

FROM USDOE, c/o Westinghouse Materials Company of Ohio
ACTING UNDER DOE CONTRACT DE-AC05-86OR21600

(Mail or street address of consignor — For purposes of notification only.)

Consigned to: _____

Destination: _____ State of: _____ County of: _____

Route: _____

Delivering Carrier: _____ Vehicle No.: Trs. #

Car Initial: _____ Car No.: _____ Seal No.: FA/WMCO

NUMBER PACKAGES	HM	DESCRIPTION OF ARTICLES, SPECIAL MARKS, AND EXCEPTIONS	* WEIGHT (Subject to Correction)	CLASS OR RATE	CHECK COLUMN
		IN THE EVENT OF AN ACCIDENT OR EMERGENCY, NOTIFY THE DOE EMERGENCY OPERATIONS CENTER, OAK RIDGE, TN — 615-576-1005, COLLECT, DAY OR NIGHT.			

Subject to Section 7 of Conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement.

The carrier may not make delivery of this shipment without receiving payment of freight and all other lawful charges.

WMCO
(Signature of consignor)

If charges are to be prepaid, write or stamp here, "To be prepaid."

Received $ _____ to apply in prepayment of the charges on the property described hereon.

Agent or Cashier

Per _____
(The signature here acknowledges only the amount prepaid.)

Charges Advanced:

$ _____

* If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "carrier's or shipper's weight."

NOTE - Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property.
The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding _____ per _____

+ THIS SHIPMENT IS CORRECTLY DESCRIBED. CORRECT WEIGHT IS _____ LBS

SUBJECT TO VERIFICATION BY THE E. W. & I. BUREAU NATIONAL WT. AGREEMENT

* Shipper's signature in lieu of shipper makes a part of the bill of lading approved by the Interstate Commerce Commission.

741 NO.: _____

SS - SO NO.: _____

MSO NO.: _____

EQUAL EMPLOYMENT OPPORTUNITY — The nondiscrimination clauses contained in section 202 of Executive Order 11246 relative to equal employment opportunity for all persons without regard to race, creed, color, or national origin, and the implementing rules and regulations of the President's Committee on Equal Employment Opportunity which, to the extent not inconsistent with Executive Order 11246, remain in full force and effect as rules of the Secretary of Labor, are incorporated herein.

THIS SHIPMENT is subject to the terms and conditions set forth in the standard form of the U. S. Government bill of lading and to any applicable special rates or charges.

* This shipment is the property of and the freight charges are assumed by the U. S. Government. Subject to the provisions of Section 10721 Guideline No. (Tender No. _____ Effective _____).

* IT IS UNDERSTOOD AND AGREED THAT THIS SHIPMENT IS MADE BY THE CONSIGNOR FOR AND ON BEHALF OF THE U. S. GOVERNMENT; THAT THE CONSIGNOR IS AUTHORIZED TO AND WILL MAKE ANY PAYMENT DUE HEREUNDER AS CONSIGNOR OR SHIPPER FROM GOVERNMENT FUNDS ADVANCED AND AGREED TO BE ADVANCED TO IT BY THE U. S. DEPARTMENT OF ENERGY AND NOT FROM ITS OWN ASSETS; AND THAT NOTHING HEREIN SHALL PRECLUDE LIABILITY OF THE GOVERNMENT FOR ANY PAYMENT PROPERLY DUE HEREUNDER IF FOR ANY REASON SUCH PAYMENT IS NOT MADE BY THE CONSIGNOR FROM SUCH GOVERNMENT FUNDS.

* THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED, AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION.

USDOE, c/o Westinghouse Materials Company of Ohio, shipper

Per _____ _____ Agent

Permanent post office address of shipper.

Per _____

P. O. BOX 398704 CINCINNATI, OHIO 45239
AREA CODE 513 738-6200

QAP-12.12-M2 (REV. 9/90)

Attachment N
Page 1 of 1

WASTE CERTIFICATION FINAL TRAILER/VEHICLE CHECKLIST

WASTE CERTIFICATION FINAL TRAILER/VEHICLE CHECKLIST

4228

(Rev.12/06/89)

Carrier:_____ Trailer No. :_____ Shipment No. :_____

	Initials
1. Verify the RST has surveyed the trailer/vehicle and recorded results on Vehicle Radiation Monitoring Report (Form FMPC-ES&H-1596-1).	_____
2. Verify the proper placards are in place, as required.	_____
3. Verify the driver has performed a safety inspection of vehicle prior to leaving the FMPC:	_____

headlights _____ horn _____
turn signals _____ tires _____
brake lights _____ braking check test (optional) _____

4. Verify the envelope with Manifest and Tally Sheets is in trailer.	_____
5. Verify that a seal has been placed on the trailer doors and that the trailer number and seal number match the trailer and seal number recorded on the Bill of Lading. Report all discrepancies to the Traffic Manager.	_____

Seal Number: _____

6. Verify all lot markings and weights on the Tally Sheet match the lot markings and weights on the Shipping Order.	_____

Date Shipped: _____ Time Shipped: _____

I hereby certify that the above items have been verified and are correct to the best of my knowledge.

Signed:_____ Date:_____
(Waste Certification Personnel)

NOTE: UPON SATISFACTORY COMPLIANCE WITH THE ABOVE CHECKLIST CERTIFICATION PERSONNEL SHOULD SIGN THE SHIPPING ORDER AT THE SPACE MARKED "QUALITY CONTROL APPROVAL".

QAC-881115-1, Rev. 2

Attachment 0
Page 1 of 1

SHIPPING ORDER FOR NUCLEAR MATERIAL

4228

NOTE: Spaces marked "A" are for use of classification stamps when required.

Westinghouse Materials Company of Ohio

SHIPPING ORDER FOR NUCLEAR MATERIAL

A

Date Prepared: _____

SHIP VIA	DELIVERY			SHIPPING AUTHORIZATION NO.	SHIPPING ORDER NO.
STREET:	PERMIT	CAR OR TRAILER NO.	SEAL NO.	SHIPPED FROM PLANT:	ORIGINATOR NO.
CITY: STATE	CONTACT:	BILL OF LADING NO.	QUALITY CONTROL APPROVAL		DATE SHIPPED
SPECIAL INSTRUCTIONS		COUNTRY CONTROL NO.	PROJECT NO.		TIME SHIPPED

Type of Material _____ FMPC Production Order No _____ Originator's Signature _____

Station RIS _____ DOE 741 No _____ Shipment Authorized By _____

MSC DATA			ORIGINATOR'S DATA						MATERIAL CONTROL DATA								
FROM AREA	COST CODE	741 NO	P O NO	LOT NUMBER	QUANTITY	WEIGHT (LBS) GROSS	TARE	NET	AREA CODE	E.U.E. ANAL	E.U.E. LBS	E.U.E. GRAMS OR KGS	LIMIT / ERROR %	ISO ANAL	U/R GRAMS OR KGS	LIMIT / ERROR %

DISTRIBUTION OF COPIES	
1 NMA (RECORD COPY)	5 Cost Accounting
2 Shipping Group	6 Originator of Shipping Order
3 Quality Control	
4 Production Control	

FMPC-CONT-168 (REV 9/89)

I, _____ certify that this shipment was made on the above date after complying with all security regulations.

A

Audited by _____ Date _____

A

WASTE CERTIFICATION TRAFFIC SHIPMENT DOCUMENTATION CHECKLIST

Waste Certification Traffic Shipment Document Checklist

4228

	Bill/Lading(B/L)	Shipping Order(S.O.)
Ship #		
B/L#		
S.O.#		
Trailer#		
Date Prep		
Mat.Type		
Gross Wt.		
Tare Wt.		
Net Wt.		
E.T.A.		
Seal #		
MCA sign		
# of cont.		
LSA/LQ/RQ		

	Low Level Checklist	Packaging Information	
Ship #		Hazard Class	
B/L #		Material Form	
S.O.#		Chemical Form	
All Checks		Labels Required	
J sign		Packaging Type	

Radiation Monitoring Sheets

	Empty	Outgoing	Survey	Cab
Trailer#				
Date/Time				
Survey com.				

*Complete liscense # _____
*Temporary Seal # _____

Container Radiological Sheets

	Date	Time	Data Complete	Ship #
Initials				
Readings				

	Off Site Tie Down	Contaminated Articles Sheet	
Ship #		Curies	
Trailer #		Signature	
Seal #		Data Complete	
Sup.Sign			

*3 Tally Sheets & 1 Storage/Disposal Sheet present _____
*Driver Inst. Pack complete and numbered _____
*Weight Ticket *Ft. Axle_____ * Rear Axle_____ * GR. Wt._____
(Maxium weight on front or rear axle 34,000 lbs.)

QAC-880731-1, Rev.1 (10/10/89)

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Attachment Q
Page 1 of 1

LLW SHIPMENT CHECKLIST

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FMPC
SECURITY, ACQUISITION & MATERIALS LOGISTICS - TRANSPORTATION SECTION
LLW SHIPMENT CHECKLIST & NTS NOTIFICATION

DATE:	SHIPMENT NO.:	B/L NO.:	SS SO NO.:	CARRIER:	TRAILER NO.:

LSA	DEPARTURE TIME:	ETA:	NOTIFICATION TO N ☐ (FTS: 575-63
RO	FROM:		
LTD. QTY.	TO:		
DRUMS	DATE:		
WASTE CERTIFICATION CONTAINER TOTALS. WEIGHTS & CURIES OF LSA/LTD QTY - RO SHEETS	BY WHOM:		
BOXES	TO WHOM		
SMEAR SHEETS	☐ FACSIMILE SENT	☐ DRIVER GIVEN DOSIMETER BAD	
WASTE MANAGEMENT STORAGE & DISPOSAL SHEETS DELIVERED — PER NTS	MONITORING REPORTS:		
TALLY SHEETS			
CARRIER/DRIVER INSTRUCTION PACK (2)			
NEVADA PERMIT			
INCOMING/EMPTY BEFORE LOADING			
OUTGOING/LOADED			
TRACTOR CAB			
OFFSITE LOADING-TIE DOWN-VEHICLE INSPECTION REPORT			
WEIGHT TICKET			
CHECKED TALLY SHEET (BY CHECKER)			
DRIVER RECEIVES: COPY OF B/L, TALLY SHEET, INSTRUCTION PACK, NEVADA PERMIT, & ENVELOPE FOR CONSIGNEE WITH TALLY SHEET & MEMO B/L			

SPECIALIST A/TRAFFIC	TRANSPORTATION SUPERVISOR: (REVIEW)	TRAFFIC MANAGER: (REVIEW)

CONDITION OF CONTAINERS	LOADERS:
CONTAINER PROPERLY LABELED	
RADIOACTIVE PLACARDS (FOR LSA ONLY)	
ENVELOPE WITH STORAGE & DISPOSAL SHEETS AND TALLY SHEETS IN TRAILER	
TRAILER LINED WITH PLASTIC & CARDBOARD ON FLOOR— SCRAP WOODEN PALLETS AND/OR BOXES ENCLOSED WITH PLASTIC AS ONE PACKAGE	
Transportation Supervisor: _____	

FMPC-561A-2065 (4/9/91)

Attachment R

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DELETED

Attachment S
Page 1 of 1

OFF-SITE LOADING TIE-DOWN INSPECTION - VEHICLE INSPECTION FORM

FMPC
SECURITY, ACQUISITION & MATERIALS LOGISTICS DEPARTMENT - TRANSPORTATION SECTION

OFFSITE LOADING — TIE DOWN INSPECTION — VEHICLE INSPECTION

4228

Date: _____

COMMODITY:	CARRIER:	TRAILER NO.:	SEAL NO.:
			FA-WMCO

BALE/BOX/DRUM/SEA LAND CONTAINER NUMBERS:

LSA _____
LSA-RO _____
LQ _____
LQ-RO _____
TOTAL _____

DISCREPANCIES DETECTED	CORRECTED! YES	CORRECTED! NO	SHIPMENT REJECTED YES	SHIPMENT REJECTED NO

Checked By _____ 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 exceeding approximately 20,000 pounds each		
1¼" steel strapping utilized (5450 lbs. minimum tensile strength)		
____ each anchor plates or "U" bolts fastened to underframe (____ each side of unit) placed and secured for ____ transverse bands over unit		
Four each brakeman plates or "U" bolts fastened to underframe (two for each band) placed under each unit and secured for two longitudinal bands, securing the boxes/skids 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		
..... Chains		
..... 2 X 4s		

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					
Condition of Roof			Condition of Rear Doors			Detected Evidence of Sabotage		

Overall appearance: _____

General Comments: _____

Accepted: _____ Rejected: _____

Checked By: _____ SIGNATURE - TRANSPORTATION SUPERVISOR

NO.	DISTRIBUTION OF COPIES
1	Transportation Section (RECORD COPY)

FMPC-SAML-025 (REV. 4/2/90)

Attachment T
Page 1 of 2

WASTE SHIPMENT VERIFICATION CHECKLIST

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WASTE SHIPMENT VERIFICATION

Page 1 of 2

Date _____ Time _____

Shipment No. WML- _____ Trailer No. _____ No./Type Container _____

1. Storage & Disposal Data Sheet

   A. Material Description _____
   B. Signed _____ Shipment No. WML- _____
   C. Total Curries _____
   D. Total Weight (Gross) _____
   E. Total Volume _____
   F. Type Container _____
   G. Date _____ Time _____
   H. Check of "G" for all copies _____

2. Tally Sheet

   Shipment No. WML- _____ Date _____ Time _____
   Check of Date & Time of all copies in Pkg. _____

A. Lot Number	Gross Weight	Net Weight
Totals		

   B. Total containers _____ Totals agree with "1" above _____
   C. Field check of Tally Sheet included _____

3. Shipping Order for Nuclear Material (FMPC-ES&H-558-3 REV. 1/29/87)

   A. Shipping Order No. _____ B/L No. _____
   B. 741 No. FVC-VAB _____ Seal No. FA-WMCO _____
   C. Trailer No. _____ MC & A Signed _____
   D. Material Type _____
   E. Lot Nos. agrees with Tally Sheet _____ Total Quantity _____
   F. Gross Weight _____* Element Analysis _____*
   G. Tare Weight _____* Element lbs. _____*
   H. Net Weight _____* Element Grams or Kgs _____*
   I. Iso Analysis _____* U235 Grams or Kgs _____*
   J. Est. Time of Arrival _____
   K. *Totals (listed) & Individual Lot values (not listed) agree with Tally Sheet. _____

4. Bill of Lading

   B/L No. _____ Trailer No. _____ Seal No. FA/WMCO _____
   741 No. FVC-VAB- _____ SS-SO No. _____
   ETA : _____
   Number of containers:

		Type Container	Gross Wt.	Net Wt.
LSA _____	RQ _____			
	NON-RQ _____			
IQ _____	RQ _____			
	NON-RQ _____			
Totals				

   _____ Above information agrees with Shipping Order & Tally Sheet.
   _____ Remainder of information of Bill of Lading checked.

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WASTE SHIPMENT VERIFICATION CHECKLIST
(continued)

WASTE SHIPMENT VERIFICATION

5. Low Level Waste Shipment Checklist and NTS Notification Form

   A. Shipment No. WML-_____ B/L No. _____
   SS-SO No. _____
   B. Data on line 5A agrees with B/L and Shipping Order _____
   Completed except for Departure Time and Traffic Manager review _____

6. Radiation Monitoring Sheet (FMPC ES&H-1596-1) For:
   A. Trailer Empty _____ Trailer ID _____
   B. Trailer Loaded _____ Trailer ID _____
   C. Cab Only _____ Trailer ID _____ License No. _____
   D. Loaded Vehicle Radiological Survey _____ Trailer ID _____
   E. Temporary Seal Numbers _____

7. Container Radiological Data
   Initial Dose Rate Data _____ 48 Hour Smears: Date_____ Time_____
   Equal to or less than 48 hours prior to Load Time _____

8. Weight Ticket
   Load Weight _____ Rear Axle Wt._____ Drive Wt._____

9. Off-Site Tie-Down Inspection Form (FMPC SAML 2495 REV 4/5/89)
   Shipment No. WML-_____ Trailer No._____ Seal No. FA/WMCO_____
   A. Checked and signed in two places _____

10. LSA/RQ, IQ documentation
    One copy in Traffic File package _____
    One copy in envelope for Driver _____
    A. Signed if non-computer report _____
    B. Wt. checks with Tally Sheet _____
    C. Curies checks with Disposal Sheet or Tally Sheet _____

11. Driver Instructions Complete (2 sets) _____
    Tally sheet also in envelope _____
    All Written identity & information checks _____

12. Waste Certification Checklist present, signed and in agreement with other documentation.
    A._____ Waste Certification Preliminary Trailer Checklist

    B._____ Waste Certification Traffic Shipment Documentation Checklist

    C._____ Waste Certification Final Trailer/Vehicle Checklist

Shipping Order signed by Certification Official _____

Shipment released on _____ at _____AM/PM

Signed _____

List Nonconformances found:

_____

_____

UNCONTROLLED COPY

Westinghouse Materials Company of Ohio — FMPC

NUMBER:	REVISION:	ISSUE DATE:
FMPC - 707	1	10/27/89

TITLE: AUDIT PROGRAM 4228

SITE POLICY AND PROCEDURE

APPROVED BY: M. B. Boswell, President

1.0 POLICY

Westinghouse Materials Company of Ohio (WMCO) shall maintain an auditing program to verify that activities are being conducted in accordance with applicable requirements, to confirm that intended results are being achieved, and that corrective action is taken where required.

2.0 SCOPE

This procedure describes the responsibilities and requirements for planning, performing and documenting formal audits of WMCO activities and of WMCO's suppliers of equipment and services. Included are the audits and appraisals required by Department of Energy (DOE) Orders and directives.

3.0 DEFINITIONS

3.1 Audit- A planned and documented activity performed by investigation, examination or evaluation of objective evidence to determine the adequacy of, and compliance to, established procedures, instructions, drawings and other applicable documents and the effectiveness of their implementation.

3.2 Appraisal- A documented review of a specialty discipline performed in accordance with written guidance and criteria to verify that applicable elements of the performing organization's program have been developed, documented, and effectively implemented in accordance with specific departmental requirements and needs.

3.3 External Audit- An audit of the quality assurance program activities of suppliers of materials and services to the Feed Materials Production Center (FMPC). Included within this definition are the onsite construction contractor of the FMPC, the contractor(s) performing remediation and/or restoration services, and the contractor(s) performing architect/engineer services.

3.4 Internal Audit

(1) An audit of a WMCO organization's activities by representatives of another WMCO organization to determine the status and assess the adequacy and effectiveness of implementation of FMPC procedures and requirements.

(2) An audit conducted by the WMCO Internal Audit organization in accordance with their annual audit plan and the procedures referenced in Section 7.0.

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3.0 DEFINITIONS (Continued)

3.5 Audit by Outside Organization- An audit of FMPC activities, which is planned and conducted by an organization other than the FMPC, such as DOE or Westinghouse Corporate, or by an independent public accountant. Included within this definition are Technical Safety Appraisals (TSA) and Quality Assurance Functional Appraisals.

4.0 RESPONSIBILITIES

4.1 Manager, Performance Assessment- Plans, directs and performs a comprehensive audit activity; uses audit results to provide feedback to WMCO management concerning the adequacy and effectiveness of FMPC programs and the internal controls used in managing WMCO resources. The Manager, Performance Assessment, shall have oversight of the internal appraisals conducted by other FMPC organizations to assure adequate coverage of WMCO functions with a minimum of duplication.

4.2 Staff Managers- Assure that the operations of their organizations are conducted pursuant to their departmental procedures in order to assess compliance with appropriate DOE Orders and other governmental regulations applicable to their department. Review and concur with audit plans and schedules when requested by the auditing organization; provide staff members to participate on audit teams when requested by the auditing organization; and insure timely approval and implementation of deviation dispositions, corrective action plans, and schedules.

4.3 Audit/Appraisal Team Leaders- Plan, direct and conduct assigned audits/appraisals to assess implementation and effectiveness of work control systems. Report the results of the audit/appraisal and identify work practices which need corrective action.

4.4 Internal Audit Section (Performance Assessment)- Perform audits of financial and operational activities which require independent assessment or verification.

5.0 GENERAL

5.1 Quality Assurance Audits - A comprehensive set of internal and external audits of the FMPC Quality Assurance Program will be planned, scheduled and conducted by Performance Assessment with support and participation from other WMCO departments. The planned audits will cover activities performed internally by WMCO organizations and activities performed externally by subcontractors and suppliers. Appropriate department procedures will be developed to implement the established responsibilities. Other organizations will make personnel available to Performance Assessment as required to assist in the conduct of audits. Audit Team members shall have access to all records, personnel, and physical facilities relevant to the performance of audits.

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5.0 GENERAL (Continued)

5.2 Department Appraisals - Other site organizations perform internal reviews of their activities as required by DOE Orders, governmental organizations, or customer imposed requirements. These reviews may be referred to as appraisals. The internal appraisal program of these organizations will provide their management an overview of their respective programs to avoid duplication, to refine interrelationships, and to strengthen overall program performance.

5.3 Internal Audits - The Internal Audit Section of the Performance Assessment Department performs internal audits as required by the DOE/WMCO contract, DOE orders, DOE Office of Inspector General, DOE Oak Ridge Operations, WMCO Management, and corporate directives. The primary objective of the Internal Audit Section's audit plan is to provide management with evaluations and recommendations to strengthen internal controls, safeguard corporate assets against loss, and improve financial visibility and operating efficiencies.

6.0 PROCEDURE

6.1 Audit Planning

RESPONSIBILITY	ACTION
MANAGER, PERFORMANCE ASSESSMENT	A. Plan and schedule a comprehensive set of audits on a near-term (quarterly) and long-range (annual) basis.
MANAGER, INTERNAL AUDIT	B. Prepare an annual audit plan which covers the full scope of audit activities as outlined in the DOE/Inspector General Manual, and is coordinated with and approved by WMCO Management and the DOE/ORO Contractor Evaluation Branch.
STAFF MANAGERS	C. Where required by DOE Orders, plan and schedule a program of internal appraisals of Department operations to assess compliance with applicable DOE Orders and federal and state laws and regulations.

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6.2 Audit Conduct

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RESPONSIBILITY	ACTION
MANAGER, PERFORMANCE ASSESSMENT STAFF MANAGERS	A. Organize audit/appraisal teams by providing team leaders and other appropriate team members and by securing technical specialists and other team members as appropriate from other departments.
TEAM LEADER	B. Prepare individual audit/appraisal plan and provide team orientation and direction.
	C. Coordinate internal audits/appraisals with the manager of the audited/appraised organization to ensure that appropriate personnel are contacted.
	D. Coordinate external audits with the appropriate WMCO contract administration personnel.
	E. Lead the team in conducting the planned audit/appraisal in accordance with the applicable departmental procedures.
	F. Prepare the audit/appraisal report recording the results of the audit/appraisal.
MANAGER, PERFORMANCE ASSESSMENT	G. Issue the report of Quality Assurance Program Audits to responsible management and request any needed corrective actions. The audit report shall be issued within 30 days after performance of the audit. Each finding of deviation shall be recorded on a Deviation and Corrective Action Report (DCAR) Form which becomes a part of the audit report. (See Site Procedure FMPC-706, "Deviation and Corrective Action Reporting.")

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6.2 Audit Conduct (Continued)

RESPONSIBILITY	ACTION
MANAGER, INTERNAL AUDIT	H. Issue the final audit report to the DOE, Oak Ridge Operations, Contractor Evaluation Branch, with a copy to the audited organization. This report includes schedules for implementing corrective action obtained from the audited organization (see step 6.3C). Audit reports are reviewed and approved by the WMCO Executive Vice President before issuance. Internal review of the audit, editing of the draft audit report, and preparation of the final audit report are accomplished in as timely a manner as possible but generally not to exceed 30 days.
APPRAISAL TEAM LEADER	I. Issue the appraisal report to the manager of the appraised organization within 30 days after performance of the appraisal. Request corrective action response for each finding of deviation.

6.3 Audit Follow-Up and Closeout

MANAGER OF AUDITED ORGANIZATION (Quality Assurance Audits)	A. Plan and implement actions to correct deviations or resolve operational problems.
	B. Provide a response to the Manager, Performance Assessment for each finding of deviation by completing the Corrective Action part of the DCAR. (See FMPC-706).
MANAGER OF AUDITED ORGANIZATION (Internal Audits)	C. Provide a response to the Manager, Internal Audits for each finding of deviation including the corrective action planned to resolve the deficiency.

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6.3 Audit Follow-Up and Closeout (Continued)

RESPONSIBILITY	ACTION
MANAGER OF APPRAISED ORGANIZATION (Internal Appraisals)	D. Provide a response to the Staff Manager within the required time frame as stated in the appraisal transmittal letter, specifying the corrective action planned for resolution of each finding of deviation and a response to each observation.
MANAGER, PERFORMANCE ASSESSMENT STAFF MANAGER	E. Evaluate the disposition of deviations or resolution of operational problems identified through audits and appraisals.
	F. Track findings of deviation on an individual basis until they are completed.
	G. Evaluate the accomplishment of corrective actions and issue a letter closing the audit/appraisal findings upon satisfactory evidence of completion.
	H. Issue bimonthly a status report to identify open items of deviation.

6.4 Program Status, Adequacy and Effectiveness Feedback

MANAGER, PERFORMANCE ASSESSMENT	A. Annually report to the WMCO President the status, adequacy and effectiveness of FMPC operations as revealed from audits/ appraisals.

7.0 APPLICABLE DOCUMENTS

ANSI/ASME NQA-1 - "Quality Assurance Requirements for Nuclear Facilities", Basic Requirement 18 - "Audits"
DOE 2321.1 - "Auditing of Programs and Operations"
DOE 5480.1B - "Environmental Protection, Safety and Health Protection Program for DOE Operations"
DOE 5482.1B - "Environmental Protection, Safety, and Health Protection Appraisal Program"
DOE 5633.3 - "Control and Accountability of Nuclear Materials "
DOE 5700.6B - "Quality Assurance"
FMPC - 706 - "Deviation and Corrective Action Reporting"
DOE-OIG Integrated Contractor Audit Manual (ICAM)
Westinghouse Audit Standards Manual

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8.0 FORMS USED

FMPC-QA-2909 - Deviation and Corrective Action Report (See FMPC-706)

9.0 ATTACHMENTS

None

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1.0 PURPOSE

The purpose of this document is to establish the procedure for taking representative samples of residues and waste at Plant 1 and Resource Conservation and Recovery Act (RCRA) Storage facilities.

2.0 APPLICABILITY

This procedure is applicable to the methods and equipment for preparing and taking samples of dry, moist, and liquid materials by Waste Management.

3.0 RESPONSIBILITIES

3.1 Supervisors shall be responsible for the following:

3.1.1 Contacting Industrial Hygiene or Radiological Safety to determine the appropriate respiratory protection for the process being performed.

3.1.2 Providing operators with the required respiratory protection.

3.1.3 Ensuring that only trained personnel take samples.

3.1.4 Reporting exceptional circumstances not addressed by this SOP in a Minor Event Report (refer to FMPC-704) and notifying the AEDO of the circumstances.

3.2 Operators shall be responsible for complying with this procedure and reporting any unusual occurrences to the supervisor or, in the supervisor's absence, the Assistant Emergency Duty Officer (AEDO).

3.3 Radiological Safety shall be responsible for furnishing a copy of P-35-013 with a "Radiation Work Permit" when sampling Plutonium Out of Specification (POOS) material.

3.4 Waste Technology shall be responsible for the preparation of RCRA or suspect RCRA sampling plans, hazardous waste determination, and homogeneous determinations on an individual basis in accordance with required EPA sampling test methods.

3.5 Solid Waste Compliance shall be responsible for hazardous waste determination.

4.0 DEFINITIONS

4.1 DELETED

4.0 DEFINITIONS (cont.)

4.2 DELETED

4.3 DELETED

4.4 DELETED

5.0 REFERENCES

5.1 1-C-701, "Plant 1 Dust Collectors"

5.2 1-C-904, "Operator Scale Checking in Plant 1"

5.3 20-C-601, "Packaging Low Level Waste for Offsite Disposal"

5.4 20-C-605, "Hazardous Waste Satellite Accumulation Areas"

5.5 20-C-905, "Ventilation Flow Indicators (VFI)"

5.6 FMPC-2178, "FMPC Lot Marking and Color-Coding System"

5.7 DELETED.

5.8 SOP 20-C-101, "Moving and Storing Nuclear Materials on Site at the FMPC"

5.9 SOP 20-C-102, "Nuclear Safety for Receiving, Storing, Repackaging, and Moving Enriched Uranium Materials <20% ^{235}U from Offsite"

5.10 SOP 20-C-904, "General Nuclear Safety Requirements"

R 5.11 SOP 20-C-606, "Hazardous Material Spill Clean-Up"

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

6.1 A defined safety system is not involved.

6.2 Operators shall wear respiratory protection provided by the supervisor when dusty conditions exist.

6.3 Leather-palm gloves shall be worn when handling drums, locking rings, lids, sharp or abrasive material, or when using tools.

6.4 Face shields and neoprene gloves and aprons shall be worn when taking samples of caustic material, acid slurries, or liquids.

R - MATERIAL REVISED, ADDED, OR DELETED.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.5 Drums with noticeable bulging shall be opened under the direction of the supervisor and Safety and Fire Protection Engineering.

6.6 Protective equipment as directed by IS&H shall be worn when handling or sampling drums that are corroded, rusted, bulging, or deformed.

6.7 Material in damaged drums shall be placed in another correctly identified container.

R 6.8 Any release of hazardous waste shall be reported and handled immediately per
R SOP 20-C-606.

6.9 Dust Collector G2-172 shall be turned on during the sampling operation at the Plant 1 sample line.

6.10 If POOS material is to be sampled, contact Radiological Safety.

6.11 Material shall be handled per the requirements of SOP 20-C-101, 20-C-102, and 20-C-904.

6.12 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion or absorption shall immediately be reported to a supervisor. The supervisor shall immediately report the circumstance of possible radioactive materials intake to Radiological Safety for evaluation. The involved employees shall report to Medical Services at the end of their shift or as directed to submit a urine sample and again report at the start of their next shift to submit another urine sample. The supervisor shall consider the circumstances to be a minor event and shall immediately complete a minor Event Report per FMPC-704 and notify the AEDO of the circumstance.

6.13 Gloves shall be leak-checked prior to use.

6.14 A Radiation Work Permit shall be obtained prior to performing any sampling operation.

R - MATERIAL REVISED, ADDED, OR DELETED.

RESTORATION PROCEDURE	SAMPLING RESIDUE AND WASTE MATERIALS	SOP 1-C-101 AREA: Plant 1
Authorization: (Signature on File) J. T. Grumski, Waste Management	Supersedes: 1-C-101, 06-29-72	Issue Date: 6-16-89

7.0 PROCEDURE

NOTE: A sampling plan, as required by EPA Document EPA SW-846, shall be prepared prior to sampling a hazardous waste or suspect hazardous waste stream.

NOTE: Any sample collected for hazardous waste or residue material taken for verification of hazardous waste determination shall follow strict chain of custody guidelines in accordance with 7.12.

NOTE: Any deviation from procedure shall be documented on a "Sampling Deviation/Special Handling Requirements", Form FMPC-PRO-3130 (See Figure 1).

NOTE: DELETED.

NOTE: When sampling a material for hazardous waste determination, a "clean" sampler must be used (Refer to Section 7.9).

7.1 Preparation for Sampling

7.1.1 At the start of the operating shift, check the scales to be used per SOP 1-C-904.

7.1.2 Move skids of material into the sampling area.

7.1.3 Prepare a composite sample drum.

7.1.3.1 Tare weigh an empty, clean, color-coded 30-gallon drum. Stencil the tare weight and the lot marking number on the drum (Refer to "FMPC Lot Marking and Color-Coding System").

NOTE: The composite sample container shall be large enough to hold the entire composite sample. Use a larger container if necessary.

7.1.4 If the drum to be sampled was received from offsite, printweigh the drum per Item 7.2.

7.1.5 Remove the locking ring and drum lid from the drum to be sampled.

NOTE: To prevent contamination of the sample, only one drum at a time shall be open.

7.1.6 Visually inspect the waste material to be sampled to determine the physi characteristics (liquid, solid, dry, moist).

7.0 PROCEDURE (cont.)

7.1.7 Select and obtain a clean sampler for the type of material to be sampled per recommendation of Table 1.

7.1.7.1 If assistance is required in determining the physical characteristics of the waste or the type of sampler to be used, contact Waste Technology.

NOTE: Clean samplers shall have a completed "Clean Equipment" tag affixed to the sampler and be sealed in plastic bags or tubes.

7.1.8 Sample the material using the procedure for the type sampler (Refer to Table 1).

NOTE: The supervisor will supply sampling requirements for nuclear materials and for suspected RCRA material based on published sampling plans. Sampling may also be specified using an approved "Sampling Deviation/Special Handling Requirements", Form FMPC-PRO-3130 (See Figure 1).

7.1.9 Replace the drum lid and lock ring following sampling.

7.1.9.1 If the drum lid and lock ring are damaged, replace with a new lid and ring.

7.1.10 Repeat Steps 7.1.4, 7.1.5, 7.1.8, and 7.1.9 for each drum in the lot.

7.1.11 After the lot has been sampled, weigh the 30-gallon composite sample drum. Record the weight on a "Sample Weight Ticket", Form FMPC-PRO-1579 (See Figure 3).

7.1.12 Take a secondary sample from the composite sample drum (Refer to Item 7.7 and 7.8).

7.1.13 Place a clean lid and locking ring on the 30-gallon composite sample drum.

7.1.14 Using a forklift, load the sampled drums and the composite sample drum onto skids.

7.1.15 Move the skids to the storage area designated by the supervisor.

7.1.16 Clean and store the sampling instrument per Items 7.9 and 7.10.

7.1.17 Complete the "Sample Weight Ticket", Form FMPC-PRO-1579 (See Figure 3).

7.0 PROCEDURE (cont.)

7.1.18 Send the documentation as completed in Item 7.11 and the secondary sample to the laboratory.

7.1.18.1 If the Chain of Custody form is being used, deliver listed samples directly to the Laboratory.

NOTE: The operator obtaining the samples shall deliver the samples to the Laboratory without the use of Transportation personnel.

7.2 Completing the Container Printweigh Card

7.2.1 If the drum to be sampled contains material from offsite, printweigh the drum on a "Container Printweigh Card", Form FMPC-PRO-1342 (See Figure 2).

7.2.2 Check that the gross weight is printed in the "WEIGHT" column.

7.2.3 Enter the drum tare weight in the column marked "CODE".

NOTE: Tare weight is stencilled on the drum.

7.2.4 After lot sampling has been completed, printweigh the composite sample drum.

7.2.5 Calculate the net weight of the composite sample drum.

NOTE: The net weight is the difference between the weight after sampling and the tare weight.

7.2.6 For each composite sample container, complete a "Container Printweigh Card" as follows:

7.2.6.1 Enter the gross and net weight of the composite sample container.

7.2.6.2 In Box #1, enter the type of material sampled.

7.2.6.3 In Box #2, enter the 15-digit lot number.

7.2.6.4 In Box #3, enter the specific sampling method.

7.2.6.5 In Box #4, enter the tare weight.

7.2.6.6 In Box #5, enter the vendor lot marking number, if available.

7.0 PROCEDURE (cont.)

7.2.6.7 In Box #6, enter the date and gross and net weights.

7.2.6.8 In Box #7, enter the date the sample was prepared.

7.2.6.9 In Box #10, enter the scale number.

7.2.6.10 In Box #13, enter the total number of containers (including the composite sample container).

7.2.6.11 In Box #15, enter when the sample was weighed.

7.2.6.12 In Box #16, enter the operator's name and badge number.

7.2.7 Affix the "Container Printweigh Card" to the composite sample drum.

7.2.8 DELETED.

7.2.9 DELETED.

7.2.10 DELETED.

7.3 Using the Automatic Closed Auger Sampler

7.3.1 After skids of material have been moved into the sampling area, place the drums on the Sampling Conveyor using a forklift.

7.3.2 Ensure Dust Collector G2-172 is in operation, and if not, start-up and operate per SOP 1-C-701.

NOTE: DELETED.

7.3.3 Check the Ventilation Flow Indicator (VFI) located on the auger enclosure. Notify supervisor and discontinue sampling if the VFI reads less than 2.2 inches differential (Refer to 20-C-905, "Ventilation Flow Indicators").

7.3.4 After the drum lid is removed, manually move the drum along the conveyor into the Auger Sampling Chamber.

7.3.5 Place the composite sample drum under the Sample Discharge Chute.

7.0 PROCEDURE (cont.)

7.3.6 Insert the auger sampler in the drum. Run the auger to the bottom of the drum.

NOTE: Vary the sampling location for each drum. Samples shall be taken from the center and off center points.

NOTE: Do not tilt the drum during sampling.

7.3.6.1 If the material type is different from that previously sampled (different lot, different material), take two samples from the first drum. Discard the samples to avoid cross contamination of samples.

NOTE: Use a separate container to collect the discarded samples. Discard samples can be returned to the drum after the drum has been sampled.

7.3.7 Withdraw the auger sampler.

NOTE: The auger sampler will automatically deposit the sample in the 30-gallon composite sample drum. Drum shall not be more than half filled to permit blending.

7.3.8 Check to ensure that the entire content of the auger was deposited in the sample container.

7.3.9 If specified by supervision, repeat Steps 7.3.9 thru 7.3.11 to take additional samples from other points in the drum.

7.3.10 When sampling is complete, move the drum along the conveyor to the lidding station.

7.3.11 Repeats steps 7.3.4 through 7.3.10 until all drums have been sampled.

7.4 Using the Grain Sampler

7.4.1 Ensure that the grain sampler is in the closed position with the slots in the outer tube face up.

7.4.2 Insert the sampler into the material being sampled.

NOTE: Insert the sampler at a point near the side of the container, through the center of the container, to a point opposite the entry point.

7.0 PROCEDURE (cont.)

7.4.3 Rotate the inner tube of the sampler to the open position.

7.4.4 Wiggle the sampler a few times to ensure that material enters the open slots.

7.4.5 Rotate the inner tube of the sampler to the closed position.

7.4.6 Withdraw the sampler from the drum of material.

7.4.7 Place the sampler in a horizontal position with the slots in the outer tube facing up.

7.4.8 Rotate the inner tube to the open position.

7.4.9 Slide the inner tube out of the outer tube.

7.4.10 Place the sample in the appropriate sample container as specified in Table 2 for residues and Table 3 for RCRA or suspect RCRA material.

7.4.11 Lid the sample container while obtaining the next sample.

7.4.12 If specified by supervision, repeat Steps 7.4.1 thru 7.4.11 to take additional samples from other points in the drum.

7.4.13 After adequate samples have been taken, sample the next drum.

7.4.14 Repeat steps 7.4.1 thru 7.4.13 until all drums in the lot have been sampled.

7.5 Using the Pipe Sampler

NOTE: The pipe sampler shall be long enough to reach the bottom of the container being sampled.

7.5.1 Insert the pipe sampler diagonally through the contents of the drum.

7.5.2 Rotate the pipe sampler once or twice to cut a core of material.

7.5.3 Ensure that the slot is face up and slowly withdraw the pipe sampler.

7.5.4 Check to ensure that the entire length of pipe contains material. If not, repeat Steps 7.5.1 thru 7.5.3.

7.0 PROCEDURE (cont.)

7.5.5 Using a clean stainless steel spatula, push the material out of the sampler into the appropriate sample container as specified in Table 2 for residues and Table 3 for RCRA or suspect RCRA material.

7.5.5.1 If an organic analysis is required, refer to Table 4 for the appropriate sample container.

7.5.6 Lid the sample container while obtaining the next sample.

7.5.7 If specified by supervision, repeat Steps 7.5.1 thru 7.5.6 to collect samples from other points in the drum.

7.5.8 Repeat Steps 7.5.1 thru 7.5.7 until all the drums in the lot have been sampled.

7.6 Using the Composite Liquid Waste Sampler (COLIWASA)

7.6.1 Using the Disposable COLIWASA

7.6.1.1 Adjust the locking mechanism, if necessary, to ensure that the neoprene rubber stopper provides a tight closure.

7.6.1.2 Place the stopper rod handle in the T-position.

7.6.1.3 Push the rod down until the handle is against the locking block.

7.6.1.4 Slowly lower the COLIWASA vertically into the drum.

NOTE: Lower the COLIWASA so that the levels of liquid inside and outside the sampler tube remain even. If the liquid level in the sampler tube is lower than the level outside the sampler, the rate is too fast and will result in a nonrepresentative sample.

7.6.1.5 When the stopper hits the bottom of the drum, push the sampler tube downward against the stopper to close the sampler.

7.6.1.6 Turn the T-handle upright with one end tight on the locking block to lock the sampler closed.

7.6.1.7 Slowly withdraw the sampler with one hand while wiping the outside of the sampler with a clean disposable cloth.

7.6.1.7.1 Dispose of absorbent cloths and trash bags which have not come in contact with RCRA, or suspected RCRA, waste per SOP 20-C-601.

7.0 PROCEDURE (cont.)

7.6.1.7.2 Dispose of absorbent cloths and trash bags which have come in contact with RCRA, or suspected RCRA, waste per SOP 20-C-605.

7.6.1.8 Place the end of the COLIWASA into the appropriate composite sample container (Refer to Table 3).

7.6.1.8.1 If an organic analysis is required, complete Step 7.13.1 through Step 7.13.3 (Refer to Table 4 for appropriate sample container).

NOTE: Waste Technology shall determine if an organic analysis is required per the Sampling Plan.

7.6.1.9 Empty the sampler by slowly pulling the lower end of the T-handle away from the locking block.

7.6.1.10 If specified by supervision, repeat Steps 7.6.1.2 through 7.6.1.9 to collect samples from other points in the drum.

7.6.1.11 After changing drums, repeat Steps 7.6.1.2 through 7.6.1.10 until all the drums in the lot have been sampled.

7.6.2 Using the Glass COLIWASA

7.6.2.1 Check to ensure that the inner tubing and the outer sheath are not cracked.

7.6.2.2 Insert the inner tubing inside the sheath.

7.6.2.3 Raise the ground glass and the tubing several inches above the hole in the bottom of the sheath.

7.6.2.4 Slowly lower the COLIWASA vertically into the drum, keeping the ground glass end away from the hole in the bottom of the sheath.

NOTE: Lower the COLIWASA so that the levels of liquid inside and outside the sampler tube remain even. If the liquid level in the sampler tube is lower than the level outside the sampler, the rate is too fast and will result in a nonrepresentative sample.

7.0 PROCEDURE (cont.)

7.6.2.5 When the sheath hits the bottom of the drum, push the inner tube downward so that the ground glass end seals the end of the sheath.

7.6.2.6 Slowly withdraw the COLIWASA sampler with one hand ensuring the ground glass end is sealed against the tube bottom while wiping the outside of the sampler with a clean disposable cloth.

7.6.2.6.1 Dispose of absorbent cloths and trash bags which have not come in contact with RCRA, or suspected RCRA, waste per SOP 20-C-601.

7.6.2.6.2 Dispose of absorbent cloths and trash bags which have come in contact with RCRA, or suspected RCRA, waste per SOP 20-C-605.

7.6.2.7 Place the end of the COLIWASA into the appropriate composite sample container (Refer to Table 3).

7.6.2.7.1 If an organic analysis is required, complete steps 7.13.1 through 7.13.3 (refer to Table 4 for appropriate sample container).

NOTE: Waste Technology shall determine if an organic analysis is required per the Sampling Plan.

7.6.2.8 Empty the sampler by pulling the inner tube upward causing the ground glass end to separate from the outer tube bottom.

7.6.2.9 If specified by supervision, repeat Steps 7.6.2.2 through 7.6.2.8 to collect samples from other points in the drum.

7.6.2.10 After changing drums, repeat Steps 7.6.2.2 through 7.6.2.9 until all the drums in the lot have been sampled.

7.7 Collecting Secondary Samples of Dry Materials

7.7.1 Place the composite sample container on its side on the drum roller.

7.7.2 Set the drum roller timer for five minutes.

7.7.3 Turn on the drum roller.

7.7.4 Mix for five minutes and turn off the drum roller.

7.7.5 Place the drum in an upright position for five minutes to allow dust to settle.

7.0 PROCEDURE (cont.)

7.7.6 Tare weigh a clean sample jar on the scale.

7.7.7 Remove the locking ring and lid from the composite sample container.

7.7.8 Using a clean grain sampler (Refer to Item 7.4), take a sample from the container.

7.7.9 Place the sample in the appropriate sample container (Refer to Table 2 or Table 3).

7.7.10 Repeat Steps 7.7.8 and 7.7.9 to collect samples from other points in the drum until an amount specified by supervision is collected.

NOTE: A minimum of two sample points is required.

7.7.11 Cap the sample jar after obtaining the secondary sample.

NOTE: No preservatives or other substances shall be added to the sample without the prior consent of the Analytical Laboratory.

7.7.12 Weigh the sample jar.

7.7.13 Complete the required records (Refer to Item 7.11).

7.7.14 Deliver the sample and completed documents to the Analytical Laboratory sample receiving room.

NOTE: All RCRA or suspected RCRA samples shall be delivered during the same shift in which they were collected.

7.7.14.1 If the Chain of Custody form is being used, deliver listed samples directly to the Laboratory.

NOTE: The operator obtaining the samples shall deliver the samples to the Laboratory without the use of Transportation personnel.

7.8 Collecting Secondary Samples - Moist or Sticky Materials

7.8.1 Tare weigh an appropriate sample jar (Refer to Table 2 or Table 3).

7.8.2 Open the composite sample container.

7.8.3 Using a pipe sampler, take a sample from the container per Steps 7.5.3 thru 7.5.5.

7.0 PROCEDURE (cont.)

7.8.4 Using a stainless steel spatula, push the sample out of the pipe into a clean five gallon can.

7.8.5 Repeat Steps 7.8.3 and 7.8.4 to collect four more samples.

NOTE: For the remaining samples, insert the pipe sampler at different points at the side of the container.

7.8.6 Blend the five core samples using the stainless steel spatula.

7.8.7 Using the stainless steel spatula, take five equal portions from different areas of the blend and place the portions in the appropriate sample container (Refer to Table 2 or Table 3).

NOTE: Sampling shall continue until an amount specified by supervision is collected.

NOTE: No preservatives or other substances shall be added to the samples without the prior consent of the Analytical Laboratory.

7.8.8 Place the unused secondary sample in the primary composite sample container and return the container to the lot.

7.8.9 Complete the required records (Refer to Item 7.11).

7.8.10 Deliver the sample and completed documents to the Analytical Laboratory sample receiving room.

NOTE: All samples shall be delivered during the same shift in which they were collected.

7.8.10.1 If the Chain of Custody form is being used, deliver listed samples directly to the Laboratory.

NOTE: The operator obtaining the samples shall deliver the samples to the Laboratory without the use of Transportation personnel.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.9 Cleaning Sampling Equipment

NOTE: This cleaning procedure is not applicable to the automatic closed auger sampler.

NOTE: Cleaning shall be performed over a container marked with the appropriate 15-digit FMPC Lot Markings.

7.9.1 Using a warm detergent solution, wash sampling equipment thoroughly. Use a bottle brush to remove particulate matter, films, or other dirt as necessary.

CAUTION: THE LID SHALL BE KEPT ON THE DRUM CONTAINING THE USED RINSE SOLUTION WHEN NOT IN USE.

NOTE: Alquinox or Liquinox may be used as the cleaning detergent.

NOTE: Only non wire-wrapped brushes shall be used.

7.9.2 Rinse the sampler several times with tap water to remove detergent residues.

7.9.2.1 When the rinse container is full, process the contents as RCRA waste per SOP 20-C-605.

NOTE: The solution accumulated from rinsing the sampling equipment shall not be mixed except when directed by the supervisor.

7.9.3 Rinse the sampler with distilled water.

7.9.4 Drain excess water off the sampler.

7.9.5 Rinse the sampler with pesticide grade purity isopropanol and, if necessary, dry with clean dry cloth.

NOTE: Pesticide grade purity isopropanol is isopropanol that is below laboratory grade purity isopropanol.

7.9.6 Place the clean sampler into a clean plastic bag or wrap with aluminum foil.

7.9.7 Dispose of absorbent cloths and trash bags which have not come in contact with RCRA waste or suspected RCRA waste per SOP 20-C-601.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.9.8 Dispose of absorbent cloths and trash bags which have come in contact with RCRA waste or suspected RCRA waste per SOP 20-C-605.

7.9.9 Fill out and attach a "Clean Equipment" tag to sampler, Form No. FMPC-PRO-3128, (See Figure 4).

7.9.10 Store the sampler per item 7.10 unless the sampler is to be used immediately.

7.9.11 If directed by the supervisor, obtain a sample of the rinsate and forward to the Laboratory for analysis.

7.9.11.1 When an analysis is required, store rinsate container in a satellite accumulation container/area until the analysis results are received and disposition determined.

7.10 Storing Sampling Equipment

7.10.1 Place the clean samplers (except closed auger) in a clean polyethylene plastic bag or wrap with aluminum foil.

7.10.2 Seal the plastic bag with tape.

7.10.3 Place the samplers in a clean, protected area.

7.11 Record Requirements

NOTE: The following record requirements apply to all secondary samples collected by Plant 1 personnel.

NOTE: All data for RCRA or suspect RCRA materials shall be recorded in waterproof ink.

7.11.1 Record the following information on the "Enrichment Label", Form No. FMPC-PRO-306 M-145 (See Figure 6). Affix the completed label to the secondary sample container.

7.11.1.1 Sampling location.

7.11.1.2 Collector signature.

7.11.1.3 Type of material.

7.11.1.4 Type of sample.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.11.1.5 Lot number of material sampled.

7.11.1.6 Date sampled.

7.11.1.7 Time sampled (AM/PM or military time).

7.11.1.8 Net weight of the secondary sample.

7.11.1.9 Isotopic range (enriched, depleted).

7.11.2 DELETED.

7.11.2.1 DELETED.

7.11.2.2 DELETED.

7.11.2.3 DELETED.

7.11.2.4 DELETED.

7.11.2.5 DELETED.

7.11.2.6 DELETED.

7.11.2 Complete a "Report of Chemical Analyses", Form FMPC-T-200 (See Figure 8).

NOTE: Supervision shall specify analyses required.

7.11.2.1 If a sampling plan is in effect, do not complete Form FMPC-T-200 for RCRA Sampling.

7.12 Chain of Custody For Hazardous Determination Samples

NOTE: Plant 1 personnel shall be notified of all lots requiring Chain of Custody documentation.

7.12.1 Fill out an "Analytical Laboratory Sample Seal," Form No. FMPC-ES&H-2774 (See Figure 9) with the sample collector's name and badge number, date and time the sample was collected, and the drum and lot numbers.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.12.2 Place the sample seal over the lid of the sample container.

NOTE: Tamper guard tape may be used if a sample seal is not available.

NOTE: The sample seal (or tamper guard tape) shall be attached so that the seal will break when the sample container is opened.

NOTE: Each container must be sealed immediately after sample is collected and labeled using waterproof ink.

7.12.3 Ensure that record requirements (Refer to Item 7.11) are complete.

7.12.4 Complete the "Chain of Custody" sheet, Form No. FMPC-PRO-3112 (See Figure 10).

7.12.4.1 If the material is being sampled according to a sampling plan, write "See Sampling Plan No. XXXX" under "Analyses Requested" on the form.

NOTE: The "Chain of Custody" sheet shall be signed each time physical control of the samples is transferred.

NOTE: More than one sample can be included on the custody form. When more than one form is required for a large shipment, each form shall be completed entirely.

7.12.5 DELETED.

7.12.6 Record the following information in the "Field Log Book".

NOTE: Log entries shall be recorded using waterproof ink in a written manner which can be easily read and understood.

NOTE: The log book shall be protected and kept in a safe place.

7.12.6.1 Purpose of sampling (RCRA determination, MC&A sampling).

7.12.6.2 Location of sampling.

7.12.6.3 Name of field contact (person responsible for answering questions concerning the sample).

7.12.6.4 Generator of waste and address (if different from location).

7.12.6.5 Type of process producing waste (if known).

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7.0 PROCEDURE (cont.)

7.12.6.6 Type of waste.

7.12.6.7 Declared/suspected waste components and concentrations.

7.12.6.8 Number and volume of sample taken.

7.12.6.9 Description of sampling point.

7.12.6.10 Date and time of collection.

7.12.6.11 Sample collector sample identification number(s).

7.12.6.12 Type of container the sample was taken from.

7.12.6.13 Drum inventory number (if available) as specified by MC&A (unique 4-digit number stenciled in white on the side of the waste drum).

7.12.6.14 FMPC lot marking system number.

7.12.6.15 Drum number (if available)

7.12.6.16 All other numbers on the drum(s).

7.12.6.17 Any written information on the drum describing the material contained in the drum.

7.12.6.18 Sampling method used.

7.12.6.19 Material description as observed by the collector.

7.12.6.20 Preservatives used.

NOTE: No preservatives or other substances shall be added to the samples without the prior consent of the Analytical Laboratory.

7.12.6.21 Any field measurements made, such as pH.

7.12.6.22 Signature of person recording the data.

7.12.7 Deliver the sample and completed documents to the Analytical Laboratory sample receiving room.

NOTE: All samples shall be delivered to the lab for analysis during the same shift in which the samples were collected.

R - MATERIAL REVISED, ADDED, OR DELETED.

7.0 PROCEDURE (cont.)

7.13 Liquid Organic Analysis

7.13.1 Carefully fill the septum bottle with the sample liquid.

NOTE: The liquid must reach the lip of the bottle.

7.13.2 Slide the teflon septum across the lip of the bottle covering the opening and then screw the plastic lid on the bottle.

7.13.3 Check the septum bottle for air bubbles by turning the bottle upside down.

NOTE: Organic analysis requires that no air bubbles be present in the septum bottle.

7.13.3.1 If air bubbles are present, empty the bottle and repeat steps 7.13.1 through 7.13.3 until the air bubbles are not present.

8.0 APPLICABLE FORMS

8.1 FMPC-PRO-3130, "Sampling Deviation/Special Handling Requirements"

8.2 FMPC-PRO-1342, "Container Printweigh Card"

8.3 FMPC-PRO-1579, "Sample Weight Ticket"

8.4 FMPC-PRO-3128, "Clean Equipment"

8.5 DELETED.

8.6 FMPC-PRO-306 M-145, "Enrichment Label"

8.7 DELETED.

8.8 FMPC-T-200, "Report of Chemical Analyses"

8.9 FMPC-OS&H-2774, "Sample Seal"

8.10 FMPC-PRO-3112, "Chain of Custody"

8.11 DELETED.

TABLE 1

SAMPLERS

MATERIAL	SAMPLER	PROCEDURE ITEM NUMBER
Dry, compacted solids	Auger	7.3
Dry, fluffy, solids	Grain	7.4
Moist solids	Pipe	7.5
Liquids, sludges	COLIWASA	7.6

TABLE 2

SAMPLE CONTAINERS FOR RESIDUE SAMPLING

SAMPLER	TYPE OF SAMPLE CONTAINER
Auger	Glass or plastic
Grain	Glass or plastic
Pipe	Glass or plastic

R - MATERIAL REVISED, ADDED, OR DELETED.

TABLE 3

SAMPLE CONTAINERS FOR RCRA OR RCRA SUSPECT SAMPLING

SAMPLER	TYPE OF SAMPLE CONTAINER
Grain	Shatterproof glass bottle with teflon cap liner
Pipe	Shatterproof glass bottle with teflon cap liner
Coliwasa	Shatterproof glass bottle with teflon cap liner

TABLE 4

SPECIAL SAMPLE CONTAINERS FOR ORGANIC ANALYSIS

SAMPLER	ANALYSIS	TYPE OF SAMPLE CONTAINER
Coliwasa	volatile	Septum Bottle (40 ml.)
Coliwasa	semi-volatile	Septum Bottle (40 ml.)
Pipe	volatile	Septum Bottle (40 ml.)
Pipe	semi-volatile	Septum Bottle (40 ml.)

R - MATERIAL REVISED, ADDED, OR DELETED.

RESTORATION PROCEDURE	SAMPLING RESIDUE AND WASTE MATERIALS	SOP 1-C-101 AREA: Plant 1
Authorization: (Signature on File) J. T. Grumski, Waste Management	Supersedes: 1-C-101, 06-29-72	Issue Date: 6-16-89

SAMPLING DEVIATION/SPECIAL HANDLING REQUIREMENTS

SAMPLING LOCATION: _____ DATE: _____

MATERIAL TYPE: _____ CONTAINER TYPE: _____

REASON FOR SAMPLING DEVIATION/SPECIAL HANDLING:

_____

_____

_____

_____

_____

_____

OUTLINE OF SPECIAL REQUIREMENTS:

_____

_____

_____

_____

_____

_____

_____

APPROVALS:

_____ _____

MC&A Representative Solid Waste Compliance Representative

_____ _____

Waste Operations Supervisor Cognizant Engineer

SAMPLING DEVIATION/SPECIAL HANDLING REQUIREMENTS
FMPC-PRO-3130
Figure 1

R - MATERIAL REVISED, ADDED, OR DELETED.

RESTORATION PROCEDURE	SAMPLING RESIDUE AND WASTE MATERIALS	SOP 1-C-101 AREA: Plant 1
Authorization: (Signature on File) J. T. Grumski, Waste Management	Supersedes: 1-C-101, 06-29-72	Issue Date: 6-16-89

FMPC-PRO-1342 (REV. 2/5/87)

PRODUCTION RECORDS - PLANT 1

CONTAINER PRINTWEIGH CARD

WO	CODE	WEIGHT	CONTR. NO.
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

1. MATERIAL TYPE:

2. FMPC LOT NO.:

3. SAMPLING METHOD (CHECK ONE): (P) ☐ PIPE (A) ☐ Auger (S) ☐ System

4. TARE WEIGHT SOURCE (CHECK ONE): (V) ☐ Vendor (F) ☐ FMPC (X) ☐ Stat. Sample ____ -lbs.

5. VENDOR LOT NO.:

WEIGHED: Date: ____ Gross ____ Tare ____

6. DATE OF MOISTURE DETERMINATION

7. DATE SAMPLE PREPARED:

8. SAMPLE AMOUNT TO VENDOR

9. MOISTURE CONTENT:

10. SCALE NO.:

11. PLANT RPT. NO.:

12. MOISTURE CONTENT:

TEST 11 12 13 14 15 16 17 18 19 20

POS. GUIDES

$-H_2O$

TEST SW 1 2 3 4 5 6 7 8 9 10

13. TOTAL NO. CONTRS.:

14. REPORT COPIES REQ.: ☐ 6 ☐ 12

15. WEIGHING INST.: ☐ Before Sample ☐ After Sample

16. OPERATOR'S NAME:

17. DATA VERIFIED BY:

NO.	DISTRIBUTION OF COPIES
1	Tabulating Section
2	Production Records - Plant 1 (RECORD COPY)

Card No. ____ of ____

WO	CODE	WEIGHT	CONTR. NO.
SAMPLE WEIGHT			
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

CODES: TD - Test Drum
SA - Scale Adjusted
CS - Changed Scales
R-SA - Reweigh-Scale Adjusted

CONTAINER PRINTWEIGH CARD
FMPC-PRO-1342
Figure 2

R - MATERIAL REVISED, ADDED, OR DELETED.

GROSS

TARE

NET

SAMPLING PLANT

SAMPLE WEIGHT TICKET

VENDOR:

LOT NO.: DATE:

CHECK (√) ☐ Partial ☐ Complete ☐ Sample Reject

WEIGHT	Gross	
	Tare	
	Net	

RETURNED DRUM NO.:

PRO-1579 (9/4/59)

SAMPLE WEIGHT TICKET
FMPC-PRO-1579
Figure 3

R - MATERIAL REVISED, ADDED, OR DELETED.

CLEANED BY: _____

DATE: _____

Cleaned according to sop : _____

FMPC-OPR-3128 (6/22/89)

CLEAN EQUIPMENT
FMPC-PRO-3128
Figure 4

R - MATERIAL REVISED, ADDED, OR DELETED.

DELETED

DELETED
DELETED
Figure 5

R - MATERIAL REVISED, ADDED, OR DELETED.

FMPC-SAMPLE LABEL/RCRA MATERIAL-ENRICHED

SAMPLING LOCATION	235 NO ENRICHMENT
COLLECTOR	
TYPE OF MATERIAL	
TYPE OF SAMPLE	
LOT NUMBER OR IDENT	
DATE / TIME / NET WT	

FMPC FORM 306 M-146 (REV 11/29/88)

ENRICHMENT LABEL
FMPC-PRO-306 M-145
Figure 6

R - MATERIAL REVISED, ADDED, OR DELETED.

DELETED

DELETED
DELETED
Figure 7

R - MATERIAL REVISED, ADDED, OR DELETED.

.PC

PORT OF CHEMICAL ANALYSES

TE: *Write Firmly — Part 4 must be legible.)*

FMPC-T-200 (REV. 5/8/86)

Lab. Nos. _____

Lot No. _____

ıalyses Requested _____

TERIAL:

COUNT NO.:

TE SAMPLED:

BMITTED BY:

EMARKS:

LAB. NO.	IDENTIFICATION	ANALYTICAL DATA					

NO.	DISTRIBUTION OF COPIES
1	Originator
2	Extra Copy
3	Quality Assurance
4	Analytical *(RECORD COPY)*

Approved By _____ Date of Report _____

REPORT OF CHEMICAL ANALYSES
FMPC-T-200
Figure 8

R - MATERIAL REVISED, ADDED, OR DELETED.

Collector: _____ (SIGNATURE)

Date Collected: _____

Time Collected: _____ ☐ AM ☐ PM

ANALYTICAL LABORATORY SAMPLE SEAL

Lot No.: _____

Drum No.: _____

FMPC-ES&H-2774 (3/18/87)

SAMPLE SEAL
FMPC-OS&H-2774
Figure 9

R - MATERIAL REVISED, ADDED, OR DELETED.

FMPC
PRODUCTION OPERATIONS
CHAIN-OF-CUSTODY RECORD

Request No. _____

Company's Name: _____ Phone No.: _____ Carrier Way Bill No.: _____ Lab Destination: _____
and Address:

Name of Sampler(s): _____ Phone No.: _____ Badge No.: _____

SAMPLE NUMBER	SAMPLE LOCATION AND DESCRIPTION (Waste Type)	SAMPLED		SAMPLE TYPE	CONTAINER TYPE	ANALYSES REQUESTED (please refer to last column)						SAMPLE COND. ON RECEIPT	TYPES OF ANALYSES
		DATE	TIME										
													1 Complete Analyses
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Possible Sample Hazards: _____

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CHAIN OF CUSTODY
FMPC-PRO-3112
Figure 10

R - MATERIAL REVISED, ADDED, OR DELETED.

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RECORD OF ISSUE/REVISIONS

DATE	REV NO.	DESCRIPTION AND AUTHORITY
06-29-72	N/A	SOP has been revised to detail secondary sampling of both dry and wet materials as well as primary sampling.
10-30-84	N/A	Corrections in format made to Industrial Health and Safety and Environmental paragraphs, no text change. Changes made by Quality Control Department.
10-30-84	N/A	Quality Control Department replacement pages. List of Effective Pages added.
10-14-85	N/A	General update of SOP to reflect current operations per SOP Change Request No. 1009, initiated by R. C. Dicken.
04-23-87	N/A	Revised to implement Chain of Custody requirements for hazardous waste sampling of stored inventories to meet EPA requirements. Section 3 added per Request No. P87-092, initiated by D. J. Carr.
06-16-89	N/A	Reissued to update and reformat per Request No. P89-320, initiated by B. L. Krupa.
07-11-90	1	Revised to update RCRA requirements and incorporate references to SOP 20-C-101, 20-C-102, and 20-C-904 per Request No. P90-017, initiated by B. Krupa/J. Angert and Request P90-162, initiated by J. Angert.
03-11-91	2	Revised to incorporate CIOs C90-056 and C90-057 per Request Nos. P90-340 and P90-342.

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PL-FMPC-3009
Supercedes
Internal Special
FMPC-2205
Dated May 1990

WASTE MINIMIZATION AND POLLUTION PREVENTION AWARENESS PLAN

Issue Date: 4/30/91

FEED MATERIAL PRODUCTION CENTER

WESTINGHOUSE MATERIALS COMPANY OF OHIO

P. O. Box 398704
Cincinnati, Ohio 45239-8704

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1.0 INTRODUCTION/BACKGROUND

1.1 Purpose of Plan

The purpose of this plan is to establish the FMPC Waste Minimization and Pollution Prevention Awareness Program. The plan specifies those activities and methods that will be employed to reduce the quantity and toxicity of wastes generated at the FMPC. In addition to establishing the FMPC Waste Minimization and Pollution Prevention Awareness Program, this plan also meets legal requirements, educates FMPC personnel, sets goals, and plans actions regarding waste minimization and pollution prevention.

1.1.1 Legal Requirements

This plan meets EPA requirements established under the Resource Conservation and Recovery Act (RCRA) regarding waste minimization and the Superfund Amendments and Reauthorization Act (SARA) Title III; Emergency Planning and Community Right-to-Know Act (EPCRA). RCRA requires that generators of hazardous waste "have a program in place to reduce the volume and toxicity of waste generated to the extent that is economically practicable." Section 313 of EPCRA states that techniques used to identify source reduction opportunities be submitted to the EPA for each toxic chemical that requires a Form R, the Toxic Release Inventory. This includes employee recommendations, external and internal audits, participative team management, and material balance audits.

The plan also satisfies requirements of DOE Orders 5400.1, 5400.3, and 5820.2A.

DOE Order 5400.1 defines general requirements for pollution prevention awareness and waste minimization programs at DOE facilities. The plan complies with the Order by:

1) establishing waste minimization and pollution prevention goals and objectives, and by identifying strategies and time tables for attaining them;

2) providing the overall framework for the design and implementation of the FMPC Waste Minimization and Pollution Prevention Awareness Program; and

3) assigning specific responsibilities for complying with the requirements of the Order.

DOE Order 5400.3 establishes DOE hazardous and radioactive mixed waste policies and requirements. The Order implements the requirements of RCRA within the framework of the environmental programs established under DOE Order 5400.1.

DOE Order 5820.2A establishes policies, guidelines, and minimum requirements by which DOE manages its radioactive waste. The Order states that the "generation, treatment, storage, transportation, and/or disposal of radioactive wastes, and the other pollutants or hazardous substances they contain, shall be accomplished in a manner that minimizes the generation of such wastes across program office functions and complies with all applicable federal, state, and local environmental, safety, and health laws and regulations and DOE requirements." The Order also requires the preparation of a Waste Management Plan for each site that generates, treats, stores, or disposes of radioactive, mixed, or hazardous waste.

DOE's "Waste Reduction Policy Statement" consolidates the requirements of DOE Orders 5400.1, 5400.3, and 5820.2A. The statement requires all DOE Program Offices and Field Operations to institute a waste reduction policy to reduce the total amount of waste that is generated and disposed of by DOE facilities through waste minimization (source reduction and recycling) and waste treatment.

1.1.2 Education

This plan has been written with the intended purpose of educating personnel on waste minimization principles, methods, and strategies.

Education of all personnel will assist the incorporation of waste minimization principles into the management's operating philosophy. Waste minimization will then be routinely integrated into site SOPs and design criteria, just as safety and quality principles are currently incorporated.

1.1.3 Set Goals and Plan Actions

The FMPC Waste Minimization and Pollution Prevention Awareness Program incorporates site specific goals and planned actions into the program. The goals that are set will be aggressive goals that emphasize implementation and execution.

Actions that are implemented are specific tasks whose completion achieves actual, measurable reductions in waste generation.

Refer to section 4.4 for a listing of site specific goals.

1.2 Scope of Plan

The waste minimization program applies to all present and future activities at the FMPC which generate any type of waste. The program is an organized, comprehensive, and continual effort to systematically reduce waste generation.

1.2.1 Benefits of Waste Minimization

Waste minimization contributes to the protection of human health and the environment by reducing risks to potentially exposed people and environmental impacts from releases of pollutants. In addition, an aggressive waste minimization program demonstrates the FMPC's commitment to environmental protection.

Other potential benefits from a sound waste minimization program include the following: 1) reduce or eliminate liabilities associated with the generation of wastes; 2) comply with regulations; 3) reduce waste management and compliance costs; 4) reduce resource usage; 5) reduce or eliminate inventories and releases of hazardous chemicals reportable under the Emergency Planning and Community Right-To-Know Act (EPCRA); and 6) improve public image.

1.2.2 Waste Minimization Definition and Methods

Waste Minimization is the reduction, avoidance, or elimination of waste generation. Methods of waste minimization include:

- source reduction
- recycle, reuse, reclaim
- treatment to reduce volume, toxicity, or mobility

The Environmental Protection Agency (EPA) has stated its regulatory intent and preference for reducing waste at the source over management of waste after it is generated. Source reduction is the major priority in the FMPC's waste minimization program, as this eliminates the problems associated with handling wastes.

Source reduction activities and techniques include material substitution, process optimization or modification, technology changes, and administrative changes including inventory control and housekeeping practices, such as waste segregation.

The second priority is to recycle, reuse, or reclaim those potential waste materials that cannot be eliminated or minimized.

Recycling allows potential waste materials, or materials destined for disposal, to be put to a beneficial use. Recycling techniques are characterized as use, reuse, and reclamation (resource recovery).

The third priority is to treat all waste that is generated to reduce the volume, toxicity, or mobility prior to storage or disposal.

Waste minimization at the FMPC will be accomplished by following the above mentioned hierarchy of environmental protection practices.

THREE MAJOR TECHNICAL ALTERNATIVES

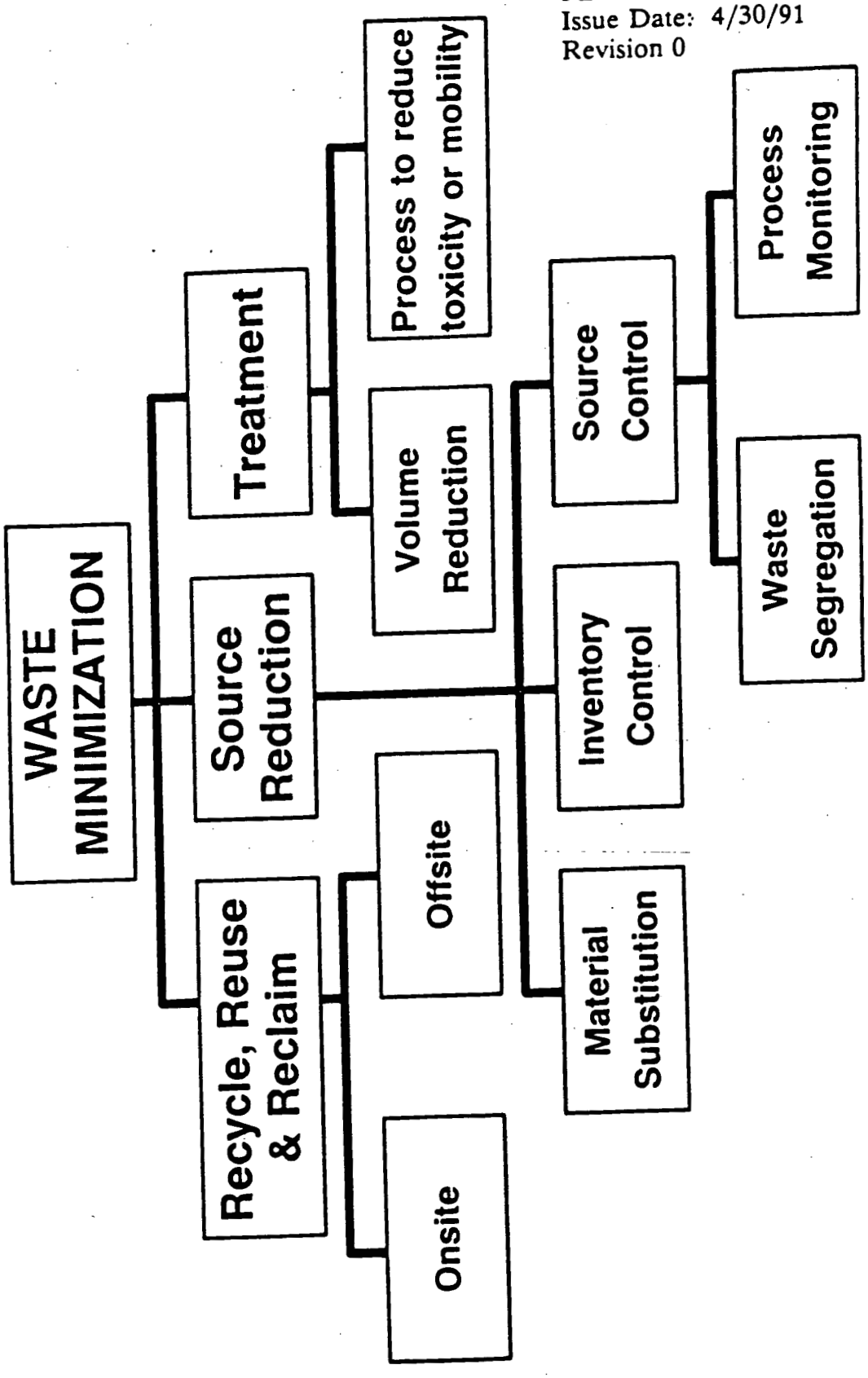

FIGURE 1
Three Major Technical Alternatives

1.3 FMPC Mission, Site Description, and Background Information

1.3.1 Mission Statement

The FMPC is owned by the U. S. Government; Westinghouse Materials Company of Ohio is the prime contractor to the U. S. Department of Energy (DOE). The FMPC's mission is environmental restoration and waste management.

1.3.2 FMPC Site Description

The FMPC is located in southwestern Ohio near the unincorporated village of Fernald, Ohio (See Figure 2). Cincinnati, Ohio, is approximately 20 miles to the southeast, and Hamilton, Ohio, is approximately 10 miles to the northeast of the FMPC. The FMPC comprises 1,050 acres and is bounded by Ohio Route 126 to the north, a dairy farm to the east, Willey Road to the south, and Paddy's Run Road to the west (See Figure 3). The production area covers approximately 136 acres near the center of the FMPC.

The historic mission of the FMPC was the conversion of uranium-containing residues and uranium compounds to high purity uranium metal for use as feed in U. S. defense programs. Production processes generated solid waste that was grouped into four categories: low level waste (LLW), hazardous waste, mixed waste, and conventional industrial waste. In 1989, the FMPC mission changed to one primarily of environmental restoration and waste management.

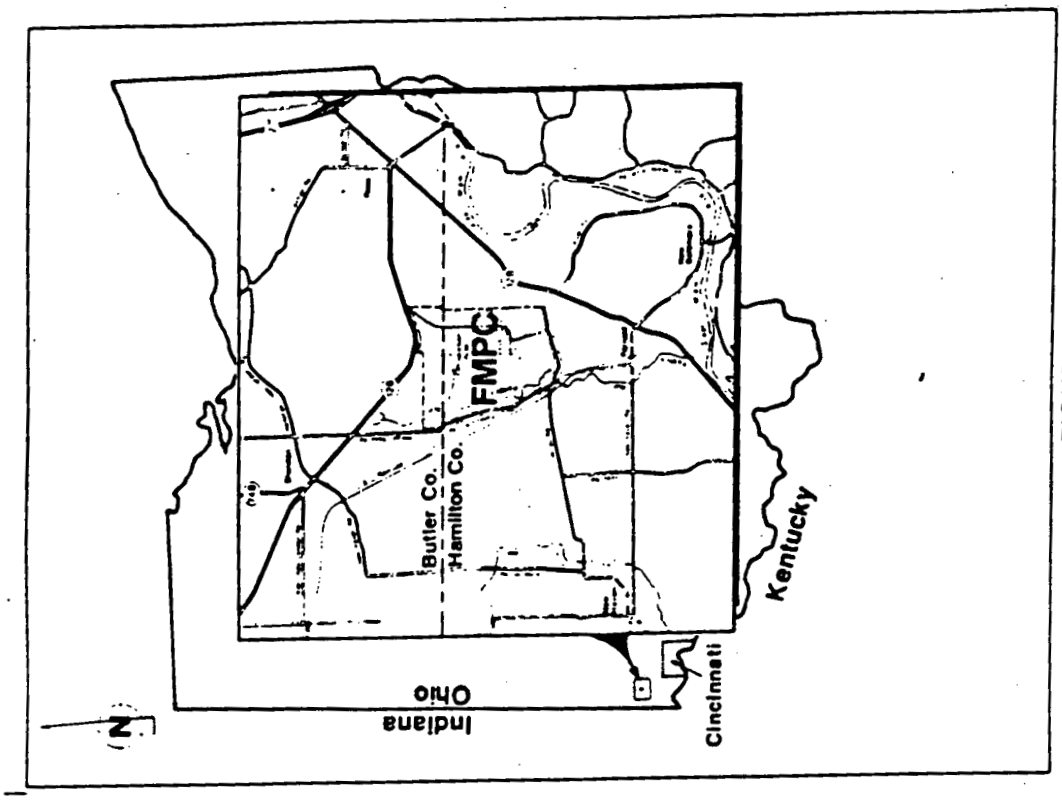

FIGURE 3
FMPC Site Map

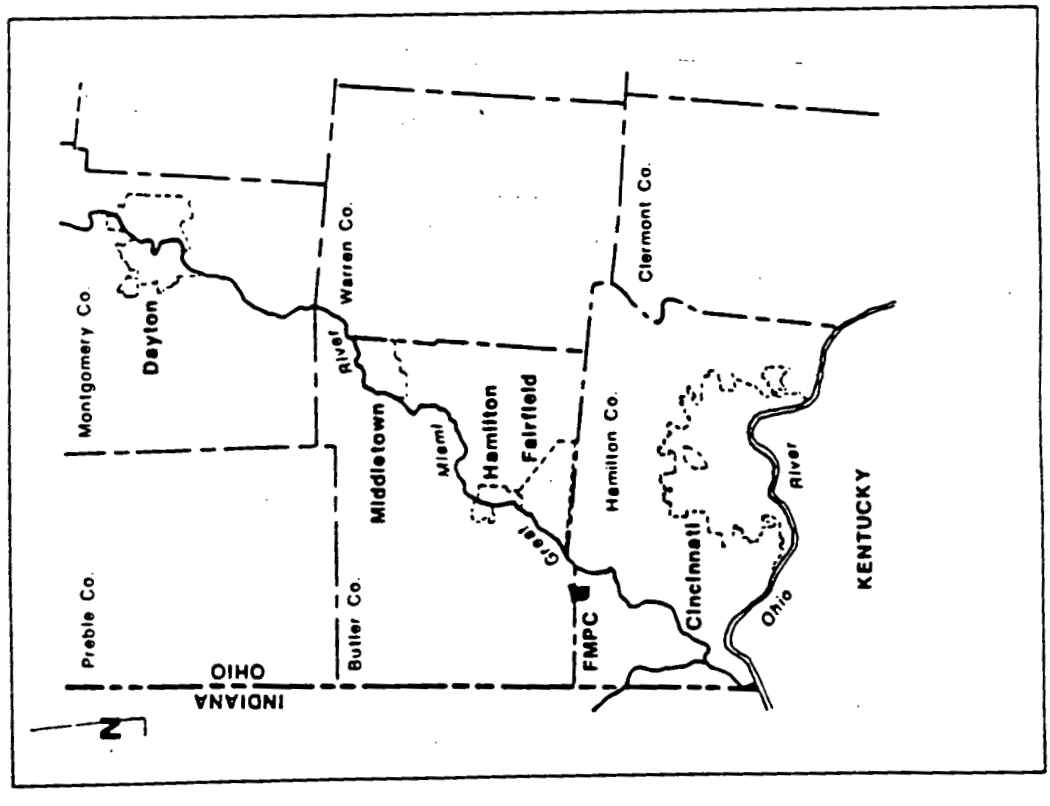

FIGURE 2
Tri-State Map

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1.3.3 Major Waste Stream Categories at the FMPC

There are four major waste categories generated onsite at the FMPC:

- Sanitary Waste
- Low Level Waste (LLW)
- RCRA/Mixed Waste
- Toxic Substance Control Act (TSCA) Waste

Each of these categories is further broken down into specific waste streams that correspond to waste streams identified in the FMPC 30-Year Roadmap.

1) Sanitary Waste
   - Noncontaminated Trash
   - Noncontaminated Rubble/Soil
   - Water Treatment Lime Sludge
   - Flyash
2) Low Level Waste (LLW)
   - Dry Compactible Waste
   - Compactible Refuse Metal/Scrap Drums
   - Noncompactible Refuse Metal
   - Scrap Recoverable Metal
   - Contaminated Rubble Soil
   - Contaminated Asbestos
   - Dry Noncompactible Waste
   - Wet and Dry Drummed Residues

3) RCRA/Mixed Waste

4) TSCA Waste

- Contaminated PCB Sludges/Liquids

Refer to Table 1 for a description of each waste stream. Each waste stream's generation rate and predicted generation rate will be discussed in section 6.1.1.

WASTE STREAM IDENTIFICATION
TABLE 1

Waste Stream	Description
Sanitary Waste	
Noncontaminated Trash	Paper and office trash generated from the uncontrolled areas such as administrative waste.
Noncontaminated Rubble/Soil	Rubble/soil generated by construction with <35 pCi/g contamination
Water Treatment Lime Sludge	Lime sludge generated from waste treatment operations, stored in 2 lime sludge ponds.
Flyash	Generated from the burning of coal in the Boiler Plant.
LLW	
Dry Compactible Waste	Compactible paper collected from the controlled area. Includes office trash, cardboard, clothing, packaging materials, floor sweepings, plastic, etc.
Compactible Refuse Metal/ Scrap Drums	Refuse metal that can be compacted or volume reduced. Includes empty drums, old lockers, metal cabinets, desks, and chairs.
Noncompactible Refuse Metal	Refuse metal that cannot be compacted and is packaged for disposal.
Scrap/Recoverable Metal	Decontaminated metal, equipment, and vehicles from onsite activities such as construction and maintenance.
Contaminated Rubble/Soil	Category 2; generated by construction with >35 pCi/g <100 pCi/g contamination. Category 3; generated by construction with >100 pCi/g contamination. Packaged for offsite shipment.
Contaminated Asbestos	All asbestos generated onsite from construction and maintenance activities.
Dry, Noncompactible Waste	Includes wood pallets, scrap filters, rubber, plastic, scrap wood, excess equipment, machinery, tools, and soil/rubble from nonconstruction activities onsite.
Wet & Dry Drummed Residues	Drummed floor sweepings, dust collector residues, sump sludges, filter cakes, and safe-shutdown residues.
RCRA/Mixed Waste	All RCRA/mixed waste that is generated from onsite activities.
TSCA Waste	
Contaminated PCB Sludges/ Liquids	All contaminated PCB sludges/liquids, ballasts, capacitors, transformers, and PCB contaminated trash and rags.

2.0 POLICY

2.1 Statement of Management Support/Commitment

The FMPC is totally committed to minimizing the generation of waste by giving preference to source reduction, material substitution, and environmentally sound recycling over treatment, control, and disposal of such wastes. Top level management have taken appropriate action to provide adequate personnel, budget, training, and material on a continuing basis to ensure that the objectives of the Waste Minimization and Pollution Prevention Awareness Program are met.

2.2 Policy Statement

The Waste Minimization and Pollution Prevention Awareness Program is supported by FMPC management which is made evident by the following Waste Minimization Policy statement declarations:

- The FMPC shall employ the most cost effective and environmentally acceptable methods to manage and minimize the generation of waste.

- The FMPC's commitment to Waste Minimization and Pollution Prevention Awareness Program activities is demonstrated by conducting waste management activities to accomplish site cleanup and waste minimization through source reduction, recycling of materials, substitution of less hazardous materials, process optimization or modification, technology changes, and waste segregation.

3.0 RESOURCES

3.1 Program Budget

The following chart itemizes the funds allocated for the Waste Minimization and Pollution Prevention Awareness Program.

Activity	Funding in $K per year					
	FY-92	FY-93	FY-94	FY-95	FY-96	Total
Waste Minimization Planning	67	48	48	48	48	240
Waste Minimization Implementation	69	72	72	72	72	357
Total	236	120	120	120	120	597

3.2 Personnel

The planning and implementation of the Waste Minimization and Pollution Prevention Awareness Program requires one full-time employee to coordinate and report on waste minimization program status.

4.0 STRATEGY, OBJECTIVES, ACCOMPLISHMENTS, AND GOALS

4.1 Strategy

The Waste Minimization and Pollution Prevention Awareness Program strategy is to develop a systematic approach that all site organizations can use to minimize waste generation. Accurate and current information on waste generation and waste management costs provides the basis for implementation of specific waste minimization techniques and technologies. The essential elements of the FMPC strategy include the following:

- Identify and characterize all wastes generated onsite.
- Prioritize waste streams for waste minimization actions.
- Select target waste streams and methods to eliminate or reduce waste generation.
- List waste minimization options and evaluate options on a technical and economic basis.
- Implement waste minimization actions.
- Document and evaluate waste minimization progress.

4.2 Program Objectives

The objectives of the Waste Minimization and Pollution Prevention Awareness Program are to:

- Foster a philosophy to conserve resources and create a minimum of waste and pollution in achieving site strategic objectives.
- Promote the use of nonhazardous materials in plant operations to minimize the potential risks to human health and the environment.

- Reduce or eliminate the generation of waste materials through materials substitution, improved housekeeping, process optimization, technology changes, and inventory control to achieve minimal adverse effects on the air, water, and land.

- Enhance communication of waste minimization objectives, goals, and ideas laterally and vertically among site organizations.

- Promote integration and coordination of waste generators and waste managers on waste minimization matters.

- Characterize waste streams and develop a baseline of waste generation data.

- Identify and implement methods and technologies for waste minimization.

- Target policies, procedures, or practices that may be barriers to waste minimization.

- Create incentives for pollution prevention.

- Collect and exchange waste minimization information through technology transfer, outreach, and educational networks.

- Enhance employee awareness of pollution prevention goals, objectives, and methods.

- Develop specific goals and schedules for waste minimization activities.

- Comply with federal and state regulations and DOE requirements for waste minimization.

- List waste minimization options and evaluate options technically and economically.

- Implement waste minimization actions.

- Document and evaluate waste minimization progress.

4.3 Accomplishments

The following is a list of waste minimization actions that have been implemented at the FMPC.

4.3.1 Source Elimination

4.3.1.1 Eliminated the use of lead-based paints and substituted with leadfree equivalents.

4.3.1.2 Initiated a chemical product inventory reduction program in the Maintenance Department. Identified 130 chemical products, thus far, that can be eliminated due to infrequent use or product duplication.

4.3.1.3 Eliminated the use of 1,1,1-trichloroethane throughout the site, with the exception of the paint shop.

4.3.2 Recycling/Reuse

4.3.2.1 Formed the FMPC Total Quality Recycling Team to develop, implement, and oversee sitewide recycling programs.

4.3.2.2 Implemented a paper recycling program for administrative paper waste. Currently, 30 tons of paper a year are projected to be collected.

4.3.2.3 Initiated an aluminum can recycling effort, with annual collection projected at 1.5 tons. Some cans were donated to a program to aid area burn victims, with the bulk of the cans going to the Crosby School Ecology Club.

4.3.2.4 Began the reuse of Xylene in the Analytical Laboratory. The lab formerly generated approximately 3 liters of Xylene waste a month; and all of this is now recycled.

4.3.3 Segregation/Decontamination

4.3.3.1 Segregated approximately 13,500 cu. yds. of rubble/soil and office waste during 1990. The rubble/soil was classified as Category 1 and stockpiled in the K-65 storage area. The office waste was sent to a sanitary landfill.

4.3.3.2 Decontaminated, for unrestricted release, more than 485 tons of scrap steel.

4.3.4 Volume Reduction

4.3.4.1 Compacted 4,850 cu. yds. of noncontaminated trash to a volume of 1,070 cu. yds.

4.3.4.2 Compacted 2,300 cu. yds. of contaminated dry, compactible waste to a volume of 770 cu. yds.

4.3.4.3 Compacted 65,000 cu. ft. of compactible, refuse metal/scrap drums to a volume of 22,000 cu. ft.

4.3.5 Organizational

4.3.5.1 Conducted a baseline waste inventory that identified all LLW and RCRA waste streams onsite. Defined the current generation rate of each of the waste streams identified by type, source, and quantity. This will be used to evaluate the FMPC waste output and determine the best methods to minimize it.

4.3.5.2 Predicted generation rates for each waste stream identified in the baseline report for FY 1991 through 1994.

4.3.5.3 Formed a Waste Minimization Team to prioritize and perform assessments of waste streams targeted as possible candidates for waste minimization actions.

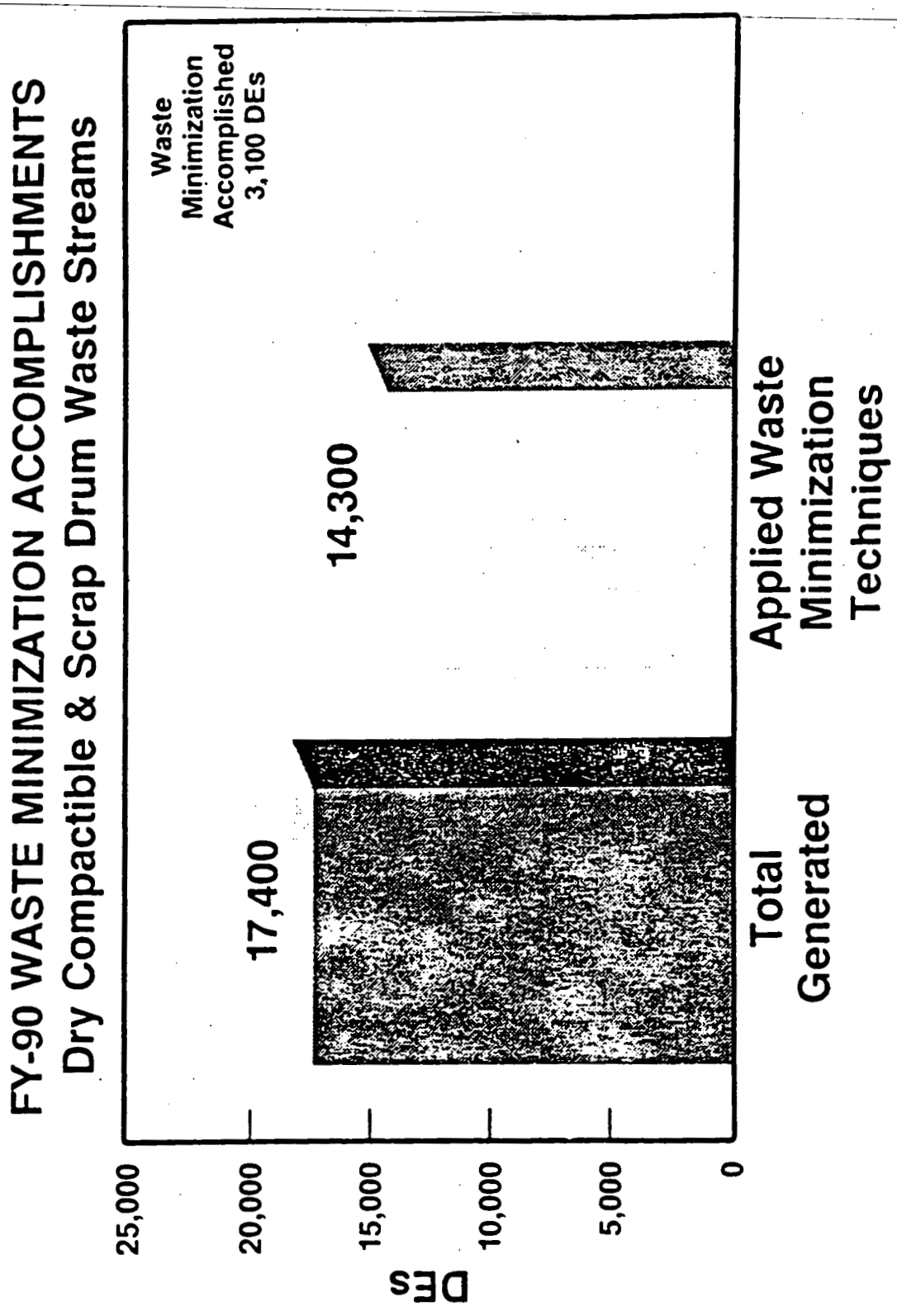

FIGURE 4
FY-90 Waste Minimization Accomplishments

4.4 Goals

The following is a list of site specific goals for the FMPC.

4.4.1 Source Elimination

4.4.1.1 Conduct sampling and analysis on the benzene contaminated oils generated from the garage to classify as LLW. This is estimated to eliminate 128 DEs of stored mixed oils in the RCRA warehouses, as well as the 2-3 DEs a month generated in the garage.

4.4.1.2 Review all chemicals used onsite and eliminate all infrequently used or duplicated products by December 1991. Purchase only chemical products that have been assessed to be indispensable.

4.4.1.3 Substitute cloth "anti-Cs" for all paper "anti-Cs" (except for asbestos work) by September 1991. This will reduce the contaminated compactible waste stream by approximately 500 cubic feet per year.

4.4.2 Recycling/Reuse

4.4.2.1 Maintain the office paper, computer paper, and aluminum can recycling effort. The FMPC Total Quality Recycling Team will continue to implement and assess these recycling programs, as well as educate personnel on the benefits of recycling.

The office paper recycling program was initiated in February 1991. This program is expected to collect 30 tons a year of recyclable paper.

The computer paper recycling program has been in operation since 1977. In 1990, 7.42 net tons of computer paper were collected. The anticipated collection rate is eight tons per year.

The aluminum can recycling effort benefits the Crosby Elementary School Ecology Club and has been operating since 1991. It is estimated that 1.5 tons per year will be collected for recycling.

4.4.2.2 Initiate a LaserJet cartridge recycling campaign in 1991. Approximately 500 cartridges are used per year at the FMPC. A recycling effort will save up to 40-50 percent on the cost of cartridges; this equates to a savings of approximately $16,000 - $20,000 a year.

4.4.2.3 Begin the operation of a distillation unit by January 1992 to recover spent solvents from the paint shop. The operation of this unit will produce a 90 percent recovery rate for the solvents run through the system. This will reduce the amount of solvents placed into RCRA storage warehouses from 6 DEs a year to 0.6 DEs a year.

4.4.2.4 Initiate the recycling of trichlorotrifluoroethane (Freon) in the Analytical Laboratory by May 1991. Approximately five liters per month of Freon is being generated by the lab during grease and oil determinations of NPDES samples. Recycling will be accomplished by the use of a distillation unit that will collect the vapors emitted and condense them back to reusable Freon. A 100 percent recovery is anticipated.

4.4.2.5 Start operation of the new Drum Reconditioning Facility in Plant 8 by September 1991. Approximately 18,000 empty drums will be generated per year from the Rotary Kiln and Rotex operations. Approximately 50 percent of these drums will be reconditioned and stored onsite or transferred to other DOE sites for reuse.

4.4.3 Segregation/Decontamination

4.4.3.1 Update the laundry system by September 1991. Several driers will be designated for clean clothing and one dryer designated for contaminated clothing, which will be equipped with a HEPA filter. This new system will provide segregation of radioactive clothing from nonradioactive clothing.

4.4.3.2 Initiate a demonstration project for the process area compactible waste by FY-92. This will be a demonstration project in Building 12 to segregate waste from nonradiological areas, within the process area, to determine whether waste can be released to a sanitary landfill. It is anticipated that 75 - 80 percent of the compactible waste from Building 12 will be considered nonradiologically controlled. This equates to approximately 1,150 DEs per year that could be released as clean.

4.4.3.3 Decontaminate 5,000 DEs (575 tons) a year of scrap metal from the scrap metal piles and sell to an offsite vendor for reuse. This will reduce the risk of contamination to the environment.

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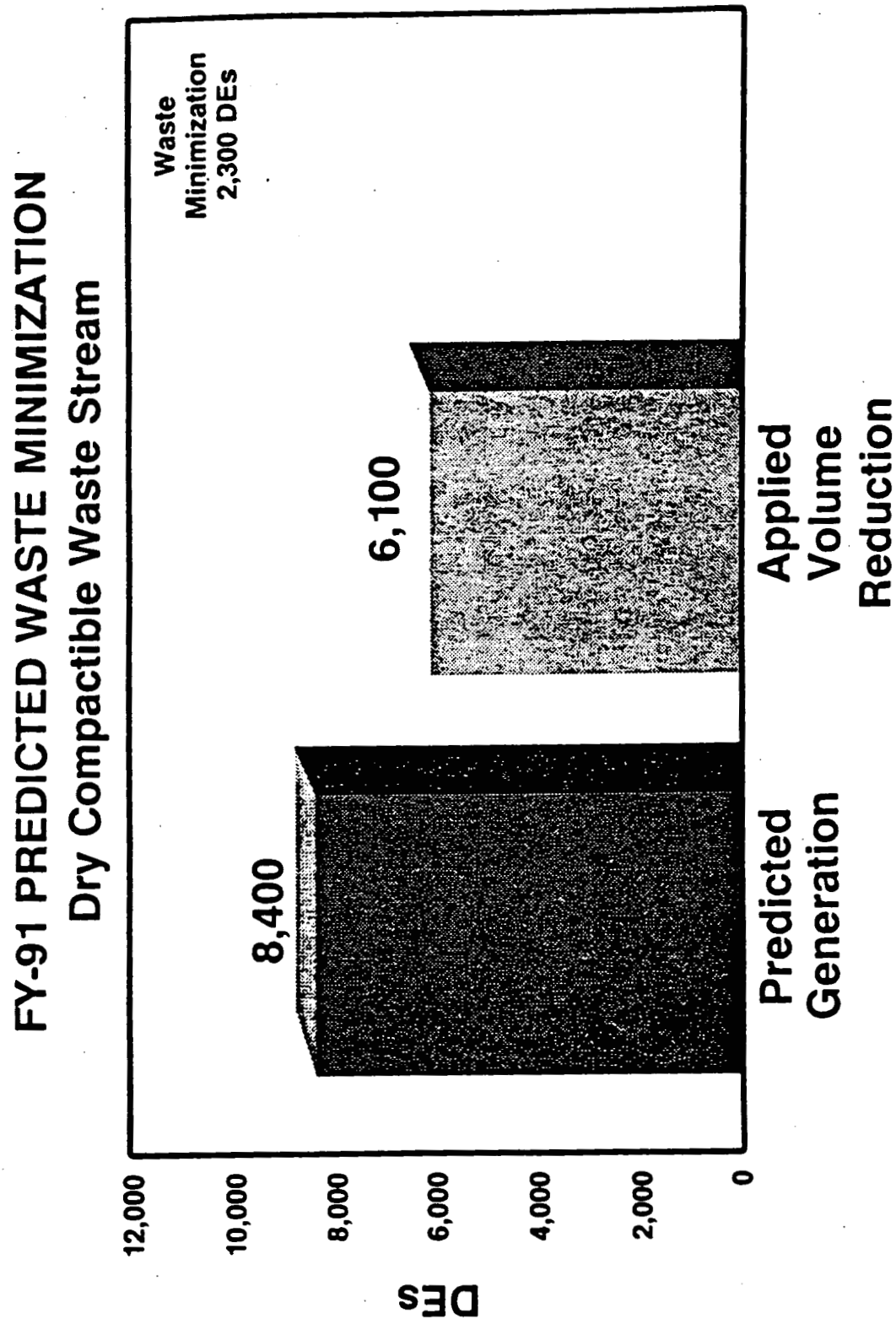

FIGURE 5
FY-91 Predicted Waste Minimization

4.4.4 Volume Reduction

4.4.4.1 Implement a super compaction system in Plant 8 by September 1991. This will volume reduce the compactible waste streams from a 3:1 compaction ratio to a 7:1 compaction ratio. This will produce a reduction in volume of approximately 1,100 DEs, which equates to a savings of approximately $171,000 for an 8 month period of operation.

4.4.4.2 Implement the Plant 8 Rotex repackaging station by July 1991. This will volume reduce the drummed residue waste stream by 20 percent, and will produce a reduction in volume of approximately 1,500 DEs. This equates to a savings of approximately $240,000 for a 10 month period of operation.

4.4.4.3 Implement the new Plant 8 rotary kiln by September 1991. This will volume reduce the wet, nonrecoverable residue waste stream by 30 percent and will produce a reduction in volume of approximately 2,400 DEs. This equates to a savings of approximately $384,000 for an 8 month period of operation.

4.4.4.4 Evaluate the feasibility of a Trash and Scrap Monitoring Facility. This facility would volume reduce the contaminated dry compactible and noncontaminated trash waste streams through shredding and compaction.

The TSMF would collect and monitor all dry compactible waste from the controlled, as well as the uncontrolled areas. The waste would be monitored numerous times to assure the cleanliness of the material. It would then be sent offsite to a local landfill. If it is monitored to be contaminated, it would be shipped to the Nevada Test Site (NTS). This facility would also provide an additional benefit through the ability to segregate specific recyclable wastes.

4.4.4.5 Initiate a demonstration project by FY-92 for solids precipitation at Plant 8 by exchanging lime with True Clear. The estimated volume reduction of the packaged wet residue waste stream is from 15 - 2 DEs per week.

4.4.5 Organizational

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4.4.5.1 Integrate waste minimization and pollution prevention awareness concepts into an existing related training course. The training program will include waste minimization concepts that should be incorporated into every job aspect, so that it is routinely integrated into each phase of an operating procedure or design consideration.

4.4.5.2 Develop and conduct a class on waste minimization for the DOE/Westinghouse School for Environmental Excellence.

4.4.5.3 Inform FMPC employees of current and ongoing waste minimization accomplishments by use of pictorial essays, site bulletin boards, and site communication media (i.e., Focus, Communicator, FMPC Update). This will be done on a monthly basis.

4.4.5.4 Implement pollution prevention/waste minimization slogan contests to heighten awareness of these issues.

4.4.5.5 Renew the waste minimization suggestion boxes and award employees whose waste minimization suggestions are efficient and cost effective.

4.4.5.6 Perform ongoing waste assessments of targeted waste streams to analyze waste minimization actions that have been implemented.

5.0 ORGANIZATION AND STAFF RESPONSIBILITIES

4228

5.1 Site Manager

The site manager is responsible for the facility's commitment to achieving a successful waste minimization program. The manager approves plans, policies, goals, and milestones and is responsible for ensuring that all employees are trained in waste minimization and pollution prevention awareness.

5.2 Waste Minimization Coordinator

The Waste Minimization Coordinator serves as chairperson of the Waste Minimization Team. The Waste Minimization Coordinator writes and updates the facility-specific waste minimization plan on an annual basis.

5.3 Waste Minimization Team

The responsibilities of the Waste Minimization Team include:

- Defining the objectives of the waste minimization program in accordance with this plan.
- Communicating program objectives to the site.
- Obtaining waste generator support and input for the program.
- Facilitating integration and coordinated interaction between waste generators and waste managers on waste minimization matters.
- Establishing waste minimization goals and objectives.
- Sponsoring ongoing employee awareness and training.
- Establishing a waste tracking system.
- Prioritizing waste streams for assessment.
- Selecting teams to conduct process waste assessments.
- Evaluating the technical and economic feasibility of options to reduce waste generation.
- Recommending and ranking options for implementation.

- Monitoring performance of waste minimization options that have been implemented and evaluating performance according to success criteria.
- Monitoring and reporting progress of the waste minimization program.
- Recommending personnel for achievement and incentive awards.
- Facilitating technology transfer and pollution prevention awareness.

5.4 Department Waste Coordinator

Each department participates in the waste minimization program through an assigned Waste Coordinator for their respective organization. The Department Waste Coordinator serves as the primary contact for all waste minimization activities and departmental reporting. Department Waste Coordinators serve on the Waste Minimization Team.

5.5 Employee

Employees are responsible for following approved waste minimization techniques and procedures to evaluate the potential for waste minimization in their work.

FMPC
WASTE MINIMIZATION & POLLUTION PREVENTION AWARENESS
LINE OF COMMUNICATION

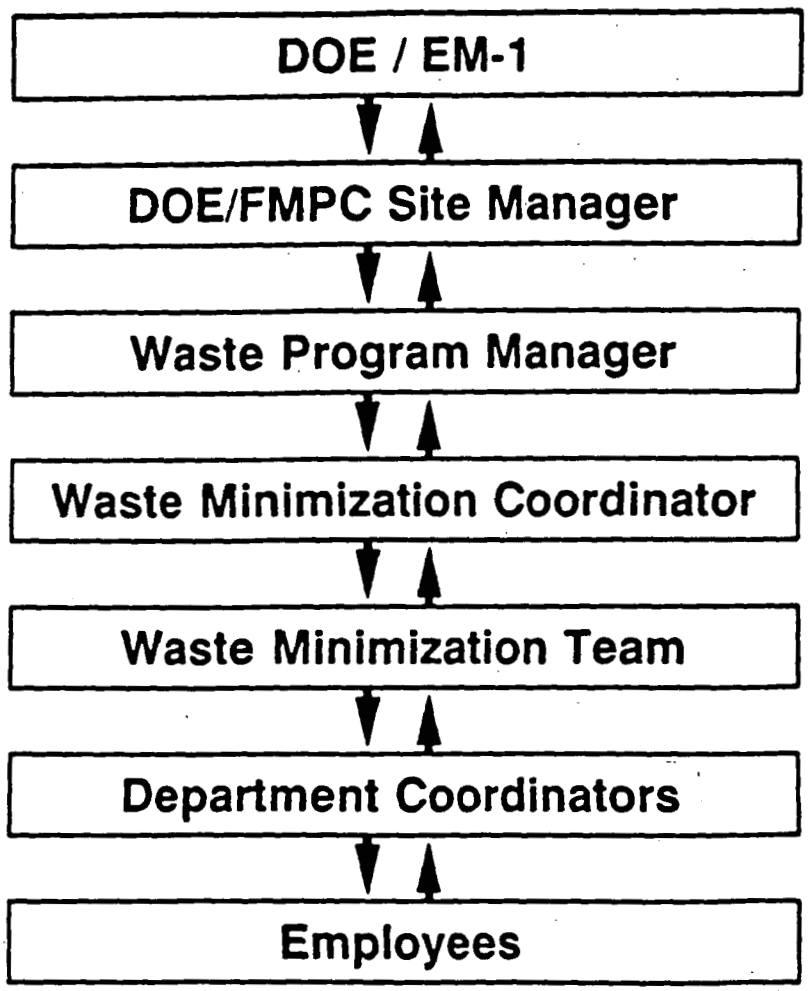


FIGURE 6
Waste Minimization & Pollution Prevention Line of Communication

6.0 DESCRIPTION OF WASTE MINIMIZATION PLAN

6.1 Waste Assessments/Audits

Waste assessments are conducted as part of an ongoing program to identify, screen, and analyze options to reduce the generation of waste.

6.1.1 Identify Waste Stream and Collect Baseline Information

The first task during a waste assessment is to identify and characterize all waste streams onsite. Current generation rates were defined by type, source, and quantity in a Baseline Inventory Report in December 1990. In February 1991, the Waste Generation Prediction Report predicted waste generation trends for current waste streams at the FMPC. Predictions were made for FY-91, 92, 93, 94. The data from these reports becomes an inventory record and will become part of a site waste data base. The information will be used to prioritize the waste streams and target specific waste streams for waste minimization actions.

Refer to the following tables and figures for Waste Stream Baseline information.

- Table 2 - FMPC Waste Stream Generation Rates and Predictions
- Figure 7 - Dry Contaminated Compactible Waste Sources
- Figure 8 - Composition of Dry, Contaminated Compactible Waste
- Figure 9 - RCRA Generation 1990

C = Generated
SH = Shipped
ST = Stored

WASTE STREAM GENERATION PREDICTIONS (Table 2)

(All figures in DEs: 1 DE = 7.4 cubic feet)
NOTE: All compactible waste streams, amounts generated, are reported as uncompacted; amounts shipped as compacted.

WASTE STREAMS	FY-90	FY-91	FY-92	FY-93	FY-94	COMMENTS
Sanitary Waste						
Non-contaminated Trash	17,700 C 3,900 SH	17,700 C 3,900 SH	17,700 C 3,900 SH	17,700 C 3,900 SH	17,700 C 3,900 SH	Offsite Rumpke compactor; 4.5:1 compaction ratio.
Non-contaminated Rubble/Soil (Cat. 1)	49,000 C	—	—	—	—	Stored at K-65 storage area. < 35 pCi/g. generated by construction
Water Treatment Lime Sludge	1,800 C 55,000 ST	1,800 C 56,800 ST	1,800 C 58,600 ST	1,800 C 60,400 ST	1,800 C 62,200 ST	Stored in two lime sludge ponds west of the west water tower
Flyash	22,000 C 600,000 ST	22,000 C 622,000 ST	22,000 C 644,000 ST	22,000 C 666,000 ST	22,000 C 688,000 ST	Stored south of the west Stormwater Retention Basin (SWRB)
TOTALS	90,500	41,500	41,500	41,500	41,500	
Low-Level Waste						
Dry Compactible Waste	8,400 C 2,200 SH	8,400 C	* 8,400 C	* 8,400 C	* 8,400 C	FY-90, 91 Plant 2/3 trash baler, 3:1 compaction ratio. FY-92,93,94 Plant 8 super compaction system, 7:1 compaction ratio assumed
Compactible Refuse Metal/ Scrap Drums	9,000 C 2,900 SH	17,100 C	*33,000 C	*33,000 C	*33,000 C	FY-91 Plant 1 drum baler; 3:1 compaction ratio FY-92,93,94 Plant 8 super compaction system
Non-compactible Refuse Metal	15,000 C 9,500 SH	1,800 C	250 C	250 C	250 C	Refuse metal from Bldg 69 and construction generated metals. Packaged for offsite disposal.
Scrap/Recoverable Metal	4,200 C	1,750 C	250 C	250 C	250 C	Decontaminated scrap metals, vehicles and equipment from construction, and maintenance.
Contaminated Rubble/Soil						
Category 2	25,100 C	—	—	—	—	Stored north of Plant 1, stockpile area. 35 pCi/g < 100 pCi/g. generated by construction
Category 3	14,600 C 8,100 SH	6,000 C	4,000 C	No projections made	No projections made	Boxed for offsite disposal. > 100 pCi/g. generated by construction
Contaminated Asbestos	1,800 C 3,700 ST	2,400 C 6,100 ST	500 C 6,600 ST	250 C 6,850 ST	250 C 7,100 ST	FY-90,91,92 include asbestos generated by construction projects. FY-93,94 No projections made for construction projects. Asbestos stored waste pending approval by NTS of a Class I Landfill Permit
Dry Non-compactible Waste	3,600 C 3,300 SH	11,000 C	4,000 C	4,000 C	4,000 C	Wood pallets, scrap filters, rubber, plastic, scrap wood, soils, maintenance activities, excess machinery, equipment and tooling. Packaged for offsite disposal
Wet & Dry Residues	1,500 C 410 SH	3,500 C	2,000 C	3,500 C	2,000 C	Dust collector residues, sludges, filter cakes, floor sweepings, safe-shutdown residues.
TOTALS	83,300	51,950	52,400	49,650	48,150	

C = Generated
SH = Shipped
ST = Stored

WASTE STREAM GENERATION PREDICTIONS (Table 2)

(All figures in DEs: 1 DE = 7.4 cubic feet)
NOTE: All compactible waste streams, amounts generated, are reported as uncompacted; amounts shipped as compacted.

WASTE STREAMS	FY-90	FY-91	FY-92	FY-93	FY-94	COMMENTS
RCRA Waste						
RCRA/Mixed Waste	387 C** 8,300 ST	406 C 8,706 ST	406 C 9,112 ST	406 C 9,518 ST	406 C 9,924 ST	FY-91,92,93,94 RCRA generation increase of 5% due to anticipated increase in decontamination. Stored waste.
TSCA Waste						
Contaminated PCB Sludges/Liquids	19 C 42 ST	5 C 47 ST	0 47 ST	0 47 ST	0 47 ST	FY-92,93,94 No PCB generation is anticipated. CWDs not yet generated for construction projects. Stored in waste PCB warehouses
RCRA Closures	0	400 C	130 C	No projection	No projection	Liquids from decontamination, contaminated clothing, equipment, etc. Packaged for offsite disposal

* All dry compactible waste and compactible refuse metal/scrap drums will be compacted in super compaction system. Packaged for offsite disposal
** CY-90

TABLE 2
Waste Stream Generation Predictions

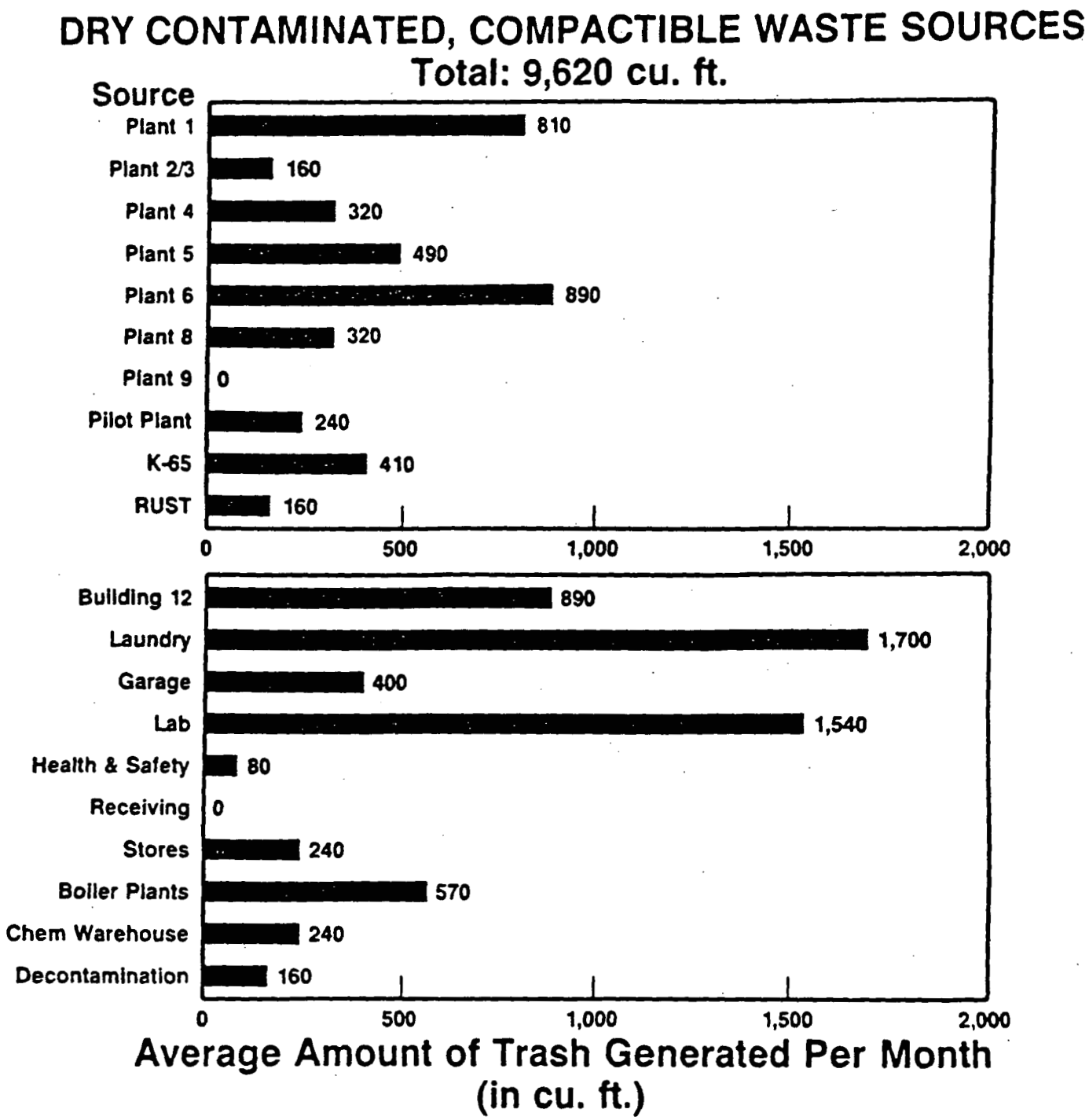


FIGURE 7
Dry, Contaminated, Compactible Waste Sources

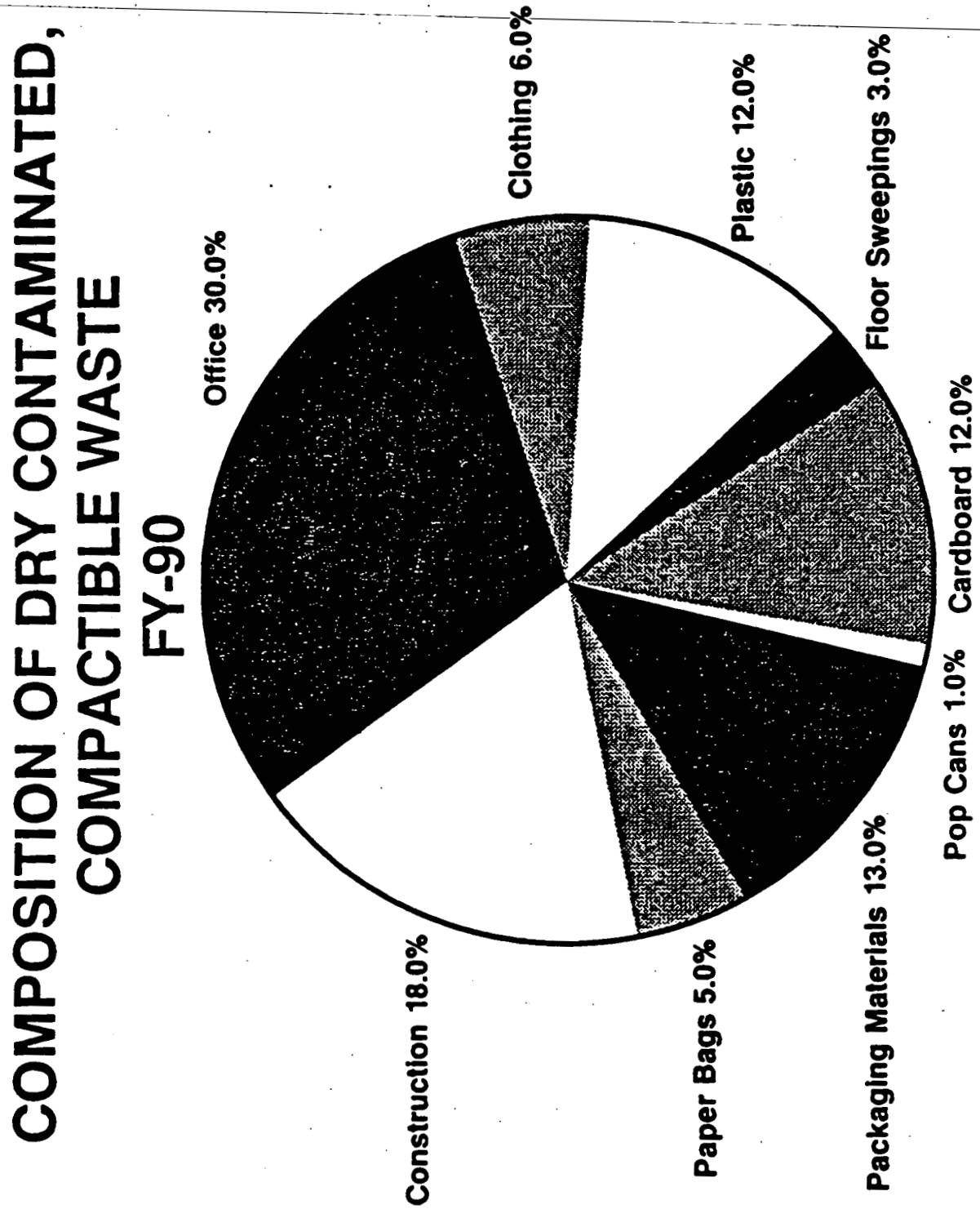


FIGURE 8
Composition of Dry, Contaminated Compactible Waste

RCRA GENERATION 1990

Figure 5

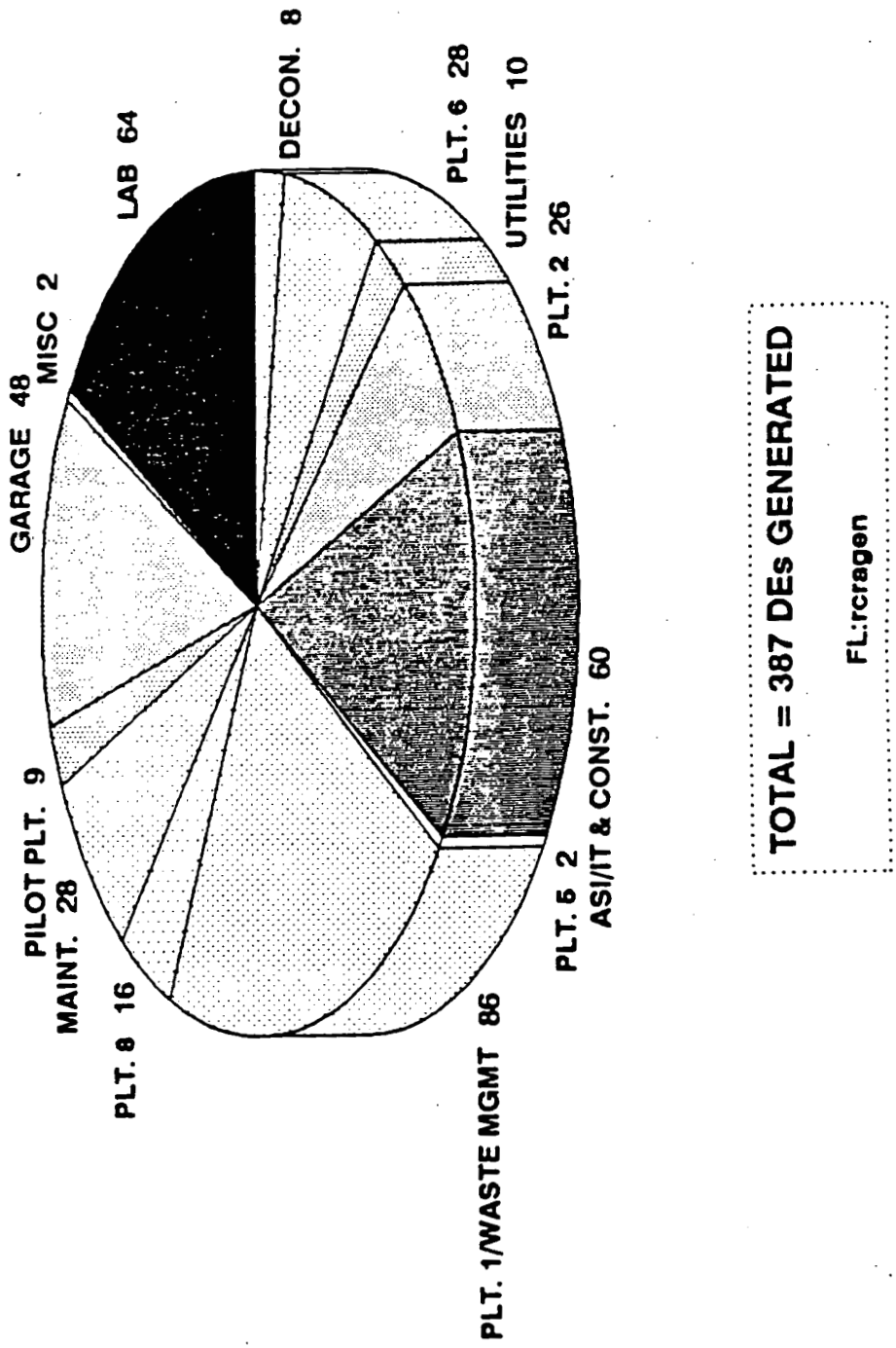


FIGURE 9
FY-90 RCRA Generation

6.1.2 Assess Waste Streams

Assessments of all waste-generating operations at the FMPC will be conducted by Waste Assessment Teams organized by the Waste Minimization Team. The assessment teams consists of individuals who can furnish specialized expertise that will be needed to conduct the assessments of specific waste streams identified by the Waste Minimization Team.

The assessment teams are responsible for evaluating and identifying waste minimization opportunities for their particular waste stream. Each team reports the data and findings from the assessment to the Waste Minimization Team and recommends options for waste minimization. The assessment team then monitors and evaluates the progress of an implemented waste minimization action on their specific waste stream and report successes, modifications, or further evaluation.

6.1.3 Prioritize Waste Streams

The Waste Assessment Team has the responsibility of prioritizing waste streams for waste minimization actions. The waste assessments will concentrate on the most important waste problems first, and then move on to the lower priority problems as the time, personnel, and budget permit.

Listed below are some of the considerations for prioritizing waste streams to assess:

- Compliance with current and future regulations.
- Costs of waste management (storage, treatment, disposal).
- Potential environmental and safety liability.
- Quantity of waste.
- Hazardous properties of the waste.
- Safety concern to employees.
- Potential for (or ease of) minimization.

6.1.4 Identify and List Options

The final phase of the assessment is for the team to develop a comprehensive set of waste minimization options. Completion of waste stream flow diagrams, material balances, and baseline information permits the identification of inefficiencies that may be potential waste minimization projects.

The process of identifying options first concentrates on source reduction options, followed by recycling technologies. Identifying options is done as part of a group brainstorming session that encourages creative and independent thinking.

6.1.5 Evaluate and Rank Options

The Waste Minimization Team evaluates the potential technical success and economic cost/benefit of each option identified by the Waste Assessment Team.

6.1.5.1 Technical Evaluation

The technical evaluation must consider facility restraints such as safety, available space, available utilities, vendor services, and any special expertise required. All organizations that might be affected by the change should contribute to the evaluation.

6.1.5.2 Economic Cost/Benefit Evaluation

Economic evaluation of options is performed using various cost elements and savings. The criteria used for selecting options is associated with capital costs or operating costs. An important item of operating cost is the avoidance or reduction of onsite and offsite waste treatment, storage, and disposal costs. Unit costs for handling waste have steadily increased, and reductions in waste volume will yield immediate savings.

For the purpose of this report and the waste minimization goals that have been listed in section 4.4, the following measures were used to evaluate the options identified.

6.1.5.2.1 Low Level Waste

LLW was evaluated by analyzing the cost of offsite disposal. For volume reduction calculations, a figure of $160 per drum equivalent (DE) was used as a disposal cost. A DE has a volume of 7.4 cu. ft. The potential savings are listed in section 4.4. under volume reduction.

6.1.5.2.2 RCRA/Mixed Waste

The FMPC generates approximately 400 DEs of RCRA/mixed waste per year (refer to Figure 9). The waste that is generated is drummed and placed into onsite RCRA warehouses. The cost of maintaining (storing) one DE of RCRA waste is estimated at $400 per DE. Along with the monetary cost of storing RCRA/mixed waste are the legal complications of storing this waste, which include: regulatory liability; cradle-to-grave responsibility; detailed record-keeping; limited disposal options; and surveillance issues.

In evaluating the options for waste minimization for RCRA mixed waste streams, operating cost and storage complications were the important criteria used.

6.2 Waste Minimization Implementation

The Waste Minimization Team identifies the department or organization that is responsible for devising the minimization method and implementing the change in operation. The implementing organization allocates the required funding and manpower to accomplish the action. The executing organization is responsible for achieving the minimization goals set by the Waste Minimization Team and for communicating any problems to the team.

6.3 Waste Tracking System

6.3.1 Tracking From Point of Generation to Point of Disposition

The major responsibility for tracking wastes from their point of generation to the point of disposition will be Materials Control and Accountability (MC&A).

MC&A currently tracks all nuclear materials onsite. They utilize a computerized database system that tracks all nuclear material that is received, stored, moved, packaged, or shipped.

MC&A will be tracking all waste onsite in the future. An all-materials inventory is currently taking place, which will incorporate all waste streams into the database system.

The database system shows the source of the waste, generation date, type of material, volume, net weight, and disposition. This database system will serve as a baseline for tracking waste minimization efforts and will provide data needed for evaluation and performance of waste minimization options. Changes in waste generation cannot be meaningfully measured unless the information is collected both before and after a waste minimization option is implemented.

6.3.2 Program Activity Tracking

The Waste Minimization Team is responsible for tracking the progress of waste minimization actions. Each member of the team is assigned a waste minimization option that is implemented, and will be responsible for tracking the progress of the action. Monthly team meetings may be held to evaluate the options and review data collected by the team member.

FMPC
WASTE ASSESSMENT FLOW DIAGRAM

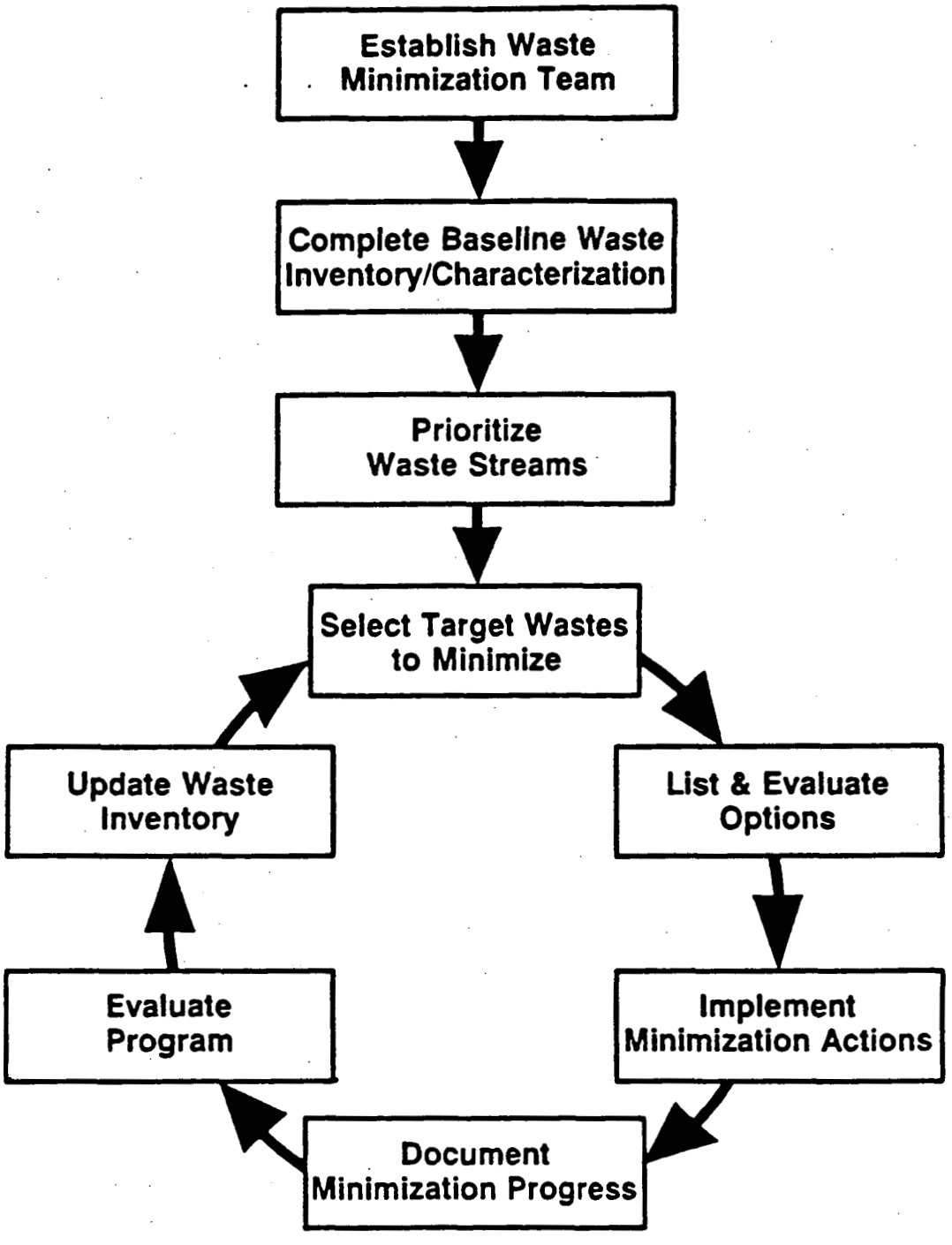


FIGURE 10
Waste Assessment Flow Diagram

6.4 Technology Transfer

Lessons learned about waste minimization technologies that have been implemented are collected by the Waste Minimization Team and disseminated to all departments at the FMPC and/or other DOE facilities. Success stories will be publicized by newsletters, bulletin boards, and pictorial essays. Publicizing success stories will trigger additional ideas and will benefit DOE if the public and local residents perceive the FMPC to be handling waste responsibly.

The waste minimization class presented at the DOE/Westinghouse School for Environmental Excellence will share FMPC site-specific accomplishments and goals to other DOE facilities.

Workshops and seminars will be utilized, as well as field trips to other DOE facilities to learn of waste minimization technology and techniques. This information will be shared with appropriate personnel by the Waste Minimization Team.

6.5 Program Evaluation

The Waste Minimization and Pollution Prevention Awareness Program will be continually evaluated and annual reviews will be documented. All major activities will be reviewed. The evaluation will document program achievements and identify potential areas for improvement. Achievements and milestones of the program will be a part of the contractor's performance evaluation and determination of award fees.

The following success criteria will be used to demonstrate the effectiveness of waste minimization efforts:

- Reduced generation rates of LLW, mixed waste and sanitary waste.
- Reduced waste management costs.
- Improved regulatory compliance.
- Reduced health risks.
- Increased process efficiency.
- Reduced accident risk.
- Improved public relations.

The Waste Minimization Team will address these criteria when evaluating the success of implemented actions to achieve waste volume or toxicity reductions.

A report will be made to the Site Manager and will contain current-year data, performance trends, forecasts, and measures used to gauge the performance of waste minimization activities. The evaluation report will be used to establish future waste minimization goals and program objectives. The report will also be used to determine changes to this plan.

7.0 TRAINING, AWARENESS, AND INCENTIVES

7.1 Employee Training Goals

One of the most important elements of the Waste Minimization and Pollution Prevention Awareness Program is training. Training activities will be integrated with an existing training program. The goal is to make each employee aware of waste generation, its impact on the site and the environment, and ways waste can be reduced and pollution prevented. The training program is to include waste minimization concepts that should be incorporated into every job aspect, so that it is routinely integrated into each phase of an operating procedure or design consideration.

A class has been developed on waste minimization techniques and presented at the DOE/Westinghouse School for Environmental Excellence.

7.2 Employee Awareness Goals

Initial FMPC employee awareness of the Waste Minimization and Pollution Prevention Awareness Program results from the WMCO management directive and policy statement. The primary responsibility for informing FMPC personnel on an ongoing basis of waste minimization activities, achievements, and concepts will be the Waste Minimization Team.

The Waste Minimization Team informs FMPC personnel of current and ongoing waste minimization accomplishments by use of pictorial essays, graphs that track progress, site bulletin boards, and site communication media (i.e., Focus, The Communicator, FMPC Update). This will be done on a monthly basis.

The Waste Minimization Team will also establish a waste minimization/pollution prevention slogan contest to heighten awareness of these issues. This will be done bi-monthly.

7.3 Employee Incentives, Awards, and Recognition

Incentives such as awards, plaques, and other forms of recognition shall be utilized to provide motivation, and to boost employee cooperation and participation. Meeting waste minimization goals will be a measure for evaluating the job performance of managers and employees through the performance management system and applicable performance objectives.

Waste minimization suggestion boxes will be used to elicit participation from employees, and awards will be given to employees whose waste minimization suggestions and/or ideas are efficient and cost effective.

Waste minimization information and graphs that track progress will be published or posted on a routine basis by the Waste Minimization Team.

8.0 REFERENCES

8.1 DOE Order 5820.2A, "Radioactive Waste Management"

8.2 DOE Order 5400.1, "General Environmental Protection Program"

8.3 DOE Order 5400.3, "Hazardous and Radioactive Mixed Waste Program"

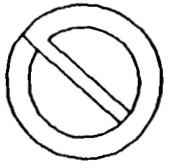
8.4 EPA, "Code of Federal Regulations," Title 40, Subchapter J, "Superfund, Emergency Planning, and Community Right-to-Know Programs"

8.5 FMPC Roadmap, Volume 1 and 2; Predecisional Draft, January 31, 1991

8.6 FMPC Baseline Inventory Report, December 28, 1990

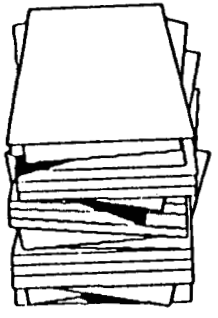
8.7 FMPC Waste Generation Prediction Report, February 20, 1991

Figure 11
FMPC WASTE MINIMIZATION ACCOMPLISHMENTS



Source Elimination

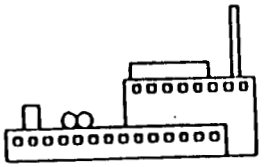
* Eliminated lead-based paint usage
* Initiated chemical product inventory reduction program
* Eliminated 1,1,1-trichloroethane use onsite, except paint shop



Recycle/Reuse

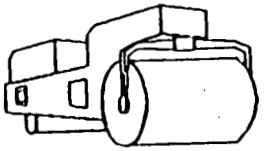
* Formed FMPC Total Quality Recycling Team
* Implemented paper and aluminum recycling program
* Began reuse of Xylene in laboratory

Figure 11 (Continued)
FMPC WASTE MINIMIZATION ACCOMPLISHMENTS



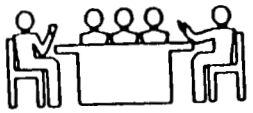
Segregation/Decontamination

* Segregated 13,500 cu. yds. of rubble/soil and office waste in 1990
* Decontaminated 485 tons of scrap steel



Volume Reduction

* Compacted 4,850 cu. yds. noncontaminated trash to 1,070 cu. yds.
* Compacted 2,300 cu. yds. contaminated dry, compactible trash to 770 cu. yds.
* Compacted 65,000 cu. ft. compactible refuse metal/scrap drums to 22,000 cu. ft.

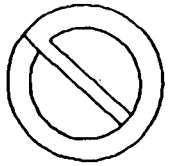


Organizational

* Conducted Baseline Waste Inventory
* Predicted Waste Generation for FY-91, 92, 93, 94
* Formed Waste Minimization Team

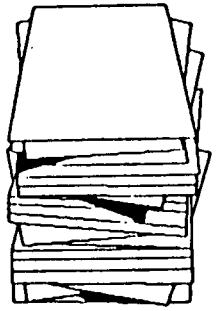
Figure 12

FMPC WASTE MINIMIZATION GOALS



Source Elimination

* Conduct sampling and analysis on benzene contaminated oils from garage to classify as LLW
* Review and eliminate all infrequently used or duplicated chemicals onsite
* Substitute cloth "anti-Cs" for all paper "anti-Cs"



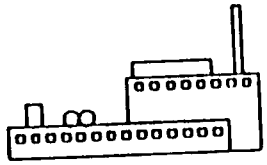
Recycle/Reuse

* Maintain office paper, computer paper, and aluminum can recycling efforts
* Initiate LasetJet cartridge recycling campaign
* Begin operation of distillation unit for spent solvent recovery in paint shop
* Initiate recycling of trichlorotrifluoroethane (Freon) in the lab
* Start operation of new Drum Reconditioning Facility

Figure 12 (Continued)

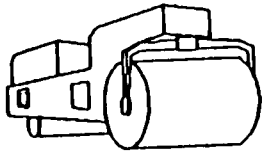
FMPC WASTE MINIMIZATION GOALS

Segregation/Decontamination



* Update laundry system to facilitate segregation
* Initiate PTA for process area compactible waste segregation
* Decontaminate 5,000 DEs (575 tons) of scrap metal per year

Volume Reduction

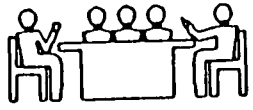


* Implement super compaction system in Plant 8
* Begin operation of the Plant 8 Rotex repackaging station
* Start operaation of the Plant 8 rotary kiln
* Evaluate feasibility of Trash and Scrap Monitoring Facility
* Initiate PTA for solids precipitation in Plant 8

Figure 12 (Continued)

FMPC WASTE MINIMIZATION GOALS

Organizational



* Integrate waste minimization/pollution prevention awareness into training courses
* Implement employee slogan contests
* Renew employee suggestion boxes and incentive programs
* Inform employees of accomplishments by use of bulletins, pictorial essays, and site media
* Perform ongoing waste assessments

WESTINGHOUSE MATERIALS COMPANY OF OHIO - FMPC	Page 1 Page Revision Date:	4228
PRODUCTION OPERATIONS PROCEDURE	Title: SEGREGATION OF WOODEN PALLETS	SOP-01-104 Section: Waste Operations Plant: All
Authorization: R. L. Gardner	Supersedes: None	Issue Date: 06-23-87

1.0 PURPOSE

The purpose of this procedure is to provide criteria to segregate wooden pallets into four categories; 1) repairable, 2) reusable, 3) nonrepairable, and 4) out-of-specification.

2.0 APPLICABILITY

This procedure applies to wooden pallets used in Production Operations plants/or areas.

3.0 RESPONSIBILITIES

3.1 Production Operations supervision shall be responsible for ensuring that specified ES&H approved equipment is available, only trained personnel perform this operation per the criteria of this procedure, and work and storage areas meet ES&H criteria.

3.2 Environment, Safety and Health Department, Environmental and Radiological Monitoring Technician (ERMT) shall be responsible for the survey of wooden pallets to determine contamination levels and dose rates. The ERMT shall establish proper radiological controls based upon survey results (for example; radiation work permits, respiratory protection, anti-c's).

3.3 Transportation Section of Administrative Services Department shall be responsible for transporting wooden pallets on site as required.

3.4 Production Operations plant or area supervisory personnel shall be responsible for the segregation and decontamination of the wooden pallets used in each plant/area.

4.0 DEFINITIONS

4.1 Designated Pallet Storage Area - An area identified by Production and approved by Environmental, Safety, and Health Department which meets the physical and radiological requirements of activities associated with this SOP.

4.2 Out-Of-Specification Pallets - Pallets which do not meet the criteria of Engineering Specification 00X-5500-X-01254.

R - MATERIAL REVISED, ADDED, OR DELETED.

4.0 DEFINITIONS (cont.)

4.3 Reusable Pallets - Pallets meeting FMPC standards per Engineering Specification 00X-5500-X-01254 (See Figure 1).

4.4 Repairable Pallets - Pallets meeting FMPC standards per Engineering Specification 00X-5500-X-01254 which do not exceed four inferior or damaged planks (See Figure 2).

4.5 Nonrepairable Pallets - Pallets meeting FMPC standards per Engineering Specification 00X-5500-X-01254 with four or more inferior or damaged planks (See Figure 3).

4.6 ES&H - Environment Safety and Health Department

4.7 ERMT - Environmental and Radiological Monitoring Technician

4.8 Anti-C - Anti-contamination clothing

5.0 REFERENCES

Engineering Specification 00X-5500-X-01254 (See Figure 1)

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS

NOTE: DEFINED SAFETY SYSTEM INVOLVED _____ YES __X__ NO

6.1 Safety glasses with side shields shall be worn at all times except when other eye protection may be required as determined by ES&H.

6.2 Respiratory protection shall be worn as specified by the ERMT if dusty conditions are expected or exist during work.

6.3 Leather-palm gloves shall be worn when handling pallets.

6.4 Only HEPA type filter vacuum cleaners or an ES&H approved vacuum system shall be used.

6.5 Only trained and supervisor authorized operators shall operate equipment.

6.6 Half-mask respirators equipped with magenta filter cartridges shall be worn when vacuuming contamination from pallets.

6.7 Lifting and movement of pallets shall be by mechanical means only. Manual lifting of pallets should be discouraged.

6.0 INDUSTRIAL HEALTH AND SAFETY REQUIREMENTS (cont.)

6.7 Any circumstance which could have resulted in an intake of radioactive materials by inhalation, ingestion, or absorption shall immediately be reported to a supervisor. The involved employees shall report to the Medical Department at the end of their shift to submit a urine sample and again report at the start of their next shift to submit another urine sample. Each involved employee shall complete an Incident Investigation Report, Form No. FMPC-ES&H-1458 while at Medical. The supervisor shall inform the Environmental and Radiological Technician of the circumstance and file a Minor Event Report (Form FMPC-QA-2689) before the end of the shift during which the circumstance happened.

7.0 PROCEDURE

7.1 Notify ERMT to monitor pallets for dose rates and contamination levels. Radiological controls (such as radiation work permit, respiratory protection, anti-contamination clothing) shall be required as designated by the ERMT based upon survey results. When pallets are empty, refer to Table 1 for determining required use.

7.2 Remove visibly loose contamination by vacuuming or other method acceptable by ES&H.

7.3 After cleaning, segregate pallets into reusable, repairable, non-repairable and out-of-specification categories (See Figures 1, 2 and 3).

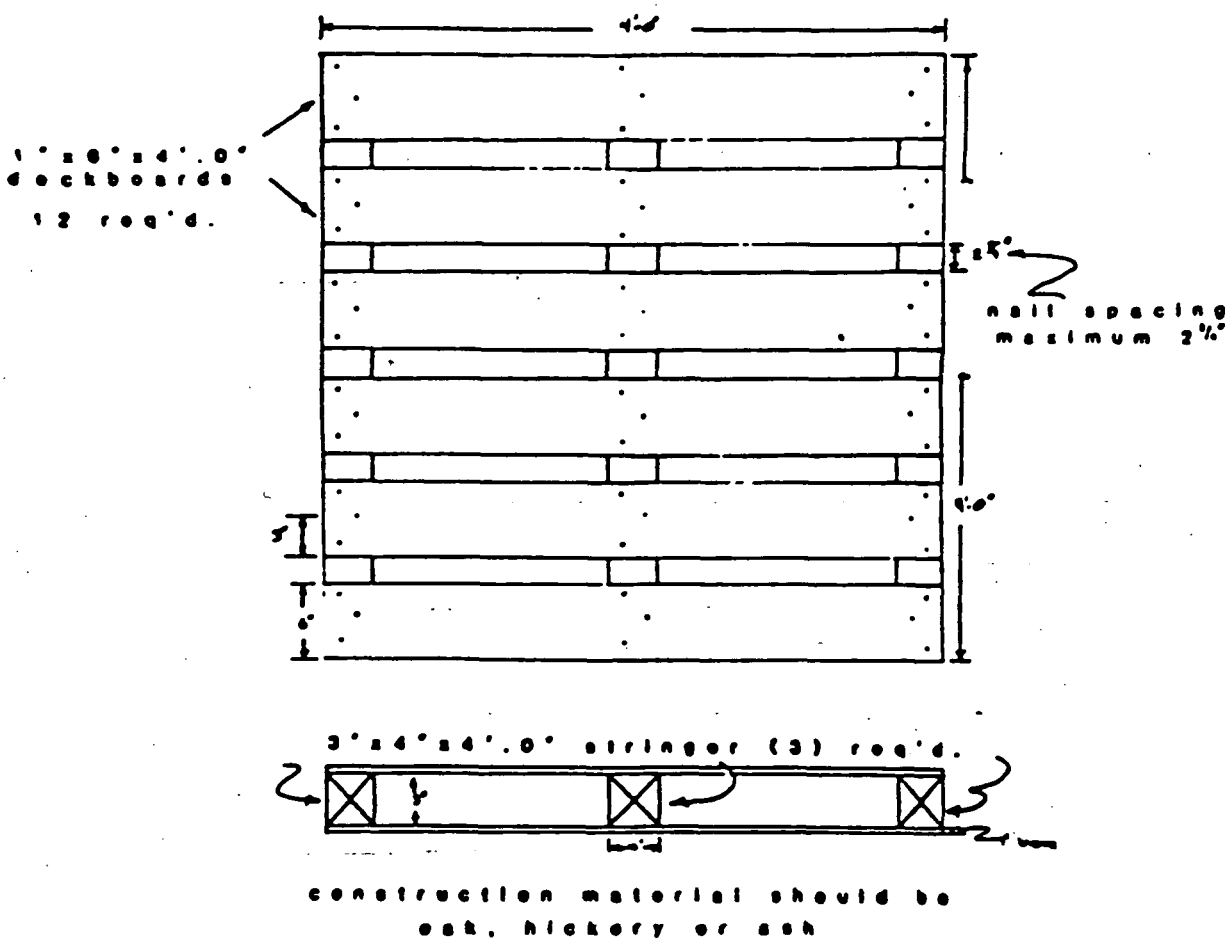
7.4 When the pallets have been segregated, the center runner of each reusable and repairable pallet shall be color-coded using either paint or stencil ink. Reusable pallets shall be color-coded white. Repairable pallets shall be color-coded black. The color code shall be placed on each end of the center runner.

7.5 Stage reusable pallets in the production plant designated pallet storage area.

7.6 Notify Transportation to transport repairable, non-repairable, and out-of-specification pallets to Waste Operations (Plant 1).

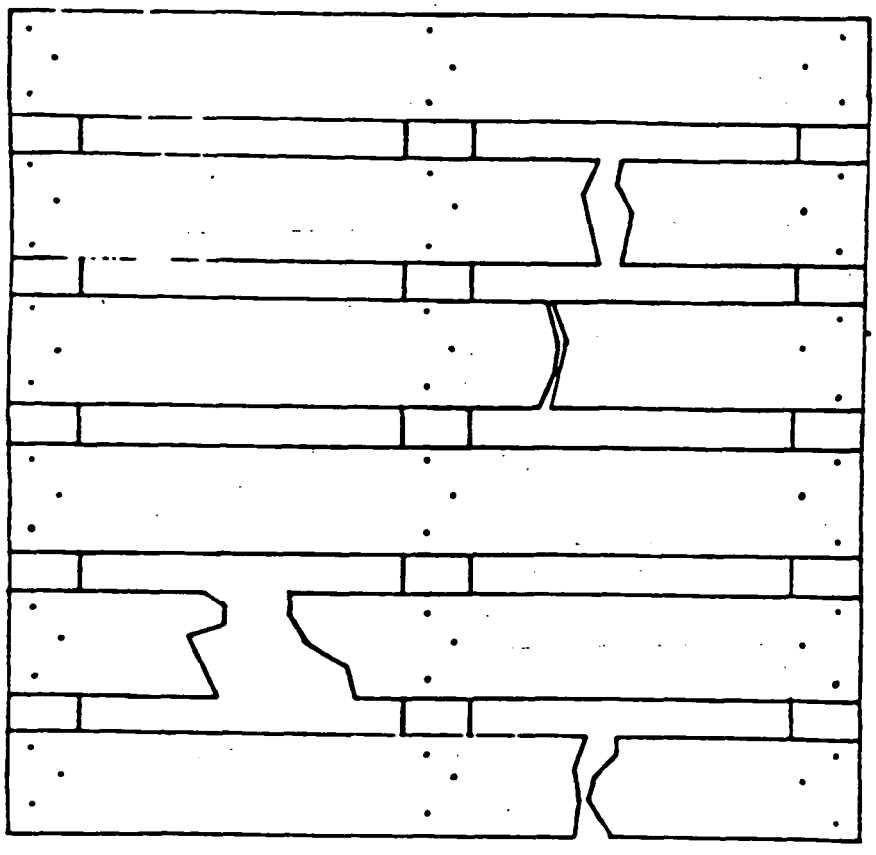
TABLE 1
EMPTY PALLET USE

Condition	Action
Visible Contamination/Damage	Do not use pallet. Identify as cleaning required.
No Visible Contamination/No Damage	Continue to use pallet within plant. If pallet is being shipped to another plant, identify as cleaning required.



REUSABLE PALLETS
(FMPC Engineering Specification 00X-5500-X-01254)
Figure 1

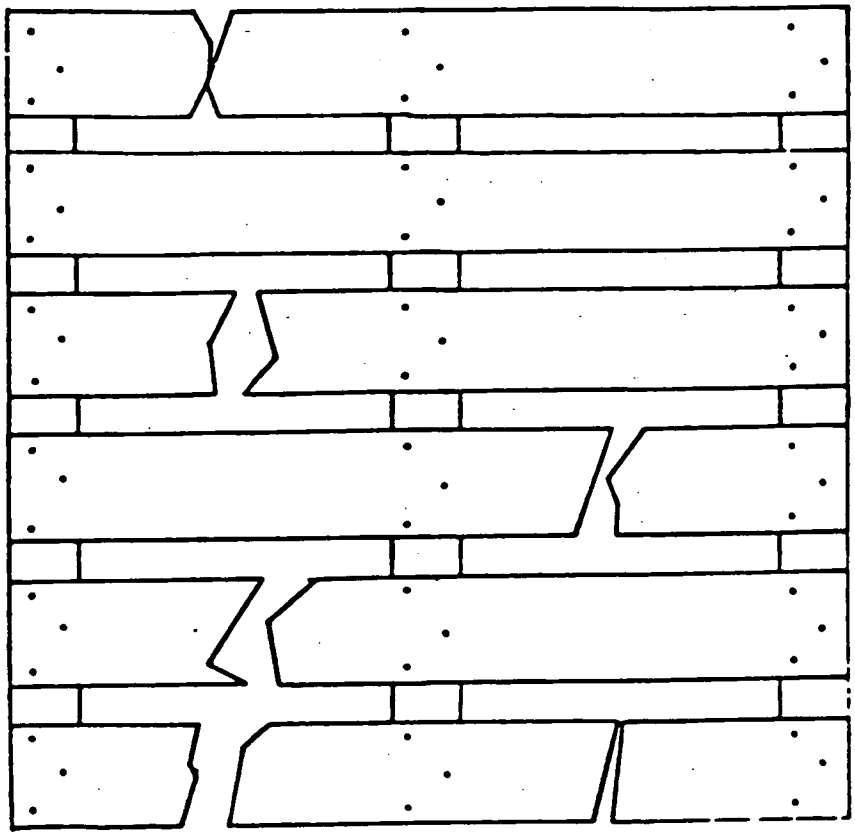
R - MATERIAL REVISED, ADDED, OR DELETED.



Pallets which have 4 or less than 4 bad planks

REPAIRABLE PALLETS
Figure 2

R - MATERIAL REVISED, ADDED, OR DELETED.



Pallets having more than 4

bad planks or

damaged beyond repair

NON-REPAIRABLE PALLETS
Figure 3

R - MATERIAL REVISED, ADDED, OR DELETED.

RECORD OF ISSUE/REVISIONS

PAGE	DATE	DESCRIPTION AND AUTHORITY
1 thru 8	06-23-87	Procedure required to segregate wooden pallets in Production Operations areas per Request No. P87-073, initiated by K. Dunbar.

LIST OF EFFECTIVE PAGES

PAGE	DATE
1 thru 8	06-23-87

R - MATERIAL REVISED, ADDED, OR DELETED.