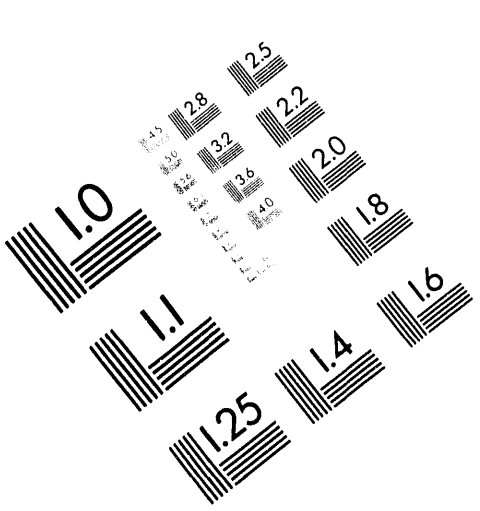


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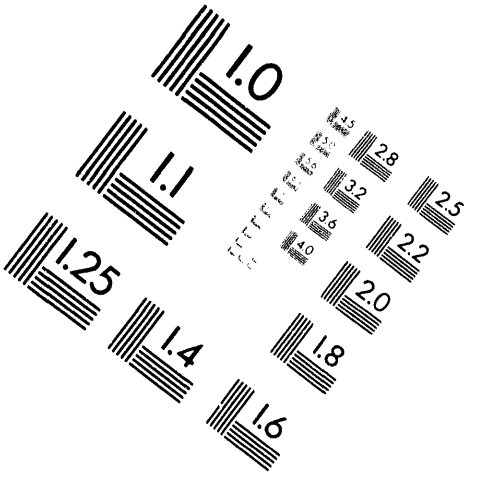


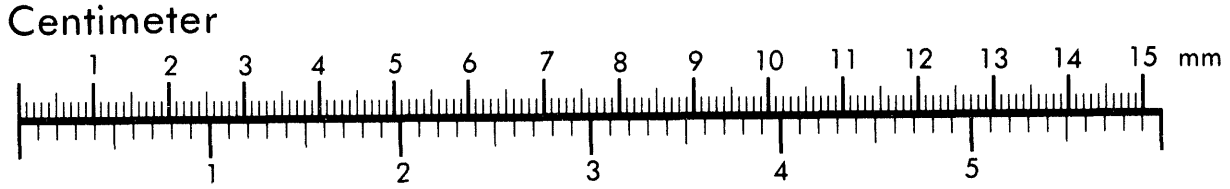


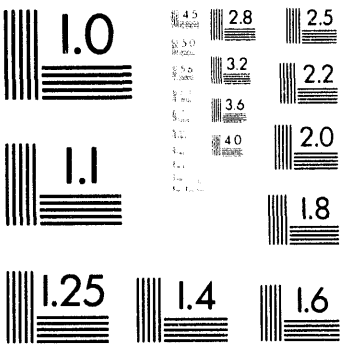


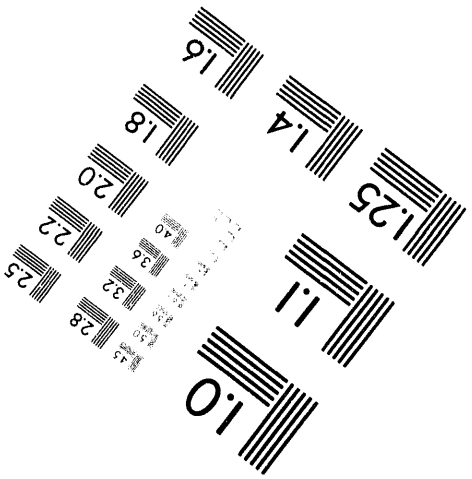


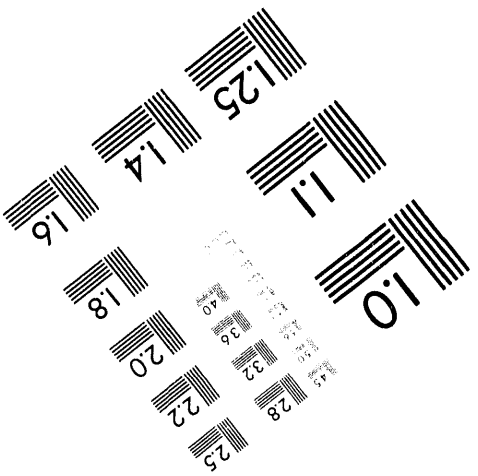


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# THE ROCKY FLATS PLANT WASTE STREAM AND RESIDUE IDENTIFICATION AND CHARACTERIZATION PROGRAM (WSRIC): PROGRESS AND ACHIEVEMENTS

Virgene L. Ideker
E.G.& G. Rocky Flats

Glenn M. Doyle
U.S. Department of Energy
Rocky Flats Office



## Abstract

The Waste Stream and Residue Identification and Characterization (WSRIC) Program, as described in the WSRIC Program Description[1], delineates the process knowledge used to identify and characterize currently-generated waste from approximately 5404 waste streams originating from 576 processes in 288 buildings at Rocky Flats Plant (RFP). Annual updates to the WSRIC documents are required by the Federal Facilities Compliance Agreement[2] between the U.S. Department of Energy, the Colorado Department of Health and the Environmental Protection Agency.

Accurate determination and characterization of waste is a crucial component in RFP's waste management strategy to assure compliance with Resource Conservation and Recovery Act (RCRA) storage and treatment requirements[3], as well as disposal acceptance criteria. The WSRIC Program was rebaselined in September 1992, and serves as the linchpin for documenting process knowledge in RFP's RCRA operating record. Enhancements to the WSRIC include strengthening the waste characterization rationale, expanding WSRIC training for waste generators, and incorporating analytical information into the WSRIC building books. These enhancements will improve credibility with the regulators and increase waste generators' understanding of the basis for credible waste characterizations.

## Introduction

In July, 1986, the State of Colorado rejected the Rocky Flats Plant hazardous waste permit application on the basis that it contained insufficient information on the identity, characterization, and quantity of wastes treated, stored, or disposed of at the facility. Arising from this situation was the 1986 Compliance Agreement[4] that stipulated a technical program be implemented to provide supplemental information regarding waste generation and management at Rocky Flats. The required waste inventory and characterization was performed in 1986 and 1987. A 26-volume Waste Stream Identification and Characterization Report,[5] which combined both hazardous and LLMW wastes, was completed in April, 1987. This report was a "point-in-time" documentation and did not take into consideration the changing nature of the waste produced at Rocky Flats. The inaccuracy of this system became evident during the FBI raid of 1989 and was further delineated during the DOE Tiger Team audit in the spring of 1990. Lack of adequate documentation and tracking of waste also caused the Nevada Test Site to suspend acceptance of Rocky Flats waste in August 1990.

The WSRIC Program was developed in 1990 to document the identification and characterization information provided by waste generators for all routine waste streams, residues, and nonroutine waste generated by Rocky Flats. The primary objective of the WSRIC program is to provide generators with accurate documentation of their waste determinations and characterizations. WSRIC books are tools the generator uses to aid in performing accurate characterization. The WSRIC is a "living" document which, under the Federal Facility Compliance Agreement with the Environmental Protection Agency and the Colorado Department of Health, must be updated annually to reflect:

- new and previously unidentified waste generating processes;
- continuing verification and validation of current waste processes through:
  - field verification and data collection of process knowledge
  - data management and building book production
- analytical characterization of routine waste streams, residues, and nonroutine waste through:
  - development of sample and analysis plans
  - sampling of waste
  - laboratory analysis
  - characterization, data validation, and quality assurance

Coordination with all Rocky Flats organizations allows for the WSRIC books to be used as the main source of waste characterization information. The books are key documents in the maintenance of the operating record for the plant and provide for traceability of waste from the point of generation to disposal.

## WSRIC Project Description

Waste and residue characterization involves the initial identification and verification of the waste outputs, as well as the collection of associated process information and existing analytical sampling and analysis data. This information is reverified annually to identify variations or changes in the process producing the waste. The data collected are input into the WSRIC database. The initial waste determination and characterization is based upon process knowledge. This information, in turn, is then used to prescribe and prioritize laboratory analysis that augments and verifies the initial process knowledge characterization. All analytical data are validated by an independent data validation organization to assure accurate and defensible results.

Information describing waste streams, process operations, process inputs, and process outputs, either product or waste, is incorporated into the WSRIC building books. Every building at Rocky Flats has a WSRIC building book delineating the waste produced in that building. The books are controlled documents and are used by the waste generators to assure proper output management and to obtain the necessary information for packaging waste and completing the Waste and Residue Traveler (WRT). The WRT is a document which records the contents of the waste container and accompanies the drum from "cradle to grave". The WSRIC information is entered into the Waste and Environmental Management System (WEMS) operating record database to maintain a current record of waste and residue generating processes, waste streams, and stored inventories. Information provided by the WRT is also entered into WEMS and is compared with information provided by WSRIC. Incompatible information is identified and the generator is given the responsibility to resolve the inconsistency.

WSRIC data reflect plant operations and output characterization at the time of data collection. Controlled Document Revision Requests and annual reverifications are used to update the information contained in the building books and in the WEMS database, promoting accurate, current, and completeness of WSRIC data. As WSRIC building books are generated, responsible EG&G building representatives review them to ensure the information accurately reflects each building's operations. Generators are responsible for notifying the WSRIC program management prior to making changes in a process.

Rocky Flats waste generators are ultimately responsible for output characterization and management. All generators must pass an eight (8) hour WSRIC/Waste Characterization training class and a four (4) hour waste

generator class. The generator must also pass extensive on-the-job training (OJT).

Because the WSRIC program includes the characterization of thousands of outputs, it is imperative that program strategies and philosophies be well defined and documented. The WSRIC Program Description is a top level controlled document which presents the specific strategies and philosophies, plans and procedures utilized by the organizations involved with the WSRIC program.

## Achievements Of The WSRIC Program

The Nevada Test Site conducted an extensive audit of the Rocky Flats waste characterization and management programs in August 1993. The objective of the audit was to ensure that the Rocky Flats Low Level Waste program complies with the Nevada Test Site Defense Waste Acceptance Criteria, Certification and Transfer Requirements, NVO-325, Revision 1[6]. Results of the audit indicated that an effective program has been implemented at Rocky Flats and that the essential elements of waste certification and characterization with the supporting quality assurance were met. The audit report specifically noted that "The Waste Stream and Residue Identification and Characterization Program provides a very clear and well-structured system for describing the use of process knowledge for waste characterization." As a result of the favorable audit, Rocky Flats received authorization to resume shipment oflow level waste to the Nevada Test Site beginning in the spring of 1994.

The Colorado Department of Health (CDH) and the Environmental Protection Agency (EPA) receive the annual updates to WSRIC. WSRIC serves as a framework to help both the regulators and the generators focus on identifying and resolving waste characterization issues. As the Department of Energy approaches a more open posture with the public, WSRIC information is used to aid in describing processes and waste management conducted at the Plant.

WSRIC was identified as the most comprehensive system for characterizing the inventory of waste produced by a DOE production facility and was used as a tool for the Complex 21 planning effort and modelling system. Information provided by WSRIC has also been utilized extensively by the Federal Facilities Compliance Agreement (FFCA) organization for the development of a Comprehensive Treatment and Management Plan (CTMP)[7] for Rocky Flats.

## Lessons Learned

1. The WSRIC program was originally designed to document and track only the current waste production at Rocky Flats. Backlog waste that was produced prior to the implementation of the WRT, and the non-routine waste generated as a result of maintenance and D&D activities were not included. It became evident that a system must be developed which accurately baselines the process knowledge characterization of backlog waste. At the present time, a system is being implemented which will include this information and is scheduled to be active by the end of FY94.

2. The WSRIC program is an active tool used by the generators to document the waste characterization and to provide information necessary for handling and packaging the waste generated. Generators found difficulties in using and understanding the information provided in the documents. In some cases, the characterization rationale did not reflect the applicable regulatory requirements utilized in making the characterization and analytical information was not included when available. As part of the FY94 reverification process, the characterization rationale is being written to strengthen the tie to the applicable regulations to ensure correct characterization and to document the basis for assigning the appropriate EPA waste codes. In addition, available analytical information is being included in the

characterization rationale to validate the accuracy of the characterization.

3. Characterization of waste with insufficient process knowledge has become a major concern at Rocky Flats. In the past, this waste has been identified as "Unknown Pending Analysis"; however, this is unacceptable to regulators. It is necessary for the generator to make a hazardous waste determination and preliminary characterization prior to obtaining the results of the analysis. All "unknown" waste streams are being reevaluated and hazardous waste determinations will be made.

4. When the WSRIC program was initially developed, personnel performing field verification activities were not provided access to floor level generators. Building managers, who did not possess the required detailed information on the process, dealt with the field verifiers and provided the information for WSRIC documentation. Field Verifiers now have direct access to floor level generators which results in more accurate process knowledge information being captured in the WSRIC database.

5. Ownership of waste determinations and characterizations by generators has been a major problem at Rocky Flats. A training program has been developed which qualifies the generator to make proper waste determinations and characterizations in accordance with the applicable regulations and explains the WSRIC program, purpose and use. Generators are required to attend this training as a prerequisite to the Waste Generator training, which is required for any personnel that produce and package a solid waste.

## Future Direction

1. The framework established in WSRIC provides Rocky Flats with a "living", controlled system for documenting waste characterization that can serve the needs of plant transition, decontamination/decommissioning (D&D), and environmental restoration (ER) planning programs. Specifically, a major objective for the WSRIC is to be used in identifying and documenting new waste streams originating from the transition of buildings from production missions to their final state. It will provide the blueprint for assuring that transition planners focus on the characterization of new waste streams resulting from transition, D&D and ER activities before they are generated. Also, it will serve (as it does for currently-generated low-level wastes) as the basis for documenting the characterization of these new waste streams to meet the waste acceptance criteria of disposal sites, such as the NTS, Envirocare and the Waste Isolation Pilot Plant (WIPP). Finally, it will aid in minimizing the hazardous wastes generated by these activities by causing planners to factor into the planning process the difficulties and costs associated with managing the characterization of such waste streams.

2. As regulations are modified, either by regulatory process or through court action, the WSRIC can be enhanced to respond to those changes. For example, a recent court ruling addressing EPA waste code F039 has resulted in a new interpretation of the basis for characterizing wastes that increases the amount of analytical information required. In response, WSRIC is being enhanced to include analytical information to strengthen the characterization rationale. This type of analytical information will be the basis for planning the design of future treatment processes to meet Land Disposal Restrictions (LDR).

3. The Idaho National Engineering Laboratory (INEL) currently stores approximately 160,000 containers of waste generated by Rocky Flats. In general, the process knowledge characterization documentation for these containers is weak. Upon completion of the Rocky Flats backlog

waste characterization baselining process, the resulting information will be shared with INEL to aid them in performing baseline characterization of the containers in storage. This will help reduce the costs of characterization INEL would otherwise incur by increasing the process knowledge of drums in storage, which should help reduce the number of analytical samples needed to adequately characterize the waste.

## Conclusions

The WSRIC program was instrumental in helping the Rocky Flats Plant (RFP) successfully pass the recent Nevada Test Site (NTS) audit for the disposal of straight low-level waste. The WSRIC documents allowed NTS auditors to easily and accurately track back to the point of waste generation, as well as understand the basis for determining how the waste meets the requirements of NVO-325. Based on this achievement, the WSRIC can serve as a model for other sites intent on sending low-level waste to the NTS.

In the near-term, the focus of WSRIC is to become the plant's single, credible source for all waste characterization (including analytical) information. The intent is to make it a "one-stop shopping" source for generators and regulators alike. The wisdom behind this approach can be summarized in one word: simplification. The simpler the system, the simpler it is to manage, modify, control, train to, and refer to when dealing with regulators and other stakeholders. Furthermore, having a single source of characterization information on the same software platform as the plant waste operating record simplifies database interfaces and maximizes consistency of the data. This contributes significantly to improved credibility with the regulatory inspectors.

## References


1. EG&G Rocky Flats, Inc., "Waste Stream and Residue Identification and Characterization (WSRIC) Program Description", Manual 1-10000-EWQA, Section 1.6.1.

2. United States Department of Energy, Environmental Protection Agency, and Colorado Department of Health, "Federal Facility Compliance Agreement II", October 1992.

3. Code of Federal Regulations (RCRA), 40 CFR Parts 260-268.

4. U.S. Department of Energy, Environmental Protection Agency, and Colorado Department of Health, "1986 Compliance Agreement", July 1986.

5. Rockwell International, "Waste Stream Identification and Characterization Report", April 1987.

6. U.S. Department of Energy, Nevada Field Office, "Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements", (NVO-325 - Revision 1), June 1992.

7. U.S. Department of Energy and EG&G Rocky Flats, "Comprehensive Treatment and Management Plan (CTMP)", July 1993.

## Attachments

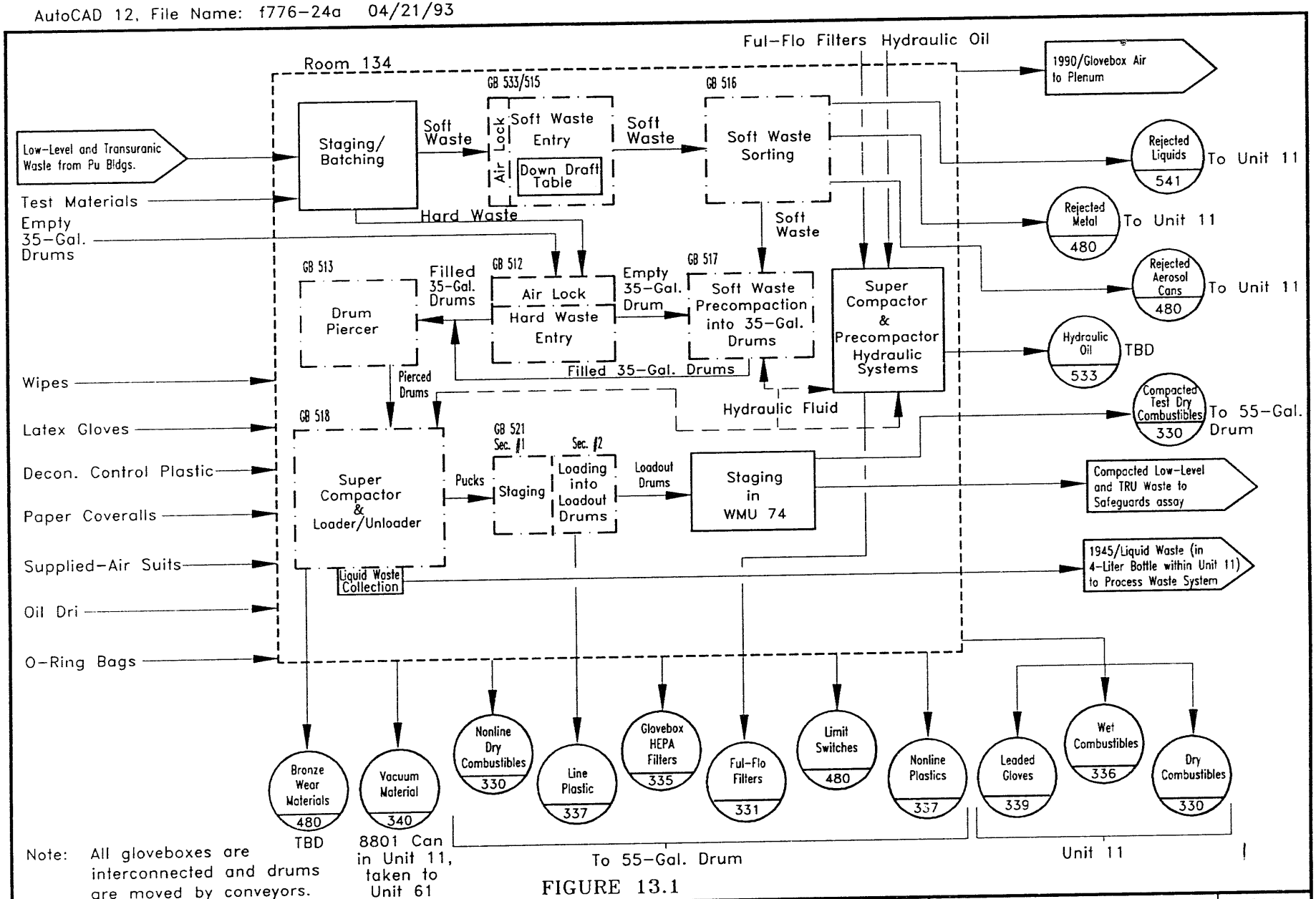
Attachment 1: Autocad flow diagram of process in WSRIC book

Attachment 2: Characterization table from WSRIC book used by generators to complete Waste and Residue Traveler.

Attachment 3: Expanded description of individual waste stream.

ATTACHMENT 1

AutoCAD 12, File Name: f776-24a 04/21/93




Note: All gloveboxes are interconnected and drums are moved by conveyors.

FIGURE 13.1

| | | |
|---|---|---|
| Rocky Flats Plant<br>Waste Stream & Residue Identification & Characterization | BUILDING 776/PROCESS 13<br>SUPERCOMPACTOR | |

| Task | By | Date |
|---|---|---|
| Designed | J. Kleckner | 09/12/91 |
| Drawn | C. Lauber | 09/13/91 |
| Checked | J. Paynter | 04/21/93 |

# PROCESS 776-13 SUPERCOMPACTOR

| Process Number | IDC-CCC Number | Comp. Codes | Description<br><br>Chemical Constituents: | Collection | Generation Rate | Solid Waste | RCRA Hazardous Waste | RCRA-Land Disposal Restricted (Part 268) | Product/ Residue/ Waste | EPA Codes |
|---|---|---|---|---|---|---|---|---|---|---|
| 776-13-24 | 330-00 | N/A | Nonline Dry Combustibles<br><br>CC:<br>None | 55-Gallon Drum | Insufficient Data | YES | NO | NO | Waste | |
| 776-13-30 | 330-00 | N/A | Dry Combustible Test Waste<br><br>CC:<br>None | 55-Gallon Drum | Insufficient Data | YES | NO | NO | Waste | |
| 776-13-33 | 330-SA | N/A | Dry Combustibles<br><br>CC:<br>Supercompacted wastes assigned the following EPA waste codes: D008, D009, D018, D019, D028, D029, D035, D038, D040, D043, F001, F002. | WMU 11 | Insufficient Data | YES | YES | YES | Waste | D008, D009, D018, D019, D028, D029, D035, D038, D040, D043, F001, F002 |

## WASTE STREAM AND RESIDUE DESCRIPTION AND CHARACTERIZATION

**Process Number:** 776-13-24 **Title:** SUPERCOMPACTOR
**IDC-CCC:** 330-00 **Description:** Nonline Dry Combustibles

| | | |
|---|---|---|
| ☐ RCRA Hazardous | ☐ Product | ☐ Fuel Blending |
| ■ RCRA Nonhazardous | ☐ High Content Residue | ☐ Uncontained Gas |
| ☐ By Analytical Data | ☐ Low Content Residue | ☐ RCRA Sample |
| ■ By Process Knowledge | ■ Transuranic | ☐ Recyclable Material |
| ☐ Insufficient Data | ■ Low-Level | ☐ Recycled/Reused |
| ☐ LDR Regulated | ☐ Nonradioactive | ☐ TSCA Reg. Waste |
| ■ Not LDR Regulated | ☐ Source/Special Nuclear Materials | ☐ Evaluated in Another Process |

**EPA Codes:**

**Descriptive Summary:**
Paper coveralls, discarded paperwork from outside the Supercompaction and Repackaging Facility gloveboxes.

**How the Output is Generated:**
Discarding coveralls and paperwork.

**How the Output is Managed:**
Collected in drums.

**Chemicals/Contaminants in or on the Output:**
None

**Characterization Rationale:**
This output is discarded and meets the definition of a solid waste per Section 261.2(a)(1). No listed or characteristic RCRA wastes are indicated on the field verification work sheet. Because the output is nonline generated, it is assumed to never be generated as a residue.

DATE
FILMED
6/17/94
END