Rocky Flats
Environmental Technology Site
1-MAN-036-EWQA-Section 1.6.1
REVISION 3
WASTE CHARACTERIZATION PROGRAM MANUAL

Responsible K-H Organization: Material Stewardship and Offsite Shipping Effective Date: 05/01/02

Approved By: TRU Waste Programs and Projects (*Title*) / 04/24/02 (*Date*)

G. A. O'Leary (*Print Name*) / /s/ E. L. D'Amico for GAO (*Approval Signature*)

The Responsible Manager has determined that the following organizations' concurrence is required. Concurrence documentation is contained in the Document History File:

Material Stewardship - Technical Operations - Waste Systems
Material Stewardship – Low Level/Low Level Mixed Waste Program
TWCP Site Project Quality Assurance Officer

IMPORTANT NOTES

This procedure supersedes 1-MAN-036-EWQA-Section 1.6.1, Rev. 2

Independent Safety Review: Not required. Periodic Review Frequency 4 years

SES/USQD Review: Not required.

Reviewing Official: UNCLASSIFIED NOT UCNI*

*REFERENCE EXEMPTION NUMBER CEX-032-00

Date: September 11, 2000

1/27

LIST OF EFFECTIVE PAGES

Pages	Effective Date	Pages	Effective Date
1 - 27	05/01/02		

Total number of pages: 27

The following DCFs are active for this document:
None

TABLE OF CONTENTS

Chapter — Page

TITLE PAGE 1
LIST OF EFFECTIVE PAGES 2
TABLE OF CONTENTS 3

1. PURPOSE 4
2. SCOPE 4
3. OVERVIEW 5
   - 3.1 Description of the Site 6
   - 3.2 Historical Development of Waste Stream Identification and Characterization 8
4. CURRENT WASTE CHARACTERIZATION PROGRAM DESCRIPTION 11
   - 4.1 WSRIC Building Books 11
   - 4.2 WSRIC Building Book Production 11
   - 4.3 Non-Routine Waste Origination Log (NRWOL) 12
   - 4.4 Backlog Waste Reassessment Baseline Book 13
   - 4.5 Waste and Environmental Management Systems Database 13
   - 4.6 Waste Generating Instruction 14
   - 4.7 Supplemental Acceptable Knowledge Documentation 14
5. WASTE CHARACTERIZATION PROGRAM REQUIREMENTS 16
6. RESPONSIBILITIES 18
   - 6.1 TWCP organization 18
   - 6.2 Waste Systems 18
   - 6.3 Facility/Operations Manager 18
   - 6.4 Waste Characterization Subject Matter Expert (SME) (All Organizations 19
   - 6.5 Radiological Engineering 19
   - 6.6 Records Management and Site Document Control 19
   - 6.7 TWCP Site Quality Assurance (QA) Officer 19
   - 6.8 Material Stewardship - Waste Management Technical Programs 19
   - 6.9 Material Stewardship - Waste Management Waste Operations 20
   - 6.10 Kaiser-Hill Closure Projects 20
   - 6.11 Waste Requirements Group 20
   - 6.12 Waste Generators (all organizations) 21
7. WASTE CHARACTERIZATION PROGRAM RECORDS 21
8. GLOSSARY 22
   - 8.1 Acronyms 22
   - 8.2 Definitions 23
9. REFERENCES 26

Figure

Figure 5-1 Waste Characterization Program Document Hierarchy 17

1. PURPOSE

This manual describes the Waste Characterization Program for the characterization of Rocky Flats Environmental Technology Site (the Site) hazardous, nonhazardous, radioactive, and mixed wastes by acceptable knowledge. Plans and procedures utilized by the organizations involved with the Waste Characterization Program are referenced.

The Waste Characterization Program, consisting of the Waste Stream and Residue Identification and Characterization (WSRIC) program, the Backlog Waste Reassessment Baseline Book (BWRBB), the Non-Routine Waste Origination Log (NRWOL), Waste Generating Instructions (WGIs) and the Waste and Environmental Management System (WEMS) database, was developed in response to federal and state regulatory requirements, disposal site waste acceptance criteria, and U. S. Department of Energy (DOE) Orders. The WSRIC, BWRBB, existing NRWOLs, and WEMS are responsible for documenting the identification and characterization information provided by waste generators for waste streams, residues, backlog waste, and non-routine waste generated at the Site.

The primary objectives of the Waste Characterization Program include the following:

- Evaluation of new and previously unidentified waste processes
- Continuing verification of current waste processes at the Site
- Characterization of routine waste streams, non-routine wastes, and residues
- Modifying and updating the existing WSRIC Building Books and BWRBB
- Documentation of acceptable knowledge
- Coordination with Site organizations involved with waste management, storage, and transportation

For the purposes of this manual, a **SHALL** statement identifies mandatory elements and requirements.

2. SCOPE

This program manual is a comprehensive overview of the Waste Characterization Program. This program manual describes the identification and characterization information provided by waste generators for waste streams, residues, and non-routine waste generated at the Site. It also provides a description of waste reassessment and supplemental acceptable knowledge documentation. All requirements related to the identification and characterization of wastes by acceptable knowledge are identified, and the method(s) of compliance with these requirements are described. Responsibilities, authorities, requirements, and procedures of the organizations and personnel involved with the Waste Characterization Program are described.

3. OVERVIEW

The Waste Characterization Program provides the acceptable knowledge information needed by the Site to meet the waste disposal sites waste acceptance criteria and the Site RCRA permit requirements.

Waste and residue characterization involves the initial identification and verification of process outputs, as well as the collection of associated process information and existing analytical data, ultimately resulting in characterization of waste or residue. Facility Managers are responsible to annually reverify waste stream characterization, and to identify variations or changes in the process producing each specific output. The data collected are documented in the WSRIC Building Books. Initially, waste stream outputs identified for consideration by the WSRIC program are characterized utilizing acceptable knowledge. In turn, this information is used to prescribe laboratory analysis, non-destructive assay, and radiography that augment and verify acceptable knowledge characterization if required.

The WSRIC waste stream information is included on the Waste Generating Instruction (WGI) which is issued to the generator for packaging waste and completing the Waste/Residue Traveler (W/RT). Information from the W/RT is entered into the WEMS database at the Site in accordance with 1-PRO-Q11-WO-1221, Controls for Updating Waste Package in WEMS, to maintain a current record of waste and residue generating processes, waste streams, and stored inventories. The WEMS database is continually updated to reflect the current status of waste/residue generation and storage at the Site.

NRWOLs were used in characterization of discovered waste or materials generated by unplanned activities. A NRWOL was used when the waste to be generated was not characterized in a WSRIC Building Book. Note: NRWOLs are no longer generated. However, current NRWOLs will be handled in accordance with the NRWOL procedure.

Waste reassessment is required for the evaluation and modification of the characterization of containerized wastes due to additional conflicting information arising during waste management, analysis, certification, or disposal activities.

3.1 Description of the Site

The Site is located in northern Jefferson County, approximately 16 miles northwest of Denver, Colorado. The 6,500-acre government-owned and contractor-operated facility was originally part of the nationwide nuclear weapons production complex. Groundbreaking for the first permanent buildings for the Site began in 1951. By 1954, approximately 700,000-square-feet of building space had been completed. As Site operations expanded, as much as 1.6-million square feet were occupied by manufacturing, chemical processing, plutonium recovery, and waste treatment and storage operations. Plutonium operations were located primarily in the 384-acre high-security area (Protected Area). Several operations, including sewage treatment, waste storage, maintenance, general office, warehouse, fire department, and uranium production and recovery, were located in the Industrial Area which was located outside the Protected Area.

The Site had two primary missions during the period of operations from 1952 through 1990: production of triggers for nuclear weapons; and recovery of plutonium from retired weapons, process residues, and wastes. The triggers, also known as pits, were the first-stage fission bombs used to initiate the second-stage fusion reaction in hydrogen weapons. Plutonium metal was recovered from retired warheads and manufacturing residues, and was also imported from the Hanford Reservation in Washington State and the Savannah River Plant in South Carolina. In general, the Site's primary mission changed little from 1952 until 1990 when plutonium operations were suspended. In the early 1960s, the DOE implemented the single mission concept to reduce redundant operations between DOE facilities. At that time, the Site became the primary manufacturer for nuclear weapons triggers.

The primary materials of construction included plutonium, uranium, beryllium, aluminum, stainless steel, cadmium and silver.

In 1993, the mission of the Site formally changed from weapons production support to environmental restoration and waste management. The four primary components of the current Site mission include:

1) Urgent Risk Reduction and Special Nuclear Materials Management: Stabilize, treat, consolidate, and safely store plutonium in shippable containers for off-site disposition.

2) Waste Management: Ensure that the transuranic and low-level wastes meet disposal Site waste acceptance criteria for shipment and disposal. Ship other hazardous and solid wastes to off-site commercial facilities.

3.1 Description of the Site (continued)

3) Facility Decommissioning: Deactivate, decontaminate, dismantle, and demolish all contaminated buildings not designed for non-mission future uses.

4) Environmental Restoration: Clean-up or close existing landfills and individual contaminated sites, while protecting surface water, minimizing the migration of ground water contamination, and addressing soil contamination. Provide an environmental monitoring system to demonstrate that the overall remediation conforms with the risk-reduction goals and clean-up levels established for the Site.

The nonhazardous/hazardous characterization of waste is guided by directives and standards issued by the Environmental Protection Agency (EPA) and the Colorado Department of Public Health and Environment (CDPHE) in support of RCRA. The Colorado Hazardous Waste Regulations (CHWR) were drafted to support the Federal RCRA program. References in this document will refer to the State regulations, as well as RCRA. The transuranic/low-level waste characterization of waste is guided by DOE Order 435.1, Radioactive Waste Management. Wastes are segregated into the following categories:

- Transuranic (TRU) radioactive wastes
- TRU-Mixed (TRM) radioactive wastes
- Low-Level waste (LLW)
- Low-Level Mixed Waste (LLMW) radioactive waste
- Hazardous Waste
- Residue Waste
- Residue Mixed Waste
- Toxic Substance Control Act (TSCA)-regulated waste
- TSCA–mixed waste
- Sanitary

3.2 Historical Development of Waste Stream Identification and Characterization

When radioactive or mixed waste is initially packaged, it is segregated by the type of waste matrix by using Item Description Codes (IDCs). IDCs are a series of four-digit numeric and alpha-numeric identifiers assigned to segregate nuclear material forms and process materials. Over the years, new IDCs have been added, obsolete IDCs have been deleted, and descriptions for some IDCs may have been modified. Procedure 1-PRO-079-WGI-001, Waste Characterization, Generation, and Packaging, describes the waste packaging, segregation, and documentation requirements for radioactive and mixed waste, and is supported by 4-D99-WO-1100, Solid Radioactive Waste Packaging, and 1-M12-WO-4034, Radioactive Waste Packaging Requirements.

Radioactive waste is segregated for the purposes of assaying and controlling nuclear material. Containers historically were sent to the appropriate drum counter to determine if they contained recoverable transuranic actinides. In addition, containers have been and are assayed to determine if they contain TRU or LLW. The determination of whether the waste contained recoverable material was based on an economic discard limit (EDL). The EDL compared the cost of manufacturing plutonium in a reactor to recovering the plutonium from specific process wastes and residues. EDLs were established by the DOE for each IDC.

A Waste Form Code (WFC) is a four-digit numeric identifier assigned to nonradioactive waste to describe the waste package contents. The WFC is assigned to the waste as it is packaged. A current list of WFCs is maintained by Waste Systems.

In November of 1985, the Site submitted RCRA Part B permit applications to the EPA and Colorado Department of Health (CDH) to comply with the requirements of RCRA. On June 4, 1986, an Agreement in Principle was signed which stipulated that a technical program would be developed to obtain information regarding waste generation and waste management at the plant. From May 1986 to March 1987, every process and process support waste stream at the Site was identified and characterized. EPA Hazardous Waste Numbers (HWNs) were assigned to low-level and nonradioactive wastes based on process knowledge, or sampling and analysis of the waste stream. The information was compiled in the Waste Stream Identification and Characterization (WSIC) document. Because the final Compliance Agreement did not apply to transuranic waste, wastes that contained or were thought to contain transuranic materials were not segregated based on their hazardous constituents.

3.2 Historical Development of Waste Stream Identification and Characterization (continued)

In October of 1989, WSIC was expanded to provide RCRA characterization of TRU waste streams and to address residues (above EDL materials) generated at the Site. This expanded program, known as Waste Stream and Residue Identification and Characterization (WSRIC), provided details on the nature, quantities, and hazards associated with nonhazardous, hazardous, radioactive, and mixed wastes that resulted from all aspects of operations at the Site. Field investigations were conducted to identify, evaluate, and verify current Site waste- and residue-generating processes, wastes and residues, and waste management units. Sampling and analysis was also performed to characterize mixed wastes and residues that were potentially hazardous based upon preliminary field investigations.

The information collected during the initial WSRIC program was documented in books created for each building. The WSRIC Building Books, which are controlled documents, described in detail the waste streams generated by every process conducted in every building at the Site. Annual reverification of the documents was conducted to assure that accurate and current information was maintained at the point of generation to assure proper waste management. The Facility Managers are responsible for updating the building books when processes or waste streams are added, deleted, or modified. The WSRIC Change Request (WCR) is used to update the information contained in the WSRIC Building Books. The files containing historical waste streams and process knowledge are maintained by Site Document Control in accordance with PRO-1329-DM-03, Site Document Control. When waste is packaged, the generator is responsible for recording the characterization information for each waste placed in a container. Characterization information is taken from the WSRIC Building Book or, historically, a NRWOL, and recorded on a W/RT. This information is then entered into the WEMS database to track the container from initial storage through disposal.

In 1994 and 1995, the Backlog Waste Reassessment project was responsible for compiling characterization information for process waste and residues generated prior to the implementation of the WSRIC and the W/RT programs. Information from numerous sources was reviewed to assess the characterization of the containers in the backlog inventory. The results of this assessment were documented in the Backlog Waste Reassessment Baseline Book (BWRBB). The resulting changes to container characterization were incorporated into WEMS and on container documentation, if necessary. The BWRBB is maintained as a controlled document and updated to reflect current container characterization as new information becomes available for the inventory. In addition, the BWRBB is being utilized to document changes to container characterization resulting from Non-Conformance Reports and other waste certification and analyses activities.

3.2 Historical Development of Waste Stream Identification and Characterization (continued)

Characterization of wastes that were not described in WSRIC Building Books were historically documented on NRWOL. These wastes were generated from non-routine activities such as spill clean-up, equipment removal, renovation, and demolition. The information collected and documented for non-routine waste was analogous to WSRIC. The completed NRWOL was attached to the W/RT, which accompanied the waste container. (Note: NRWOLs are no longer used.)

Supplemental acceptable knowledge documentation was developed in response to the Waste Isolation Pilot Plant (WIPP) transuranic (TRU) waste characterization requirements which were not addressed by either WSRIC or the BWRBB. This supplemental acceptable knowledge includes any documentation that describes or verifies Site history, mission, and operations, in addition to waste stream-specific information used to define the generating process, matrix, and contaminants (radiological and chemical). This supplemental acceptable knowledge is grouped into four general categories: correspondence, published documentation, unpublished data, and internal procedures and notes.

In November 1997, the Customer Service Organization (CSO) was established to provide waste characterization generation and packaging assistance to the Site waste generators. In July 2001, the CSO was reorganized to become Waste Requirements Group (WRG). The WRG provides guidance to waste generators through a Waste Generating Instruction (WGI), which is based on Site-level procedures, offsite disposal facility waste acceptance criteria, and Site agreements. (Refer to 1-PRO-079-WGI-001, Waste Characterization, Generation, and Packaging.) Prior to the use of the WGI, the Site required waste generators to obtain waste packaging, labeling, and characterization requirements from a myriad of Site-level documents. The Waste Management WRG now assumes responsibility for determining the appropriate waste management requirements that the waste generator must follow to produce compliant waste at the point of generation and to avoid subsequent unplanned treatment or repackaging prior to offsite disposal.

4. CURRENT WASTE CHARACTERIZATION PROGRAM DESCRIPTION

The information generated during the WSRIC, BWR, and Non-Routine Waste Characterization Programs is a principal source of acceptable knowledge used to support the final characterization and certification of retrievably-stored and newly-generated waste populations. For each container of waste generated at the Site, the relevant waste-specific information generated by these programs is incorporated into the WEMS database.

4.1 WSRIC Building Books

The WSRIC Building Books are controlled documents that provide process- and waste-specific information including:

- Process knowledge and flow diagram
- Waste stream description
- How the waste stream is generated and managed
- Chemicals and contaminants associated with the waste stream
- EPA Hazardous Waste Numbers, Land Disposal Restrictions (LDR) status, and characterization rationale

The waste stream information in the WSRIC Building Books is provided by the Facility Manager or process owner in accordance with WSRIC procedure 4-H19-WSRIC-001, WSRIC Characterization and Reverification. A WCR package is prepared and submitted to the WSRIC Program Lead. Waste streams that are deleted are maintained in archived files to retain a historical record. Electronic copies of the process description and flow diagram are also maintained. In addition, revisions of the processes (including records of interviews, analytical data, and informational process inputs) are kept on file or on microfilm.

4.2 WSRIC Building Book Production

The method used to create and revise the WSRIC Building Books through the processing of WCRs is defined in 4-H19-WSRIC-001, WSRIC Waste Characterization and Reverification. Waste Systems is responsible for submitting changes to WSRIC Building Books to Site Document Control for posting on the Site Intranet.

4.2 WSRIC Building Book Production (continued)

The WSRIC Building Books, WSRIC database, WCRs and supporting documentation are maintained as a permanent records in accordance with 1-V41-RM-001, Records Management Manual; and 1-PRO-077-WIPP-005, Management of Waste Information Prior to Transmittal to the Waste Record Center.

4.3 Non-Routine Waste Origination Log (NRWOL)

Note: NRWOLs are no longer generated. However, existing (or historical) NRWOLs will be handled in accordance with the NRWOL procedure.

If the waste was not adequately described in the WSRIC Building Book, a determination was made by the waste generator and Waste Systems whether or not the waste was included in the WSRIC Building Book through a revision to the Building Book, or was characterized using a NRWOL. In general, waste generated by planned or routine activities was characterized by updating the appropriate WSRIC Building Book to include this waste. Procedure 4-H19-WSRIC-001, WSRIC Characterization and Reverification, provides the forms and instructions for updating the WSRIC Building Book. A NRWOL was used for discovered waste or materials generated by unplanned activities. The NRWOL provided the same type of characterization information as the WSRIC Building Book. Procedure 1-I34-WO-1103-NRWOL, NRWOL Instructions, provided the NRWOL form and instruction for completing the NRWOL form.

The waste stream information entered on the NRWOL is equivalent to that compiled for WSRIC streams. In addition, several other pieces of information were also documented for non-routine waste including, when applicable:

- Contractor performing the work
- Work Control Number
- Building and room number where the work is being performed
- Work Package title or job description

A copy of the completed NRWOL and supporting documentation was attached to the W/RT. A non-record copy of the NRWOL is maintained by Waste Systems. A record copy of the NRWOL and the supporting documentation will be maintained by the Waste Records Center in accordance with 1-PRO-077-WIPP-005, Management of Waste Information Prior to Transmittal to the Waste Records Center.

4.4 Backlog Waste Reassessment Baseline Book

The backlog inventory was segregated into similar "waste forms" using existing IDC designations. Wastes were further subdivided into subpopulations consisting of wastes with similar generation locations and contaminants. Review of the existing characterization was accomplished primarily using process knowledge, interviews with waste generators, and available analytical data. The information collected by the reassessment program was compiled in the BWRBB which characterized each subpopulation and described the generating processes, process knowledge, and other information used during assessment of the characterization. Characterization assessments were accomplished by teams comprised of generators, waste characterization experts, and operations personnel familiar with the processes under consideration. Changes to the BWRBB are accomplished in accordance with 4-H19-WSRIC-001, Waste Characterization and Reverification.

A similar waste reassessment process continues to be used whenever a characterization discrepancy is discovered for any container of waste that has been previously characterized. When a characterization discrepancy is identified, a BCF is prepared to document the changes required to WEMS and the BWRBB. The waste custodian is notified and the appropriate changes are made to WEMS, the W/RT, and the container labeling.

4.5 Waste and Environmental Management Systems Database

The WEMS database is described in 1-MAN-039-WEM-WP-1200, Waste and Environmental Management System (WEMS) Program Management Manual. The system is designed as a waste inventory and tracking system. Information concerning waste containers from the point of generation to final disposition is maintained. Data entered into WEMS is taken from the W/RT, an existing NRWOL, or the BWRBB. The information entered in WEMS may include:

- Waste type (e.g., IDC, low-level, TRU)
- Container/packaging information
- Current location (on-site storage or off-site shipment)
- Generation location and date
- Radioassay, RTR, and fingerprint test results
- Headspace gas and solid homogeneous sample analysis results
- Packaging certification information

4.6 Waste Generating Instruction

The WGI is a document prepared by the WRG that provides the necessary instructions for documenting, packaging and shipping waste compliantly for disposal. The WGI will be specific to the waste generating project by specifying the number and type of waste containers, the necessary container labeling, the required packaging materials, and the required supporting documentation for subsequent disposal. This manual will also provide a set of concise requirements on how to package the waste based on the requirements specified in Site procedures, as well as disposal Site waste acceptance criteria. The WGI is maintained as a quality record in accordance with 1-PRO-079-WGI-001, Waste Characterization Generation and Packaging.

4.7 Supplemental Acceptable Knowledge Documentation

Because the WSRIC and BWRBB focus primarily on hazardous constituents, there are some areas of acceptable knowledge which are not addressed because they are not within the scope of these characterization documents. The Site TRU Waste Acceptable Knowledge Supplemental Information document describes the acceptable knowledge required by the U.S. DOE Carlsbad Field Office Quality Assurance Program and the WIPP Hazardous Waste Permit, Attachment B, Waste Analysis Plan (WIPP WAP) and not found in either WSRIC or BWRBB. The supplemental acceptable knowledge documentation is required to ensure that TRU and TRM waste meet the Waste Isolation Pilot Plant (WIPP) waste acceptance criteria and the WAP requirements.

Current topics covered in the supplemental acceptable knowledge documentation are:

- Radionuclides
- Defense waste
- Waste Matrix Code (DOE Waste Treatability Groups) linked to Item Description Codes (IDC) and waste segregation
- Non-solvent volatile organic compounds present in TRU waste
- Pyrophorics
- Underlying Hazardous Constituent Codes
- Assessment of RCRA Metal Contaminating Plutonium

4.7 Supplemental Acceptable Knowledge Documentation (continued)

The following documentation **may** be used for acceptable knowledge:

- Process design documents (e.g., Title II Design).
- Standard operating procedures that may include a list of raw materials or reagents, a description of the process or experiment generating the waste, and a description of wastes generated and how the wastes are managed at the point of generation.
- Preliminary and final safety analysis reports and technical safety requirements.
- Waste packaging logs.
- Test plans or research project reports that describe reagents and other raw materials used in experiments.
- Site databases (e.g., chemical inventory database for Superfund Amendments and Reauthorization Act Title III requirements).
- Information for Site personnel (e.g., documented interviews).
- Standard industry documents (e.g., vendor information).
- Analytical data relevant to the waste stream, including results from fingerprint analyses, spot checks, or routine verification sampling. This may also include new information acquired apart from the confirmatory process which supplements required information (e.g., visual examination not performed in compliance with the WAP).
- Material Safety Data Sheets, product labels, or other product package information.
- Sampling and analysis data from comparable or surrogate waste streams (e.g., equivalent nonradioactive materials).
- Laboratory notebooks that detail the research processes and raw materials used in an experiment.

All specific, relevant supplemental acceptable knowledge documentation assembled and used in the acceptable knowledge process, whether it supports or contradicts any required acceptable knowledge documentation, shall be identified and an explanation shall be provided for its use (e.g., identification of a toxicity characteristic). None of these documents, individually, are regarded as comprehensive; but supplemental documentation is used to further document the rationale for the hazardous characterization results.

4.7 **Supplemental Acceptable Knowledge Documentation (continued)**

If discrepancies exist between the new supplemental information and the existing acceptable knowledge information, then all hazardous waste codes indicated by the supplemental information are added to the waste stream unless there is documentation to justify an alternative assignment.

5. WASTE CHARACTERIZATION PROGRAM REQUIREMENTS

The Waste Characterization Program meets the applicable requirements of the following documents:

a) Nevada Test Site Waste Acceptance Criteria

b) 94-RWP/EWQA-0014, Low Level/Low-Level Mixed Waste Management Manual

c) 1-MAN-008-WM-001, TRU Waste Management Manual

d) Waste Isolation Pilot Plant Hazardous Waste Permit, Attachment B, Waste Analysis Plan

e) 95-QAPjP-0050, Rocky Flats Environmental Technology Site TRU Waste Characterization Program Quality Assurance Project Plan

f) Colorado Hazardous Waste Regulations (6 CCR 1007-3)

g) EPA Resource Conservation and Recovery Act Regulations (40 CFR 260-268)

h) Applicable DOE Orders:

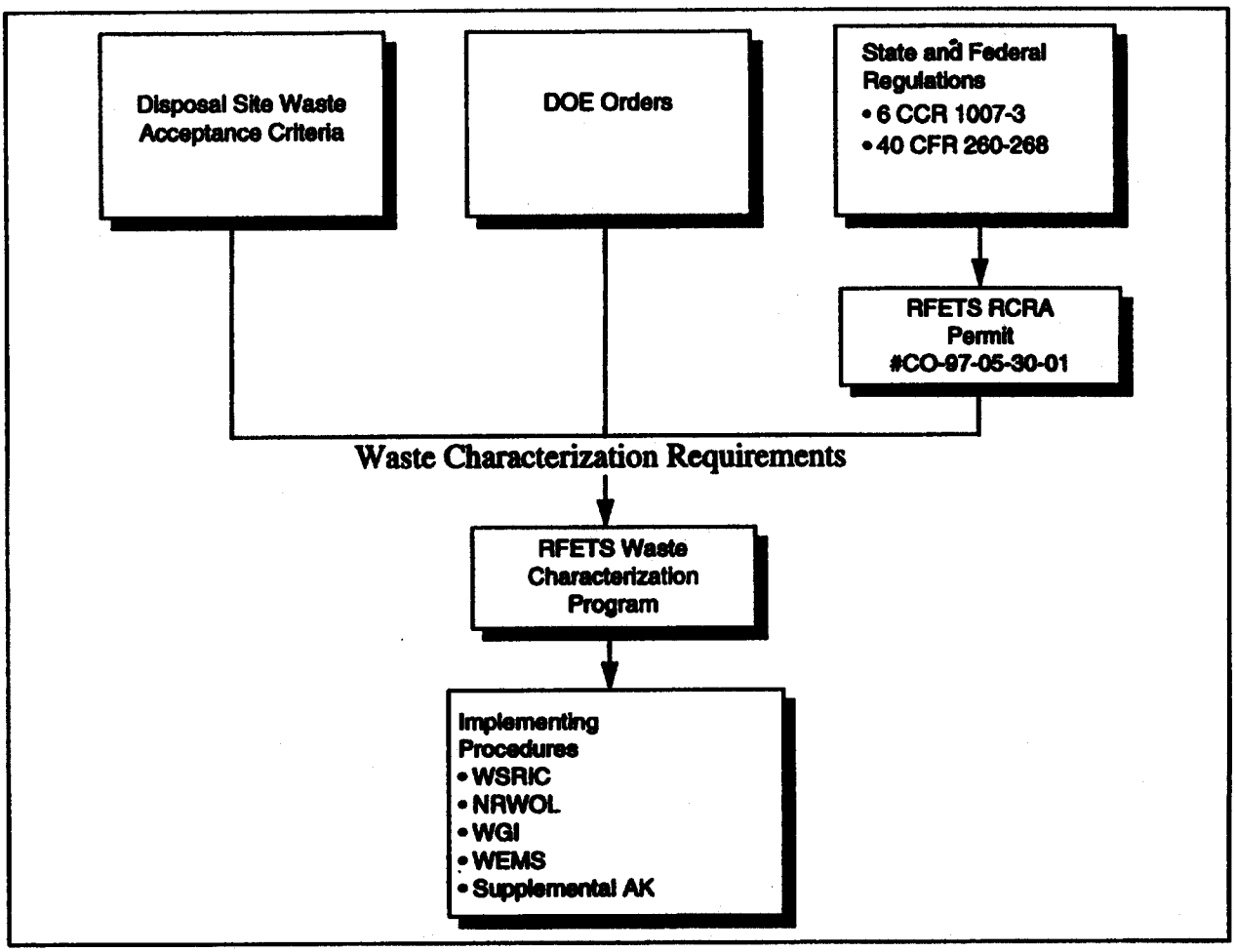
- 435.1, Radioactive Waste Management
- 5400.1, General Environmental Protection Program
- 5480.4, Environmental Protection, Safety, and Health Protection Standards

i) Rocky Flats Environmental Technology Site RCRA Permit #CO-97-05-30-01

Figure 5-1, Waste Characterization Program Document Hierarchy, shows the requirements documents hierarchy for the Waste Characterization Program Manual.

5. WASTE CHARACTERIZATION PROGRAM REQUIREMENTS (continued)

FIGURE 5-1,
WASTE CHARACTERIZATION PROGRAM DOCUMENT HIERARCHY



6. RESPONSIBILITIES

A coordinated effort is required between organizations to successfully identify and characterize the Site wastes and residues.

6.1 TWCP organization

- Maintains this manual.

6.2 Waste Systems

- Manages the overall management of the Waste Characterization Program.

Waste Systems Supervisor

- Responsible for the overall Waste Characterization Program and oversees all activities performed by the Waste Systems organization.

WSRIC Program Lead (Waste Systems)

- Responsible for general oversight.
- Manages the WSRIC program and related documentation as described in 4-H19-WSRIC-001, WSRIC Waste Characterization and Reverification.

Waste Reassessment Program Lead (Waste Systems)

- Responsible for general oversight of container reassessment operations.
- Manages the Waste Reassessment program and related documentation as described in 4-H19-WSRIC-001, WSRIC Waste Characterization and Reverification.

6.3 Facility/Operations Manager

- Responsible for the overall waste management or disposition of wastes from a given building, operation, process, or area.
- Responsible for all aspects of waste management relating to waste generation, inspection, and certification. The Facility/Operations Manager's or delegate's responsibilities with regard to WSRIC are defined in 4-H19-WSRIC-001, WSRIC Characterization and Reverification.

6. RESPONSIBILITIES (continued)

6.4 Waste Characterization Subject Matter Expert (SME) (All Organizations

- Oversees proper waste characterization for a given operation, building, or area.
- Works with the WSRIC Program Lead, Waste Reassessment Program Lead, and Facility/Operations Manager within each company or organization to document waste characterization and reverification in accordance with 4-H19-WSRIC-001, WSRIC Characterization and Reverification.

6.5 Radiological Engineering

- Reviews and approves DCFs relating to radiological determination of new outputs and changes to the radiological determination of existing outputs.
- Provides technical guidance to the Facility/Operations Manager and Subject Matter Expert (SME) for the proper management of radioactive wastes and residues.

6.6 Records Management and Site Document Control

- Provides records management and document control services for records and procedures.

6.7 TWCP Site Quality Assurance (QA) Officer

- Develops and maintains the Quality Assurance (QA) Program that supports the Waste Characterization Program.
- Performs surveillance and assessments of activities including waste management activities.

6.8 Material Stewardship - Waste Management Technical Programs

- Manages the TRU/TRM and the LLW/LLM waste programs at the Site.
- Responsible for program-specific interfacing with the DOE, disposal sites, and regulatory agencies.
- Responsible for technical guidance for treatment and/or disposition of wastes.

6. RESPONSIBILITIES (continued)

6.9 Material Stewardship - Waste Management Waste Operations

- Reviews container documentation (e.g., W/RT, WEMS) for conformances to the Colorado Department of Public Health & Environment (CDPHE) RCRA Permit and Site procedural requirements before waste packages are sent to respective storage areas to ensure compliance with all applicable requirements.
- Manages RCRA-permitted hazardous waste storage units, TSCA storage area, environmental restoration storage area, and non-regulated waste storage areas.
- Performs WEMS data entry for waste disposal activities.
- Stores RCRA regulated wastes in compliance with applicable regulations.
- Operates non-destructive assay equipment used to determine the radionuclide content of waste packages.
- Sends rejected waste packages back to those responsible for corrective action.

6.10 Kaiser-Hill Closure Projects

- Provides overall integration for waste management and environmental restoration activities at the Site. Manages interfaces among the contractors performing tasks on the low-level and TRU Waste Programs.
- Monitors radioactive and mixed waste generation and packaging at the Site.
- Allocates funding to accomplish waste management objectives at the Site.
- Communicates with the Department of Energy on waste management status and issues.

6.11 Waste Requirements Group

- Responsible for the following activities in accordance with 1-PRO-079-WGI-001, Waste Characterization, Generation and Packaging:
  - Provides guidance and assistance to waste generators in the area of characterization, segregation, and packaging of waste.
  - Specifies the requirements to be met by waste generators in the form of WGIs to ensure generation of disposal compliant waste.

6. RESPONSIBILITIES (continued)

6.12 Waste Generators (all organizations)

A Waste Generator at the Site is defined as any person whose act or process produces a waste, or whose act creates a waste. Waste generators include Operations Management personnel within Kaiser-Hill and other Site contractor organizations. Waste Generators are responsible for the following activities:

- Identifying and segregating process outputs, maintaining the accuracy of the WSRIC Building Books, and certifying that all outputs are properly identified, segregated, and characterized by utilizing WEMS, WSRIC Building Books, NRWOLs, and other resource material.

- Providing corrective action for nonconforming wastes and waste containers, and fulfilling the requirements described in the following documents:

  — PRO-U76-WC-4030, Control of Waste Nonconformances

  — 1-M12-WO-4034, Radioactive Waste Packaging Requirements

  — 4-D99-WO-1100, Solid Radioactive Waste Packaging

- Meeting and maintaining the training requirements of the Waste Generator Training and Qualification Program as defined in MAN-094-TPM, Training Program Manual.

7. WASTE CHARACTERIZATION PROGRAM RECORDS

The Waste Characterization Program implementing procedures produce records documenting waste characterization. Specific implementing procedures provide record disposition in the Records Processing Instructions section.

8. GLOSSARY

8.1 Acronyms

BWR	Backlog Waste Reassessment
BWRBB	Backlog Waste Reassessment Baseline Book
CCR	Code of Colorado Regulations
CDH	Colorado Department of Health (On July 1, 1994, this became Colorado Department of Public Health and Environment)
CDPHE	Colorado Department of Public Health and Environment
CFR	Code of Federal Regulations
CHWR	Colorado Hazardous Waste Regulations
DCF	Document Change Form
DOE	U. S. Department of Energy
EDL	Economic Discard Limit
EPA	Environmental Protection Agency
HSWA	Hazardous and Solid Waste Amendments
HWN	Hazardous Waste Number
IDC	Item Description Code
LDR	Land Disposal Restrictions
LLMW	Low-Level Mixed Waste
LLW	Low-Level Waste
WNCR	Waste Nonconformance Report
NRWOL	Non-Routine Waste Origination Log
PBI&R	Planning, Budgets, Integration, and Records
RCRA	Resource Conservation and Recovery Act
RMRS	Rocky Mountain Remediation Services, L.L.C.
Site	Rocky Flats Environmental Technology Site

8.1 Acronyms (continued)

TRM	Transuranic Mixed Waste
TRU	Transuranic Waste
TSCA	Toxic Substances Control Act
WAP	WIPP Hazardous Waste Permit Waste Analysis Plan
WC&O	Waste Certification and Oversight
WEMS	Waste and Environmental Management System
WFC	Waste Form Code
WGI	Waste Generating Instruction
WIPP	Waste Isolation Pilot Plant
WRG	Waste Requirements Group
WRR	Waste Requirements Representative
W/RT	Waste/Residue Traveler
WSIC	Waste Stream Identification and Characterization
WSRIC	Waste Stream and Residue Identification and Characterization

8.2 Definitions

Acceptable Knowledge (AK). Refers to information used to support waste characterization and certification activities. Depending on the application, acceptable knowledge can be used as an alternative to waste analysis or as the basis for implementing waste testing and sampling programs. Acceptable knowledge includes any documentation that describes or verifies Site history, mission, and operations, in addition to waste stream-specific information used to define the generating process, matrix, and contaminants (radiological and chemical).

Backlog Waste. Any containerized wastes that are:

- Nonradioactive hazardous waste generated before November 1, 1992
- Transuranic and low-level waste generated before the implementation of the W/RT
- Residue generated before July 31, 1991

Hazardous and Solid Waste Amendments (HSWA). The RCRA amendments of 1984 that included new standards for disposal facilities and restrictions for land disposal of untreated hazardous wastes.

8.2 Definitions (continued)

Hazardous Waste. Those wastes that exhibit the characteristics of being corrosive, ignitable, reactive, toxic, or are listed in 40 CFR 261 or the Code of Colorado Regulations (CCR), 6 CCR 1007-3, Colorado Hazardous Waste Regulations.

Hazardous Waste Requirements Manual. The governing document stating how the Site identifies, treats, packages, and stores hazardous and mixed wastes.

Low-Level Waste. Waste that contains radioactivity and is not classified as high-level waste, transuranic waste, or spent nuclear fuel. At the Site this is radioactive waste less than or equal to100 nCi or less of alpha-emitting transuranics per gram of waste matrix or contaminated with uranium.

Low-Level Mixed Waste. Radioactive wastes exhibiting less than or equal to 100 nCi of alpha-emitting transuranics per gram of waste matrix or contains uranium contamination and exhibits a RCRA characteristic or is mixed with or contains a RCRA listed waste, or is derived from the treatment or storage of a RCRA hazardous waste.

Mixed Waste. Radioactive waste contaminated with hazardous constituents exhibiting hazardous characteristics (as defined in 40 CFR 261 and 6 CCR 1007-3).

Nonhazardous. As used in the WSRIC program, means that a substance is not subject to the CHWR.

Non-Routine Waste Origination Log (NRWOL). A historical form used to document the characterization of waste generated by unexpected or unplanned activities not addressed by the Waste Stream and Residue Identification and Characterization (WSRIC) program.

Process Knowledge. Knowledge of the material used in a given operation or activity that provides information for characterization of waste from that process.

Residues. Plutonium-bearing materials which had historically contained sufficient quantities of plutonium to warrant processing to recover plutonium.

Transuranic Mixed Waste (TRM Waste). Radioactive wastes equal to or above 100 nCi of alpha-emitting transuranics per gram of waste matrix and exhibit a RCRA characteristic or are mixed with or contain a RCRA listed waste, or are derived from the treatment or storage of a RCRA hazardous waste.

Transuranic Waste (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.

8.2 Definitions (continued)

Waste and Environmental Management System (WEMS). A computer database used to perform waste package inventory, tracking, and control functions.

Waste Generating Instruction (WGI). A document prepared by the Waste Requirements Group that provides the necessary instructions for documenting, packaging and shipping waste compliantly for disposal.

Waste Generator. Any person whose act or process produces a waste, or whose act creates a waste.

Waste Item. Waste that is placed or packaged for placement into a waste package.

Waste Package. The waste, the waste container, and any absorbent that is intended for disposal as a unit.

Waste Stream. A waste generating process whose known or measured characteristics fall within a pre-established range of specific chemical and physical characteristics.

Waste Stream and Residue Identification and Characterization (WSRIC). A program designed to verify waste streams at the Site through the collection of process knowledge, analytical data, data management, and WSRIC Building Book production. These books are reference documents for operating personnel and are used as aids in the characterization of Site wastes.

Waste Type. Physical types of waste such as solidified inorganics, solid inorganics, solidified organics, or solid organics.

9. REFERENCES

DOE Order 435.1, Radioactive Waste Management

DOE Order 5400.1, General Environmental Protection Program

DOE Order 5480.4, Environmental Protection, Safety, and Health Protection Standards

MAN-094-TPM, Training Program Manual

Nevada Test Site Waste Acceptance Criteria

PRO-1329-DM-03, Site Document Control

PRO-U76-WC-4030, Control of Waste Nonconformances

Rocky Flat Environmental Technology Site RCRA Permit #CO-97-05-30-01

WIPP Hazardous Waste Permit, Attachment B, Waste Analysis Plan

1-I34-WO-1103-NRWOL, Non-Routine Waste Origination Log Instructions (archived)

1-M12-WO-4034, Radioactive Waste Packaging Requirements

1-MAN-008-WM-001, TRU Waste Management Manual

1-PRO-Q11-WO-1221, Controls for Updating Waste Package in WEMS

1-PRO-077-WIPP-005, Management of Waste Information Prior to Transmittal to the Waste Records Center

1-PRO-079-WGI-001, Waste Characterization, Generation and Packaging

1-V41-RM-001, Records Management Manual

4-D99-WO-1100, Solid Radioactive Waste Packaging

4-H19-WSRIC-001, WSRIC Waste Characterization and Reverification

1-MAN-039-WEM-WP-1200, Waste and Environmental Management System (WEMS) Program Management Manual

9. REFERENCES (continued)

6 CCR 1007-3, Colorado Code of Regulations, Chapter 6, Part 1007-3

40 CFR 260-268, EPA Resource Conservation and Recovery Act Regulations

94-RWP/EWQA-0014, Low Level/Low-Level Mixed Waste Management Manual

95-QAPjP-0050, Rocky Flats Environmental Technology Site TRU Waste Characterization Program Quality Assurance Project Plan