

STATE R.C.R.A.

PERMIT

FACILITY U.S.D.O.E. ROCKY FLATS PLANT

ID# CO7890010526

EFFECTIVE DATE OCTOBER 30, 1991

EXPIRATION DATE OCTOBER 30, 1996

REVIEWED FOR CLASSIFICATION

By *[Signature]* (NUN)

Date 11/22/91

SW-A-000177

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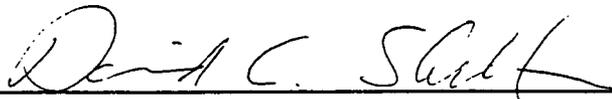
Permit No. 91-09-30-01

Pursuant to the Colorado Hazardous Waste Act (Title 25 Article 15, Section 101 et seq.) hereafter called the Act and regulations promulgated thereunder by the Colorado Board of Health (Codified and to be codified in Title 6 of the Code of Colorado Regulations (CCR)), a State RCRA Permit is issued to the United States Department of Energy and its Prime Operating Contractor (jointly, "the Permittee") to operate a hazardous and low-level radioactive mixed waste storage facility located in Jefferson County, Colorado, centered at Latitude 39° 53' 30" North and Longitude 105° 11' 30" West. The Permittee must comply with all the terms and conditions of this permit.

This permit consists of the conditions contained herein (including those in any attachments) and the applicable regulations contained in 6 CCR 1007-3, Parts 260 through 268, 2, 99, and 100 as specified in the permit. Applicable regulations are those which in effect on the date of issuance of this permit. This permit is based on the assumption that the information submitted to the Hazardous Materials and Waste Management Division of the Colorado Department of Health (CDH) in the Permittee's Part A and Part B permit application dated November 28, 1986 as modified by subsequent revisions dated December 15, 1987, and April 13, 1988, (hereafter referred to as the application), and additional information submitted to clarify previously submitted material, is accurate. Any inaccuracies found in this information may be grounds for the termination or modification of this permit (see 6 CCR 1007-3, Section 100.6) and potential enforcement action. The Permittee must inform the Hazardous Materials Waste Management Division of the Colorado Department of Health of any deviation or changes in the application which would affect the Permittee's ability to comply with the applicable regulations or permit conditions.

This permit is effective thirty days after it is issued pursuant to 6 CCR 1007-3, Section 100.511 (b) and shall remain in effect until October 30, 1996 (5 year duration) unless revoked and reissued, or terminated.

Signed:


David C. Shelton, Director
Hazardous Materials and Waste Management Division
Colorado Department of Health

9-30-91
Date

INTRODUCTION

The Department of Energy (DOE) owns and operates a facility at the location specified below which manufactures metal components for nuclear weapons. The plant is involved in fabricating components from plutonium, uranium, beryllium, and stainless steel. The prime operating contractor for the facility is EG&G. Parts fabricated at the facility are shipped elsewhere for final assembly.

Nature of Business

The Rocky Flats Plant is a government-owned and contractor-operated facility. It is part of a nationwide nuclear weapons research, development, and production complex administered by the U.S. Department of Energy (DOE).

The primary mission of the Rocky Flats Plant is production of metal components for nuclear weapons. The plant is involved in fabricating components from plutonium, uranium, beryllium, and stainless steel. Production activities include metal fabrication, assembly, chemical recovery and purification of recyclable transuranic radionuclides, and related quality control functions. Other activities include R&D work in metallurgy, machining, non-destructive testing, coatings, remote engineering, chemistry, and physics. Parts made at the Plant are shipped elsewhere for final assembly.

Description of Processes Involved in Generation of Wastes

At the Rocky Flats Plant, major plant structures, including all production buildings, are located within a security-fenced area of 384 acres. The Plant is divided into several areas constituting separate operational complexes. Each building within an area is identified by a three-digit number; the first digit signifies the area in which the specific building is located. There is no 200 area as such. Numbers in the 200 series are applied to the miscellaneous facilities that are distributed throughout the Plant site. Examples are utility structures and parking lots. The major production and associated complexes are in the 300, 400, 600, 700, 800, and 900 areas.

Rocky Flats Plant production activities include metal fabrication and assembly, chemical recovery and purification of process-produced transuranic radionuclides, and related quality control functions. Research and engineering programs supporting these activities involve chemistry, physics, materials technology, ecology, nuclear safety, and mechanical engineering. During these production activities, some hazardous wastes (as defined by RCRA and the Colorado Hazardous Waste Act) are generated. As an integral part of production, some of these hazardous wastes become commingled with low-level radioactive materials and are referred to as low level radioactive mixed wastes.

There are five categories of waste generated at Rocky Flats: (1) radioactive waste, (2) radioactive mixed waste (low level and transuranic), (3) hazardous waste, (4) sanitary waste, and (5) refuse. Solely radioactive waste, sanitary waste and refuse are not regulated under

and (5) refuse. Solely radioactive waste, sanitary waste and refuse are not regulated under the hazardous and mixed waste regulations.

A general summary of the waste generation activities at the plant follows.

Radioactive Waste Generation

The Rocky Flats Plant processes large quantities of plutonium (Pu239), significant amounts of depleted uranium (U238), small amounts of enriched uranium (U235 and U233), and trace amounts of americium (Am241) and neptunium radioactive-contaminated wastes are generated, or potentially could be generated. These include; (1) low level radioactive waste, (2) transuranic wastes, and (3) special category PCB wastes.

Low Level Waste (LLW)

Low level wastes (LLW) contain naturally-occurring radioactive elements such as uranium and thorium. They may also contain transuranic substances at concentrations of less than 100 nCi/g (nano Curies per gram) of waste material. Examples of low level wastes routinely generated at Rocky Flats are plutonium contaminated solids and liquids (100 nCi/g) and depleted uranium-contaminated solid and liquid waste.

Transuranic Waste

Transuranic (TRU) waste contains plutonium or americium in concentrations above 100 nCi/g of materials. Transuranic wastes comprise a wide variety of materials, including but not necessarily limited to, sludges, plastics, rubber and metal equipment, filters, insulation and combustible materials. All Rocky Flats transuranic waste is segregated and classified into separate item description codes or content codes.

Special Category PCB Waste

Radioactive PCB wastes are occasionally generated at Rocky Flats. These solid and liquid radioactive PCB wastes are a result of the cleaning and retrofilling of PCB transformers, decommissioning PCB capacitors, and the clean-up of PCB-contaminated debris within plutonium handling buildings. These wastes are stored inside buildings or cargo containers and will be disposed per requirements of applicable Toxic Substances Control Act (TSCA) regulations.

Radioactive Mixed Waste Generation

Hazardous wastes are those wastes which meet one of the four general hazardous characteristics (ignitability, reactivity, toxicity, and corrosivity) or which contain materials listed in Part 261 of the Colorado Hazardous Waste Regulations. Radioactive mixed wastes are both hazardous and radioactive, and can be either low level or TRU.

Low level radioactive mixed wastes are presently being treated and stored at Rocky Flats until an approved out-of-state disposal facility is available. Typical Rocky Flats waste forms in this category include solvents, oils, acids and bases, laboratory chemicals, paint and paint thinner, plating solutions, sludges and solvent contaminated solids.

Hazardous Waste Generation

The manufacturing processes and support operations at the Rocky Flats Plant also generate hazardous wastes as defined by RCRA. Examples of typical hazardous wastes forms generated at the Rocky Flats Plant are solvents, oils, acids and bases, laboratory chemicals, paint and paint strippers, plating solutions, sludges, gas cylinders, and solvent contaminated solids.

Wastes Addressed by this Permit

Hazardous and low-level radioactive mixed wastes generated during manufacturing operations are stored and/or treated in specific waste management units at the facility. This draft permit addresses nine hazardous and low-level mixed waste management units at Rocky Flats. See Part III of the permit, "Storage in Containers", for a listing and specific description of these units. These units are a portion of the 20 contained in DOE's hazardous and low-level mixed waste RCRA Part B permit application.

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PART I-STANDARD CONDITIONS

A. EFFECT OF PERMIT

The Permittee is allowed to store hazardous or low-level mixed radioactive waste in accordance with the conditions of this permit. Storage of hazardous or low-level mixed wastes addressed in this permit is permitted only to the extent authorized by this permit. Treatment or storage units not addressed in this permit continue to be regulated under the interim status requirements of the Colorado Hazardous Waste Regulations, 6 CCR 1007-3, Part 265, and the generator requirements, 6 CCR 1007-3, Part 262. Any treatment or storage of hazardous or low-level mixed waste not authorized in this permit or under the interim status or generator requirements is prohibited.

Compliance with this permit constitutes compliance, for purposes of enforcement, with the Colorado Hazardous Waste Act (the Act). Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of Federal, State, or local law or regulations. Compliance with the terms of this permit does not constitute compliance with Federal, other State or local laws or regulations. Compliance with the terms of this permit does not constitute a defense to any order issued or any action brought under the imminent hazard provisions of the Act, Sections 3008(a), 3008(h), 3013 or Section 7003 of RCRA, Sections 106 (a), 107, 104, or 102 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. 9606 (a), and 9607 commonly known as CERCLA), or any other law providing for protection of public health or the environment.

B. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated for cause as specified in 6 CCR 1007-3, Section 100.6. The filing of a request for a permit modification, revocation and reissuance, or termination or the notification of planned changes or anticipated noncompliance on the part of the Permittee does not stay the applicability or enforceability of any permit condition.

C. DEFINITIONS

For the purposes of this permit, terms used herein shall have the same meaning as those in 6 CCR 1007-3, Parts 2, 99, 100, 260, 264, 266, and 268, unless this permit specifically provides otherwise. Where terms are not defined in the regulations or the permit, the meaning associated with such terms shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term. "The Director" means the Executive Director of the Colorado Department of Health, or his designee or authorized representative. "The Division" means the Colorado Department of Health, Hazardous Materials and Waste Management Division.

D. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstance and the remainder of this permit shall not be affected thereby.

E. DUTIES AND REQUIREMENTS

1. Duty to Comply. The Permittee shall comply with all conditions of this permit. Except to the extent and for the duration certain noncompliance is authorized by an emergency permit, non compliance constitutes a violation of the Act and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or denial of a permit renewal application.
2. Duty to Reapply. If the Permittee wishes to continue an activity allowed by this permit after the expiration date of this permit, the Permittee shall submit a complete application for a new permit at least 180 days before this permit expires (6 CCR 1007-3, Sections 100.11 (e)(1) and 100.42(b)).
3. Permit Expiration. This permit and all conditions contained in this document will expire at the end of five years unless extended by reapplication under 6 CCR 1007-3 100.11(e) or modification under 6 CCR 1007-3 Section 100.61.
4. Need to Halt or Reduce Activity Not a Defense. It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
5. Duty to Mitigate. In the event of noncompliance with the permit, the permittee shall take all resonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.
6. Proper Operation and Maintenance. The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facility or similar systems only when necessary to achieve compliance with the conditions of the permit.
7. Duty to Provide Information. The Permittee shall furnish to the Director within a

reasonable time, any relevant information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

8. Inspection and Entry.

The Permittee shall allow the Director, or authorized representative, upon the presentation of credentials and other documents as may be required by law to:

- a. Enter at reasonable times upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- d. Sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

9. Monitoring and Records.

- a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The method used to obtain a representative sample of the waste to be analyzed must be the appropriate method from Appendix I of 6 CCR 1007-3, Section 261, or an equivalent method from Appendix I of 6 CCR 1007-3, Section 261, or an equivalent method as described in Part IV of this permit. Laboratory methods must be those specified in Test Methods for Evaluating Solid Waste: Physical/Chemical Methods SW-846, (promulgated edition), or equivalent methods as described in Part IV of this permit.
- b. The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit for a period of at least 3 years from the date of the sample, measurement, report or application, or as long as a particular waste is on-site; whichever is longer. These periods may be extended by request of the Director at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility.

c. Records of monitoring information shall include:

- i. The dates, exact place, and time of sampling or measurements;
- ii. The individual(s) who performed the sampling or measurements;
- iii. The date(s) analyses were performed;
- iv. The individual(s) who performed the analyses;
- v. The analytical techniques or methods used; and
- vi. The results of such analyses.

10. Reporting Planned Changes. The Permittee shall give notice to the Director as soon as possible of any planned physical alternations or additions to the permitted facility as required by 6 CCR 1007-3, Section 100.42(1)(1).

11. Anticipated Noncompliance. The Permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements, as required by 6 CCR 1007-3, Section 100.42(1)(2).

12. Transfer of Permits. This permit may be transferred to a new owner or operator only if it is modified or revoked and reissued pursuant to 6 CCR 1007-3, Section 100.62. Before transferring ownership or operation of the facility during its operating life, the Permittee shall notify the new owner or operator in writing of the requirements of 6 CCR 1007-3, Sections 100, 264, and 266.

13. Compliance Schedules. The Permittee shall comply with the compliance schedules set forth in the individual Parts of this permit.

14. Twenty-four Hour Reporting. The Permittee shall report to the Director any noncompliance with the permit which may endanger health or the environment. Any such information shall be reported orally within 24 hours from the time the Permittee becomes aware of the circumstances. This report shall include the following:

- a. Information concerning the release of any hazardous or mixed waste that may cause an endangerment to public drinking water supplies.
- b. Information concerning the release or discharge of any hazardous or mixed waste, or of a fire or explosion at the facility, which could threaten the environment or human health outside the facility. The description of the occurrence and its cause shall include.
 - i. Name, address, and telephone number of the owner or operator;
 - ii. Name, address, and telephone number of the facility;
 - iii. Date, time and type of incident;
 - iv. Name and quantity of material(s) involved;
 - v. The extent of injuries, if any;
 - vi. An assessment of actual or potential hazard to the environment and human health outside the facility, where this is applicable; and
 - vii. Estimated quantity; and disposition of recovered material that resulted from the incident.

A written submission shall also be provided within 5 days of the time the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance (including exact dates and times); and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. The permittee need not comply with the five-day written notice requirement if the Director waives the requirement and the Permittee submits a written report within fifteen days of the time the Permittee becomes aware of the circumstances.

15. Other Noncompliance. The Permittee shall report all instances of noncompliance not reported under Part I.(E)(9, 13, and 14) of this permit, at the time monitoring reports are submitted. The reports shall contain the information listed in Condition I.E.14.

16. Other Information. When the Permittee becomes aware that it failed to submit any relevant facts in its permit application, or submitted incorrect information in a permit application or in any report to the Division, the Permittee shall promptly submit such facts or information.

F. SIGNATORY REQUIREMENTS

All reports or other information requested by the Director shall be signed and certified as required by 6 CCR 1007-3, Sections 100.42(k) and 100.44(a).

G. CONFIDENTIAL INFORMATION

The Permittee may claim confidential any information required to be submitted by this permit in accordance with the procedures of 6 CCR 1007-3, Part 2.

H. DOCUMENTS TO BE MAINTAINED AT FACILITY SITE

The Permittee shall maintain at the facility, until closure is completed and certified by an independent registered in the State of Colorado professional engineer, the following documents along with amendments, revisions and modifications to these documents:

1. Waste analysis plan as required by 6 CCR 1007-3, Section 264.13 and this permit.
2. Personnel training documents and records as required by 6 CCR 1007-3, Section 264.16(d) and this permit.
3. Contingency plan as required by 6 CCR 1007-3, Section 254.53(a) and this permit.
4. Closure plan as required by 6 CCR 1007-3, Section 264.112(a) and this permit.
5. Operating record as required by 6 CCR 1007-3, Section 254.73 and this permit.
6. Inspection schedule as required by 6 CCR 1007-3, Section 254.15(b) and this permit.

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PART II-GENERAL FACILITY CONDITIONS

A. DESIGN AND OPERATION OF FACILITY

The Permittee shall maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous or mixed waste constituents to air, soil, or surface or ground water which could threaten human health or the environment, as required by 6 CCR 1007-3, Section 264.31.

B. HAZARDOUS WASTE FROM OFF-SITE SOURCES

The Permittee shall not receive mixed waste from an off-site source, unless granted prior approval in writing by the Director. The Permittee shall not receive hazardous waste from an off-site source except that which originated at the Rocky Flats Plant.

C. GENERAL WASTE ANALYSIS

The Permittee shall follow the waste analysis procedures as required by 6 CCR 1007-3, Section 264.13, and described in the waste analysis plan, Part IV of this permit.

1. Specific Waste Analysis Requirements. See Part IV of this permit.

D. SECURITY

The Permittee shall comply with the security provisions of 6 CCR 1007-3, Section 264.14(b)(2) and (c); and as described in Part V of this permit. Signs required by 6 CCR 1007-3, Section 264.14(c) must be posted in English.

E. GENERAL INSPECTION REQUIREMENTS

The Permittee shall follow the inspection schedules in Part V of this permit, as required by 6 CCR 1007-3, Section 264.15. The Permittee shall remedy any deterioration or malfunction discovered by an inspection as required by 6 CCR 1007-3, Section 264.15(c). Inspection logs shall be kept for three years as required by 6 CCR 1007-3, Section 264.15(d).

F. PERSONNEL TRAINING

The Permittee shall conduct personnel training as required by 6 CCR 1007-3, Section 264.16. Managers, supervisors, and operators shall have training to the extent required as specified in Part VII of this permit. All persons involved in the handling of hazardous or mixed waste, even if only on an occasional basis, shall be trained in areas appropriate to their function. The Permittee shall maintain training documents and records as required by 6 CCR 1007-3, Section 264.16(d) and (e) and this permit.

G. SPECIAL PROVISIONS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

The Permittee shall comply with the requirements of 6 CCR 1007-3, Section 264.17(a). The Permittee shall follow the procedures for handling ignitable waste set forth in Part V of this permit. Sparkproof tools shall be used near containers storing ignitable wastes.

H. LOCATION STANDARDS

The Permittee shall operate and maintain the facility to prevent washout of any hazardous waste by a 100-year flood as required by 6 CCR 1007-3, Section 264.18(b)(1). (The facility is located as shown in the Introduction.)

I. PREPAREDNESS AND PREVENTION

1. Required Equipment. At a minimum, the Permittee shall equip the facility with the emergency equipment set forth in "Procedures to Prevent Hazards", Part V of this permit, as required by 6 CCR 1007-3, Section 264.32.
2. Testing and Maintenance of Equipment. The Permittee shall test and maintain the equipment specified in permit Part II (I)(1) above according to the schedule in Part V.
3. Access to Communications or Alarm System. The Permittee shall maintain access to the communications or alarm system as required by 6 CCR 1007-3, Section 264.34. A telephone or two-way radio communication system shall be available at each permitted waste management area when personnel are in the area.
4. Required Aisle Space. At a minimum, the Permittee shall maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, decontamination equipment to any area of facility operation in an emergency, (6 CCR 1007-3, Section 264.35). For unit specific aisle space requirements, see Part III, "Storage in Containers".
5. Arrangements with Local Authorities.
 - a. The Permittee shall obtain arrangements with the local Fire and Police Departments that familiarize these agencies with the layout of the facility, properties of the hazardous and mixed wastes handled onsite and their associated hazards. These arrangements must also specify each agency's assigned tasks when responding to emergency situations (6 CCR 1007-3, Section 264.37 (a)(1) and (2)). If state or local officials refuse to enter into preparedness and prevention arrangements with the Permittee, the Permittee must document this refusal in the operating record and notify the Director in writing within 10 days of any refusal to enter into emergency response agreements.(6 CCR 1007-3, Section 264.31(b)).
 - b. The Permittee shall make an arrangement with a local hospital familiarizing this hospital with the properties of hazardous and mixed wastes handled at the facility and document a written agreement with the hospital outlining their responsibility should emergency medical services be required (6 CCR 1007-3, Section 264.37(a)(4)).

J. CONTINGENCY PLAN

1. Implementation of Plan. The Permittee shall immediately carry out the provisions of the contingency plan, Part VI, Section C whenever the conditions in Part VI (C) Implementation of Plan occur.

2. Copies of Plan. The Permittee shall maintain a copy of the contingency plan at the facility and submit copies to all local police departments, fire departments, hospitals, and local emergency response teams according to 6 CCR 1007-3, Section 264.53.
3. Amendments to Plan. The Permittee shall review and immediately amend, if necessary, the contingency plan, as required by 6 CCR 1007-3, Section 264.54.
4. Emergency Coordinator. A trained emergency coordinator shall be available at all times in case of an emergency, as required by 6 CCR 1007-3, Section 264.55.
5. Emergency Procedures. The Permittee shall comply with the requirements of 6 CCR 1007-3, Section 264.56, concerning emergency procedures.

K. MANIFEST SYSTEM

The Permittee shall comply with the manifest requirements of 6 CCR 1007-3, Sections 264.71, 264.72 and 264.76.

L. RECORDKEEPING AND REPORTING

1. Operating Record. The Permittee shall maintain a written operating record at the facility in accordance with 6 CCR 1007-3, Section 264.73, which shall include any other documentation required by this permit.
2. Annual Report. The Permittee shall comply with the annual report requirements of 6 CCR 1007-3, Section 264.75.
3. 90-Day Storage Areas. The Permittee shall maintain a current list of 90-Day storage areas and provide a list to the Director or authorized representative upon request.

M. GENERAL CLOSURE REQUIREMENTS

1. Performance Standard. The Permittee shall close the facility as required by 6 CCR 1007-3, Sections 264.111, and 264.178, and in accordance with Part VIII of this permit.
2. Amendment to Closure Plan. The Permittee shall amend the closure plan, in accordance with 6 CCR 1007-3, Section 264.112(c), whenever necessary.
3. Notification of Closure. The Permittee shall notify the Director at least 45 days prior to the date he expects to begin closure of container storage units, as required by 6 CCR 1007-3, Section 264.112(d)(1).
4. Time Allowed for Closure. After receiving the final volume of hazardous waste, the Permittee shall treat or remove from the site all hazardous or mixed waste from permitted hazardous or mixed waste management units in accordance with 6 CCR 1007-3, Section 264.113 and the schedule specified in the Closure Plan, Part VIII.
5. Disposal or Decontamination of Equipment. The Permittee shall decontaminate and/or dispose of all contaminated equipment, structures, and soils as required by 6 CCR 1007-3, Section 264.114, and the closure plan presented in Part VIII.
6. Certification of Closure. The Permittee shall certify that the facility has been closed in accordance with the specifications in the closure plan as required by

6 CCR 1007-3, Section 264.115. The certification must be submitted to the Department within 60 days after completion of final closure of each permitted unit.

N. SPECIFIC CLOSURE REQUIREMENTS

See Part VIII, IX and X of this permit.

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PART III-STORAGE IN CONTAINERS

A. SITE DESCRIPTION

There are 14 areas used to store hazardous waste and low-level radioactive mixed waste in containers or boxes and crates at the Rocky Flats Plant. Part III of the permit establishes specific conditions for storage in nine container storage areas. Two container storage areas, Unit 1 and Unit 23 are dedicated to container storage areas, Unit 1 and 23 are dedicated to storage of only hazardous waste, while the remaining units addressed in Part III store low-level mixed radioactive waste.

Container storage areas are divided into three categories; namely, areas which store containers with free liquids, areas which store containers without free liquids, and areas which store a combination of containers with and without free liquids.

Tables 1 and 2 list the container storage areas covered by this permit.

B. PERMITTED AND PROHIBITED WASTE IDENTIFICATION

The Permittee may store the following wastes in containers, boxes or crates at the facility subject to the terms of this permit and as follows.

1. Unit 1. Main Hazardous Waste Storage Area.

The Permittee may store hazardous waste as described by the following waste codes:

D001	Ignitable Waste
D002	Corrosive Waste
D003	Reactive Waste
D004	Arsenic Waste
D005	Barium Waste
D006	Cadmium Waste
D007	Chromium Waste
D008	Lead Waste
D009	Mercury Waste
D010	Selenium Waste
D011	Silver Waste
F001	Halogenated Solvent Waste
F002	Halogenated Solvent Waste
F003	Non-halogenated Solvent Waste
F005	Non-halogenated Solvent Waste
F006	Wastewater Treatment Sludges
F007	Cyanide Plating Waste
F009	Cyanide Plating Waste
P Series Waste	Various (as listed in 6 CCR 1007-3 Part 261.33, as amended)
U Series Waste	Various (as listed in 6 CCR 1007-3 Part 261.33, as amended)

a. Liquid Hazardous Waste Storage

- i. The Permittee may store liquid hazardous waste in 55-gallon drums, or other approved containers subject to the compatibility requirements of Part III (K) of this permit. Overpack drums may be used as necessary, and must be properly labeled.
- ii. All containers storing liquid hazardous waste will be stored within aluminum or steel cargo containers with approximate dimensions of 20-ft. long by 8-ft. wide by 8-ft. high, 40-ft. long by 8-ft. high; or within one of the 8-ft. long by 8-ft. wide by 8-ft. high heated compartments contained within cargo containers. A typical cargo container is shown in Figure III-3.
- iii. Each cargo container will contain a steel or fiberglass catch basin. All containers storing liquid hazardous waste will be placed within catch basins.
- iv. Each catch basin will have at least a 2.6 inch high integral lip around its perimeter to contain leaks and spills, or shall be of sufficient height to

contain 10% of the total container volume, held by the catch basin.

- v. Each metal catch basin will be coated with epoxy paint or equivalent protective material approved by the Director in order to prevent waste incompatibility with the catch basin, unless fabricated from stainless steel or fiberglass.
- vi. Each catch basin will be maintained in good condition and the coating or liner will be free of cracks, gouges or chips which would impair the effectiveness of the containment.
- vii. Waste stored in an individual cargo container or heated compartment must have the same compatibility code, or must have compatibility codes which are compatible, as designated in the Waste Analysis Plan, Part IV, Table 3. of this permit.
- viii. Each cargo container will be clearly labeled on the outside door with the appropriate waste compatibility codes.
- ix. No more than twenty-two 55-gallon drums will be stored in each 20-ft. long cargo container, or an equivalent volume of other approved DOT containers.
- x. No more than forty 55-gallon drums will be stored in each 40-ft. long cargo container.
- xi. No more than six 55-gallon drums will be stored in each heated cargo container.
- xii. The maximum volume of liquid hazardous waste which may be stored at any one time is 39,160 gallons in 712 fifty-five-gallon drums or equivalent volume of other DOT approved containers.
- xiii. Drums will not be stacked within the cargo containers or compartments.
- xiv. A 26-in. wide access aisle will extend down the center of each cargo container and heated compartment for the full length and will not be blocked while wastes are in storage.
- xv. Each cargo container will contain its own individual inspection and inventory log.
- xvi. Each cargo container will be fitted with an electrical ground and air ventilators.

- xvii. All containers which may be prone to expansion or failure due to freezing will be stored within a heated cargo container unit when weather conditions necessitate this precaution.
- xviii. The maximum number of cargo containers which may be used to store waste at any one time is 28 forty-ft. cargo containers or an equivalent capacity of smaller cargo containers.

b. Solid Hazardous Waste Storage

- i. The Permittee may store solid hazardous waste in 55-gallon drums or in other DOT approved containers subject to the compatibility requirements of Part III(K) of this permit.
- ii. The drums will be stored in steel drum racks, cargo containers, on pallets, or in other suitable arrangements with the Director's approval. The containers will be covered to protect them from the elements.
- iii. The total weight of the drums stored in racks shall not exceed the structural design capacity of each drum rack.
- iv. No more than three drums will be stacked vertically in individual drum racks. Drum racks may not be stacked.
- v. The maximum volume of solid hazardous waste which may be stored at any one time is 150 cubic yards in 550 fifty-five gallon drums.
- vi. A 10-ft. wide access aisle will extend between each double row of drum racks and will not be blocked while wastes are in storage.
- vii. Appropriate warning signs shall be placed on the fence surrounding Unit 1.

c. General Waste Storage

- i. The unit must be physically defined and fenced around the perimeter.
- ii. The perimeter fence will be regularly maintained and kept in good condition; for example, free of holes and gaps.

MAXIMUM STORAGE CAPACITY

Approx.

Length

20 ft.

40 ft.

Capacity

22-55 gal drums

40-55 gal drums

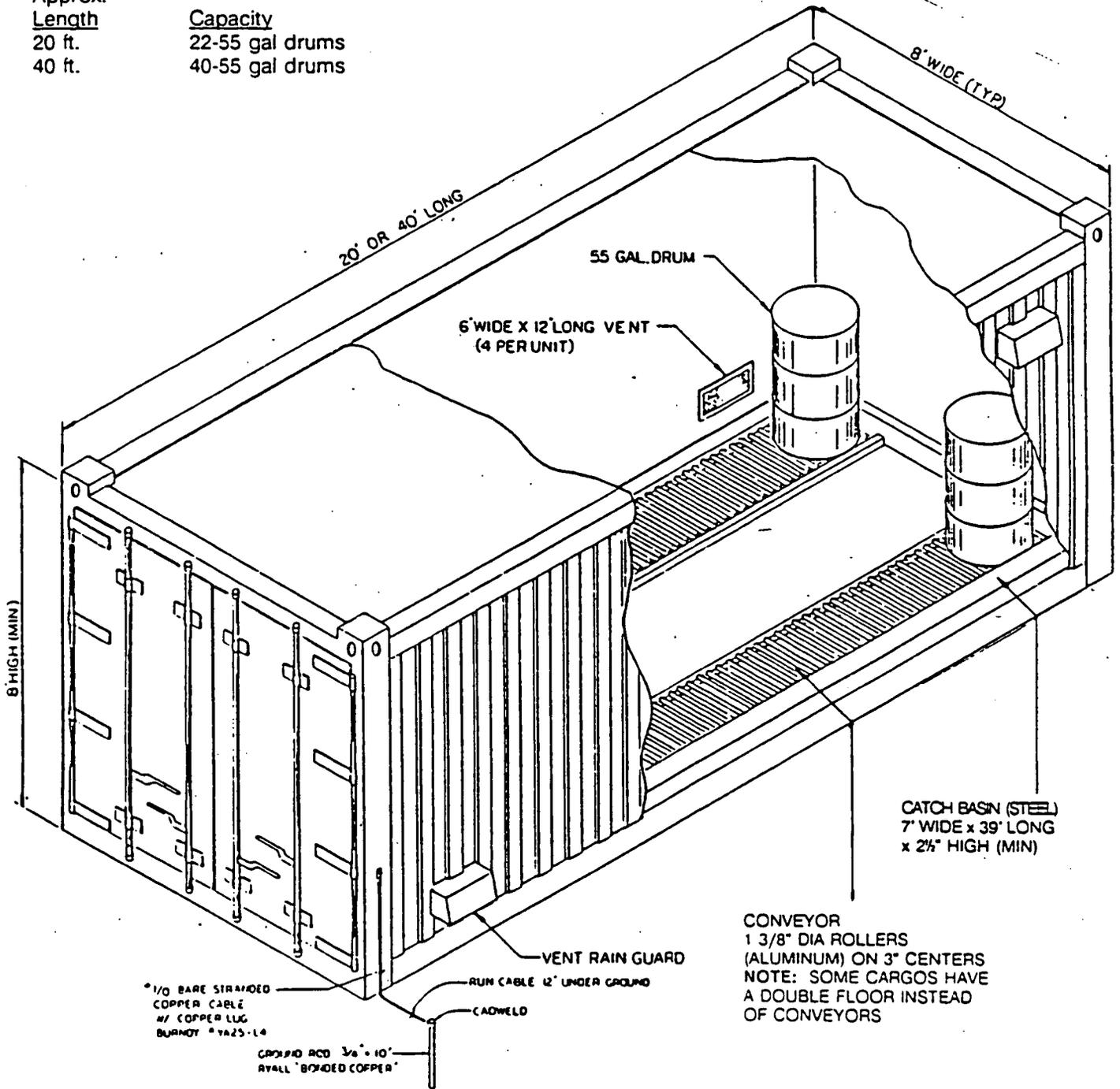


FIGURE III-3
CARGO CONTAINER (TYPICAL)

2. Unit 10. Building 561 Drum Storage Area.

- a. The Permittee may store low level mixed radioactive waste as described by the following waste codes:

D001	Ignitable Waste
D002	Corrosive Waste
D004	Arsenic Waste
D005	Barium Waste
D006	Cadmium Waste
D007	Chromium Waste
D008	Lead Waste
D009	Mercury Waste
F001	Halogenated Solvent Waste
F002	Halogenated Solvent Waste
F003	Non-halogenated Solvent Waste
F005	Non-halogenated Solvent Waste
F007	Cyanide Plating Waste
F009	Cyanide Plating Waste

- b. The Permittee may store liquid low-level radioactive mixed waste in 55-gallon drums or other DOT approved containers, subject to the compatibility requirements of Part III (K) of this permit.
- c. All drums containing low-level mixed radioactive waste will be stored within aluminum or steel cargo containers of approximate dimensions 40-ft. long by 8-ft. wide by 8-ft. high, or 20-ft. by 8-ft. wide by 8-ft. high, or within a heated compartment in the cargo containers.
- d. Each cargo container and compartment will contain a steel or fiberglass catch basin. All mixed waste containers will be placed within catch basins.
- e. Each catch basin will have a minimum 2.6-in. high integral lip around its perimeter to provide secondary containment for leaks and spills or 10% of the total volume of hazardous waste held within each catch basin.
- f. Each metal catch basin will be coated with epoxy paint or other coating approved by the Director in order to prevent waste incompatibility with the metal. Alternatively, fiberglass or stainless steel catch basins may be used.
- g. Each catch basin will be maintained in good condition and the coating will be free of cracks, gouges or chips which may impair the effectiveness of the containment.

- h. Waste stored in an individual cargo container must have the same compatibility code, or have compatibility codes which are compatible, as designated in the Waste Analysis Plan, Part IV, Table 3 of this permit.
- i. Each cargo container will be labeled on the outside door with the appropriate waste compatibility codes.
- j. No more than forty 55-gallon drums will be stored in each cargo container.
- k. The maximum volume of liquid low-level radioactive mixed waste which may be stored at any one time is 17,600 gallons in 320 fifty-five-gallon drums.
- l. The maximum number of cargo containers which may be used to store waste at any one time is nine 40-foot cargo containers, or an equivalent capacity of smaller cargo containers.
- m. Drums will not be stacked within the cargo containers.
- n. A 26-inch wide access aisle will extend down the center of each cargo container for the full length and will not be blocked when wastes are in storage.
- o. Each cargo container will contain its own individual inspection and inventory log.
- p. Each cargo container will be fitted with an electrical ground and air ventilators.
- q. The unit must be physically defined around the perimeter with appropriate warning signs on the surrounding fence.
- r. All drums which may be prone to expansion or failure due to freezing will be stored within a heated cargo container unit.

3. Unit 12. Building 776 Drum Storage Area (Room 237)

- a. The Permittee may store low-level radioactive mixed waste as described by the following waste codes:

D001	Ignitable Waste
D006	Cadmium Waste
D007	Chromium Waste
D008	Lead Waste
D009	Mercury Waste
F001	Halogenated Solvent Waste
F002	Halogenated Solvent Waste
F003	Non-halogenated Solvent Waste
P Series	Various listed in 6 CCR 1007-3, Part 261.33 as amended
U Series	Various listed in 6 CCR 1007-3, Part 261.33 as amended

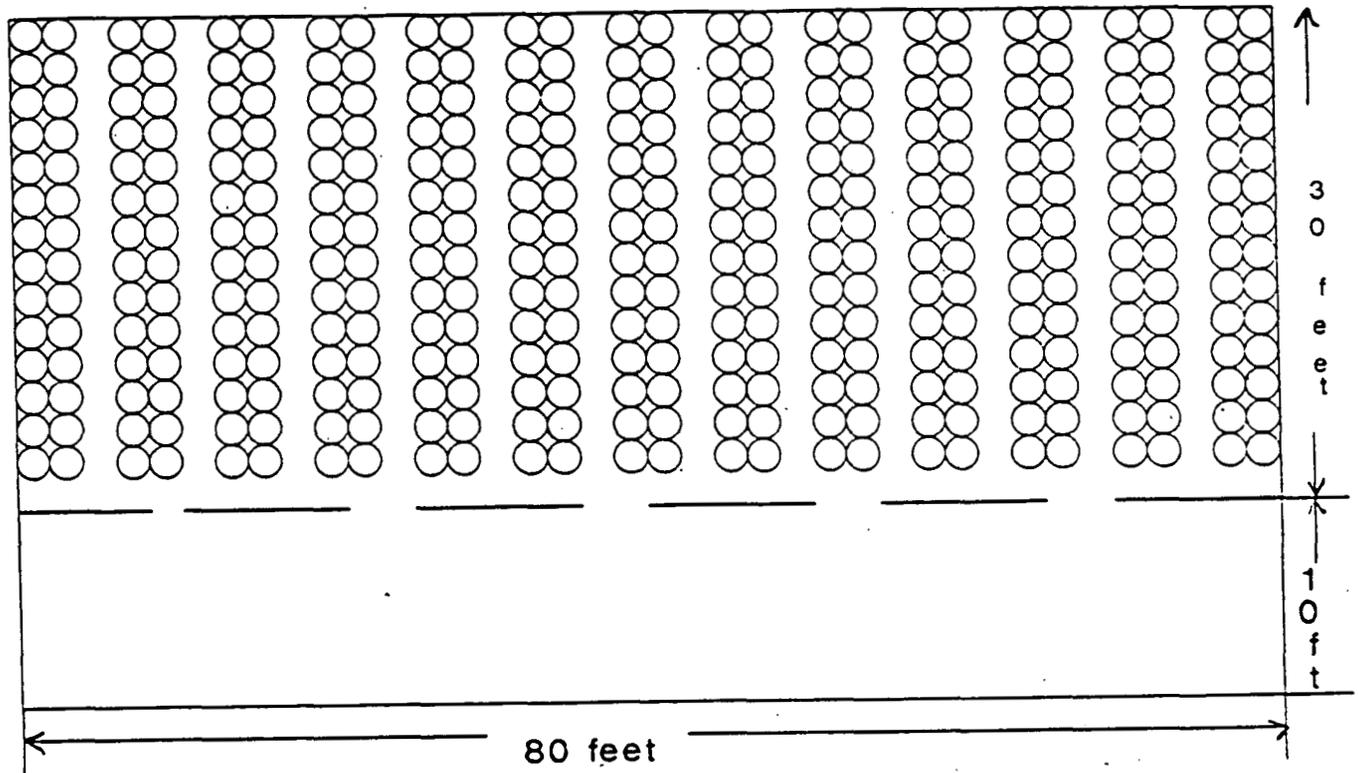
- b. The Permittee may store liquid and solid low-level radioactive mixed waste in 55-gallon drums or other DOT approved containers, subject to the compatibility requirements of Part III(K) of this permit. Overpack drums may be used as necessary, and must be properly labeled.
- c. All drums containing low-level radioactive mixed waste will be stored upon a concrete floor which is free of cracks and gaps and is coated with epoxy paint or other compatible coating approved by the Director and maintained in good condition.
- d. A concrete berm or wall which is at least 1.8 in. high, free of cracks and gaps, and coated with epoxy paint, or other compatible coating in good condition, will completely surround the drum storage area.
- e. All drums will be stored on pallet or otherwise elevated off the floor in a stable configuration within the berm and the drums will not extend onto or over the edge of the berm.
- f. The maximum volume of low-level radioactive mixed waste which may be stored at any one time is 10,010 gallons in 182 fifty-five gallon drums.
- g. Drums will not be stacked within the storage area.
- h. Each stored drum must be accessible and inspectable without moving any other drum.
- i. Incompatible wastes stored within the unit must be separated by a dike, berm, wall or other device.
- j. Any accumulated liquid within the bermed area will be removed in a timely manner using a portable pump, and transferred to a drum of adequate integrity and stored within a 90-day, interim status, or permitted storage area as appropriate.
- k. The unit shall be surrounded by a perimeter fence or wall which is maintained in good condition; for example, free of holes or gaps.
- l. A minimum 26-inch aisle space will be maintained between double rows of drums.

4. Unit 13. Mixed Waste Storage Building

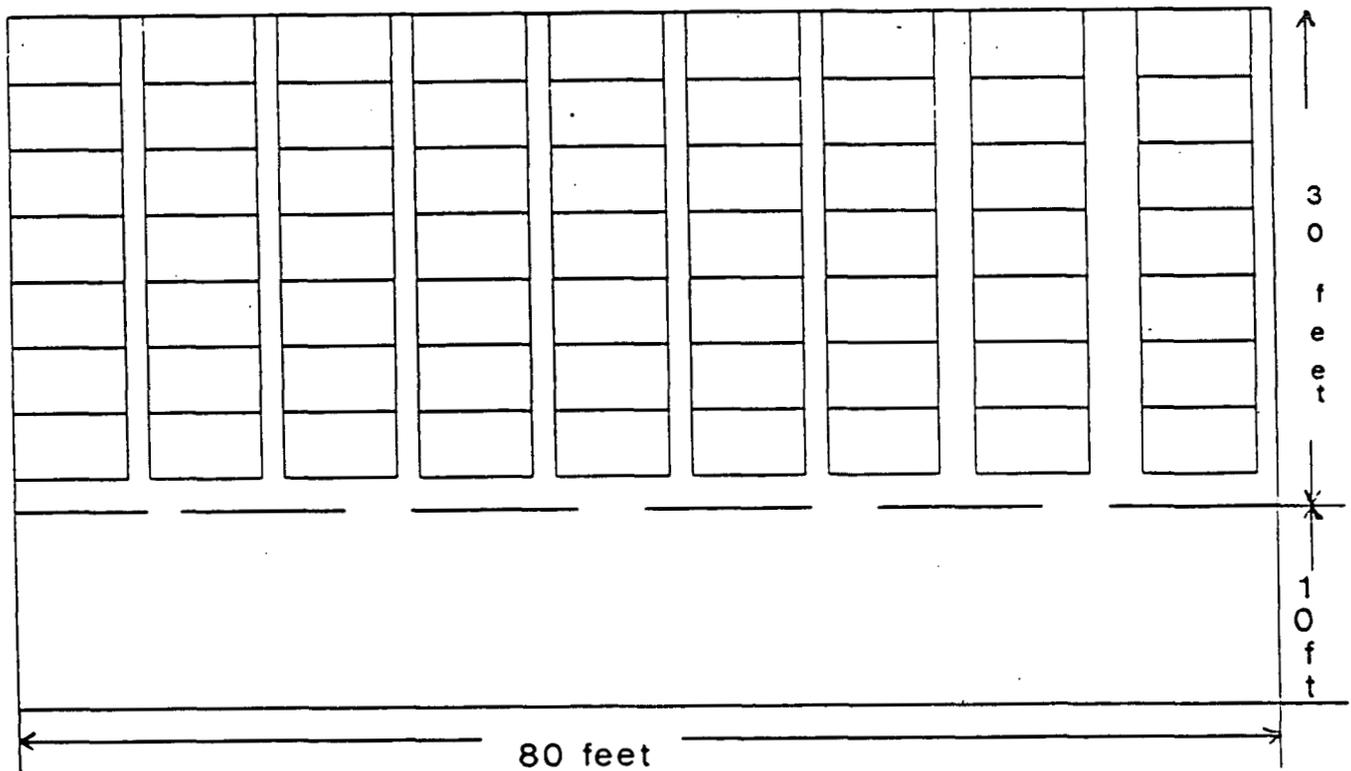
- a. The Permittee may store low-level radioactive mixed waste as described by the following waste codes:

D001	Ignitable Waste
D003	Reactive Waste
D006	Cadmium Waste
D007	Chromium Waste
D008	Lead Waste
D009	Mercury Waste
D011	Silver Waste
F001	Halogenated Solvent Waste
F002	Halogenated Solvent Waste
F003	Non-halogenated Solvent Waste
F005	Non-halogenated Solvent Waste
P015	Beryllium Dust

- b. The Permittee may store solid and liquid low-level radioactive mixed waste in 55-gallon drums or other DOT approved containers, subject to the compatibility requirements of Part III(K) of this permit. Properly labeled overpack drums may be used as necessary.
- c. The concrete floor will be maintained in good condition and be free of cracks and gaps.
- d. The Mixed Waste Storage Building walls and roof will be maintained in structurally good condition and be free from holes, leaks and gaps which could reduce the efficiency secondary containment, see Part III(F).
- e. For solid mixed waste, drums on the first and second levels may either be banded in groups of four on pallets or stored with the first level directly on the concrete floor and the second level on plywood sheets. The third level of drums will be banded in groups of four and stored on pallets. All drums stored on pallets within the storage area will be stored on pallets strengthened by two center-reinforcing 2x4's.
- f. Drums of solid mixed waste will be stacked no more than three high within the storage area.
- g. Each stored drum must be accessible for inspection without moving any other drum.
- h. All drums stored on pallets will be banded together in groups of four. Hazardous waste labels will not be obstructed from view.
- i. A minimum aisle space of 26-inches will be maintained between double rows of drums.
- j. A minimum aisle space of 10-feet will be maintained at the beginning of each row of drums to allow for forklift access to each row. See Figure III.1.
- k. The maximum volume of combined solid and liquid low-level radioactive mixed waste which may be stored at any one time is 55,440 gallons in 864 fifty-five-gallon drums.
- l. Drums of liquid mixed waste will be stacked no more than two high, with fiberglass, coated steel or stainless steel containment pans under each level of drums. Containment pans will be of sufficient capacity to contain at least 10% of the volume of waste in storage in each pan. Drums will be elevated off the floor of the pan by pallets, or otherwise elevated off the floor in a stable configuration and on a stable platform.



Drum Arrangement (Typical)
 $13 \text{ rows} \times 28 \text{ drums/row} \times 3 \text{ high} = 1092 \text{ drums} = 60,060 \text{ gallons}$



Crate Arrangement (Typical)
 $9 \text{ rows} \times 7 \text{ crates/row} \times 2 \text{ high} = 126 \text{ crates} = 523 \text{ cubic yards}$

FIGURE
UNIT 13 BUILDING 884 MIXED WASTE STORAGE AREA

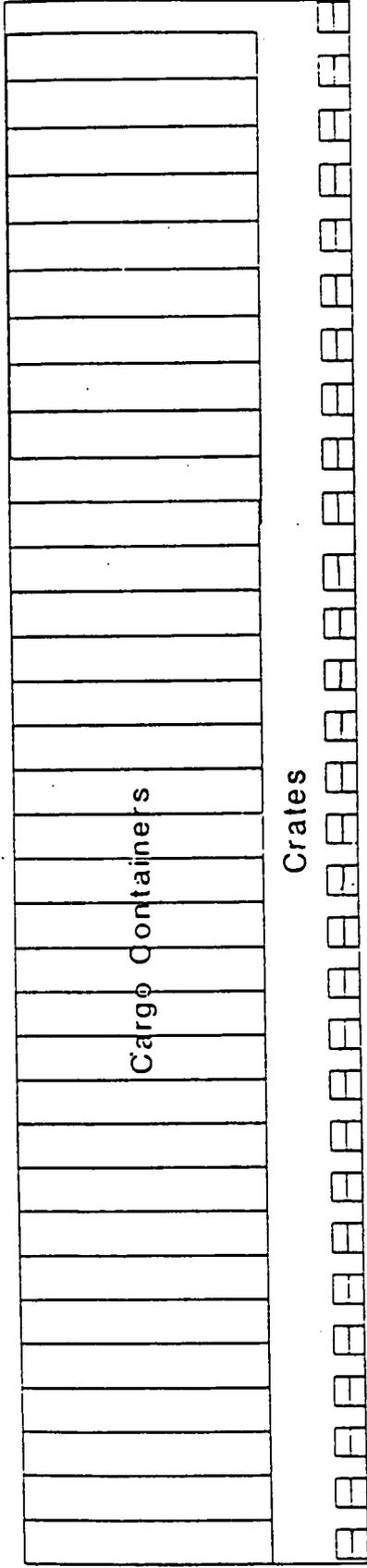
5. Unit 15-A. Mixed Waste Cargo Container Storage Area of 904 Pad

- a. The Permittee may store low level radioactive mixed waste as described by the following waste codes:

D001	Ignitable Waste
D002	Corrosive Waste
D003	Reactive Waste
D006	Cadmium Waste
D007	Chromium Waste
D008	Lead Waste
D011	Silver Waste
F001	Halogenated Solvent Waste
F002	Halogenated Solvent Waste
F003	Non-halogenated Solvent Waste
F005	Non-halogenated Solvent Waste
F006	Wastewater Treatment Sludges
F007	Cyanide Plating Waste
F009	Cyanide Plating Waste

- b. The Permittee may store chip roaster oxide, vacuum filter sludge, and other solid low-level radioactive mixed wastes and liquid solvent contaminated oil in 55-gallon drums or other DOT approved containers, subject to the compatibility requirements of Part III(K) of this permit. Overpack drums may be used as necessary, and must be properly labeled.
- c. The Permittee may store two types of solid low-level mixed wastes; soil and debris from corrective action drilling activities and cemented composite chips in metal or plywood crates north of the berm which separates Unit 15-A and Unit 15-B. The cemented chips are to be contained within drums, which in turn must be placed in crates and covered for storage.
- d. All drums containing solid low-level radioactive mixed waste will be stored within aluminum or steel cargo containers of approximate dimensions 20-ft. long by 8-ft. wide by 8-ft. high or 40-ft. long by 8-ft. wide by 8-ft. high
- e. Wastes which are stored in plywood or metal crates must be covered to protect them from the elements.
- f. Each cargo container will be lined with a metal or a fiberglass catch basin extending the full length and width of the cargo container unless the drums have been tested and shown to contain no free liquids by Real Time Radiography (RTR). A functionally equivalent method which demonstrates the absence of free liquids, approved by the Director may be used in place of Real Time Radiography. The dimensions of the catch basins may be altered to allow for the storage of spill response equipment provided that the adequate secondary containment capacity of 10% of the total waste volume in the basin is maintained.
- g. Each catch basin will have at least a 2.6-in. high integral lip around its perimeter to contain leaks and spills, or be of sufficient height to contain at a minimum 10% of the volume of waste in storage.

- h. Each metal catch basin will be coated with epoxy paint or another coating offering equivalent protection, in order to prevent waste incompatibility with the catch basin, unless fabricated from stainless steel or fiberglass.
- i. Each catch basin will be maintained in good condition; the coating will be free of cracks, gouges, or chips which would impair the effectiveness of the containment.
- j. Waste stored in an individual cargo container must have the same compatibility code, or must have compatibility codes which are compatible, as designated in the Waste Analysis Plan, Part IV, Table 3 of this permit.
- k. Wastes stored in crates must have a compatibility code assigned to them prior to placement in the unit which is the same or compatible with the other wastes stored within a 10-ft. radius.
- l. Each cargo container will be labeled on the outside door with the applicable waste compatibility code(s).
- m. No more than forty 55-gallon drums will be stored in each 40-ft. cargo container, and no more than 22 drums will be stored in each nominal 20-ft. cargo container.
- n. The maximum volume of solid low-level radioactive mixed waste which may be stored at any one time is 55,770 gallons in 1014 fifty-five gallon drums.
- o. The maximum volume of liquid low-level radioactive mixed waste which may be stored at any one time is 4785 gallons in 87 fifty-five gallon drums.
- p. The maximum volume of combined solid and liquid low-level radioactive mixed waste which may be stored at any one time is 60,555 gallons in 1101 fifty-five gallon drums.
- q. The maximum volume of solid low-level radioactive mixed waste which may be stored in crates is 750 cubic yards.
- r. Drums will not be stacked within the cargo containers.
- s. Crates will not be stacked more than three high.
- t. A 26-inch wide access aisle will extend down the center of each cargo container for the full length and will not be blocked when wastes are in storage.
- u. A minimum 10-ft aisle space will be maintained between the cargo containers and the crates.
- v. Each cargo container will contain its own individual inspection and inventory log. An inventory log for the crates will be maintained in a designated cargo container.
- w. Each cargo container will be fitted with an electrical ground and air ventilators. Appropriate warning signs will be placed on the fence surrounding Unit 15-A.
- x. The maximum number of cargo containers which may be used to store waste at any one time is 34 forty-foot cargo containers, or the equivalent capacity of smaller cargo containers.
- y. The unit perimeter of the cargo container storage area must be physically defined and clearly separate Unit 15-A from the solidified mixed waste pad storage area, Unit 15-B.



296 Feet

66 feet wide

34 Cargos X 40 Drums/Cargo = 1360 Drums = 74,800 Gallons

30 Rows X 2 Crates/Row X 3 High = 180 Crates = 747 Cubic Yards

Figure

Unit 15-A904 Pad

Mixed Waste Storage Area

6. Unit 17. Building 777 Mixed Waste Storage Area Room 432C

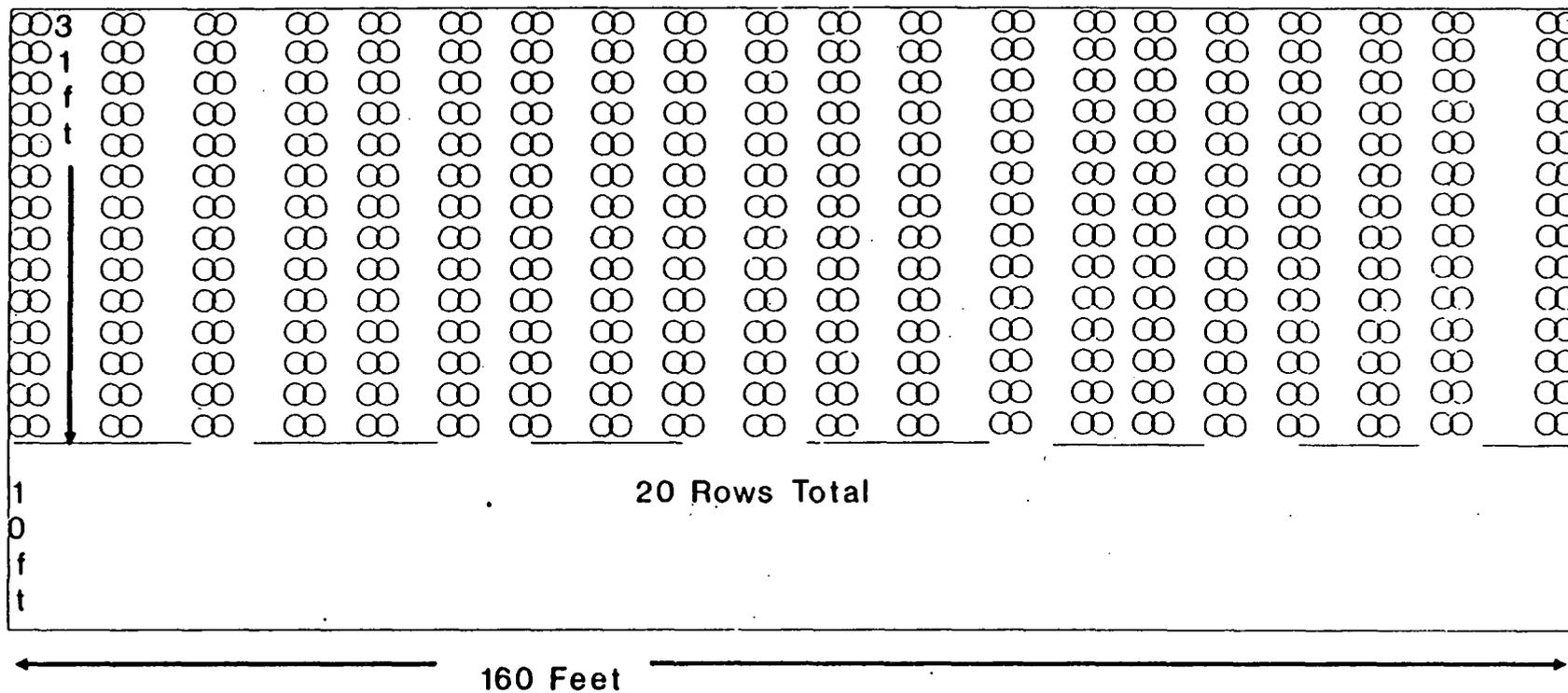
- a. The Permittee may store low-level radioactive mixed waste as described by the following waste codes:
- | | |
|------|-------------------------------|
| D001 | Ignitable Waste |
| U239 | Dimethyl Benzene Waste |
| F001 | Halogenated Solvent Waste |
| F002 | Halogenated Solvent Waste |
| F003 | Non-halogenated Solvent Waste |
| F005 | Non-halogenated Solvent Waste |
| D008 | Lead Waste |
- b. In addition to the waste codes listed in Part III(B)(6)(a) above, the Permittee may store the solid low-level radioactive mixed waste known as solidified scintillation cocktail in 55-gallon drums or other DOT approved containers, subject to the compatibility requirements of Part III (K) of this permit.
- c. All drums containing low-level radioactive mixed waste will be stored upon a concrete floor which is free of cracks and gaps and is coated with epoxy paint in good condition, or an alternate coating offering equivalent protection.
- d. To protect the drums stored in Room 432C from run-on liquids, a six inch continuous concrete berm or wall will surround Room 432C.
- e. The concrete berm or wall will be free of cracks and gaps and coated with epoxy paint in good condition, or another coating offering equivalent protection.
- f. Each stored drum must be accessible and inspectable without moving any other drum.
- g. The maximum volume of solid low-level radioactive mixed waste which may be stored at any one time is 330 gallons in six 55-gallon drums.
- h. Drums will not be stacked within the storage area.
- i. All drum lids will be fitted with carbon filter inserts to prevent pressure build-up within the drums. The filters will be maintained in good condition, and replaced prior to deteriorating to a point where their effectiveness is compromised.

7. Unit 23 Gas Cylinder Storage Building 952

- a. The Permittee may store hazardous wastes as described by the following waste codes:
- | | |
|----------|--|
| D001 | Ignitable Waste |
| D002 | Corrosive Waste |
| D003 | Reactive Waste |
| P Series | Various listed 6 CCR 1007-3, 261.33 as amended |
| U Series | Various listed 6 CCR 1007-3, 261.33 as amended |
- b. The Permittee may store hazardous wastes in gas cylinders and lecture bottles subject to the compatibility requirements of Part III(K) of this permit.
- c. All gas cylinders and lecture bottles which contain hazardous waste will be stored upon a concrete pad which is free of cracks and gaps.
- d. The steel gas cylinder storage building and roof will be maintained in good condition and be free from holes and leaks, see Part III(F).
- e. Vents will be installed at floor level to provide ventilation for heavier than air gases, see Part III(F).
- f. Vents will be maintained in good condition.
- g. The door to the gas cylinder storage building will be kept locked.
- h. The steel gas cylinder storage building will be grounded to conform with applicable electrical and fire codes.
- i. Each gas cylinder or lecture bottle will be labeled with the applicable waste compatibility code.
- j. Each gas cylinder or lecture bottle will be chained to the building or secured within a rack which is secured to the wall to prevent potential toppling.
- k. The maximum volume of gas which may be stored at any one time is 6400 cubic meters, at standard temperature and pressure (STP).

8. Unit 24 Building 964 Mixed Waste Storage Building

- a. The Permittee may store low-level radioactive mixed waste as described by the following waste codes:
- | | |
|------|-------------------------------|
| D006 | Cadmium Waste |
| D007 | Chromium Waste |
| D008 | Lead Waste |
| F001 | Halogenated Solvent Waste |
| F002 | Halogenated Solvent Waste |
| F003 | Non-halogenated Solvent Waste |
| F005 | Non-halogenated Solvent Waste |
| F006 | Wastewater Treatment Sludges |
- b. The Permittee may store vacuum filter sludge, a solid low-level radioactive mixed waste, in 55-gallon drums or other DOT approved containers, subject to the compatibility requirements of Part III(K) of this permit.
- c. The concrete floor will be maintained in good condition and be free of cracks and gaps.
- d. The Mixed Waste Storage Building walls and roof will be maintained in structurally good condition and be free from holes and leaks, see Part III (F).
- e. Drums will be stacked no more than four high within the storage area. Drums on the fourth level will be banded together in groups of four and will be stored on reinforcing pallets strengthened by two center-reinforced 2x4's. Drums on the first, second, and third level may either be banded in groups of four on reinforced pallets, or stored individually with the first level directly on the concrete floor, and the second and third levels on plywood sheets.
- f. Drums on the first level will be stored on pallets and banded together unless verified that there are no free liquids by Real Time Radiography or other method approved by the Director
- g. Each stored drum must be accessible for inspection without moving any other drum.
- h. A minimum aisle space of 26 inches will be maintained between rows of pallets.
- i. A minimum aisle space of 10 feet will be maintained at the beginning of each row of drums to allow for forklift access to each row, see Figure III-2.
- j. The maximum volume of vacuum filter sludge which may be stored at any one time is 123,200 gallons in 2240 fifty-five-gallon drums.



Drum Arrangement (typical)

20 Rows X 28 Drums/Row X 4 High = 2240 Drums = 123,200 Gallons

FIGURE III.2
Unit 24. Building 964 Mixed
Waste Storage Area

9. Unit 27 Building 776 Mixed Waste Storage Area Room 201

- a. The Permittee may store low-level radioactive mixed waste as described by the following waste codes:
- | | |
|------|-------------------------------|
| D001 | Ignitable Waste |
| D006 | Cadmium Waste |
| D007 | Chromium Waste |
| D008 | Lead Waste |
| D009 | Mercury Waste |
| F001 | Halogenated Solvent Waste |
| F002 | Halogenated Solvent Waste |
| F003 | Non-halogenated Solvent Waste |
- b. The Permittee may store liquid and solid low-level radioactive mixed waste in 55-gallon drums or other DOT approved containers, subject to the compatibility requirements of Part III(K) of this permit. Overpack drums may be used as necessary, and must be properly labeled.
- c. All drums containing low-level radioactive mixed waste will be stored upon a concrete floor which is free of cracks and gaps and is coated with epoxy paint in good condition or another coating offering equivalent protection approved by the Director.
- d. An angle iron berm or wall which is at least 1.9 inches high, free of cracks and gaps, sealed to the floor, and coated with epoxy paint in good condition, or another coating offering equivalent protection, will completely surround the drum area.
- e. All drums will be stored on pallets within the berm or otherwise elevated off the floor in a stable manner, and drums will not extend onto or over the edge of the berm.
- f. The maximum volume of low-level radioactive mixed waste which may be stored at any one time is 2,750 gallons in fifty 55-gallon drums.
- g. Drums will not be stacked within the drum storage area.
- h. Each stored drum must be accessible for inspection without moving any other drum.
- i. A minimum 26-inch aisle space will be maintained between double rows of drums.
- j. Any accumulated liquid within the bermed area will be removed in a timely manner using a portable pump and transferred to a drum of adequate integrity. The appropriately labeled drum will be stored in a 90-day area, or a permitted unit as appropriate. The drum must have the same dating as the original drum.
- k. Any incompatible waste stored within the unit must be separated by a dike, berm, wall or other device.
- l. The unit will be physically defined by walls or a fence around the outside perimeter.
- m. The perimeter fence, walls, and warning signs will be regularly kept in good condition and maintained free of holes or gaps.
- n. Signs required by 6 CCR 1007-3, Section 264.14(c) must be posted in English.

C. CONDITION OF CONTAINERS

If a container holding hazardous waste is not in good condition, for example severe rusting, apparent structural defects, or if it begins to leak, the Permittee shall transfer the hazardous waste from this container to a container that is in good condition or otherwise manage the waste in compliance with the conditions of this Permit. (6 CCR 1007-3, Section 264.171).

D. COMPATIBILITY OF WASTE WITH CONTAINERS

The Permittee must use a container made of or lined with material which will not react with and is otherwise compatible with the hazardous waste to be stored so that the ability of the container to contain the waste is not impaired. (6 CCR 1007-3, Section 264.172)

E. MANAGEMENT OF CONTAINERS

1. Secondary Containment and Sign Posting. The Permittee shall maintain the secondary containment system in accordance with the unit-specific conditions as given for the individual units listed in Part III(B) of this permit. All container storage areas shall have signs containing the legend "Danger Unauthorized Personnel Keep Out", conspicuously posted at the perimeter and entrance to the unit. (6 CCR 1007-3, Sections 264.173(a), 264.174, and 264.14(c)). A container holding hazardous waste must always be closed during storage, except when it is necessary to add or remove waste.
2. Container Labeling All containers and crates of hazardous and mixed waste shall be properly packaged and labeled in accordance with 6 CCR 1007-3, Section 262. All containers and crates must have the applicable EPA waste codes clearly displayed on the hazardous waste label.

F. COMPLIANCE SCHEDULE

The Permittee shall provide the following information to the State Director:

1. Compliance Testing for Free Liquids. Written documentation summarizing the results of compliance testing of solid hazardous and mixed waste containers for free liquids stored in Units 1, 13, and 24 as described in the Waste Analysis Plan, Part IV of this permit is due to the Director 90 days from the effective date of this permit.

G. INSPECTION SCHEDULES AND PROCEDURES

The Permittee shall inspect all container areas at least weekly (6 CCR 1007-3, Section 264.174) in order to detect leaking containers and deterioration of containers and the containment system caused by corrosion and other factors. Records of inspections shall be maintained in each unit's inspection log. (6 CCR 1007-3, Section 264.175)

H. RECORDKEEPING

The Permittee shall place the results of all waste analyses, trial tests, waste compatibility analyses and ignitable and reactive waste handling compliance documentation in the facility operating record.

I. CLOSURE

At closure of the container areas, the Permittee shall remove all hazardous waste and hazardous waste residues from the containment system in accordance with the procedures in the Closure Plan, Part VIII of this permit.

J. SPECIAL CONTAINER REQUIREMENTS FOR IGNITABLE OR REACTIVE WASTE

1. Boundary Condition for Ignitable or Reactive Waste. The Permittee shall locate containers storing ignitable or reactive waste at least 15-meters or 50-feet inside the facility's property line.
2. Accidental Ignition Reaction Precautions. The Permittee shall take precaution to prevent accidental ignition or reaction of ignitable or reactive waste and follow the procedures specified in Part III(L) and Part V of this permit.

K. SPECIAL CONTAINER PROVISIONS FOR INCOMPATIBLE WASTE

1. Incompatible Waste Not in Same Cargo Container. The Permittee will not place incompatible wastes, or incompatible wastes and materials, in the same cargo container or heated cargo container compartment.
2. Incompatible Waste Not in Unwashed Containers. The Permittee will not place hazardous waste in an unwashed container that previously held an incompatible waste or material.
3. Incompatible Waste Container Separation. The Permittee shall separate containers of incompatible wastes by means of a dike berm, wall or other device pursuant to 6 CCR 1007-3, Section 264.177(c).

L. IGNITABLE OR REACTIVE WASTE PROCEDURES

1. Ignition or Reaction Source Separation. The Permittee must separate and protect ignitable or reactive waste from any sources of ignition or reaction.
2. Smoking and Open Flame Confinement. The Permittee must confine smoking and open flames to specially designated locations while ignitable or reactive waste is being handled.
3. Posted "No Smoking Signs". The Permittee shall conspicuously post, "No Smoking", signs wherever there is a hazard from ignitable or reactive waste.
4. Precautions to Prevent Reactions. The Permittee must take precautions to prevent reactions which:
 - a. Generate extreme heat or pressure, fire or explosions, or violent reactions.
 - b. Produce uncontrolled toxic mists, fumes, dusts or gases in sufficient quantities to threaten human health and the environment.
 - c. Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions.
 - d. Damage the structural integrity of the device or facility.
 - e. Threaten human health and the environment through other means.

TABLE 1. LIQUID AND SOLID CONTAINER STORAGE AREAS

UNIT NAME	Main Hazardous Waste Storage Area
UNIT NUMBER	1
UNIT DIMENSIONS	Outdoor storage area dimensions 106-ft. x 169-ft.
UNIT DESCRIPTION	Cargo Containers 20x8x8-feet or 40x8x8-feet.
WASTE TYPE	Liquid Hazardous Waste
UNIT DESCRIPTION	Steel Drum Racks
WASTE TYPE:	Solid Hazardous Waste
UNIT NAME	Building 561 Drum Storage
UNIT NUMBER	10
UNIT DIMENSIONS	Outdoor storage area dimensions 115-ft. x 130-ft. 60-ft. x 60-ft. cut out N.E. corner adjoining Bldg 561.
UNIT DESCRIPTION	Cargo Containers 20x8x8-feet or 40x8x6-feet.
WASTE TYPE	Low-Level Liquid and Solid Radioactive Mixed Waste
UNIT NAME	Building 776 Room 237 Drum Storage Area
UNIT NUMBER	12
UNIT DIMENSIONS	Indoor Fenced Storage bermed area 59x29-feet. 17-ft. x 12-ft. cut out S.W. corner.
UNIT DESCRIPTION	Drum Storage
WASTE TYPE	Low-level Liquid and Solid Radioactive Mixed Waste
UNIT NAME	Building 884 Mixed Waste Building
UNIT NUMBER	13
UNIT DIMENSIONS	Building with outside dimensions 80-ft. x 40-ft.
UNIT DESCRIPTION	Corrugated metal building with concrete floor.
WASTE TYPE	Low-level Liquid and Solid Radioactive Mixed Waste
UNIT NAME	904 Pad Mixed Waste Storage Area
UNIT NUMBER	15-A
UNIT DIMENSIONS	Outdoor storage area dimensions 66-ft. x 296-ft.
UNIT DESCRIPTION	Cargo Containers 20x8x8-ft or 40x8x8-ft. Crates
WASTE TYPE	Low-level Liquid and Solid Radioactive Mixed Waste
UNIT NAME	Building 776 Room 201 Mixed Waste Storage Area
UNIT NUMBER	27
UNIT DIMENSIONS	Indoor storage area dimensions 20-ft. x 20-ft.
UNIT DESCRIPTION	Elevated drum storage on epoxy coated concrete floor
WASTE TYPE	Low-level Liquid and Solid Radioactive Mixed Waste

TABLE 2. SOLID CONTAINER STORAGE AREAS

UNIT NAME	Building 777 Room 432C Mixed Waste Storage Area
UNIT NUMBER	17
UNIT DIMENSIONS	
UNIT DESCRIPTION	Drum storage on epoxy coated concrete floor with 6-in. continuous perimeter berm or wall.
WASTE TYPE	Solidified Scintillation Cocktail.
UNIT NAME	Building 952 Gas Cylinder Storage Building
UNIT NUMBER	23
UNIT DIMENSIONS	Building with dimensions 10-ft. x 10-ft.
UNIT DESCRIPTION	Corrugated metal building with concrete floor.
WASTE TYPE	Waste Gas.
UNIT NAME	Building 964 Mixed Waste Storage Building
UNIT NUMBER	24
UNIT DIMENSIONS	Corrugated metal building with dimensions 41-ft. x 160-ft.
UNIT DESCRIPTION	Drum storage on concrete floor.
WASTE TYPE	Vacuum Filter Sludge Low-Level Mixed Waste

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PART IV-WASTE ANALYSIS PLAN

A. GENERAL WASTE ANALYSIS

The Permittee shall follow the waste analysis procedures required by 6 CCR 1007-3, Section 264.13, and attached waste analysis plan as modified by the following conditions.

The Permittee shall verify the analysis of each waste stream as specified in the attached waste analysis plan as part of its quality assurance program, in accordance with currently promulgated version of Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA Publication SW-846, or equivalent methods approved by the Department. At a minimum, the Permittee shall maintain proper functional instruments, use approved sampling and analytical methods, verify the validity of sampling and analytical procedures, and perform correct calculations. If the Permittee uses a contract laboratory to perform analysis, then the Permittee shall inform the laboratory in writing that it must operate under the waste analysis conditions set forth in this permit.

1. Conditions Added to Waste Analysis Plan.

- a. This waste analysis plan shall be revised as necessary if waste identification and characterization data required under the June 28, 1989, Agreement in Principle and subsequent waste characterization efforts require revisions to waste sampling or analysis procedures or parameters, quality assurance/quality control, procedures for records maintenance, or other revisions determined by the Department to be subject to the permit modification requirements of 6 CCR 1007-3, Section 100.6.
- b. The Permittee shall perform fingerprint analysis on each waste for the following parameters: gross alpha, gross beta, and gamma activity to determine if the waste is TRU mixed, low-level mixed, or non-radioactive waste. These analyses will be performed in order to assure safe and separate storage of TRU mixed, low-level mixed, and non-radioactive wastes. For the purposes of this radiological analysis, identification of specific radionuclides is not necessary. However, if low-level waste versus non-radioactive waste determinations become based on a REM dose, the Permittee will be required to identify the specific radionuclides in the waste.
- c. All references to a computerized database for maintaining records required by this plan shall be changed to the Waste and Environmental Management System (WEMS). All required waste analysis records will be maintained on the WEMS database, or equivalent data system.

- d. For all units storing solid hazardous or low-level mixed waste, the Permittee shall determine if free liquids are present in the wastes in storage. For wastes generated after the effective date of this permit ("new wastes"), this determination shall be based upon fingerprint testing using Real Time Radiography (RTR) or other methods approved by the Division in writing. For wastes generated prior to the effective date of this permit ("existing wastes"), the determination may be based upon RTR, other approved methods, or upon results obtained by the generator of the waste, including process knowledge.

If no record of fingerprint testing for free liquids is available, or no written documentation of this determination based upon process knowledge, existing waste must be fingerprinted using RTR or other method approved by the Division. Alternatively, the existing waste may be stored as if free liquids were present in an interim status or permitted unit, with adequate secondary containment and allowable waste codes, until fingerprinted.

- e. In the case where process knowledge is used to fingerprint a waste in order to prevent worker exposure, the facility will verify and document this information. These records must be made available to the Division upon request.

B. INTRODUCTION AND DESCRIPTION OF WASTE ANALYSIS PLAN

The Waste Analysis Plan as described in this section consists of three parts: a description of the Generator Waste Analysis Plan, the Unit Specific Waste Analysis Plan and Additional Waste Analysis Plans. The Permittee conducts ongoing generator waste analysis for the purpose of determining which solid wastes are hazardous wastes. The hazardous waste determination is required by 6 CCR 1007-3, Section 262.11, and is not incorporated in this permit. The information developed in the generator waste analysis can be used to support the Unit Specific Waste Analysis Plan and the Additional Waste Analysis Plans. Consequently, a description of the Generator Waste Analysis Plan has been included in this permit.

The unit specific waste analysis plans, Part IV (D) have been prepared for each of the permitted storage units in this permit. The purpose of these plans are: first, to ensure that the wastes are compatible with the assigned storage unit and second, to confirm that the wastes are consistent with the waste characterization.

The additional waste analysis plans, Part IV (E) cover spills, decontamination, precipitation run-on, closure and non-routine waste analyses. The analytical methods are discussed in Part IV (F). Sampling methods are presented in Part IV (G). Quality Control and Quality Assurance for the entire program is described in Part IV (H).

C. GENERATOR WASTE ANALYSIS PLAN

The information developed by the facility as part of the Generator Waste Analysis Plan serves two purposes. First, the information allows the generator of the waste to determine if that waste is a hazardous waste as required by 6 CCR 1007-3, Section 262.11. Second, the information provides data which is used during the Unit Specific Waste Analysis plan to characterize wastes to the extent necessary to store the wastes in accordance with the requirements of 6 CCR 1007-3, Parts 264 and 268 and this permit. As a result of the latter purpose, a description of the Generator Waste Analysis Plan is included in this permit. This description covers parameters of analysis, transfer of generator waste analysis information, frequency of analysis, sampling methods, and analytical methods.

1. Parameters of Analysis.

Information developed during the Generator Waste Analysis Plan shall be supplied to the personnel conducting the Unit Specific Waste Analysis. The information which shall be supplied is as follows:

- EPA hazardous waste code
- waste type/waste description
- whether the waste is subject to the land disposal restrictions
- physical state of waste / free liquids
- whether the waste is ignitable (liquids only)

The rationale for each of the above parameters is discussed.

- a. EPA hazardous waste code: The container storage section of the permit limits the wastes which can be stored in each unit by EPA hazardous waste code.
- b. Waste type / waste description: As part of the waste description the generator categories the waste using either an Item Description Code (IDC) and/or a general waste name (such as acetone or acid). The waste description is used to assign compatibility codes. A primary emphasis of the fingerprint analysis described in Part IV (D) is to verify the generator waste description.
- c. Land disposal restricted: Wastes which are subject to the land disposal restrictions may only be stored in container storage units solely for the purpose of accumulating quantities of waste as are necessary to facilitate proper recovery, treatment, or disposal. The issue of storage of land disposal restricted wastes is addressed in the September 19, 1989 compliance agreement and compliance order on consent signed by DOE, CDH and EPA. Wastes subject to the land disposal restrictions must also be marked with an accumulation date. The facility may decide to store a given waste as if it were subject to the land disposal restrictions in which case determination of this parameter is unnecessary.
- d. Physical State / Free Liquids: The generator of a waste will initially determine whether or not the waste may contain free liquids. If the waste does not contain free liquids, it may be stored as a solid hazardous waste. The facility may decide to store a given waste as a liquid in which case the determination of this parameter is unnecessary.
- e. Ignitability: The generator of a waste will initially determine whether or not the waste is ignitable. If the waste is ignitable, it must be stored in a container storage area which is designed to house ignitable wastes. The facility may decide to store a given waste as ignitable in which case the determination of this parameter is unnecessary.

Each of these parameters will be determined by analytical tests, by process knowledge or by a combination of both testing and process knowledge.

2. Transfer of Generator Waste Analysis Information

The Generator Waste Analysis information summarized in Part IV (C)(1) will be transferred to the personnel conducting the Unit Specific Waste Analysis by one of two means: a Waste Processing Request Form and/or the WEMS database. Both methods of transferring data are described in this permit because the WEMS database is not yet fully in operation.

- a. **Waste Processing Request Form:** When a generator needs to ship a waste to one of the container storage areas covered in this permit, the generator fills out a Waste Processing Request Form. The form at minimum will contain information on the parameters listed in Part IV (C)(1) as well as the generator's name, the date, the amount of waste, and the location of the waste. The generator then contacts personnel in charge of the container storage areas. The container storage area personnel checks the form to make sure that the waste is acceptable for storage in the container storage area. The container storage area personnel contacts the laboratory and provides the laboratory with the generator information. Upon completion of the Unit Specific Waste Analysis, laboratory personnel assign a compatibility code completing the Waste Processing Request Form. One copy of the form is kept by the container storage area personnel and one copy of the form is kept by the generator.
- b. **WEMS Database:** The WEMS data base serves as an alternative means of transferring the generator waste information. The WEMS data base will contain at a minimum the parameters listed in Part IV (C)(1), the generator's name, the date of characterization, the amount of waste in a shipment and the location of a waste. When the WEMS data base system is fully operational, the on-site laboratories will be able to access the information in the data base directly from terminals in the lab.

3. Frequency of Generator Waste Analysis

All hazardous wastes which are sent to the container storage areas identified in this permit will be characterized in accordance with the Generator Waste Analysis at least annually, unless a frequency change is granted by the Director as discussed below. (Note: wastes which are generated on a "one-time only" basis, from treatability studies, or pilot and bench scale testing are to be characterized at the time of generation.) In addition to annual re-characterization, a waste will be re-characterized if one of the following conditions occurs:

- the generator changes a process which impacts the waste generation,
- the generator requests re-characterization, or
- fingerprint analysis of waste identifies a change.

A generator may use process knowledge to characterize or re-characterize a waste. Process knowledge can be used in place or in combination with analytical tests to provide a complete characterization of a waste. Process knowledge may also be used to identify similar waste streams and wastes which have not changed. The date of the most recent generator waste characterization will be maintained in the WEMS database or in the Waste Processing Request Form files.

New waste categories will be characterized in accordance with the Generator Waste Analysis prior to storage in one of the permitted units. However, no new waste may be stored in a permitted storage area unless it exhibits the EPA hazardous waste codes for the particular storage unit. Before a new waste can be stored in a storage unit which is not permitted for the EPA hazardous waste code of the new waste, a modification of the permit is required.

A change in the frequency of sampling/analysis and/or a change in analytes for individual waste streams may be implemented after having been requested in writing and having been approved by the Department based upon one of the following events:

- a. At least four consecutive analyses for an individual waste stream confirm that the original characterization was correct;
- b. Upon completion of the 1989-1990 Waste Stream Recharacterization a reliable characterization of the individual waste stream is available that is based on analytical results, not solely based upon process knowledge.

4. Sampling Methods

Sampling methods used to collect hazardous waste for Generator Waste Analysis will comply with those described in Appendix I of 6 CCR, 1007-3, Section 261. Table IV-7 lists waste matrices and the appropriate sample methods.

5. Analytical Methods

The Generator Waste Analysis will use a combination of analytical tests and process knowledge. The analytical test methods for Generator Waste Analysis are presented in Part IV (C)(5), Analytical Methods, and are summarized on Table IV-4 and Table IV-5. Where appropriate, procedures presented in SW-846 are followed. Details on each analytical test method are contained in the "L-Procedures" which are the facility's in-house laboratory procedures. The L-Procedures used for waste characterization are based on SW-846 for tests present in SW-846. Modifications are made to the SW-846 methods when issues such as nuclear safety concerns arise. For example, it may be necessary to conduct an initial preparation step which involves extraction of radionuclides prior to proceeding with a SW-846 methodology. Up to date L-Procedures which apply to waste characterization will be submitted to the Director. Any changes to the L-Procedures will be submitted to the Director as a Class 1 permit modification prior to implementation of the change. The Permittee may send samples off-site to a laboratory which uses EPA approved methods for generator waste analysis. Before initiating a completely new method, the Permittee must receive approval from the Department.

As an alternative to conducting an analytical test, a generator may use process knowledge to characterize or re-characterize a waste. Process knowledge can be used in place or in combination with analytical tests to provide a complete characterization of a waste.

D. UNIT SPECIFIC WASTE ANALYSIS PLAN

The unit specific analysis is referred to as "Fingerprinting." The intention of fingerprinting is to confirm that each container or shipment of waste is consistent with the complete characterization. Once a waste passes a fingerprint test it is considered as acceptable for the assigned treatment or storage unit if the EPA hazardous waste code is allowed for that storage unit.

The Permittee has the unit specific waste analysis plan on file. Attachment 1 to the unit specific plan describes in detail how compatibility codes are assigned.

1. Objective.

This plan covers the analytical requirements and procedures necessary to store hazardous waste safely in the container storage areas. As a result of the information obtained in this plan, the Permittee will determine the waste characteristics which are necessary to safely store the wastes in the hazardous and low level mixed waste storage units. In addition, the plan serves the purpose of checking the initial generator waste characterization. Sampling methods, test methods and the frequency of sampling are specified in the following sections.

2. Waste Stream Source.

Solid and liquid wastes that meet the definition of non-radioactive hazardous or low level mixed radioactive and hazardous wastes may be stored if the unit specific permit conditions are met. These wastes are generated throughout the plant and are transferred to the storage units in compliance with Rocky Flats' approved procedures.

The fingerprint tests described below have been designed to verify that the waste fits the general category to which an EPA compatibility code has been assigned.

3. Analysis Plan.

Hazardous wastes to be stored in these units are initially characterized and tested as required for waste generators by 6 CCR 1007-3, Section 262.11 (Hazardous waste determination). This plan provides additional information necessary for permitted storage of these wastes as required by 6 CCR 1007-3, Section 264.13 (General waste analysis). The performance standard specified for the waste analysis plan is as follows: the analysis must at a minimum, contain all the information which must be known to store the waste in accordance with the requirements of 6 CCR 1007-3, Parts 264 and 268, and with the conditions of this permit.

To achieve this performance standard, the following waste characteristics must be determined. These characteristics will allow for storage of the hazardous waste in accordance with regulations and this permit.

- EPA hazardous waste code
- compatibility of wastes
- ignitability of wastes
- presence of free liquids
- waste subject to land disposal restrictions

-radiological parameters as necessary to assure safe and separate storage of hazardous, low-level mixed, and TRU mixed waste will be provided to the Director upon request.

These characteristics may be determined through additional tests as described in this plan or by using existing published or documented data or by using data developed as part of the generator waste analysis.

In addition to achieving the performance standard for general waste analysis of wastes destined for storage, the plan provides a second purpose. The plan serves as an extra check on the determination made by the generator of the waste.

Containers will then be stored according to the procedure provided in the general and specific conditions of this permit.

- a. Full Sample Analysis
See generator waste analysis plan.
- b. The fingerprint tests serve as a check to assure that the generator description of the waste is correct. This check assures that incompatible wastes are correctly segregated, that proper EPA hazardous waste codes are assigned, and that other characteristics which effect storage are properly identified. The procedure described below will confirm (or reject) the generator's description of the waste to the degree necessary to assure proper storage.

The fingerprint tests are implemented under the following procedure.

- i. The Permittee shall collect a sample when ready to ship the container(s). The container(s) may be sampled in a satellite storage area, a 90-day storage area, or a temporary holding area.
- ii. Containers will be fingerprinted and tests completed prior to transfer to a storage unit, and a minimum of 10 days prior to the end of the 90-day accumulation area limit. Each different waste shall be sampled. When

multiple containers of the same waste are present, at least 20 percent of the containers are sampled. (For waste which remain consistent, the Permittee may sample less than 20 percent of the containers after first receiving approval from the Department. In addition, it should be noted that if the health and safety of any employee involved in the sampling and/or analysis of radioactive materials is in jeopardy, process knowledge will be utilized to fingerprint these wastes.) The tests listed in Tables IV-1 and IV-2, will be performed to confirm or assign the proper waste characteristics for storage.

- iii. After the fingerprint tests are completed the Permittee will assign a proper compatibility code and revise other waste characteristic information as appropriate, including EPA waste codes.
- iv. The container(s) are then shipped to the storage unit and stored according to the assigned compatibility code and EPA waste code.
- v. Unused laboratory sample may be returned to the generator of the waste to be reincorporated in the waste stream.

c. Engineering Analysis

A combination of process knowledge and data from analytical testing will be used by the generator to provide the initial waste characterization. The generator provides this information to the personnel conducting the Unit Specific Waste Analysis using the Waste Processing Request Form or the WEMS data base as described in Part IV (C)(2) of the permit. Fingerprint samples and tests will then be used to confirm the generator's information. This process will provide information necessary to store the waste in accordance with requirements of this permit which includes assigning compatibility codes, checking EPA identification codes, and verifying other waste characteristics such as whether or not the waste is ignitable and whether or not the waste is subject to the land disposal restrictions. The information gained in the Unit Specific Waste Analysis will be used to designate proper storage.

d. Quality Control

Sample management, analytical methodology, data handling and reporting will be handled following approved Rocky Flats laboratory procedures. Analytical procedures used for the full sample analysis and fingerprinting will follow standard operating procedures for the laboratory. Duplicate sampling and use of blanks are described in Part IV (F).

e. Analytical Results

All waste stream results from the fingerprint analysis will be transferred to the WEMS data base. Records of analysis results will be maintained at least three years after the waste is shipped off-site or maintained until the facility closes, whichever is later. The WEMS data base consists of an operating log with each dated entry showing the container identification number, and complete analytical results.

E. ADDITIONAL WASTE ANALYSIS PLANS

Additional sampling and analysis will be conducted during clean up of spills, decontamination, closure and when run-off is collected in secondary containment areas. When these activities occur, sampling, analysis, and QA/QC procedures will follow those present in Part IV (F),(G) and (H) of this document. The WEMS data base will be used to select appropriate analytes. Information concerning hazardous constituents potentially present in any release of waste residuals may be obtained by determining which stream(s) is present.

F. ANALYTICAL METHODS

The required analytical work is intended to be performed on site at the Rocky Flats Plant. The analytical test methods for waste analysis are summarized on Table IV-4, Table IV-5, and Table IV-6. Where appropriate, procedures presented in SW-846 are followed. Details on each analytical test method are present in the "L-Procedures" which are the facility's in-house laboratory procedures. The L-Procedures used for waste characterization are based on SW-846 for tests present in SW-846. Modifications are made to the SW-846 methods when issues such as nuclear safety concerns arise. For example, it may be necessary to conduct an initial preparation step which involves extraction of radionuclides prior to proceeding with a SW-846 methodology. Up to date L-Procedures which apply to waste characterization will be submitted to the Director. Any changes to the L-Procedures will be submitted to the Director as a Class 1 permit modification prior to implementation of the change. Before initiating a completely new method for waste analysis, the Permittee must receive approval from the Department. The Permittee may send samples off-site for waste analysis to a laboratory which follows EPA approved methods.

Table IV-4 shows the methods used in analyzing nonradioactive wastes. Slightly different methods are used for low-level contaminated wastes. These procedures are presented in Table IV-5. The methods used for fingerprint analysis are shown in Table IV-6.

G. SAMPLING METHODS

Sampling methods used to collect hazardous wastes at the Rocky Flats Plant comply with those described in Appendix I of 6 CCR, Section 261. Methods were chosen for their ease in the collection of a representative sample, 6-CCR, 1007-3, Section 264.13

(b) (3). Sampling location, sampling matrix, sample container type and size, and accessibility are taken into consideration when assigning a sampling method.

Table IV-7 lists waste matrixes and appropriate sample methods.

H. QUALITY ASSURANCE/QUALITY CONTROL (QA/OC)

Quality Engineering and Control, an organization not associated with the waste group, will be responsible for quality assurance. This organization will be responsible for (1) reviewing analytical results to determine validity of the information, (2) conducting and documenting periodic system and performance audits, (3) use of blind or performance samples in the sampling/analysis process, (4) documenting observed problems with recommendations directly to the waste group for resolution and, (5) ensuring that the requirements of the analytical laboratory's quality assurance program are implemented, the program is reviewed at least annually and the program is revised as appropriate.

Quality Engineering and Control is responsible for ensuring that the following procedures are implemented during the sampling and analysis program for waste characterization.

1. Laboratory QA/OC Program

This subsection of the Quality Assurance/Quality Control Program briefly describes the organization and guidelines used to produce reliable analytical data in the Rocky Flats Plant analytical laboratories. A more detailed and comprehensive presentation of the analytical laboratories' organization and quality assurance guidelines may be found in the quality assurance program.

a. Organization

The ultimate responsibility for the generation of reliable laboratory data rests with the laboratory management. Laboratory management is vested with the authority to effect those policies and procedures necessary to ensure data of acceptable quality.

Laboratory management and quality assurance personnel are ultimately responsible for the implementation of the established policies and procedures. They possess the authorities commensurate with their responsibilities for the day-to-day enforcement and monitoring of laboratory activities.

b. Laboratory management has the following responsibilities:

- Direct implementation of the quality assurance program.

- Ensuring that their personnel are adequately trained to perform analytical procedures.
 - Ensure that equipment and instrumentation under their control are calibrated and functioning properly.
 - Review and perform subsequent corrective action on internal and external audits.
- c. Quality assurance personnel have the following responsibilities:
- On-going review of quality assurance procedures.
 - Providing assistance in the development and implementation of specific quality assurance plans for special analytical programs.
 - Coordination of internal and external quality assurance audits.
 - Coordination of quality assurance training.
 - Overall coordination of the analytical laboratories' quality assurance program manual.
 - Review procedures and QA plans of any outside laboratory.

b. Sample Management

An organized, efficient sample management system is a necessary and critical foundation on which analyses of samples are based. Sample management includes document creation, bottle preparation, sample preservation, sample receipt, sample storage, chain-of-custody documentation, reporting, and sample and records retention. Sample management is practiced as specified in the Rocky Flats Plant L-Procedure L-6002, "Sample Administration - General Laboratory."

Sample bottles will be prepared by the laboratory and made available to the sampling team. The bottles will be prepared according to the analysis plan procedures and will include sample preservatives appropriate for the analytes and matrices of concern.

Samples received at the laboratories are inspected for integrity, and any field documentation is reviewed for accuracy and completeness.

Chain-of-custody and sample integrity problems are noted and recorded during sample log-in. The waste group is informed of any deficiencies and will advise the laboratory on the desired disposition of the samples. If the sampler also conducts the analysis the chain-of-custody form is not necessary.

As each sample is received by the laboratory, it is assigned a unique sequential sample number which will identify the sample in the laboratory's internal tracking system. References to a sample in any communication will include the assigned sample number. Unused sample

2. Analytical System

a. Instrument Maintenance

Instruments will be maintained in accordance with the manufacturer's specifications. More frequent maintenance may be dictated depending on operational performance. Instrument logs will be maintained to document the date and type of any maintenance performed and the rationale for maintenance.

Contracts on major instruments with manufacturers and service agencies may be used to provide routine preventive maintenance and to ensure rapid response to emergency repair service.

b. Instrument Calibration

All instruments will be calibrated using the procedures outlined in individual analytical methods found in L-Procedure, L-6220.

c. Personnel Training

Prior to conducting analyses on an independent basis, analysts are trained by experienced personnel in the correct procedures for performing the analytical methods. A list of experienced personnel qualified to do the training and perform the test, will be maintained by the laboratory. The analysis is required to independently generate data on several methods and/or matrix spikes to demonstrate proficiency in that analytical method. The type of data to be generated will be dependent on the analytical method to be performed. Results of this "certification" are then reviewed for adequacy.

d. Analytical Methods

All analytical measurements are made using methodology appropriate for the specific purpose and are performed according to a plan individually developed and optimized for each situation. The requirements of each problem are studied and thoroughly understood before hand in order to ensure the measurements planned will be adequate in kind, number, and quality. All measurements are made using standard methods, methods with peer recognition, methods developed in the specific laboratory, or those mandated by outside requirements. No method will be used for data output purposes until it is known to be applicable and competence has been acquired in its use. If or when it appears that available techniques are not adequate to solve a particular problem, the requester of the services is usually informed of any preliminary investigations or research required, including estimated costs in terms of laboratory time.

- i. **L-Procedures.** To control routinely employed analytical laboratory analyses and avoid errors leading to unsatisfactory results, formal procedures are written to provide direction for those doing the work. Instructions for performing most routine analytical laboratory operations are provided in L-Procedures, also known as Analytical Laboratory Procedures. L-Procedures are developed and written by the analytical laboratories' technical staff and apply to routinely performed analytical work.

These procedures are reviewed prior to approval by laboratory management and are subject to periodic audits. The L-Procedures for analytical methods are usually adaptations of SW-846. L-Procedures also cover other standard operating practices such as sample handling protocols, security procedures, and nuclear accountability practices. L-Procedures for analytical methods perform the following functions:

- Describe operations, materials, and equipment required.
 - Serve as training guides for indoctrination and education of personnel.
 - Identify potential hazards, safety requirements, and safeguard considerations associated with the procedure.
 - Describe calibration and standardization procedures.
 - Describe techniques for quality assessment of data (e.g., measurement control samples, replicate measurements, etc.)
 - Describe sample preparation and handling.
 - Describe data handling and calculations, including statistical analysis of the data and reporting of uncertainties.
 - Provide a format or model for report generation if appropriate.
- ii. **Nonroutine Procedures.** For non-routine analytical investigations that are encountered infrequently, written procedures are not generated. The analytical methodology, in these cases, is based upon the analyst's knowledge and skill. The data from such work are supported by documentation of good laboratory practices and data verification steps.
 - iii. **Protocol Control.** The control of written procedures and the policies for changing procedures are defined in Procedure L-1000. Master copies of all qualified procedures are maintained by the managers of the laboratory groups to which the procedures apply. Working copies of approved procedures are distributed to the responsible managers and technical staff members.

e. Reagents/Standards

All laboratory reagents and standards will be prepared and/or maintained in accordance with the procedures in "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", EPA Publication SW-846; 40 CFR Part 136, "Guidelines Establishing Test Procedures for Analysis of Pollutants; or other methods approved by the Director such as the L-Procedures.

f. Corrective Actions

When an analytical system is deemed to be questionable or out-of-control at any level of review, corrective action is taken. If possible, the cause of the out-of-control situation is determined, and efforts are made to bring the system back into control. Demonstration of the restoration of a reliable analytical system will normally be accomplished by generating satisfactory calibration and/or quality control sample data. The major consideration in performing corrective action is ensuring that only reliable data are reported from the laboratory.

3. Data Management

a. Data Collection

In addition to the data collected in the field and recorded on the chain-of-custody forms, data describing the processing of samples will be accumulated in the laboratory and recorded. Laboratory records may contain:

- Date and time of processing
- Sample numbers
- Project (optional)
- Analyses or operation performed
- Calibration data
- Quality control samples included
- Dates of Analysis
- Concentrations/dilutions required
- Instrument readings
- Special observations
- Analyst's signature

b. Data Reduction

Data reduction is performed by the individual analyst and consists of calculating results in samples from the raw data obtained from the measuring instruments. The complexity of the data reduction will be dependent on the specific analytical method and the number of discrete operations (extractions, dilutions, and concentrations) involved in obtaining sample that can be measured.

Copies of all raw data and the calculations used to generate the final results will be retained by the Permittee to allow reconstruction of the data reduction process at a later date.

c. Data Reporting

All data will be reported in a format approved by laboratory management and the laboratory QA/QC officer. Data reports will include the following information:

- Waste ID Number
- Laboratory Sample Number
- Sample Date
- Analysis Date
- For each Analyte:
 - Parameter
 - Units
 - Value
 - Flags (where appropriate)

When errors are detected in laboratory results, subsequent reports will clearly designate which results have been revised.

4. Performance and System Audits

Quality assurance audits will be conducted during the sampling and analysis program as mandated by the AL quality assurance program. The audits are a key mechanism for ensuring the technical and procedural accuracy of hazardous waste and environmental sampling analysis. A field audit will be performed periodically in accordance with an established schedule.

Specific system audits of deliverables, field notebooks, calculations, and data entry will be coordinated by the quality assurance function throughout the year on random, unscheduled intervals.

Specific audits will be planned, organized, and clearly defined before they are initiated. Auditors will identify non-conformances or deficiencies, report and document, initiate corrective action through appropriate channels, and follow up with a compliance review.

For randomly selected sites where samples are collected, an unannounced field audit, investigating conformance with QA/QC procedures will be performed during a randomly selected performance period. A written report on the results of this audit, along with a notice of non-conformance if necessary, will be submitted to management.

Annually, or more frequently if necessary, a quality assurance audit will be performed in accordance with an established schedule. A report will be prepared that summarizes any deviations from approved plans or procedures and their impacts on results.

After each audit, auditors will identify non-conformances in a written non-conformance notice and initiate corrective action. The non-conformance notice will describe any non-conforming conditions and set a date for response and corrective action. A written response outlining the proposed corrective action is required. Follow-up review will be performed as necessary to confirm that the corrective actions have been implemented.

TABLE 1

FINGERPRINT TESTS FOR WASTES SENT TO BE STORED IN HAZARDOUS OR LOW LEVEL MIXED WASTE STORAGE AREAS
(LIQUID) Page 1 of 4.

<u>Waste Type</u>	<u>Test</u>	<u>Rationale</u>	<u>Action Criteria</u>	<u>Action Alternatives *</u>
All Wastes	gross alpha gross beta gamma activity	to determine if TRU, or Low-Level or non-radioactive waste	If > 100 nCi/gram If < 100 nCi/gram If no radiation	If > 100 nCi/gram store as TRU If < 100 nCi/gram store as Low Level If no Radiation store as Non-radioactive
Acetone	appearance sp. gravity miscibility ignitability	should be liquid usually 1 phase clear/colored by solute viscous, evap. fast < 1 miscible, no reaction ignitable	multiple phases appearance of contaminants > 1 not miscible with water nonignitable	1. obtain more definitive ID 2. overpack for temporary storage 3. store as 3-A if not reactive with water and alcohol 4. store as nonignitable
Acids	appearance sp. gravity miscibility pH	liquid, 1 phase solute dependent color > 1 miscible, conc. acids may generate heat < 2	solid not miscible with water > 2	1. obtain more definitive ID 2. overpack for temporary storage
Alcohol	appearance sp. gravity miscibility ignitability	liquid, usually 1 phase solute dependent color, non-viscous should be < 1 miscible, no heat ignitable	solid very viscous > 1 generation of heat nonignitable	1. obtain more definitive ID 2. overpack for temporary storage 3. store as 3-A if not reactive with water and alcohol 4. store as nonignitable
Aqueous lab waste	appearance miscibility pH ignitability	liquid, 1 phase clear to color of solution miscible/no reaction 2-12.5 nonignitable	solid not miscible with water reacts with water ignitable pH < 2 or > 12.5	1. obtain more definitive ID 2. overpack for temporary storage 3. store as 3-A if not reactive with water and alcohol 4. store as ignitable
Blankrola	appearance miscibility ignitability sp. gravity	liquid, 1 or 2 phases clear to color of solu., non-viscous non-miscible, no reaction ignitable Sp.Gr > 1	solid miscible or reacts with water nonignitable Sp. Gr > 1	1. obtain more definitive ID 2. overpack for temp.storage 3. store as 3-A if not reactive with water and alcohol 4. store as 4-A if no reaction with oil & halo solvents 5. store as nonignitable

Halogenated solvents	<p>appearance liquid, 1 or 2 phases</p> <p>miscibility clear to color of solution non-viscous</p> <p>ignitability non-miscible, no reaction</p> <p>sp. gravity nonignitable</p> <p>Sp. Gr > 1</p>	<p>solid</p> <p>miscible or reacts w/water</p> <p>ignitable</p> <p>Sp. Gr < 1</p>	<ol style="list-style-type: none"> 1. obtain more definitive ID 2. overpack for temp. storage 3. store as 3-A if not reactive with water and alcohol 4. store as 4-A if no reaction with oils & halo. solvents 5. store as ignitable
Machine coolant	<p>appearance liquid, 1 or 2 phases</p> <p>miscibility yellow or green/cloudy</p> <p>pH miscible/no reaction</p> <p>6-8</p> <p>ignitability nonignitable</p>	<p>solid</p> <p>clear solution</p> <p>not miscible or reacts with water</p> <p>pH < 6 or > 8</p> <p>ignitable</p>	<ol style="list-style-type: none"> 1. obtain more definitive ID 2. overpack for temp. storage 3. store as 3-A if not reactive with water 4. store as ignitable
Cyanide	<p>appearance liquid, 1 phase</p> <p>miscibility clear to yellow solution</p> <p>pH miscible</p> <p>> 7</p> <p>reactive CN test - positive</p>	<p>solid</p> <p>not miscible with water</p> <p>pH < 7</p> <p>CN negative</p>	<ol style="list-style-type: none"> 1. obtain more definitive ID 2. overpack for temp. storage 3. store as 3-A if no reaction with water and alcohol
DOP	<p>appearance liquid, 1 phase</p> <p>sp gravity clear to yellow solution</p> <p>miscibility Sp. Gr < 1</p> <p>ignitability not miscible/no reaction</p> <p>nonignitable</p>	<p>solid</p> <p>miscible or reacts with water</p> <p>Sp. Gr > 1</p> <p>ignitable</p>	<ol style="list-style-type: none"> 1. obtain more definitive ID 2. overpack for temp storage 3. store as 3-A if no reaction with water and alcohol 4. store as 4-A if no reaction with oils and halo solvents 5. store as ignitable
ECM sludge	<p>appearance 1 phase</p> <p>miscibility brown sludge</p> <p>pH insoluble/no reaction</p> <p>4-9</p>	<p>solid</p> <p>miscible or reacts with water</p> <p>pH < 4 or > 9</p>	<ol style="list-style-type: none"> 1. obtain more definitive ID 2. overpack for temp storage 3. store as 6-A if no reaction with water & alcohol 4. store as 6-A if no reaction with oils and halo solvents
Fixer	<p>appearance liquid, 1 phase</p> <p>miscibility clear to off-white solution</p> <p>pH miscible/no reaction</p> <p>6-8</p> <p>ignitability nonignitable</p>	<p>solid, not miscible or reacts w/water</p> <p>ph < 6 or > 8</p> <p>ignitable</p>	<ol style="list-style-type: none"> 1. obtain more definitive ID 2. overpack for temp. storage 3. store as 3-A if no reaction with water and alcohol 4. store as ignitable
Non-halogenated	<p>appearance liquid</p> <p>sp gravity clear/color dependent on solute, usually non-viscous</p> <p>miscibility Sp. Gr. < 1</p> <p>ignitability miscibility depends on chemical, not exothermic</p> <p>ignitable</p>	<p>solid, very viscous</p> <p>Sp. Gr. > 1</p> <p>reacts with water</p> <p>nonignitable</p>	<ol style="list-style-type: none"> 1. obtain more definitive ID 2. overpack for temp. storage 3. store as 3-A if on reaction with water & alcohol 4. store as 4-A if no reaction with oils and halo solvents 5. store as nonignitable

Organic lab waste	<p>liquid</p> <p>appearance dark color, may have small water phase</p> <p>organic odor</p> <p>miscibility not miscible/no heat</p> <p>pH of water mix should be = or < 7</p> <p>ignitability ignitable</p>	<p>solid, non organic</p> <p>odor</p> <p>miscible or reacts with water</p> <p>pH > 7</p> <p>nonignitable</p>	<ol style="list-style-type: none"> 1. Obtain more definitive ID 2. overpack for temp. storage 3. store as 3-A if no reaction with water and alcohol 4. store as 4-A if no reaction with oils and halogenated 5. store as nonignitable
Oxout	<p>liquid</p> <p>appearance clear to yellow, 1 phase</p> <p>miscibility miscible, reacts with bicarbonate</p> <p>pH < 2</p>	<p>solid, 2 phase</p> <p>non-miscible with water</p> <p>pH > 2</p>	<ol style="list-style-type: none"> 1. obtain more definitive ID 2. overpack for temp. storage 3. store as 3-A if no reaction with water and alcohol 4. store as 4-A if positive for nitrate
Paint	<p>liquid often a solid phase is present</p> <p>appearance colored/viscous/paint</p> <p>50/50 water not miscible-oil base miscible-latex</p> <p>no reaction</p> <p>ignitability oil base - ignitable</p> <p>latex - non ignitable</p>	<p>colorless liquid or non-sludge like solid</p> <p>non viscous</p> <p>oil base-non ignitable</p> <p>latex-ignitable</p>	<ol style="list-style-type: none"> 1. obtain more definitive ID 2. overpack for temp. storage 3. store as 3-A if no reaction with water and alcohol 4. store as 4-A if no reaction with oils and halo solvents 5. revise ignitable classification
Scintillation Cocktail	<p>liquid</p> <p>appearance water white, sometimes 2 phases</p> <p>cloudy /yellow</p> <p>ignitability ignitable</p>	<p>solid</p> <p>non-viscous</p> <p>non-ignitable</p>	<ol style="list-style-type: none"> 1. obtain more definitive ID 2. overpack for temp. storage 3. store as 3-A if no reaction with water and alcohol 4. store as 4-A if no reaction with oils and halo solvents 5. store as nonignitable
Mixed solvent-freon alcohol/water	<p>liquid</p> <p>appearance white to yellow 2 phases</p> <p>miscibility get unequal phase separation, no heat</p> <p>ignitability depends on alcohol content</p>	<p>solid, 1 phase</p> <p>not partially miscible</p> <p>reacts with water</p>	<ol style="list-style-type: none"> 1. obtain more definitive ID 2. overpack for temp. storage 3. store as 3-A if no reaction with water and alcohol 4. store as 4-A if no reaction with oils and halo solvents
Waste water	<p>liquid</p> <p>appearance clear to dirty</p> <p>multiple or 1 phase</p> <p>miscibility miscible, no heat</p> <p>ignitability nonignitable</p>	<p>solid</p> <p>not miscible with water, reacts with water</p> <p>ignitable</p>	<ol style="list-style-type: none"> 1. obtain more definitive ID 2. overpack for temp. storage 3. store as 3-A if no reaction with water or alcohol 4. store as 4-A if no reaction with oils and solvents 5. store as ignitable
Zyglo	<p>liquid</p> <p>appearance fluorescent yellow/green or red 1 phase</p> <p>miscibility not miscible, no reaction</p> <p>ignitability nonignitable</p>	<p>solid</p> <p>no fluorescent color</p> <p>miscible/reaction</p> <p>ignitable</p>	<ol style="list-style-type: none"> 1. obtain more definitive ID 2. overpack for temp. storage 3. store as 3-A if no reaction with water and alcohol 4. store as 4-A if no reaction with oils and halo solvents 5. store as ignitable

Used oil	<p>appearance sp. gravity miscibility ignitability</p>	<p>should be liquid yellow to brown viscous Sp. Gr. < 1 not miscible, no reaction ignitable</p>	<p>solid non viscous Sp. Gr > 1 reaction nonignitable</p>	<p>obtain more information obtain more information obtain more information store as 4-A store as nonignitable</p>
Coolant	<p>appearance sp. gravity miscibility pH</p>	<p>should be liquid yellow,green, rust color Sp. Gr. > 1 miscible/no reaction 6-8</p>	<p>solid unclean solution Sp. Gr. < 1 reaction <2 or >12</p>	<p>obtain more information obtain more information obtain more information store as 4-A store as corrosive</p>
PCB contaminated liquid waste	<p>appearance PCB test ignitability</p>	<p>liquid clear/yellow/brown, usually viscous positive ignitable</p>	<p>appearance of solids negative nonignitable</p>	<p>obtain more data from generator treat as non PCB contaminated waste store as nonignitable</p>
Other Wastes	<p>physical description pH sp Gravity ignitability</p>	<p>to determine if waste matches the description from generator</p>	<p>does not match generator description of waste</p>	<p>obtain more definitive ID return to generator for redetermination and analysis to fully characterize the waste</p>

TABLE 2.
FINGERPRINT TESTS FOR WASTES SENT TO BE STORED IN HAZARDOUS OR LOW LEVEL MIXED WASTE STORAGE AREAS
(SOLID)

Waste Type	Test	Rationale	Action Criteria	Action Alternatives *
All Solid Waste Forms	Paint filter or penetrometer, or real time radiography	to determine if free liquids are present	Presence of free liquids	Store as liquid or reprocess to solidify
Magnesium chips	appearance miscibility reactivity	solid metal chips/no moisture, release H ₂ , especially if a little acid added reacts with dil. acid	liquid non-metallic does not react with dilute HCl	1. obtain more definitive ID
Mercury	appearance	liquid silver/liq. droplets form spheres	solid, not metallic liquid, droplets do not form spheres	1. obtain more definitive ID
Sample & clean-up waste equipment	appearance other	solid paper, gloves, debris no free liquid depends on spl. or spill	fingerprint samples are not routinely taken on this type of waste	1. obtain more definitive ID
Waste wipes	appearance	solid paper, rags,	non combustible	return to generator
Waste water sludge	content code appearance	process knowledge black color with absorbent material mixture	not on approved list unusual color, excess absorbent	reject waste return to generator return to generator
Solidified salt	content code appearance	process knowledge should be solid grayish in color	not on approved list not whole, unusual color	reject waste return to generator
Drummed cemented sludge	content code appearance	process knowledge should be solid grayish in color	not on approved list not whole, unusual color	reject waste return to generator
Cemented composite chips	content code appearance	process knowledge should be solid grayish in color	not on approved list not whole, unusual color	reject waste return to generator

TABLE 3.
 FINGERPRINT TESTS FOR WASTES SENT TO BE STORED IN HAZARDOUS OR LOW LEVEL MIXED WASTE STORAGE AREAS
 (CONTAINERIZED GAS)

Waste Type	Test	Rationale	Action Criteria	Action Alternatives *
Containerized Gases	gas identification verification (infra red or mass spec)	process knowledge	not on approved list	reject waste return to generator

TABLE 3.

COMPATIBILITY CODE CROSS REFERENCE												
Compatibility Code												
	1-A	1-B	2-A	2-B	3-A	3-B	4-A	4-B	5-A	5-B	6-A	6-B
Y es	1-A 5-A	1-B	2-A		3-A 4-A 5-A		3-A 4-A 5-A		1-A 3-A 5-A		6-A	
N o	1-B 2-A 3-A 4-A	1-A 2-A 3-A 4-A 5-A 6-A	1-A 1-B 4-A	2-A	1-A 1-B 2-A 3-B 6-A	3-A 4-A	1-A 1-B 2-A 4-B 6-A	4-A 3-B	1-B 5-B	5-A	2-A 3-A 4-A 6-B	6-A

Yes: Compatible

No: Not Compatible

* Means not compatible with some items in the group.

TABLE 4.
Part 1 of 2.

ANALYTICAL METHODS FOR LABORATORIES OUTSIDE THE PSZ			
ANALYTE	METHOD DESCRIPTION	BASE METHOD	PROCEDURE
Inorganic	ICP		
	Digestion Aqueous	3010	L-6219
	Digestion Solid	3050	L-6219
	Analysis	6010	L-6219
Inorganic	AA	3000 Series	L-6233
	Digestion	3000 Series	L-6233
		7000 Series	L-6177
	Analysis	7000 Series	L-6203
Volatile	GC-MS	8240	L-6230
Base/Neutral/Acid	GC-MS		
	Extraction Liq/Liq	3510	L-6218
	Extraction soxhlet	3540	L-6218
	Extraction sonication	3550	L-6218
	Analysis	8270	L-6216
EP Toxicity	Extraction	1310	L-6209
EP Tox Leachate	AA Analysis	3000 Series	L-6206
	ICP Analysis	6010	L-6200

TABLE 4
Part 2 of 2.

ANALYTICAL METHODS FOR LABORATORIES OUTSIDE THE PSZ.			
ANALYTE	METHOD DESCRIPTION	BASE METHOD	PROCEDURE
Reactivity:			
Cyanide	Preparation	7.3.3	None
	Analysis	9010	None
	Analysis	9012	L-6238
Hydrogen Sulfide	Preparation/Analysis	7.3.4	L-6214
Corrosivity	pH Meter Aqueous	9040	L-6215
	pH Meter Solid	9045	L-6215
Ignitability	Setaflash	D. 3278-82*	None
	Pensky Martens	1010	L-6220
Total Amenable Cyanide	Preparation/Analysis	9010	None
	Preparation/Analysis	9012	L-6238
	HACH Test Kit	None	L-6220
Total Dissolved Sulfides	Preparation/Analysis aqueous	9040	L-6215
	Preparation/Analysis solid	9031	None
TCLP	Preparation/Analysis	6 CCR 268 Appendix I	None
Free Liquids	Paint Filter/RTR Visual/Pentrometer	9095	None

* Reference number is for ASTM test methodology.

TABLE 5.
Part 1 of 2.

ANALYTICAL METHODS FOR LABORATORIES INSIDE THE PSZ			
ANALYTE	METHOD DESCRIPTION	BASE METHOD	PROCEDURE
Inorganic	ICP		
	Digestion aqueous	3010	None
	Digestion solids	3050	None
	Analysis	6010	None
Inorganic	Atomic Absorption		
	Digestion	3000 Series	None
		7000 Series	None
	Analysis	7000 Series	None
	Selenium	Sodium Borohydride	None
Volatile	GC-MS	8240	L-4100
Base/Neutral/Acid	GC-MS		
	Extraction Liquid/Liq	3510	L-4142
	Extraction Soxhlet	3540	L-4142
	Extraction sonication	3550	L-4142
	Analysis	8270	None
EP Toxicity	Extraction	1310	None
EP Tox Leachate	AA Analysis	3000 Series	None
		7000 Series	None
	ICP Analysis	6010	None

TABLE 5.
Part 2 of 2.

ANALYTICAL METHODS FOR LABORATORIES INSIDE THE PSZ.			
ANALYTE	METHOD DESCRIPTION	BASE METHOD	PROCEDURE
Reactivity:			
Cyanide	Preparation		None
		7.3.3	None
	Analysis	9010/9012	None
Hydrogen Sulfide	Preparation/Analysis	7.3.4	None
Corrosivity	pH Meter Aqueous	9040	None
	pH Meter Solid	9045	None
Ignitability	Setaflash	D 3278-82*	None
	Pensky-Martens	1010	None
Total/Amenable Cyanide	Preparation/Analysis	9010/9012	None
	HACH Test Kit	None	None
Total Dissolved Sulfides	Preparation/Analysis aqueous	9030	None
	Preparation/Analysis solid	9031	None
TCLP	Preparation/Analysis	6 CCR 268 Appendix I	None
Free Liquids	Paint Filter/RTR Visual/Penetrometer	9095	None

* Reference number is for ASTM test methodology.

TABLE 6.

ANALYTICAL METHODS FOR FINGERPRINT ANALYSIS (L-6220)	
TEST	METHOD DESCRIPTION
Appearance	Physical identification, color viscosity, phase and odor.
pH	Electrode or pH paper.
Ignitability	Match test, Pensky-Martens closed cup tester or Set-a-Flash.
Specific Gravity	Hydrometer
Miscibility	50/50 mixture with water.
Reactivity	50/50 mixture with water or waste surrogate.
Chlorinated Solvents	Colorimetric test or Beilsten test.
PCB	Colorimetric test
Cyanide	Electrode or Colorimetric test.
Free Liquids	RTR or Paint Filter test, penetrometer or visual.
Nitrates	Colorimetric test

TABLE 7.

MATRIX SPECIFIC SAMPLE METHODS		
MATRIX	ABB.	SAMPLE METHOD
Aqueous	aqu.	bailer, coliwasa, dipper, pour, pump, theif, weighted bottle, sample tap, wipe sample.
Liquid	liq.	bailer, coliwasa, dipper, pour, pump, theif, weighted bottle, sample tap, wipe sample.
Oil	oil	coliwasa, dipper, pout, pump, scoop, theif, sample tap, wipe sample.
Sludge	slu.	scoop, wipe sample, shovel, grab, (hand, tongs, tweezers, etc.)
Solid	sol.	grab, (hand, tongs, tweezers, etc.), scoop, tin snips, wipe sample.

PART V-PROCEDURES TO PREVENT HAZARDS

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PART V-PROCEDURES TO PREVENT HAZARDS

The information provided in this section is submitted in accordance with the requirements of 40 CFR 270.14(b)(4),(5),(7),(8), and (9) and 6 CCR 100.41(a)(4),(5),(8), and (9). The section addresses the following subject areas.

- General security provisions;
- Inspection schedule;
- Preventive procedures, structures, and equipment; and
- Prevention of accidental ignition or reaction of ignitable, reactive, or incompatible wastes.

A. SECURITY

1. Security Procedures and Equipment

a. 24 Hour Surveillance System

A 24-hour surveillance system is provided at the Rocky Flats Plant Site to monitor and control entry into the facility. The Plant Security Department has uniformed guards to provide protection service. Armed guards are stationed at the entrances to the plant 24 hours per day to monitor vehicle and personnel traffic into the area.

All persons entering the plant must have an appropriate security badge. Visitors are allowed at the site only with prior approval and are issued a temporary badge by the guards prior to being admitted to the plant. A justification form must be completed prior to entry. Badges must be shown to the guard along with a registered vehicle pass upon entering the main facility. All personnel must wear their badges fully displayed while onsite.

Visitors without permanent visitor badges must be escorted within certain areas of the plant by a Prime Operating Contractor or Department of Energy (DOE) employee. All visitors must return their temporary badges by depositing the badge into a marked Visitor Badge Return Dropbox located at each guard gate prior to departing the site.

The gate guard posts are located on the east and west sides of the plant. The posts maintain 2-way radio and telephone communications with the plant protection dispatch station. Closed circuit television provides continuous monitoring of the four entry gates and selective monitoring of the hazardous waste facilities.

b. Barrier and Means to Control Entry.

The boundary of the Rocky Flats Plant Site is surrounded by a three strand barbed wire cattle fence. There are two gates in the fence, located on the access roads, one on the west side and one on the east side of the plant. Access through these gates is controlled by armed guards 24 hours a day.

The production and support areas of the plant are surrounded by a six foot high, chain link fence, topped with two feet of three strand barbed wire. There are also two main gates in this fence on the east and west sides of the plant. These gates are electrically operated by armed guards 24 hours a day. Within the production and support areas there are internal security areas that isolate classified information and nuclear material from the remaining controlled area of the plant.

c. Warning Signs.

The Rocky Flats Plant Site is a high security area and is visibly posted as such. Signs legible from a distance of 25 feet are posted at the entrances to the site and every 150 feet on the perimeter fence. These signs are visible from all approach angles and state "Authorized Personnel Only; Keep Out".

The hazardous waste storage and treatment facilities in the plant are posted with signs stating "Hazardous Waste" and "Danger Unauthorized Personnel Keep Out". If ignitable wastes are stored or treated in the area, a "No Smoking" sign is also posted. The lettering on all signs is at least 2 inches high. The warnings are visible from 25 feet for all approaches to each area. All signs are printed in English.

2. Waiver

A waiver from the security requirements is not being requested.

B. INSPECTION SCHEDULE

1. General Inspection Requirements

Rocky Flats personnel conduct regular inspections of the facility to ensure that equipment is properly maintained and functioning and that no discharges or leaks have occurred or have the potential to occur. As part of the Rocky Flats hazardous waste training courses, personnel have received general training concerning hazardous waste inspections. In addition, these personnel have been instructed on-the-job to conduct the specific inspections in their area.

The inspection checklists specify a schedule to ensure that inspections take place at the appropriate frequencies. The frequency of inspection varies according to the type and age of the equipment, frequency of use, and the role the equipment plays in the prevention of an environmental incident.

The inspection checklists identify any potential problems that may occur at each waste management facility. Problems that are noted during the inspection will require immediate remedial action. The type of remedial action to be taken (and the subsequent time needed to implement the action) are dependent on the type of problem noted during the inspection. Any actions taken will be described on the inspection checklist where the problem was noted.

2. Specific Process Inspection Requirements

The specific inspection requirements for each treatment or storage facility are outlined below.

a. Container Inspection

Weekly inspection of container storage areas identify the status of warning signs, container condition, container inventory, spill control and personnel protective equipment (including structures such as dikes and pads), and the condition of aisle space and access routes. Required aisle space for container storage areas is specified in Part III of this permit.

b. Main Hazardous Waste Storage Area (Unit 1)

Containers of hazardous waste are stored in modified steel or aluminum cargo containers. The containers are 20 or 40 feet long, eight feet wide and a minimum of eight feet high. The cargo containers are fitted with waste compatibility code signs, air vents, electrical grounds, and locks.

A catch basin partially lines the floor of each cargo container used to store liquids. Each catch basin is sized to contain a minimum of 10% of the volume of all liquids contained within. The approximately 20-foot long cargo container's catch basin is capable of holding a minimum of 110 gallons. The volume of the catch basin in the nominally 40-foot long container is a minimum of 220 gallons. 55-gallon drums are stored on conveyors or a double floor within the catch basin. The conveyors consist of 1-3/4 " diameter aluminum rollers on 3" centers as described in Figure III-3, (Typical Cargo Container) on page 26 of this permit.

The hazardous waste storage area is composed of 28 modified cargo containers located in the buffer zone northwest of the production and support area. The storage area is inspected weekly to ensure that spill response equipment is maintained in storage within the unit boundaries. The cargo containers are inspected weekly to be sure that container condition is adequate and no leakage has occurred. The catch basins with conveyer systems are checked weekly for corrosion and container leakage. The double floored cargo containers are inspected quarterly by lifting the inside floor panels to inspect the catch basin beneath. The unit area is checked weekly to ensure that emergency response equipment can access the facility. A fire extinguisher is stored inside the spill response equipment storage shed.

c. Drum Storage Area: Building 561 (Unit 10)

Fifty-five gallon drums or other DOT approved containers are stored in modified steel or aluminum cargo containers located near Building 561.

A catch basin partially lines the floor of each cargo container used to store liquids. Each catch basin is sized with a 2.6 inch integral lip, to contain a minimum of 10% of the volume of all liquids contained within. The approximately 20-foot long cargo container is capable of holding a minimum of 110 gallons. The volume of the catch basin in the approximately 40-foot long container is a minimum of 220 gallons. 55-gallon drums are stored on conveyors or a double floor as described in the previous unit and in Figure III-3, (Typical Cargo Container). A minimum 26-inch wide aisle space extends down the center of the cargo container. The cargo containers are inspected weekly to be sure that container condition is adequate and no leakage has occurred. The catch basins with conveyor systems are checked weekly for corrosion and container leakage. The double floor cargo containers are inspected quarterly by lifting the inside floor panels to inspect the catch basin beneath. The unit area is checked weekly to ensure that emergency response equipment can access the facility. A fire extinguisher and spill response equipment are present at the storage area.

Weekly inspections conducted include observation of the catch basin, container integrity, the aisle width and an inventory of the spill kits and fire extinguishers. "No Smoking" signs will be visibly posted at the unit perimeter.

d. Drum Storage Area: Building 776 (Unit 12).

The Building 776 mixed waste drum storage area is located in Room 237 on the second floor. The area, 59-feet by 29-feet, is surrounded by a minimum 1.8-inch high berm or wall.

The drums are arranged in rows so they can be inspected for leaks and damage. A fence encloses the storage area, restricting movement through it. Weekly inspections include observation of container integrity, secondary containment integrity, and unobstructed aisle space. Spill response equipment and fire extinguishers are maintained within Building 776 and are readily available to the unit.

e. Mixed Waste Storage Area: Building 884 (Unit 13)

The mixed waste drum storage for mixed waste generated outside of the Perimeter Security Zone (PSZ) is located in Building 884. The storage area is 80-feet by 40-feet with walls and roof made of corrugated steel. The floor is concrete. Waste types stored in Unit 13 are specified in Part III of this permit. Solid wastes may also be stored in other DOT approved containers.

Liquid waste drums are contained in fiberglass, coated steel or stainless steel catch pans that have a 2.6-inch integral lip, which can provide secondary containment for 10% of the total volume of the waste stored in the catch basin. Drums will be segregated in separate catch basins according to waste type in order to separate incompatible wastes. The 55-gallon steel drums or other DOT approved containers are arranged in rows so that they can be inspected for leaks and damage.

Weekly inspections of the unit include observation of the secondary containment, container integrity, unobstructed aisle space, and an inventory of the spill response equipment located at the storage area. A fire extinguisher is present at the area.

f. Gas Cylinder Storage Area: Building 952 (Unit 23)

The gas cylinder storage building is a ten foot square corrugated steel building located in an isolated area. It sits on a concrete pad which is two inches thick. Beneath the steel roof is a metal screen for ventilation, and floor level vents are also located around the building base. The door to the building is fitted with a lock and the building is grounded.

Weekly inspections are conducted to observe container integrity, the concrete pad on which the cylinders are placed, careful check of the ventilation, adequate number of signs and make certain that the building is locked.

g. Mixed Waste Storage Area: Building 964 (Unit 24)

Building 964 is a 41-foot by 160-foot corrugated metal building with a concrete floor which will be used for storage of solid mixed wastes. Waste types stored in Unit 24 are specified in Part III of this permit.

Weekly inspections of this area will include visual observation of container integrity for all containers in storage, observation of the concrete floor to detect spills and conducting an inventory and check of the facility spill response equipment.

h. 904 Pad: Mixed Waste Storage Area (Unit 15-A)

This mixed waste storage area is located outside the PSZ area, on the 904 pad, on the south side of Central Avenue, approximately 750 feet west of the East Guard Building 900.

The portion of the storage pad included in this permit is approximately 296-feet by 66-feet, and is constructed of six inches of Number 6 roadbase topped with three inches of asphalt.

Cargo containers will be used to store containers of liquid and solid mixed wastes. The cargo containers are approximately 20 or 40 feet long, eight feet wide, and eight feet high. The cargo containers are fitted with electrical grounds, air vents, locks and appropriate signs. A coated steel, fiberglass or stainless steel catch basin with a 2.6-inch integral lip designed to provide secondary containment for 10% of the total volume of the waste contained in the catch basin.

Fifty-five gallon steel drums or other DOT approved containers are stored within the area of the catch basin. An aisle wide enough to safely access the drums extends down the middle of each cargo container. Aisle space is specified in Part III of this permit. Weekly inspection of this area includes observations of the storage unit and containment structures.

Wood or metal crates containing solid wastes may also be stored outside the cargo containers at Unit 15-A. These crates will be stacked no more than three high.

The cargo containers, crates, and 55-gallon drums are inspected for structural integrity and signs of deterioration or leakage. Proper aisle space inside the cargo containers is checked. The aisle space between the crates and cargo containers is also inspected to ensure access is available for emergency response equipment. Spill response equipment is also maintained within the unit.

i. **Building 777: Mixed Waste Drum Storage Area (Unit 17)**

The mixed waste storage area in Building 777 is located in Room 432C. The allocated space for storage is approximately 24 square feet. This area will be permitted for the storage of solidified scintillation cocktail. Drum lids are fitted with carbon filter inserts to prevent pressurization. Generation of this waste has ceased. Occasionally, it is necessary to store other drums of non-routine, tritium contaminated, non-RCRA regulated material in this room. Radiation safety is the determining factor for storage in this location.

Weekly inspections of this area include observation of the integrity of the drums and surrounding floor area; the area will also be checked for signs of leakage. Spill response equipment is maintained in Building 777.

j. **Building 776: Mixed Waste Drum Storage (Unit 27)**

A drum storage area for 55-gallon drums of mixed waste has been designated in Room 201 of Building 776. This 20-foot by 20-foot area is located between columns G9, G10, H9, and H10. The area is presently fenced for storage of plutonium contaminated mixed wastes generated inside the Perimeter Security Zone.

Weekly inspections of this area include observation of the integrity of the 55-gallon drums and the 20-foot by 20-foot floor area. The area will also be checked for signs of leakage or spills. Spill response equipment is stored within Building 776, available for use at Unit 27.

3. Security, Safety, and Emergency Equipment Inspections

The specific procedures for security inspections are considered sensitive information. They are detailed in documents entitled "Physical Protection of Security Interest" and "Plant Protection General Orders". These documents are maintained by the plant security force at Rocky Flats and are available for review by approved personnel.

Much of the on-site safety equipment is inspected by the Rocky Flats Fire Department. This includes the fire phone system, the on-site ambulances, the emergency self-contained breathing apparatuses (SCBAs), building sprinkler systems, manual and automatic fire alarms, fire extinguishers, fire hydrants, smoke detectors, cooling tower shutdown alarms, and firehoses. These items are checked to insure that they are functioning properly and no deterioration has occurred.

Emergency power generators are inspected and tested by the Utilities Department at least monthly. The inspection and testing procedures and schedules are detailed in a document entitled "Alternate Power Source Test Procedures". This information is considered sensitive and therefore will be available for review by authorized personnel in Utilities, located at Rocky Flats in Building 124.

Emergency eyewashes and safety showers are inspected by a division of the Custodial Department. Each item is checked monthly to insure that it is in good operating condition. They are then tagged with the inspection date and the name of a person to contact if building personnel notice a malfunction between inspections.

4. Remedial Action

Any problems noted during an inspection are brought to the attention of the unit's supervisor and the building superintendent, and action is taken to correct the problem. The remedial actions taken are described on the inspection checklist where the problem was first noted. The item is dated when the remedial action is complete.

5. Inspection Logs

Inspection checklists are maintained by each waste management unit's supervisor or the building superintendent. The checklists are kept at least three years. They will be kept during any enforcement action by the Director or the Environmental Protection Agency at least for the duration of the enforcement action and possibly longer if dictated by a compliance agreement. The inspection logs identify the inspector, date and time of inspection, frequency of inspection; and specific items to be checked for each waste management facility. Any problems are noted on the form and the date the remedial action is completed is recorded. An example inspection log for container storage facilities is presented in Figure 1, (Sample Inspection Log). All container storage area inspection logs will contain the information listed above as a minimum requirement.

C. PREPAREDNESS AND PREVENTION REQUIREMENTS

1. Internal Communications

All personnel at the hazardous waste facilities are able to request emergency assistance if needed. At remote locations, such as the main hazardous waste storage area, this is done by two-way radio contact over reserved channels with the Fire Department and with Plant Security. Hazardous waste facilities within the buildings use the plant telephone system (Extension 2911) or the fire phones to report any emergencies.

The fire alarm system and the Plant LW/PW Public Address system are used to notify facility personnel of an emergency situation and provide immediate emergency instruction to personnel. The Plant Security dispatcher has access to the LW/PW system to make announcements concerning an emergency situation. Some buildings have a PA system which is part of the plant LS/PW system and can be accessed by the Building Manager.

2. External Communications

Off-site communications with Federal and State agencies, hospital facilities and other agencies are maintained by telephone, two-way radio systems, and the Metropolitan Emergency Telephone System (METS). The METS is a Denver Metro Area emergency notification and information system with approximately 50 subscribers that include law enforcement, government agencies, emergency organizations and news media.

3. Emergency Equipment

Rocky Flats emergency equipment consists of fire control equipment, spill response equipment and decontamination equipment. Each unit in this permit will have spill response equipment available for emergency response. Part VI of this permit provides additional information concerning the number and types of emergency response equipment available at the site.

A list of the minimum contents of spill response kits/equipment for various types of spills (i.e. acid, base, solvent, other inorganic) shall be maintained at the facility.

4. Water For Fire Control

The Rocky Flats Plant has a series of fire hydrants available to provide water of adequate volume and pressure for fire control. A current list of the locations of all fire hydrants shall be maintained at the facility. The Rocky Flats Fire Department has a pumper tank truck to provide a supply of water to outlying areas not within the fire hydrant distance. Automatic sprinkler systems and fire extinguishers are located in the buildings as per National Fire Protection Agency (NFPA) codes.

5. Aisle Space Requirements

Adequate aisle space will be provided at the hazardous waste storage facilities to allow for the unobstructed movement of personnel, fire protection or spill control equipment in the event of any emergency. Aisle space requirements for permitted container storage areas are specified in Part III, "Container Storage". Weekly inspections are conducted to ensure that aisles are kept clear.

D. PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT

The facility currently maintains a general set of procedures which address the health, safety and environmental concerns related to plant operations. New employees are required to attend training regarding environmental procedures and policies, fire prevention and control procedures, and general safety awareness.

Safety meetings are conducted to discuss topics of fire prevention and control, safety problems and procedures, good housekeeping programs and any problems related to each particular work area. Records of meetings attended by the employee are kept in his or her personnel files and are reviewed to insure that each employee has met the required training program requirements. Additional programs include training sessions, reward incentives through the Sentry Safety Award Program and the Good Housekeeping Program. There are monthly and detailed annual inspections conducted by the Fire Department, Industrial Hygiene and Industrial Safety Departments. Deficiencies are noted in formal reports that are sent to the appropriate management. A Health, Safety and Environment Department representative is assigned to each area of the plant to review the safety of operations.

1. Loading, Unloading, and Waste Transfer Operations

To prevent accidents and spills during transport and unloading operations in these areas, hazardous or mixed wastes will be handled by facility personnel trained in correct handling procedures and in proper spill response. Wastes are kept on loading docks for less than 24 hours and are monitored during that time to ensure that no spills or other releases occur. When wastes are transferred from containers to tanks, the containers are open for only a minimal length of time to prevent the possibility of spills or leakage.

Loading and unloading of drums and smaller containers is conducted using approved procedures set forth in the Rocky Flats Traffic Department On-Site Transportation Manual. The hand brake of the transport vehicle must be engaged and the wheels chocked during loading and unloading operations.

On-site transport of hazardous waste complies with procedures set forth in the On-Site Transportation Manual, and the applicable CHWA regulations. All drivers are trained in the correct transport procedures. This way the threat of accidental release of any hazardous wastes to the environment is minimized.

Drums and other containers containing liquid or solid wastes are transported in covered trucks with roll-down doors. Trucks carry a maximum of twenty-five 55-gallon drums, and trucks transfer full loads of drums most often. For truckloads with less than 25 drums, the drums are secured with a locking bar mounted on the truck. This prevents the drums from moving and assures the safe transport of the drums. Crates and boxes of solid wastes are transported on flatbed trucks. The crates and boxes are never stacked more than two high, and are secured in place with nylon straps. Compressed gas cylinders are transported on trucks with racks on which the cylinders are securely mounted. Cylinders are not transported without proper valve protection unless the cylinders are properly mounted for use in a service cart.

Wastes are always transported in approved vehicles on approved routes.

Ramps have been installed where necessary to permit fork-lifts, hand trucks, or dollies to negotiate containment curbing.

End aisle space is wide enough to allow access of this equipment. Aisle space between rows of drums is specified in Part III of this permit.

The loading and unloading areas are inspected daily for evidence of spillage or leakage and to ensure that the loading docks are used as staging areas just prior to transport rather than for storage of hazardous or mixed wastes.

Special precautions are taken during the loading, unloading, and transport of ignitable wastes. Procedures ensuring a non-sparking environment are always followed when handling ignitable wastes. These procedures include the following precautions:

- o Cargo containers where ignitable wastes are stored are grounded.
- o Containers are grounded during waste transfer operations.
- o Tank trucks carrying ignitable wastes are grounded during loading/unloading operations.
- o "No sparking" bung wrenches are used to open drums.
- o When transferring waste from a container to a tank, the containers are only open for a minimal length of time.

2. Run-off and Run-on

Site operations are designed to minimize the exposure of waste management facilities to run-on. Site drainage is designed to handle a 10-year, 24-hour storm

so the site is effectively drained during and immediately after precipitation events. Refer to the Surface Water Management Plan for details.

To prevent run-on, most of the facilities to be permitted are located within permanent buildings. Perimeter exterior drainage systems are located at permanent buildings to control the run-on.

All hazardous and mixed wastes stored outside are elevated off the ground to prevent run-on problems. All loading docks are raised and/or covered to prevent run-on. No liquid wastes are stored outside. Detailed information concerning the permitted units is given in Part III of this permit.

The facilities that are located outside of buildings involve tank and container storage of hazardous waste, and storage of pond crete and salt crete containers. The tank and liquid container storage facilities outside of buildings are located within impermeable berms to protect them from coming into contact with run-on and to prohibit the accidental migration of any spilled material by run-off transport. The pond crete and salt crete storage pad is located on a sloped area to prevent run-on from coming in contact with the wastes. The reinforced cardboard boxes and plywood boxes are located on wood pallets and covered with tarps to prevent damage to the boxes from precipitation and to eliminate the possibility of contaminated run-off.

Liquids that accumulate in any of the bermed areas are sampled to determine if the liquid is contaminated. If contaminated, the liquid is pumped into drums and handled as hazardous waste. If the liquid is not contaminated, it is pumped to the storm drainage system.

3. Water Supply Protection

Containment is provided for all liquid waste management facilities to prevent contamination of domestic drinking water supplies resulting from a spill of wastes. The natural drainages onsite have a series of basins to contain spillage should any of the other containment structures fail.

Any releases to the soil or surface water are controlled and cleaned up as quickly as possible to prevent the spread of contamination that might threaten water supplies. Part VI of this permit details the equipment and personnel available onsite to ensure prompt clean up of any spill.

The specific response procedures to minimize the impact of hazardous waste in the event of a release to the plant surface water control system is specified in the Surface Water Management Plan. The procedures for comprehensive community notification of releases, remedial actions and evacuations are given in Part VI of this permit.

The procedure for sampling and analysis of surface water prior to discharge from the facility are specified in the Surface Water Management Plan.

4. Mitigation of Effects of Equipment Failure and Power Outages

Rocky Flats utilizes a preventive maintenance scheduling and recordkeeping (PMO or preventive maintenance order) systems to ensure proper operation of hazardous waste equipment. This system is operated by the Maintenance Department and is on a computer call-up based on frequencies determined by past practice or equipment manufacturer's recommendations. Any item found to be deficient during the PMO check is reported and a work order issued for immediate service or replacement. The program is described and documented in a manual which is prepared and updated by the Maintenance Department.

Spare parts as required for quick repair and long lead time items are stored on the plant site for use in repairs. Manufacturer's recommendations and past repair records are used to determine the necessary spare parts to be stocked by the warehouse.

Facility personnel are trained in inspection of equipment and emergency procedures to assure proper personnel action in the event of equipment failure. Emergency power systems onsite are available as back-up power sources during power outages. The emergency power system is activated 20 seconds after a power failure. This short time period minimizes the effects of a power failure and assures no release of hazardous materials to the environment.

A description of the emergency power system is given in Part VI permit.

5. Personnel Protective Equipment

Plant personnel are directed by Industrial Hygiene and Industrial Safety to wear the appropriate safety equipment for a specific working area. Each employee is responsible for obtaining and ensuring the proper fit of each piece of safety equipment. If an employee notices a defect, it is that employee's responsibility to replace the equipment and notify the appropriate personnel to facilitate timely repair. Each employee is also responsible for notifying each individual up the chain of command as to the nature and the corrective action necessary for the safe completion of the task in question. To facilitate this process all employees are trained in the safe operating practices to be used in handling hazardous and radioactive mixed wastes. The Rocky Flats Plant maintains onsite a large inventory of monitoring instruments available from the Health, Safety and Environment Department.

Hazardous waste incidents are evaluated by Industrial Hygiene to identify the protective equipment requirements for the protection of facility personnel. Upon identifying the type and concentration of the contaminants involved, a decision is made as to the level of respiratory protection which will be required. Only those respiratory protective devices that have received NIOSH certification are used. All respiratory devices are maintained in compliance with OSHA requirements and are issued only to qualified employees who have received medical approval and training.

The Plant Fire Department has a large inventory of personnel protective equipment for responding to fires or spills. This includes Class 1 fire gear for all firefighters consisting of polyvinyl chloride (PVC) hip boots, self-contained breathing apparatuses (SCBAs), and helmets, and different types of fully encapsulating suits. SCBA's are also located in the production buildings on the plant. Part VI of this permit contains additional information regarding personnel protective equipment and storage locations. A current list of the personnel protective equipment necessary for hazardous materials response will be maintained at the facility.

Each storage facility is equipped with personnel protective equipment kept in storage with spill response equipment, or has the equipment readily available in the building. A cargo container or storage shed at the main hazardous waste storage area, which is located northwest of the production areas, is used for storage of emergency personnel protective equipment. The equipment includes goggles, face shields, inner and outer gloves, respirators with several different types of cartridges, and Tyvek and Saranex suits. There is adequate equipment for two people during an emergency.

E. PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTES

1. General Waste Handling Precautions

General waste handling precautions throughout the Plant include handling incompatible wastes in separate cargo containers or areas of the building and not allowing ignition sources near ignitable waste satellite collection and storage areas. Mixing of wastes by the generators is discouraged through instruction in the RCRA training program to prevent reactions caused by the mixing of incompatible waste streams.

Part IV of the permit provides the procedures used at Rocky Flats to identify ignitable, reactive, and incompatible wastes. Table 3, in Part IV, (Compatibility Codes Cross Reference) presents a compatibility cross-reference procedure based on the results of fingerprint tests. This procedure, along with the unit-specific

waste characterization procedures given in Part IV provide the operator with the information needed to avoid mixing incompatible wastes.

The Rocky Flats Fire Department will inspect all of the permitted units on a yearly basis to assure continued compliance with all of the applicable National Fire Protection Association (NFPA) codes.

2. Management of Ignitable or Reactive Wastes in Containers

Ignitable and reactive wastes are separated from any sources of ignition within operations buildings by placing the containers away from machines that may be sources of sparks and by posting the areas with "No Smoking" signs. Smoking is prohibited throughout many of the buildings, in which case signs are posted at all entrances.

Cargo containers function as storage areas for some ignitable and reactive wastes. Each cargo container containing ignitable or reactive waste is posted with a "No Smoking" sign at the entrance. The cargo containers are located away from other ignition sources. All storage areas are more than 50 feet from the property line.

3. Management of Incompatible Wastes in Containers

The hazardous waste management training program outlines measures to prevent ignition or reaction of wastes and to prevent mixing of incompatible wastes.

In addition, all generators must contact Waste Operations personnel to dispose of the wastes they generate. The compatibility cross-referencing procedures and waste analysis procedures given in Part IV provide operators with the information needed to avoid mixing incompatible wastes in containers.

Incompatible wastes in containers and tanks are kept separate at the Plant by several means. Satellite collection areas for incompatible wastes are separated by physical distance within a building. Incompatible wastes in containers are kept in separate cargo containers or in separately bermed areas to prevent mixing.

TABLE 1.
HAZARDOUS WASTE PERMITTED CONTAINER STORAGE AREA
WEEKLY INSPECTION LOG SHEET

Building _____ Permitted Unit No. _____

Inspector: _____

Date: _____

Time: _____

CHECK EACH OF THE FOLLOWING:

	YES	NO	N/A
1. Container(s) located within authorized boundaries?	—	—	—
2. Area warning signs correct, present and legible? (Both Danger and No Smoking)	—	—	—
3. Base underlying containers with free liquids free of cracks or gaps?	—	—	—
4. Containers' hazardous waste labels correct and legible? EPA Code ?	—	—	—
Compatibility code ?	—	—	—
5. All containers free of corrosion, buckles, dents, holes, or damaged seams ?	—	—	—
6. Area free of spillage, leakage, or other accumulated liquid ?	—	—	—
7. Is there adequate (18-inch minimum) aisle space, which is clear of obstruction?	—	—	—
8. Is RCRA hazardous waste spill equipment available?	—	—	—
9. Is the perimeter fence or the building and roof in good structural condition?	—	—	—

REMEDIAL ACTIONS:

- Always notify supervisor of any problems.
- Any "no" answer requires the following to be included in the "Comments" section:
 - a) Explanation of problem;
 - b) Description of corrective action taken;
 - c) Date corrective action was taken.

COMMENTS:

PART VI-CONTINGENCY PLAN

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PART VI-RCRA CONTINGENCY PLAN

A. PURPOSE OF PLAN

The Rocky Flats RCRA Contingency Plan is designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water.

Throughout this document, the term hazardous waste(s) includes mixed residues. Residues are one of the by-products of plutonium production processes. Residues are specifically defined as by-products containing concentrations of plutonium above the Economic Discard Limit (EDL) established by U.S. Department of Energy (DOE). The Rocky Flats Plant stores residues in various areas. Some of these residues are mixed with hazardous wastes as defined by the Colorado Hazardous Waste Regulations and are called "mixed residues."

B. EMERGENCY COORDINATORS

The Emergency Coordinator (EC) for the Rocky Flats Plant is the Shift Superintendent on duty. The EC is responsible for the implementation and coordination of the site Contingency Plan. He/she is responsible for determining the extent of the emergency, assessing hazards to human health and the environment, and coordinating the emergency response activities. All personnel who may serve as EC are thoroughly familiar with all aspects of the Contingency Plan, site operations and activities. They have the authority to commit the resources necessary to carry out the Plan.

A Shift Superintendent is available 24 hours a day at the site. The phone number for the Shift Superintendent is extension 2914 (966-2914). If the Shift Superintendent is injured or unable to act as EC during an incident, the Senior Fire Protection Officer will assume command of the scene until relieved by an alternate Shift Superintendent who will be called to the plant.

C. IMPLEMENTATION OF THE PLAN

The RCRA Contingency Plan may be implemented as a part of the Rocky Flats Emergency Plan. The Emergency Plan will be implemented in response to a wide variety of unplanned events or emergencies, including but not limited to RCRA incidents. Examples of emergency situations that would result in implementation of the Emergency Plan include:

- Fire/explosion
- Chemical hazardous materials releases
- Radioactivity releases
- Nuclear excursion/criticality
- Utility failures
- Natural disasters; winter storms, high winds/tornados, earthquake, floods
- Medical illness/injury
- Civil disturbances
- Terrorist Attack
- Bomb Threat
- Vehicular/Aircraft accident

The initial discovery, notification, and response for any type of emergency will follow procedures contained in the Emergency Plan. The facility Emergency Plan serves as an umbrella to ensure the proper reporting of and response to all emergency incidents at the Plant. The Shift Superintendent will notify and direct the Occurrence Notification Center (ONC) to initiate notifications in accordance with the "Occurrence Notification Procedure" specified in DOE Order 5000.3A. The ONC is the on-site facility charged with making required initial and follow-up notifications to appropriate notifications to the Director and the U.S. Environmental Protection Agency (EPA).

When information becomes available on the specific nature of an incident, including such items as type and quantity of released material or injuries incurred, the EC will consult with environmental specialists and other appropriate personnel to make a determination whether the incident requires implementation of the RCRA Contingency Plan. Figures 1 and 2 present decision trees used at the facility to determine when RCRA Contingency Plan notification and reporting are required. As shown in the figures, the RCRA Contingency Plan will be implemented in the following situations:

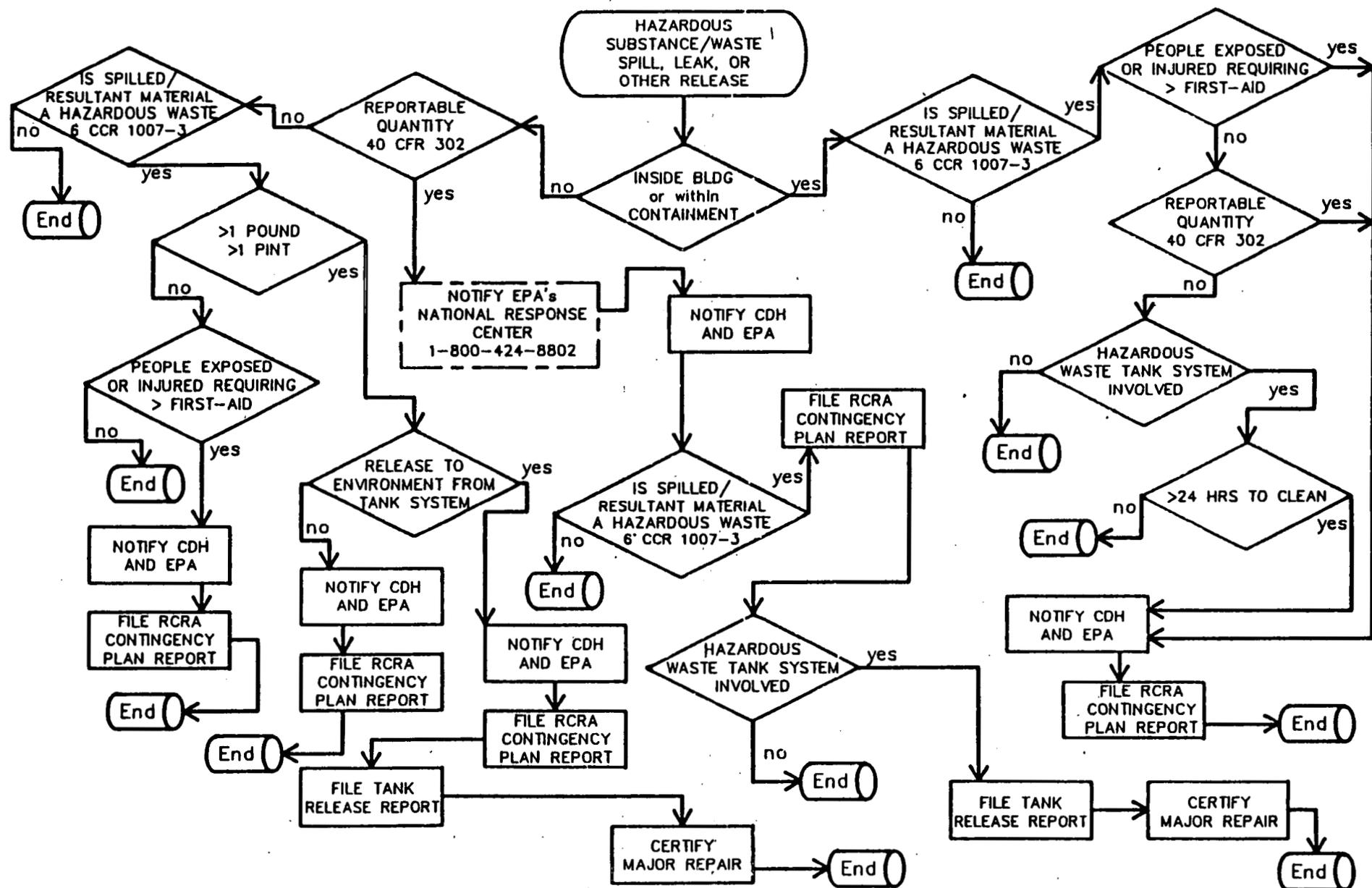
- A hazardous waste incident results in an injury requiring more than first-aid.
- A spill, leak, or other release of hazardous substance or waste to the air, soil, or surface water (i.e. outside a building) if the release is greater than one pint or one pound.
- A spill, leak, or other release of hazardous waste inside a building results in:
 - A release which exceeds a reportable quantity equivalent volume as defined in Title 40 of the Code of Federal Regulations (CFR) Part 302;
 - A spilled material from a hazardous waste tank system not removed from secondary containment within 24 hours.
- A fire and/or explosion in which a hazardous waste release or an active hazardous waste management unit is involved.

The RCRA Contingency Plan can be implemented in situations other than those outlined above at the discretion of the EC.

D. EMERGENCY RESPONSE PROCEDURES

Response procedures vary from incident to incident as to specific details. However, several phases of response efforts are common to all incidents, and include:

Offsite Notification for Hazardous Substance/Waste Spills



Offsite Notification

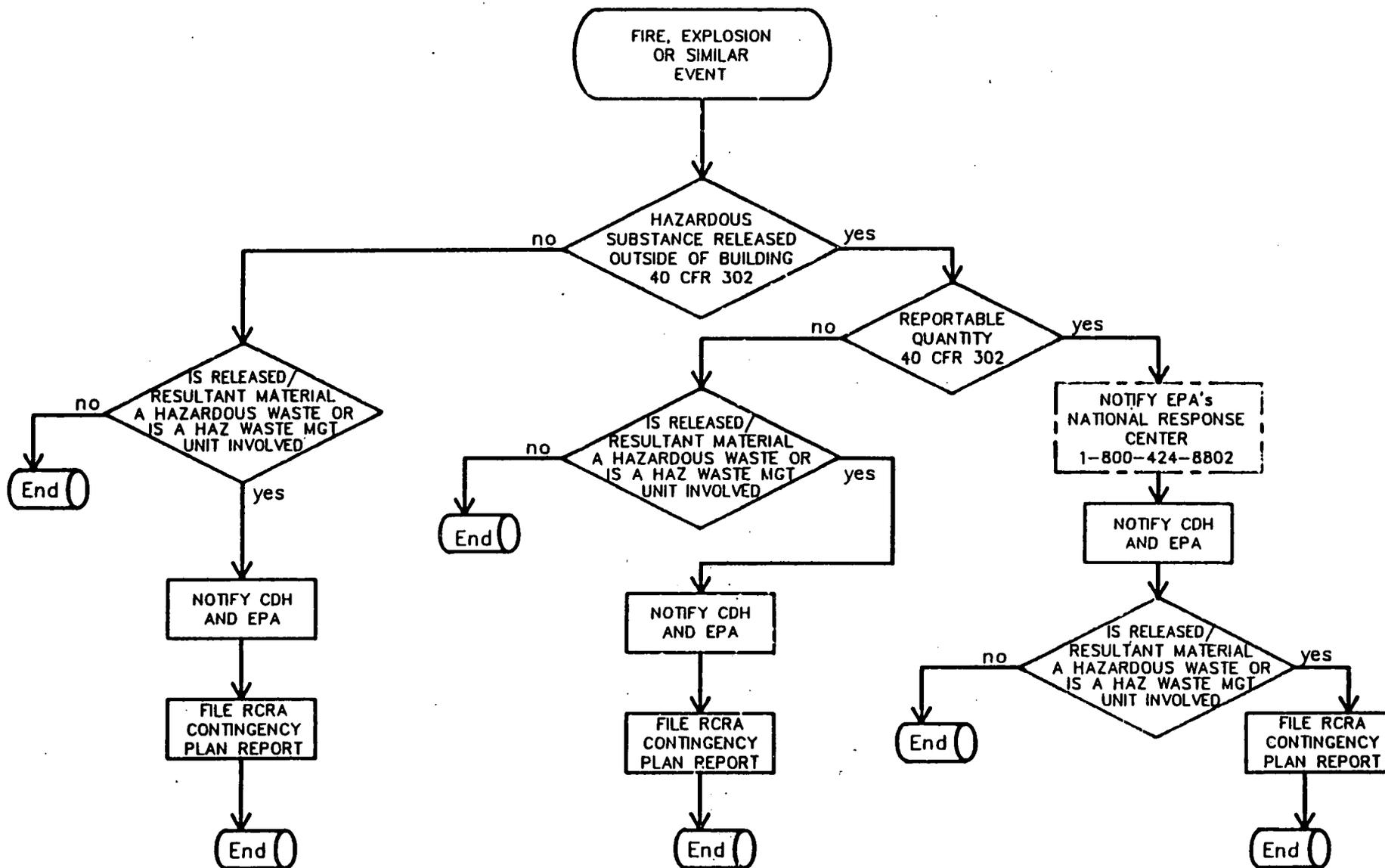


FIGURE 2

1. Discovery and notification;
2. Identification of released or suspected released materials;
3. Hazard assessment;
4. Response and control procedures;
5. Measures to prevent recurrence; and
6. Storage and treatment of released materials.

The initial steps of emergency response to any incident are implemented as part of the Rocky Flats Emergency Plan, as described previously in Part VI (C). These steps are described in the following sections.

1. Notification

There are two types of notification relevant to this plan; on-site and off-site. These are discussed in the following subsections.

- a. On-site Notification

Upon discovery of a release of materials or other non life-threatening emergency situations, all Rocky Flats personnel are instructed and have been trained to immediately notify their supervisor. The supervisor will evaluate the situation and notify the appropriate personnel.

If the supervisor is not available, or if the situation is immediately life-threatening, the employee notifies on-site emergency response personnel as detailed below.

The fire phone system can be used in an emergency situation. Lifting the handset of a fire phone activates the building fire alarm bells and is automatically received at the Fire Station and the Plant Protection Central Alarm Station. If the situation allows, the caller will give the Fire Department information relative to the situation. If the situation does not permit the caller to give details of the incident the Fire Department will respond automatically. Some buildings are equipped with manual fire pull stations; however, no verbal communication is available with these alarms. In either case, an announcement on the Life Support/Plant Warning (LS/PW) Public Address System will provide instruction to personnel on actions to be taken.

The Fire Department can dispatch a fire engine, ambulance, and/or the HAZMAT Response vehicle, with trained personnel to the scene if necessary. The specific fire fighting equipment available on-site is detailed in Part VI (E).

Non life-threatening emergencies are reported to the Shift Superintendent by calling extension 2914. Life-threatening emergencies other than automatic fire alarms are reported by calling extension 2911. This automatically rings telephones in the following offices:

- Emergency Coordinator (Shift Superintendent);
- Plant Protection Central Alarm Station;
- Fire Department Dispatch Center; and
- Medical Department.

The EC will immediately respond to all emergency alerts and alarms. At his/her discretion, the EC may activate the Emergency Operation Center (EOC) and notify a number of departments that have an advisory role in the management of an emergency. The EOC is activated during normal work hours using any or all of the following: the LS/PW system, a dedicated management ringdown telephone system, and a Digital Emergency Response System (DERS) using personal digital pagers. With these systems, the EOC can be staffed and operational within 15 minutes. During non-operational hours, key management officials are notified using radios, pagers, cellular telephones and the Automatic Dialing Annunciation System (ADAS). Using these systems, the EOC can be staffed and operational within 30-40 minutes. Some of the personnel on the system include health physicists, environmental specialists, and the plant meteorologist.

Two-way radios are used to communicate with response group personnel and the EC. Emergency operations are conducted on a designated radio channel. Other plant radio channels, e.g., Support Operations and Health and Safety (HS), are monitored by the EOC when activated. The EC can communicate on all plant radio channels.

In addition to the above notification methods, the production buildings are equipped with an automatic fire detection and alarm system that concurrently alerts the Fire Department and the Plant Protection Central Alarm Station immediately when a fire is detected. The Plant Protection Dispatcher notifies the EC, and the Medical Department. The emergency response then proceeds as described above.

b. Off-site Notification

Notification to Federal, State, and local agencies will be performed in accordance with Federal and State regulatory requirements, DOE regulations, and other formal agreements. The purpose of the off-site notification procedure is to ensure that various agencies are advised of an emergency situation at the Rocky Flats Plant. Contingency Plan reporting procedures will follow the regulatory requirements of Title 6 of the Colorado Code of Regulations (CCR) 1007-3 Part 264.56. Additional notification procedures to regulatory agencies, including the Director, are detailed in Figures 1 and 2.

The Permittee will notify the CDH within 24 hours after implementing the Contingency Plan. A release involving a reportable quantity of a hazardous

Table 1.
EMERGENCY RESPONSE CONTACTS
MEDICAL ATTENTION NEEDED

Hospital

St. Anthony North
2551 West 84th Avenue
Westminster, CO
303-426-2020 (24 hours)

Univ. of Colorado Health Sciences Center
4200 East 9th Avenue
Denver CO
303-270-8901 (24 hours)

Ambulance

Onsite Ambulance Service
onsite x2911 (24 hours)

Flight for Life Air Ambulance Service
303-629-3900

FIRE/EXPLOSION

Fire Department

Onsite Service

onsite x-2911 (24 hours)

EXTERNAL EMERGENCY RESPONSE

Police

Jefferson County Sheriff Department
17900 W. 10th Ave
Golden, CO
onsite dial 9 then 911
303-277-0211 (24 hours)

Boulder County Sheriff Department
1805 33rd Street
Boulder, CO 80302
303-441-4444
Emergency calls from Jefferson Cty

Colorado State Patrol
700 Kipling
Lakewood, CO 80215
303-239-4501 (24 hours)
Boulder Regional Communications Center

Boulder Regional Communications Center
303-441-4444

SPILLS/RELEASES

Federal

U.S. Environmental Protection Agency
Region VIII
303-293-1788 (24 hours)

EPA/National Response Center
Washington, D.C.
800-424-8802 (24 hours)

Local

Jefferson County Health Department
260 South Kipling
Lakewood, CO
303-239-7097

Boulder County Emergency Planning Committee
(Community Right-To-Know Reporting)
303-441-3886 (working hours)

Jefferson County Emergency Planning Committee
(Community Right-To-Know Reporting)
303-277-8215

Broomfield Public Works Department
6 Garden Center
Broomfield, CO 80020
303-469-3301 x364(working hours)
303-466-2345 (police after hours)

Westminster Water Department
3031 West 76th Ave
Westminster, CO
303-430-2400 x 2707

Thornton Water Department
303-538-7420

Northglenn Water Department
303-451-1289

State

Colorado Department of Health
4210 East 11th Avenue
Denver, CO
303-320-8333 (working hours)
303-370-9395 (after hours)

Hazardous Materials and Waste Management Division
303-331-4830 (working hours)

Water Quality Control Division
303-331-4530 (working hours)

Air Pollution Control Division
303-331-8500 (working hours)

Colorado Emergency Planning Committee
(Community Right To Know Reporting)
4210 E 11th Ave
Denver, CO 80220
303-331-4858 (working hours)
303-377-6324

DODES

(Colorado Division of Disaster Emergency Services)
George West
Golden, CO
303-279-8855

substance as defined in 40 CFR 302.4 will be reported to the National Response Center with 24 hours.

If the EC determines that additional help from off-site agencies (police, hospitals, etc.) is required, or if agencies must take immediate action for the protection of community populations, he will contact the appropriate agencies or request the Emergency Operations Center to contact them. A list of agencies and phone numbers is maintained in the EOC. These agencies include the Colorado Division of Disaster Emergency Services (DODES), Jefferson County, and Boulder County. Off-site emergency response contacts are listed in Table 1.

2. Identification of Hazardous Substances/Wastes

The initial response of the Emergency Coordinator will be to obtain the following information:

- The character, exact source, amount, and real extent of the release;
- Whether or not the release could move offsite;
- Containment procedures that have been implemented;
- Whether there are any injuries resulting from the incident.

The initial release identification method will be visual inspection of the material and the location of the release. Material stored at Rocky Flats is labeled as to contents; therefore, a visual inspection, in addition to knowledge of the Building Emergency Representative (BER) and building personnel, should be sufficient to identify the material.

A file of Material Safety Data Sheets (MSDSs) for raw materials is maintained by Industrial Hygiene, and copies of each MSDS pertaining to materials used in each area or building are available in that area for worker referral. The waste management group maintains a list of wastes stored in each waste management unit and can identify components of any regularly generated hazardous waste from the most recent waste analysis records or from process knowledge.

3. Hazard Assessment

The Emergency Coordinator will assess the possible hazards, both direct and indirect, to human health and the environment. This assessment will be based on information obtained during the identification of the material and on the following:

- The process or storage facility from which the released material is emanating and the proximity to surface waters;
- Weather patterns and wind direction at the time of the release; and

- The characteristics of the released material, including physical characteristics, reactivity, and both human and animal toxicity.

Resources available to the Emergency Coordinator include spill control reference texts, Material Safety Data Sheets, 24-hour meteorological data, and specialists from the following groups: safety, environmental compliance, fire department, industrial hygiene, radiation monitoring, radiation engineering, medical, and others as necessary. If required, key personnel from these groups will staff a Satellite Control Center with direct contact to the Emergency Coordinator and the EOC during the response to a major release.

Should on-site or off-site evacuation be necessary, the Emergency Coordinator will notify the appropriate personnel, including on-site fire and security personnel, and regulatory agency contacts. Evacuation and notification procedures are further addressed in Part VI (G) and Part VI(D)(1)(b), respectively.

4. Response and Control Procedures

Potential incidents fall under the following three general classifications:

- Fire and/or explosion
- Spills, leaks, or other releases
- Power or equipment failure

Response to these incidents may require notification or request for DOE assistance and/or resources from offsite. Notification procedures are outlined in Part VI (D)(1).

a. Fire and/or Explosion

If there is a fire or explosion in an area where a hazardous waste is released or an active hazardous waste management unit is involved, the Contingency Plan will be implemented as outlined in Part VI(C). The Emergency Coordinator will be notified and will be responsible for assessing the situation and advising emergency personnel as to special hazards relating to the released material. The LS/PW system can be activated by the BER for the particular building, or by the Security Dispatcher of the entire plant site or portions thereof.

If the fire has the potential of reaching hazardous waste or materials, such materials may be relocated to a safe area. If the materials are not movable or are inaccessible because of spreading fire, they may be sprayed with the appropriate fire suppressant. IF the possibility of an impending explosion is high; i.e., the fire envelopes ignitable waste, the area may be evacuated (see Part VI Section G). Decisions such as these will be made at the discretion of the EC, or by the BER or Fire Chief as necessary.

Personnel will remain in work areas until instructed over the LS/PW system by the BER, the EC or the dispatcher to evacuate to the designated assembly area and account for the visitors and employees under their supervision. If the LS/PW system

is not operational, the evacuation will be conducted by building supervisors, assisted by Security and other personnel as available. The fire Department will conduct search and rescue operations for any unaccounted personnel.

The EC will authorize personnel re-entry when the fire has been extinguished and radiological monitoring ensures that personnel are no longer endangered.

All equipment used in the emergency will be characterized and then cleaned and made ready for use or replaced prior to resumption of plant operations in the affected areas. Appropriate steps must be taken to contain cleaning solutions and contaminated materials. These materials will be appropriately packaged for storage, treatment, or disposal.

b. Spills, Leaks, or Other Releases

Waste management areas are routinely inspected for signs of leaks, spills, deterioration, or damage. If there are indications of unit failure or containment system failure that may threaten human health or the environment or that meet the implementation criteria outlined in Part VI (C), this Contingency Plan will be implemented by the Emergency Coordinator.

Upon observing or detecting a spill, leak, or other release, facility employees will implement the following procedures:

- Immediately contact their supervisor and describe the location, quantity (approximate), extent, and composition (if known) of the spill. If the supervisor is not available, the employee will report the situation by dialing extension 2914; if the emergency is immediately life-threatening, they will call extension 2911 immediately.
- The supervisor will contact the Emergency Coordinator by calling Ext. 2914 and will implement immediate containment measures if necessary;
- If the Emergency Coordinator determines that a reportable quantity has not been released to the environment (i.e. soil, water, air) and there is no fire or injury, he will implement the following steps:
 - Contact the appropriate Rocky Flats response groups (e.g. Fire Department HAZMAT Team, health and safety, environmental and compliance specialists, radiation monitoring and engineering, etc.) for dispatch of experienced personnel and appropriate containment and cleanup equipment.
 - Notify appropriate environmental or waste management staff who may dispatch an investigation team to the release site to prepare a report that defines the problem and details the follow-up activities that are necessary.

- If the amount of material released to the environment is a reportable quantity the Emergency Coordinator will assume control and implement the following procedures:
 - Go to the scene of the incident;
 - Determine the nature and extent of the release;
 - Order evacuation of the affected area if the incident involved uncontrolled releases of ignitable, corrosive, reactive or toxic materials;
 - Direct the response personnel to the location of the spill or leak if they are able to safely mitigate the incident;
 - Contact the DOE Rocky Flats Office (DOE/RFO) and advise them to call the National Response Center;
 - Monitor the status of the incident and direct the response until an emergency condition no longer exists.
 - Instruct the response personnel to begin cleanup operations.
 - Once an emergency condition no longer exists and cleanup operations are in progress, advise the appropriate management of the situation. The management will establish an investigation team to prepare a report that describes the incident and details any corrective measures that are necessary to prevent a recurrence.

Releases which cannot be contained will enter the surface water control ditches and be diverted to the surface water control ponds by control valves. Uncontrolled releases occurring on plant site will be diverted to the A,B, and C series ponds. Spills which cannot be contained in the spill control ponds will be pumped to other spill control ponds or into containment vessels such as drums or portable tanks. Off-site discharges will be controlled, monitored and reported in accordance with the facility's NPDES permit, or the most current approved version of the Surface Water Management Plan.

Once the incident has been controlled, clean-up and decontamination will begin. Clean-up involves collecting and containing any released material including liquid releases, contaminated sorbent material, and contaminated soil. Liquid releases can be pumped into drums and analyzed to determine appropriate action. Contaminated sorbent material will be contained in DOT-approved containers. Soil in the area of the release that can be determined visually to be contaminated will be removed and contained. The remaining soil in the area will be identified as an Individual Hazardous Substance Site (IHSS) and will be sampled and investigated as a part of the

Environmental Restoration program (ER) activities at the Rocky Flats Plant. In general, the ER calls for removal of contaminated soils until the contaminant concentrations in remaining soils do not pose an unacceptable risk to human health and the environment. In the unlikely event that the spill causes groundwater contamination, the contaminated groundwater will also be cleaned up as a part of the ERP activities at the Rocky Flats Plant.

Decontamination involves removing contaminants from equipment and structures such as berms. Part IX-Decontamination of this permit presents a list of decontamination methods appropriate for hazardous and mixed wastes at Rocky Flats Plant.

TABLE 2.
Typical Materials and Equipment for Spill Containment and Cleanup

<u>Material(s)/Equipment</u>	<u>Location</u>	<u>Substances Contained or Absorbed</u>
Standard industrial absorbents (Sorb-All, vermiculite, oil sorbent)	CC662	For spills of oil, solvents, and organic materials. Not used for acids or caustics unless first neutralized.
Sorbent dam	CC662	For sorption of liquid waste except acids and oxidizers.
55-gallon recovery drums and 85 gallon overpack drums; steel and poly-lined steel	Bldg. 668 storage yard	Most organics (steel); acids, caustics, contaminated absorbent materials (poly-lined steel).
Portland Cement	Bldg. 551 warehouse	Cement is relatively unreactive and can be used to contain most chemicals (except concentrated acids)
Backhoe	Bldg. 331	For containment or removal of solid or liquid material, contaminated soil, sediment, etc.
Tanker Truck stainless-steel 4,000-gal. capacity	Bldg. 331	For collection and removal containment of 4000 gal. of liquids.

c. **Power or Equipment Failure**

The Rocky Flats Plant has emergency power generation capabilities for all critical operations. The emergency power system is automatically activated after a power failure.

Smoke detection, criticality, glovebox overheat, and alpha air monitor alarms are immediately connected automatically to the uninterrupted power supply system in the event of a power failure. Process area ventilation is maintained by a diesel-powered emergency generator which is fully operational 20 seconds after a main power failure.

In the event of a power failure all processing is shut down. All waste transfer and processing operations would cease and waste management units would be maintained until full power was restored.

Incidents involving equipment failure would be handled as a fire or release if the failure caused either a fire or release to occur. Otherwise the equipment would be promptly repaired or replaced.

5. Prevention of Recurrence or Spread of Fires, Explosions or Releases

To prevent the further spread of fires or releases during an incident the Emergency Coordinator may instruct response personnel to move any hazardous material or hazardous wastes near the release or fire to a safe area. During a fire, if any materials cannot be moved because of danger to response personnel, the materials may be sprayed with an appropriate fire suppressant. Decisions such as these will be made at the discretion of the Emergency Coordinator, or Fire Chief as necessary.

The Emergency Coordinator can also authorize area, building and plant shutdown to ensure that the fires, explosions or releases do not spread to other areas. Process operations shutdown procedures are maintained in each production building. These procedures include instruction for any post-shutdown monitoring required. Area supervisors will ensure that their area is secured prior to evacuation by checking process systems shutdown procedures and securing area fire doors, except in instances where personal safety is jeopardized.

Rocky Flats personnel are trained through safety classes and supervisor instructions to handle various emergency incidents. Plant-wide emergency drills are conducted on a routine basis both internally and in conjunction with extended support groups. Records of these drills are kept at the Rocky Flats Emergency Preparedness Office. Key employees are familiar with the emergency equipment and fire control structures available to prevent the spread of fires in their work area. To prevent recurrence of an incident, any faulty or defective monitoring equipment, valves, pumps, alarms, or other equipment will be repaired. If repair is not possible, the equipment will be replaced. The facility or unit will not be used until the minimum required equipment for safe operation is fully functional.

If the corrective measures necessitate a change in this plan, it will be updated per the procedures in Part VI.(H)(1). Records of any corrective actions relating to the storage, treatment, or disposal of hazardous and radioactive mixed waste will be maintained in the facility operating record.

6. Storage and Treatment of Released Hazardous and Radioactive Mixed Wastes

Once cleanup procedures are completed, the Emergency Coordinator will contact the waste management group who will make arrangements for the treatment, storage, or disposal of the hazardous or mixed wastes resulting from the incident and in accordance with the Colorado Hazardous Waste Regulations. These wastes will be containerized in DOT approved containers and staged in a secure area prior to treatment or storage. After containment, the waste management group will be responsible for sampling and analysis of the wastes in accordance with the Waste Analysis Plan, Part IV, to determine how to store, treat and dispose of the material.

7. Incompatible Materials

Incompatible materials at the site are segregated. Should storage of spill cleanup material be required, the waste management group will direct personnel to maintain physical segregation of incompatible wastes and proper marking of such stored material.

8. Post-Emergency Equipment Maintenance

All contaminated materials from a release of hazardous waste or materials, including respirators, boots and protective clothing will be decontaminated or managed as hazardous or radioactive mixed wastes. The decontamination solution and any contaminated material will be stored, treated, or disposed of as arranged by the waste management group and in accordance with the decontamination section of this permit, Part IX.

All emergency equipment used or located in the area of the incident will be cleaned and repaired so that it is fit for reuse. If the equipment cannot be repaired, it will be replaced. Before operations are resumed, at least the minimum HAZMAT equipment and supplies required for safe operation will be placed in an operational condition by Plant Fire Department personnel. Notification that post-emergency equipment maintenance has been performed and that operations will be resumed will be provided to CDH prior to resuming operations in the affected areas of the plant.

E. LOCATION, DESCRIPTION, AND CAPABILITIES OF EMERGENCY EQUIPMENT

The emergency equipment available for use at the Rocky Flats Plant includes:

- Fully equipped, first response, HAZMAT van;
- Fire control equipment; fire pumper vehicles, sprinkler systems, building hose reels, portable fire extinguishers, etc.;
- Personnel protective equipment for fire fighters and first response personnel;

- On-site ambulance and medical facilities;
- Emergency decontamination equipment;
- Emergency communication systems;
- Heavy equipment such as bulldozers, backhoes, tanker trucks, etc.

The majority of the spill control equipment is currently under the control of the Fire Department HAZMAT teams at the Plant Fire Department and in Fire Department response vehicles. In addition, most hazardous waste storage or treatment facilities are equipped with spill control equipment. Fire Department personnel currently perform regularly scheduled inspections of all safety equipment.

The materials stored on site include items such as absorbent materials in rolls, sheets, pillows and booms, chemical spill kits, chemical sorbent pillows, sorbent dams, vermiculite, cement, and recovery and overpack drums. Large inventories of vermiculite and cement are kept on-site for a number of routine uses and would be available during an incident response. In addition, a backhoe is available for containment or removal of solid or liquid materials, and a stainless steel tanker truck with 4,000 gallon capacity is on site for the collection and removal of liquid.

The facility operates a fully staffed fire department on-site for emergency response. The department depends on the on-site water supply available from a series of fire hydrants throughout the plant. A list of the fire hydrant locations is maintained by the Rocky Flats Fire Department.

The majority of the fire fighting equipment is located at the on-site fire department. Typical equipment is listed in Table 3. In addition, a number of self-contained breathing apparatus (SCBAs) are located in the major production buildings and are specified for emergency response only. Information on the current numbers and locations of these units is kept by the Rocky Flats Fire Department. Adequate SCBA units are maintained in the buildings to provide units for response personnel. As the number of response personnel changes, the number of SCBA units in any building will change. The Fire Department maintains enough units to fully equip the maximum number of fire fighting personnel on each shift.

Fire extinguishers are also located throughout the plant. A list is maintained by the Fire Department and is available to all personnel. The locations of these units may change if process changes move a fire hazard from one area to another.

Details on the Fire Department's hazardous materials response program are contained in Plant Fire Department standard operating procedures.

TABLE 3.

TYPICAL FIRE FIGHTING EQUIPMENT

- Fully equipped HAZMAT van
- Two pumper trucks
- Two fully equipped ambulances with trained Emergency Medical Technicians as staff 24 hours/day
- One fully equipped rescue vehicle/"brush" truck
- Two general purpose vehicles
- Survive Air brand self-contained breathing apparatus
- Assortment of organic vapor and acid gas respirators
- Tyvek suits
- Gloves
- PVC hip boots
- Fully encapsulating suits including butyl, chlorinated polyethylene, and PVC suits.

Note: All equipment is maintained in the Fire Department Building when not in use.

F. COORDINATION AGREEMENTS

Rocky Flats has negotiated and executed two formal agreements with offsite agencies for mutual assistance and cooperation in emergency situations.

- St. Anthony Hospital Systems - This agreement provides for emergency treatment and care for Rocky Flats employee casualties in the event of a radiation disaster at the plant.
- University of Colorado Health Sciences Center - This agreement provides for emergency treatment and care for Rocky Flats employee casualties in the event of a radiation disaster at the plant.

These facilities have been furnished a copy of this Contingency Plan. The Permittee will maintain these agreements or agreements with other hospitals to provide equivalent service.

G. EVACUATION PLAN

1. Criteria for Evacuation

The evacuation plan is an established set of procedures directing employees to a safe assembly area to ensure their personal safety or enhance the emergency response. Major emergencies that could threaten human health and the environment may require that an area, a building, or the entire plant be evacuated.

a. Process Area Shutdown

Emergency shutdown procedures are prepared by the area supervisors and maintained to instruct operating personnel as to alarms, evacuation routes and safety issues. Building shutdown procedures will generally be followed prior to the evacuation unless delay would threaten human life.

b. Building Evacuation

Building procedures include guidance for the evacuation of personnel, diagrams of routes and assembly areas. The evacuation signal will be a verbal command by the BER or Emergency Coordinator over the LS/PW system, an evacuation alarm, or the employee's own decision to evacuate for his personal protection if he feels that he is in any type of danger. Evacuation routes for buildings containing hazardous waste storage or treatment facilities are kept in the building emergency plan.

When evacuation of any part of the facility is called for by the Emergency Coordinator, all employees, contractors, and visitors in that area will immediately leave the work areas and proceed to the designated assembly area(s). Rocky Flats personnel will be accounted for by their supervisors. A list of visiting personnel will be available from the site and building sign-in records. Personnel evacuation will, in general, proceed as follows:

- If downwind of the incident evacuate perpendicular to the wind direction over the accessible route.
- If upwind of the incident, evacuate in the upwind direction.

The plant LS/PW system will keep all personnel updated during evacuation as to any changes to the evacuation routes or information pertaining to the incident.

c. **Plant Shutdown**

In the event emergency conditions warrant the evacuation of the entire plant, the evacuation will be authorized by the DOE/RFO Manager, the Prime Operating Contractor General Manager or the Emergency Coordinator, or their designated alternate. Plant personnel will be notified via the LS/PW System and provided with information regarding best routes and methods of transportation. In addition to the LS/PW system, two-way radios and the internal telephone system are used to notify facility personnel of the nature of the emergency and the recommended plan of action. In the event of the failure of both the normal and emergency power, the Emergency Coordinator will communicate instructions to area supervisors by telephone, two-way radio, messenger, etc.

d. **Off-site Evacuation**

If a release threatens or may threaten areas off of the plant site, the Jefferson County/Boulder County Emergency Response Plan will be implemented to evacuate any necessary areas.

H. **REQUIRED REPORTS**

The Emergency Coordinator will record the date and details of any incident that required the implementation of the Contingency Plan in the facility operating record. The Permittee must file a written report with the Director and EPA within 5 days after the incident unless waived by the Director. The written report must include:

- Name, address, and telephone number of the facility owner or operator;
- Name, address, and telephone number of facility;
- Date, time, and type of incident;
- Name and quantity of material(s) involved;
- An assessment of actual or potential hazards to human health or the environment, where this is applicable; and
- Estimated quantity and disposition of recovered material that resulted from the incident.

1. Plan Review and Update

Any fires, explosions, or releases that require implementation of the Contingency Plan will be thoroughly reviewed. The appropriate management may appoint a committee which will be responsible for:

- Investigation of the cause of the occurrence or incident;
- Identification of measures to prevent a recurrence; and
- Coordination of the implementation of measures to reduce the risk of a recurrence.

The contingency plan will be reviewed and amended, if necessary, whenever one of the following occurs:

- The facility permit is revised;
- The plan fails in an emergency;
- The hazardous waste management units change in design, construction, operation, maintenance, or other circumstances in a way that materially increases the potential for fires, explosions, or releases of hazardous wastes or hazardous waste constituents, or changes the response necessary in any emergency;
- The list of required emergency equipment changes.

The General Manager of the Prime Operating Contractor for Rocky Flats and the DOE Rocky Flats Office Manager are the authorized persons responsible for directing personnel to change or amend the Contingency Plan. Changes will be made by the direct replacement of outdated pages with new pages containing the additional or modified information.

Old pages will be removed and discarded. Replacement pages will be issued to the agencies/organizations to which copies of the Rocky Flats Contingency Plan have been distributed to ensure that all copies of the plan have been updated.

I. DOCUMENTS TO MAINTAINED ON SITE AS PART OF THIS PERMIT

1. A copy of the facility specific and building specific evacuation plans will be submitted to the Director's on-site inspectors within 30 days of the effective date of this permit.
2. An up-to-date list of all satellite and 90-day accumulation areas will be maintained at the facility, and will be presented to the Director's inspectors upon request.
3. An up-to-date list of all fire hydrants at the facility will be maintained and will be presented to the Director's inspectors upon request.
4. Phone numbers for emergency contacts will be kept up-to-date, and checked monthly at a minimum.
5. A list of specific situations and criteria under which outside help is needed and the role of each emergency response authority will be submitted to the Director's on-site inspectors within 30 days of the effective date of this permit.
6. A criteria list for determining off site evacuation such as air monitoring at the plant boundary and other parameters will be submitted to the Director's on site inspectors within 30 days of the effective date of this permit.
7. An updated version of Table 2. Spill Response Equipment will be kept up-to-date and presented to the Director's inspectors upon request.

PART VII-PERSONNEL TRAINING

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PART VII-PERSONNEL TRAINING

A. INTRODUCTION.

This section presents the training program which is implemented at the Rocky Flats Plant (RFP) to ensure that all employees perform their work in full compliance with Colorado Hazardous Waste Regulations 100.41 (a)(12) and 254.16. These regulations prescribe the requirements for personnel training at facilities which generate, treat, store and dispose (TSD) of hazardous materials.

At RFP, training courses are presently used to ensure that personnel are properly prepared to work at this complex facility. RCRA training is an ongoing program which includes the basic series of RCRA courses and related coursework. These include ongoing technical, safety and contingency plan training programs.

A through review of the RFP personnel position description list indicates that a majority of all employees have some interaction with hazardous materials, wastes and radioactive mixed wastes. Other employees either have no interaction with these materials or deal only with non-RCRA regulated waste. In the case of the latter, exhaustive non-RCRA training is provided to ensure safe operation of the facility.

The overall training program includes the basic RCRA training courses plus other health and safety oriented related courses.

All facility personnel involved in hazardous and mixed waste management including generation, packaging, analysis, storage, treatment, and shipping shall be properly trained for their position and shall have their responsibilities clearly defined by the facility.

Facility personnel shall not handle or otherwise manage hazardous or mixed waste, unless under direct supervision, until the applicable training requirements for that individual's position are met.

B. RCRA TRAINING OFFICER

The RCRA training program is directed and approved by appropriate personnel at the director level of management. The responsibility for developing and implementing the RCRA training and certification process have been delegated to the RCRA Training Officer.

1. Qualifications of the RCRA Training Officer.

- a. The RCRA Training Officer shall possess a four year science or engineering degree or (b).

- b. The RCRA Training Officer shall have sufficient experience in hazardous and mixed waste management to oversee the requirements of the training program, as modified by this permit.
- c. The RCRA Training Officer shall have working knowledge of the Colorado Hazardous Waste Regulations and the specific requirements contained within this permit.
- d. The RCRA Training Officer shall be knowledgeable of the purpose and implementation of the facility Contingency Plan and Emergency Procedures contained in Part VI and the conditions of this permit.
- e. The RCRA Training Officer shall be knowledgeable of waste operations procedures.

2. Responsibilities of the RCRA Training Officer.

- a. The implementation of On-the-Job Training is the responsibility of the line supervisors and foremen most familiar with RFP's operation; however, all training remains the ultimate responsibility of the RCRA Training Officer as delegated by the appropriate personnel at the Director level of management.
- b. The personnel training program development and implementation shall be the responsibility of the RCRA Training Officer.
- c. The RCRA Training Officer is responsible for the development and implementation of the RCRA training and certification program.
 - i. The Permittee is responsible for course development and revision.
- d. The RCRA Training Officer establishes qualifications policy, approves qualification requirements, course curricula, instructors, and ensures proper implementation of the program.
- e. The RCRA Training officer maintains a computerized list of all employees requiring RCRA training.
 - i. This list includes a personalized training history for each employee which includes his job title, training schedule, course attendance and test results.
 - ii. The master list is continually updated to reflect the current employee position description list.

- iii. The RCRA Training Officer reviews the many job classifications at RFP and makes a determination as to which employees should receive initial RCRA training.
 - iv. Additionally, supervisors may request that employees receive RCRA training.
 - v. Employees are then scheduled with plant training to receive the training.
 - vi. The date training is completed is entered in the RFP computer system. Job titles, job descriptions, the name of the employee filling the job and records of training given to employees engaged in hazardous waste management are kept in the plant training and plant employment offices.
- f. It is the responsibility of the RCRA Training Officer to ensure that all personnel with RCRA responsibilities are trained within six months of their effective date in a position and are annually updated.
- g. The RCRA Training Officer shall conduct an annual review to determine which personnel require hazardous waste and mixed waste management training.

C. RCRA TRAINING.

The RCRA Training is designed to meet the requirements of 6 CCR 1007-3, Section 264.16 (a)(3) through the computer aided instruction course, whose goals and objectives are described in Part VII (C)(3) of this permit and through on-the-job training as described in Part VII (C)(2) of this permit. RCRA training consists primarily of a RCRA Computer-Aided-Instruction (CAI) course, and on-the-job training.

1. Certification Requirements.

Employees who do not test satisfactorily are retrained until they are certified. New, reassigned staff or employees who do not test satisfactorily will not work in unsupervised positions until they have successfully completed the training program.

2. On-The-Job Training (OJT).

The classroom (CAI) RCRA Hazardous Waste Training instructs the employee in the regulatory requirements for the management of regulated and permitted units and emergency response. The on-the-job training instructs employees in the management of the hazardous waste and emergency response aspects that pertain to their specific area of responsibility. OJT is tailored to each employees actual job responsibilities.

All employees who handle hazardous waste and their immediate supervisors are required to complete both classroom instruction and on-the-job training (OJT).

The on-the-job training is conducted by the line supervisor or foreman prior to the CAI program.

- a. On-the-job training is conducted by the employee's supervisor in the work area and takes approximately 30 minutes to complete.
- b. OJT is tailored to the specified tasks of each employee.
- c. An on-the-job checklist is used for this training. This checklist specifically addresses the management of satellite collection and 90-day accumulation area, permitted units, and emergency response for the employee's work area.
- d. On-the-job training shall meet the following requirements.
 - i. No employee assigned to the hazardous waste management facility shall be allowed to work without direct supervision until he or she has completed the training program.
 - ii. New personnel shall be required to complete the training program within six months of their assignment to the hazardous waste management areas.
 - iii. The on-the-job training will be consistent for all employees performing similar duties and with similar responsibilities.
 - iv. The on-the-job training checklist shall specifically address the following procedures where applicable to the individual's position, to ensure that personnel involved in hazardous or mixed waste management are familiar with these procedures, and shall indicate the individual(s) with the authority to direct each procedure.
- e. Contents of the on-the-job training checklist.
 - i. Key operating parameters, and waste feed cut-off systems.
 - ii. Location and use of communications or alarm systems.
 - iii. Response to environmental contamination incidents.

- iv. Emergency and routine shutdown of operations.
- v. Facility contingency plan and emergency procedures.
- vi. Response to leaks, spills, overflows, and any releases.
- vii. Waste Analysis Plan procedures.
- viii. Inspection and maintenance procedures.

f. Training Documentation.

Once the employee and supervisor have completed the on-the-job training and signed the checklist, it is sent to plant training. Plant training maintains all employee training records.

3. Computer Aided Instruction.

The RCRA CAI course was completed September 1987, and is presently being used. It is designed for all employees (including management) who are impacted by RCRA requirements in their daily activities.

The Computer-Aided-Instruction approach was identified as one of the best ways for Rocky Flats to comply with the RCRA training requirements. Advantages of the RCRA CAI program are; all employees are guaranteed consistent training, convenient locations throughout the plant site can be provided for delivery of information, the program can easily be updated, and it is an effective presentation device for such a large target group of people. In order to meet the demand of the CAI course, traditional RCRA standup instruction which parallels the CAI program is also offered.

The RCRA CAI course consists of computerized instruction, embedded questions, and a mastery test.

a. Course Goal

The primary goal of the RCRA course is to train and/or retrain employees on the policies and procedures necessary to protect human health and the environment, and to ensure personal safety through proper management of hazardous wastes.

b. Content of Hazardous and Mixed Waste Computer Aided Instruction

i. The trainee has the option to go through a course review and practice test.

ii. The CAI shall reference the specific requirements of this permit.

- iii. The hazardous and mixed waste CAI shall provide a basic knowledge of the Colorado Hazardous Waste Regulations.
 - iv. The CAI shall provide knowledge of the requirements pertaining to Rocky Flats facilities which generate treat, or store hazardous or mixed waste.
 - v. Knowledge of waste disposal procedures.
 - vi. Knowledge of waste operations procedures
 - vii. Knowledge of the Contingency Plan and Emergency Response procedures.
- c. Objectives of Hazardous and Mixed Waste Computer Aided Instruction. Upon completion of the CAI course the employee will be able to:
- i. Recognize that the handling of RFP wastes must comply with the following legislation; Resource Conservation and Recovery Act (RCRA), Hazardous and Solid Waste Amendment (HSWA), and Superfund Amendments and Reauthorization Act (SARA).
 - ii. Recognize the characteristics of hazardous wastes; hazardous properties, EPA listing, and Mixed waste.
 - iii. Recognize the RCRA training requirements for generators of hazardous waste.
 - iv. Recognize RCRA satellite collection and 90-day accumulation requirements for generators of hazardous waste.
 - v. Recognize the RCRA inspection requirement for generators of hazardous waste.
 - vi. Recognize the RCRA record-keeping requirements for generators of hazardous waste.
 - vii. Recognize the RCRA emergency response requirements for generators of hazardous waste.
 - viii. Recognize the purpose and five-part approach of the Waste Minimization Plan at RFP.

- ix. Recognize the labeling requirements for containers, crates, and all other storage and shipping containers which are used for the various waste streams at the facility.
 - x. Trainees must achieve an 80% proficiency level to pass the CAI to demonstrate a working knowledge of RCRA in order to be certified.
- d. Updates of CAI Information.
The CAI shall be updated, under the direction of the RCRA training officer, to reflect amendments in the Colorado Hazardous Waste Regulations.
- e. Annual review.
All employees who undergo RCRA training as presented in the CAI program are subject to annual recertification.
- f. Annual retesting is subject to the purview of the RCRA training officer.
- g. Attendance is verified using an attendance sheet or is automatically entered into the Rocky Flats computer system. Employees unable to attend the scheduled session are rescheduled for the next training opportunity. Make-up sessions are scheduled as necessary to ensure that training is completed in a timely fashion.

4. Training Documentation

- a. 6 CCR 1007-3, Section 264.16(d) requires that records be maintained for each employee with RCRA duties as defined by specific job descriptions.
- b. Summary job descriptions for all personnel with RCRA responsibilities are maintained by plant employment.
- c. As much as possible, generic job descriptions are used in establishing the initial and continuing training requirements. Although training is scheduled on the basis of generic job descriptions; employee notification for training sessions is conducted by employee name, number, department and building.
- d. A position description list of all facility personnel involved in hazardous waste and mixed waste management shall be maintained by plant training.
- e. The position description list shall include job titles and descriptions.

- f. The position description for both exempt and non-exempt personnel shall include the requisite skill, education, and other qualifications for each position involved in hazardous or mixed waste management.
- g. The position descriptions shall include the training requirements for each position.
- h. The Permittee shall update the position description list when new positions are identified or created which are involved in hazardous or mixed waste management.
- i. The dates of CAI and on-the-job certification and training shall be recorded.

D. COMPLIANCE SCHEDULE

1. The position descriptions referred to in permit condition Part VII (C)(4)(d) and Part VII(C)(4)(i) shall be initiated within 60 days of this effective date of this permit.
2. Within 90 days of the effective date of this permit, the Permittee shall provide documentation to the Director verifying that the facility is in compliance with permit condition VII(D)(1) above.
3. Within 30 days of the effective date of this permit, the Permittee shall submit a copy of the on-the-job checklist to the Division.

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PART VIII-CLOSURE PLANS

A. CONTAINER STORAGE CLOSURE OVERVIEW AND REVISIONS.

1. Introduction.

This section of the operating permit addresses closure of those hazardous and mixed waste storage units which are covered by Part III-Container Storage of this permit. See Part III for a detailed description of these units.

The individual closure plans for units listed in permit condition VIII (A)(2) below, are approved, as modified, and incorporated into this permit. These closure plans were submitted in the Permittee's RCRA Part B permit application and subsequent revisions, dated December 15, 1987 and April 13, 1988 and December 20, 1989.

2. Identification of Units.

The Permittee shall perform closure activities, including waste removal and decontamination, on the following units in accordance with the Closure Plan, Parts VIII, IX and X of this permit.

- . Main Hazardous Waste Storage Area Unit 1
- . Drum Storage Area Bldg 561, Unit 10
- . Drum Storage Area Bldg 776, Unit 12
- . Mixed Waste Storage Bldg 884, Unit 13
- . Gas Cylinder Building Bldg 952, Unit 23
- . Mixed Waste Storage Bldg 964, Unit 24
- . Mixed Waste Storage Area 904 Pad, Unit 15-A
- . Mixed Waste Storage Area Bldg 777, Unit 17
- . Mixed Waste Storage Area Bldg 776, Rm 201, Unit 27

3. Unit Decontamination.

- a. The Permittee shall follow decontamination procedures detailed in the Part VIII-Closure Plan and Part IX-Decontamination Procedures, for permitted container storage areas, secondary containment structures, and auxiliary equipment.
- b. The Permittee shall implement the procedures detailed in Part VII Closure and Part IX-Decontamination, to verify that the unit undergoing closure has been decontaminated to meet the Closure Performance Standard levels, as defined in Part VIII (B)(5) of this plan.
- c. The Permittee shall repeat decontamination procedures at units undergoing closure until verification test results meet the applicable closure performance standards. If the unit cannot meet the closure performance standards, the equipment and structures will be managed as hazardous or mixed waste and disposed of at an approved offsite facility in accordance with all applicable local, State and Federal regulations.

- d. Indicator parameters listed in Table 3 of Part IX-Decontamination shall include specific radiologic or hazardous parameters which may affect the Permittee's waste management options.
- e. Where the building is used for secondary containment for a unit, decontamination of that portion used for secondary containment must be completed at the same time as closure of the unit.

4. Soils Sampling.

- a. The Permittee shall perform the soils screening for radiologic and organic contaminants and inspect for visual signs of contamination as specified in Part X-Soil Sampling, for units undergoing closure.
- b. The Permittee shall sample soils at permitted units for contamination under the conditions specified in Part X-Soil Sampling. This soils sampling program shall follow the procedures detailed in Part X.
- c. The Permittee shall sample all permitted asphalt storage pads for underlying and adjacent soil contamination. The Permittee shall core through the asphalt to obtain samples for those asphalt storage pads which the Permittee intends to leave in place after closure of the unit. Soil samples will be taken in accordance with the procedures specified in Part X of this permit.
- d. Indicator parameters listed in Table 2 of Part X-Soil Sampling shall include specific radiologic or hazardous parameters which may affect the Permittee's waste management options for contaminated soils.
- e. Background levels of a contaminant in soil will be those obtained in the sampling and analyses activities conducted under the Background Hydrogeological Characterization and Monitoring Plan being implemented at the Rocky Flats Plant, and any additional background soil sampling approved by the Division.

5. Excavation of Soils.

- a. The Permittee shall perform the soil screening step and the verifying soil sampling, as detailed in Part X-Soil Sampling, to determine if the area under investigation is contaminated.
- b. To determine the areal extent and depth of soil contamination, the Permittee shall repeat the steps in Permit Condition VIII (A)(5)(a) above until the hazardous or mixed waste constituents in the area under investigation no longer exceed the Closure Performance Standard. Alternatively, the Permittee may choose to close the unit as a landfill as detailed in Part VIII(B)(7) and Part X-Soil Sampling and perform post-closure care. If post-closure care is necessary, the Permittee shall submit a Post-Closure Care Plan that meets the

requirements of 6 CCR 1007-3, Section 264.118 to the Division for approval within 90 days of the final date on the approved closure schedule.

- c. The Permittee shall dispose of soils excavated during closure which are not decontaminated at an approved offsite facility in accordance with local, State, and Federal requirements.

6. Recordkeeping

- a. The Permittee shall maintain the following closure records at the facility during closure activities, and for a minimum of 30 years following closure certification:
 - i. Record of sampling activities (date, number and type).
 - ii. Results of screening activities, sampling of decontamination rinsewaters, soil sampling, or groundwater sampling.
 - iii. Actions taken to decontaminate or remove wastes structures, or soils; including contaminated soils.
 - iv. Records of volume of hazardous waste generated during closure, including contaminated soils;
 - v. Other documentation which verifies that the Permittee is following the approved closure plan, and the conditions of this permit.

7. Criteria for Determining Post-Closure Care

- a. The criteria to be used to determine if a unit undergoing closure will be certified closed or follow post-closure procedures will be based upon the presence of ground-water contamination caused by the unit. If groundwater or soils are left in place, which have been contaminated by that RCRA unit is identified, then the unit will follow post-closure care procedures. For clean closure the unit will be cleaned to meet the applicable closure performance standard.

B. REGULATORY REQUIREMENTS AND PERFORMANCE STANDARDS.

1. Introduction.

A Closure Plan for the closure of the hazardous and mixed waste treatment and storage units at the Rocky Flats Facility is required pursuant to Part 264 of the Colorado State Hazardous Waste Regulations (CHWR).

2. Purpose and Scope of Plan

- a. The purpose of this plan is to provide for closure of the permitted hazardous and low-level mixed waste container storage facilities at the Rocky Flats Facility in compliance with CHWR Part 264 closure regulations.
- b. This plan addresses the following section of the CHWR: Part 264, Subpart G - Closure and Post-Closure, Sections 264.110 through 264.120; Subpart I - Containers, Section 264.178.
- c. No demonstration of financial responsibility is required since, under current

regulations, compliance with Part 266 Subpart A, Financial Requirements, is not required for government-owned facilities (CHWR 266.10(c)).

- d. A post-closure plan under the Colorado State and Federal RCRA regulations is not required for operating, permitted storage facilities (only for land treatment or disposal facilities), except a contingent post-closure plan is required for certain tank systems under Section 264.197(c) of the Colorado Hazardous Waste Regulations.

3. Description of Units Requiring Closure Plans

Hazardous and mixed wastes are generated primarily in the production and maintenance areas of the Rocky Flats Facility. Hazardous or mixed waste management units included in this permit which require Part 264 closure plans are shown in Table 1, Permitted Units Receiving Part 264 Closure Plans. These waste management units consist of indoor and outdoor container storage units.

4. Facility Contact

The Rocky Flats facility contact for closure plan activities is:
Manager, Rocky Flats Office at the following mailing address:

U.S. Department of Energy
Rocky Flats Office
P.O. Box 928
Golden, Colorado 80402-0928
Phone: (303)966-2025

5. Closure Performance Standard

- a. This closure plan provides for closure of the hazardous and mixed waste storage units, listed in Table 1, in a manner that minimizes the need for further maintenance and controls, minimizes or eliminates threats to human health and the environment, and minimizes or eliminates the post-closure escape of hazardous waste, hazardous waste constituents, leachate, contaminated rainfall or waste decomposition products to the ground or surface waters or to the atmosphere.
- b. Closure performance standard for "USED RINSATE" from decontamination of concrete secondary containment areas:
 - (i) Non-detectable levels of organic hazardous constituents, and
 - (ii) Does not exhibit any characteristic of a hazardous waste, as defined in 6 CCR 261-Subpart C, and
 - (iii) Levels of Toxicity Characteristic (TC) metals at or below the background level in the "unused rinsate" solution.

Selection of the parameters for which the "used rinsate" will be analyzed will be based on the specific wastes stored at the unit. These wastes are specified in Part III of this permit.

- c. Closure performance standard for INORGANIC HAZARDOUS CONSTITUENTS, including METALS, in soil:
 - (i) Background soil concentrations plus two standard deviations, or
 - (ii) Risk levels of 1.0×10^{-6} , using a risk analysis procedure approved by the Director for CARCINOGENIC METALS, and
 - (iii) Hazard Index less than 1.0 for NON-CARCINOGENIC METALS.
 - (iv) Does not exhibit any characteristic of a hazardous waste, as defined in CHWR Section 261-Subpart C.

- d. Closure Performance Standard for ORGANIC HAZARDOUS CONSTITUENTS in Soil:
 - (i) Non-detectable levels, or
 - (ii) Risk based levels of 1.0×10^{-6} for CARCINOGENIC ORGANIC COMPOUNDS using a risk analysis procedure approved by the Director, and
 - (iii) Hazard Index less than 1.0 for NON-CARCINOGENIC ORGANIC COMPOUNDS.
 - (iv) Does not exhibit any characteristic of a hazardous waste, as defined in CHWR Section 261-Subpart C.

- e. The applicable background soil concentrations are those obtained under the Background Hydrogeochemical Characterization & Monitoring Plan being implemented, or other background soil sampling approved by the Director.

- f. The closure performance standards establish concentrations of constituents that achieve the goals stated in item 5.a. (above) . When the closure performance standard is exceeded the following actions may be undertaken: decontamination or removal of containment system components, decontamination or removal of ancillary equipment, decontamination or removal of soil, removal of hazardous waste and removal of hazardous waste residues to a level that will meet the applicable closure performance standard.

6. Amendment of Plan

- a. The closure plan will be amended whenever changes in operating plans or facility design affect the closure plan in accordance with CHWR 264.112, or a change in the expected year of closure occurs.
- b. In conducting partial or final closure, unexpected events which are identified during the implementation of required closure activities may also require an amendment of the existing closure plan. Soil sampling and analysis will be required at some of the units undergoing closure in order to evaluate the presence of soil contamination. Should soil sampling identify contaminated soils associated with an area undergoing closure, a request for modification of the closure plan will be submitted, which includes a schedule for further closure activities. The request for modification of the closure plan will be made within 30 days of identification of the event that causes modification of the closure plan to be necessary, as required by 6 CCR 1007-3, Part 264.112(c)(3).

C. CLOSURE SCHEDULES, PARTIAL AND FINAL CLOSURE ACTIVITIES.

1. Closure Schedule.

The Closure Plan for each of the permitted units consists of the following information: unit description, maximum inventory, closure schedule, closure personnel, identification of partial closure or final closure.

Part IX-Decontamination describes procedures for disposal of wastes, decontamination, and verification of decontamination.

2. Final Closure Schedule

- a. Rocky Flats is an integral part of a nationwide nuclear weapons production facility. The U.S. Department of Energy estimates the plant will undergo closure in the year 2100.
- b. The facility has developed an orderly close-down schedule. Closure of each individual unit will fit within this overall closure plan. Figure 1- Master Closure Schedule, depicts the schedule developed for the orderly sequential close-down of the hazardous waste management system.
- c. Although closure of the Rocky Flats waste management complex may require up to 720 days, no permitted container storage unit will require greater than

180 days. The closure of each individual container storage unit will begin within 30 days after receiving the final volume of hazardous or mixed waste. All waste will be removed from each container storage unit within 90 days of receipt of the final volume of waste. See Figure 2-Container Areas Closure Schedule. The receipt of the final volume of waste is determined by how a unit interacts and relates to other hazardous or mixed waste management units.

- d. Due to the sequential progression of unit closures, no unclosed but inactive portions of the waste treatment complex will be present. Each unit will be in operation until closure activities commence. Human health and the environment will be protected during all closure activities through the required inspections, monitoring activities, sampling activities, and security measures established by conditions in this State RCRA Permit. All such monitoring activities will continue until all waste management units are certified closed.
- e. The environmental monitoring and security procedures will identify the migration of any hazardous constituents and prevent unauthorized access onto the plant facilities. Remedial actions will be taken if problems are identified in the course of environmental monitoring. Analyses will be performed in accordance with approved EPA procedures or other Director approved analytical procedures, such as the L-Procedures specified in the waste analysis plan, for those analyses for which the EPA does not have an approved procedure.
- f. Closure of waste-handling facilities will be scheduled according to the closure of associated production facilities. The logical closure sequence is described in the following paragraphs. The closure activities described will occur in the order described; however, the activities will overlap as shown in Figure 1.

3. Order of Unit Closure

- a. The first facilities to be closed will be the Main Hazardous Waste Storage Area (Unit 1); the container, tanks and storage areas associated with the production facilities; and portions of the Process Waste System. These facilities include the satellite portions of the process waste system, and all storage areas except the 374 addition (Unit 19) and two drum storage areas (Unit 11 and 12).
- b. The second group of facilities to be closed will be the remaining portions of the Process Waste System. The last parts of the Process Waste System to be closed will be Buildings 774 and 374, which will be closed in that order.

c. The third group of facilities to be closed will comprise the Salt Crete and mixed waste storage areas. The mixed waste storage areas are the Building 374 Salt Crete Storage Addition (19), the Building 964 Mixed Waste Storage Building (Unit 24), and the Pond Crete and Salt Crete Storage Area (Unit 25). The closure of the Salt Crete storage areas will complete the closure of the Rocky Flats Waste Treatment Facility.

4. Partial Closure Activities

a. Partial closure pertains to closing one hazardous waste management unit at a facility as opposed to closing the entire hazardous waste management facility. This may occur if the useful life of a unit has been expended, or operations have changed obviating the need for the unit, or if amendments to the State or Federal RCRA laws or regulations mandate closure of a one or more of the units at the facility.

b. Partial closure actions are not anticipated at the Rocky Flats Plant. However, should partial closure become necessary, the procedures described in this section of the permit would be followed. Units operating under interim status that require closure will be closed following the procedures outlined in an approved interim status closure plan. Interim status closure plans must be approved by the Director prior to implementation of the plan and certification of closure.

c. Amendments to this closure plan to address partial closures require a permit modification pursuant to 6 CCR 1007-3, Section 100.6.

5. Facility Closure Notifications

As is defined in the Colorado Hazardous Waste Regulations, the Director will be notified of the intent to perform partial or final closure of any hazardous waste or mixed waste container storage unit covered by this permit at least 45 days prior to the beginning of closure of the unit.

6. Closure of Containers

a. Introduction. This section contains a description of closure activities for each hazardous and mixed waste container area. The disposition and destination of the wastes in each container area is discussed in Part VIII (D)(5-11).

b. There are two general types of permitted container storage areas at the facility: areas which store hazardous waste and areas which store mixed waste. Hazardous waste is generally stored in enclosed cargo containers which are stored outdoors. Solid and liquid mixed waste is generally stored inside buildings or in enclosed cargo containers which are placed outside. Detailed facility descriptions of each container storage area covered by this permit are found in Part III of this permit.

7. Maximum Waste Inventory

- a. The maximum inventory capacity of each of the permitted container areas under normal operating conditions, is listed in Part III of the State RCRA Permit, "Storage in Containers". Wastes permitted for each container storage area are also listed in Part III of this permit.

8. Closure Schedule

- a. The closure of the container areas and associated equipment will be accomplished in accordance with this permit.
- b. These areas will be closed in a manner to ensure that the closure performance standard, specified in Part VIII (B)(5), will be met.
- c. The Director and the EPA Regional Administrator will be notified of the intent to close each container storage area listed in Part VIII, Table 1 of this Part B Permit forty-five days prior to the initiation of closure activities.
- d. Closure of each container storage area listed in Part VIII, Table 1 will begin within 30 days of the receipt of the last volume of waste at each area and will proceed in accordance with the closure schedule presented in Part VIII, Figure 2. Decontamination of containers and containment will be implemented as soon as empty containers or bare containment areas are available.
- e. The decontamination of equipment will follow the last expected use of the equipment in closure activities, or prior to leaving the contaminated area. It is expected that decontamination of equipment will take no longer than 10 days total.
- f. The closure of each permitted container area will be completed within 180 days.
- g. Soil sampling and analysis required by this plan will be accomplished within 120 days from the beginning of closure of each container storage unit. If soil sampling does identify contaminated soil, a request for modification of the closure plan will be submitted within 30 days of identification of the contaminated soil. The closure plan and schedule for that unit will be amended to address the complete identification and removal of contaminated soil. Similarly, a request for modification of the closure plan will be submitted within 30 days of the identification of any other problem requiring amendment of the closure plan identified during the implementation of partial or final closure.

- h. Within 60 days following completion of closure of each permitted hazardous and mixed waste management unit, and following final closure, the Permittee and an independent Professional Engineer, registered in the State of Colorado, will submit certification of closure, based upon compliance with the approved closure plan, to the Director.

9. Closure Personnel

- a. Part VIII, Table 2-Personnel Required for Closure, identifies the personnel required for closure of the various drums and container areas in accordance with the schedule and safety and regulatory standards. The persons listed will be qualified workers, trained in basic mechanical skills, decontamination techniques and safety procedures necessary to accomplish closure. The lists do not specify management personnel beyond the work-area supervisor, nor any health and safety personnel. Minimum crews (2 for hazardous and 4 for mixed waste areas) are required for health and safety requirements. Only two areas require more than minimum crews to complete decontamination according to the procedures in Part IX-Decontamination, and within the time allotted.
- b. If it is found that decontamination or other closure activities necessarily take longer than expected, additional qualified personnel may be required to ensure implementation of closure within the approved time schedule.

10. Replacement with Like Equipment

- a. Due to the extended lifetime of the Rocky Flats Plant, some permitted units may become worn and require replacement before the plant officially undergoes closure. In such cases, the permitted unit or piece of equipment will be removed and replaced with an identical or similar unit. The old unit will undergo all of the required decontamination and closure activities described in this Part of the permit. The Director will be notified at least 45 days prior to such activities. A request for a permit modification will be submitted whenever a change in operating plans or facility design affect the closure plan.
- b. In the event that replacement of equipment requires partial closure activities, the permitted units undergoing closure will be closed in accordance with all of the requirements in this permit.

11. Final Closure of Container Areas

- a. This section presents programs for the final closure of the container storage areas listed in Part VIII, Table 1. The closure plans are based on the assumption that as part of closure each container storage area listed in Table 1 will be decontaminated to levels consistent with the applicable closure performance standard specified in Part VIII (B)(5).

- b. The plans also assume that the plant waste management and treatment capabilities will be available to receive the area inventory and the cleanup waste. In the event of final closure of this facility, the container areas would be closed according to the overall schedule described in Part VIII (C) and presented graphically in Part VIII, Figure 1.
- c. Consistent with the objective of minimizing wastes generated during closure, the following closure plans presume that, where practical, facility equipment will be decontaminated. Where this is not feasible, such materials may be disposed of in compliance with local, State and Federal regulations and according to standard operational procedures for handling such wastes.
- d. The disposition of any hazardous or mixed waste from a unit undergoing closure will depend on the exact characteristics of the waste and the permitted treatment and disposal facilities of all commercial and DOE facilities. The disposition of all hazardous and mixed waste will fully comply with all State and Federal Hazardous Waste Regulations applicable at the time of disposal.
- e. The disposition/destination of drummed hazardous waste will be dependent upon the type of waste present in the drum. Treatment of hazardous wastes at the Plant will always be the preferred waste treatment alternative. If on-site treatment is not feasible, then the disposition of each waste will depend upon the characteristics of each waste and the capabilities of other designated treatment, storage, and disposal facilities. All wastes shall be properly disposed.
- f. Liquid wastes that, based on the waste characteristic, are suitable for recycle will be sent to OSCO in Henderson, Colorado, for recycle, or to another designated recycle facility.
- g. Solid wastes with levels of PCB's suitable for landfilling, or soft wastes contaminated with hazardous organics at concentrations less than the RCRA Land Ban requirements will be sent to the USPCI Green Mountain Utah facility for burial. This same facility can take heavy metal contaminated waste or corrosive-type waste for treatment and burial. Wastes with the cyanide-reactive characteristic, wastes highly contaminated with cyanides, Toxicity Characteristic wastes, and all other solvent-free hazardous wastes, will go to the USPCI Oklahoma facility for treatment or encapsulation and disposal. Hazardous wastes contaminated with levels of PCB's greater than approved for landfill disposal will be sent to the Rollins Environmental Services facility in Deer Park, Texas for incineration, or other designated facility.

- h. All mixed low-level radioactive wastes will be disposed at the DOE Nevada Test Site facility, or another approved facility. If no DOE facilities can accept this waste then commercial facilities will be considered. Finally, if no facilities exist for shallow or deep burial of this waste, or other off-site waste disposal, long-term monitored storage of the waste will be conducted at the Rocky Flats Plant until a disposal facility is approved. The Permittee shall notify Director if long term storage is the only waste management option for Rocky Flats low-level mixed waste, and obtain the Directors approval for this waste management option PRIOR to exceeding approved permitted or interim status storage capacity for any waste type.
- i. The approximate distances to various off-site treatment and disposal facilities are listed below.

APPROXIMATE ONE-WAY DISTANCES TO
TREATMENT/DISPOSAL FACILITIES

Facility	Distance (miles)
OSCO, Henderson, Colorado	25
USPCI, Green Mountain, Utah	614
USPCI, Lone Mountain, OK	581
Rollins Environmental Services, Deer Park, TX	1,172
DOE Nevada Test Site, Nevada	986

- j. All cleaning waters generated during closure decontamination activities which are compatible with the Rocky Flats Plant waste treatment facilities will be treated onsite. Wastes compatible with the Rocky Flats Plant waste treatment facilities currently include high and low pH solutions, radioactive solutions, and solutions contaminated with inorganics. Waste that are reactive, ignitable, or highly concentrated in organics are incompatible with the RFP waste treatment facilities. It is currently anticipated that all cleaning wastes will be compatible with the RFP waste treatment facilities.
- k. Some aqueous wastes in the container areas contain organics. Upon initiation of final closure, a wastewater pretreatment unit may be installed at the container area being closed or at Building 374 to remove organics from wastewater prior to its discharge to the Building 374 wastewater treatment system. The following discussions assume any wastewater containing organics will be pretreated prior to its discharge into the Building 374 wastewater treatment system. The types of waste generated during cleaning depend on the method used. The methods considered appropriate for the decontamination of containers are steam cleaning and foam washing.

- l. It is currently believed that a single wash and rinse cycle will be adequate to decontaminate the containment device or other equipment and structures at a unit. However, the schedule currently presented is adequate to allow triple wash and rinse of the unit. These procedures are described in Part IX-Decontamination.
- m. In the event of closure, the volume of waste requiring ultimate disposal would include the maximum waste volume held in storage and the waste volume generated during the closure decontamination activities.
- n. The waste volumes generated from closure decontamination activities for each unit are given in the subsections of this closure plan for individual units.
- o. The volume of waste which will require off-site disposal upon closure is difficult to determine due to the large variety of wastes generated at Rocky Flats over time. However, a conservative estimate of this volume would be the total volume of waste on plant site, as summarized in item m. (above).

D. UNIT CLOSURE ACTIVITIES

1. Main Hazardous Waste Storage Area (Unit 1)

- a. Drums in the Main Hazardous Waste Drum Storage Area (Unit 1) are stored in cargo containers or outside in drum racks. Wastes stored at this area typically contain hazardous wastes such as solvents, coolants, organics, acids, and waste machining, combustible solids, cutting and lubricating oils, and solvent containing wipes. No mixed waste is stored at the Main Hazardous Waste Storage Area. Removal of the waste inventory will follow normal operating procedures for the unit. A more detailed description of the operations at this unit and the wastes managed is given in Part III of this permit.
- b. Based upon the composition of the wastes, Waste Operations will make arrangements to transport the waste for treatment, storage, disposal or recycling. Wastes will be either pumped into a tanker truck or placed on a truck for transport. Drums containing residues of hazardous or mixed waste will either meet the RCRA requirements for disposal as an empty container, or will be transported off-site to an approved treatment or disposal facility as discussed in this section. If the drums meet the definition of an empty container they may be disposed in the Rocky Flats sanitary landfill. Alternatively, drums containing residues of hazardous or mixed waste will be washed as described below.
- c. Empty drums will be inspected to ensure that they meet the requirements of 6 CCR 1007-3, Part 261.7. The requirements of this section state that all wastes have been removed using common practices, no more than one inch

of residue remains in the container and no more than three percent by weight of the total capacity of the container remains in the container or inner liner. Any drums that do not meet this requirement will be steam cleaned three times prior to disposal. Rocky Flats manages no acute hazardous wastes and therefore there are no drums that require triple rinsing prior to being considered a empty. All spent steam condensate (approximately 21 gallons for each drum triple cleaned) will be collected and treated on-site in the process waste treatment system. If the spent steam condensate is highly concentrated in organics, then the waste may go offsite for treatment or disposal. After the triple rinsing procedure the drums can be reused or disposed in a sanitary landfill as non-hazardous waste. If any drums do not meet the requirements of Part 261.7, described above, then the drums will be disposed at an approved site as a hazardous waste.

- d. After the drums have been removed, the cargo containers and the catch basins will be decontaminated. The catch basins will be washed down with a decontamination solution specific to the dominant waste type managed in the unit. A foaming agent may be used to reduce the amount of spent cleaning solution generated. After washing, the rinsate will be sampled and analyzed as described in Part IX-Decontamination. The washdown and rinsate solutions will be removed by a portable vacuum unit and placed in 55-gallon containers or in a tanker truck.
- e. The interior and exterior walls of the cargo containers will be steam cleaned as described in Part IX-Decontamination. The spent steam cleaning condensate will be sampled as described in Part IX-Decontamination. The steam cleaning condensate will be removed by a portable vacuum unit and placed in 55-gallon containers or in a tanker truck.
- f. The cleaning effluent generation rate will be between 110 and 6910 gallons for each 20 foot long cargo container, and between 200 and 12670 gallons for each 40 foot container, assuming a single cycle of washing and rinsing with steam cleaning equipment. The most probable generation rates are expected to be 614 and 1126 gallons for the 20 and 40 foot cargo containers, respectively. The generation rate of cleaning effluent will vary depending upon the geometry of the surface to be decontaminated as well as the type of contamination potentially present on the surface. For instance, an outdoor concrete or asphalt surface caked with soil will have a greater cleaning effluent generation rate than a clean, epoxy coated concrete surface in a building.
- g. Drums or trucks of cleaning effluent will be transported to Building 374 or 774 for treatment. The empty cleaning effluent drums will be transferred to a portable unit for cleaning after the cargo containers are decontaminated.

The asphalt pad of this unit may be cleaned either by hand or by truck mounted equipment. The cleaning solutions foam, and rinsate will be collected by a vacuum truck.

- h. Pad washing activities will generate cleaning effluent at the rate of between 24 and 360 gallons while decontaminating 150 square feet with a single wash and rinse cycle using steam cleaning equipment. The most probable generation rate is expected to be 50 gallons per 150 square feet with a single wash and rinse cycle.
- i. The rinsate will be analyzed and compared to the applicable closure performance standard. The asphalt pads will be screened for volatile organic compounds and radiological parameters in accordance with Part X of this permit to verify that the asphalt pad has been decontaminated for these constituents, and to verify that no release has occurred from the unit. Underlying soils will be addressed as specified in Part X.
- j. If parts of a cargo container cannot be decontaminated, those parts will be shipped off-site for disposal at an approved facility.
- k. Closure of the Main Hazardous Waste Storage Area (Unit 1) may involve collection of soil samples, from an area including the boundary of the unit and the volume of soil affected by a release from the unit. The need for soil sampling will be predicated by criteria listed in Part X-Soil Sampling. Soil sampling and analysis procedures, and soil removal or decontamination criteria, are addressed in Part X.
- l. The vacuum unit, drum hugger unit, and truck used for loading the drums, will be washed or steam cleaned with a portable cleaning unit.

2. Building 561: Drum Storage Area (Unit 10)

- a. The Building 561 Drum Storage Area (Unit 10) is adjacent to Building 561. Wastes are stored in 55 gallon drums inside cargo containers. Removal of the waste inventory will follow normal operating procedures for the unit. A more detailed description of operations at this unit, and a more specific description of the wastes stored at this unit are given in Part III of this permit.
- b. After washing, the catch basin will be rinsed, and the rinsate sampled, as described in Part IX-Decontamination. The washdown and rinsate solutions will be removed by a portable vacuum unit, and placed in 55 gallon drums or tanker trucks. After the catch basins are cleaned, the interior and exterior walls of the cargo containers will be steam cleaned as described in Part IX-Decontamination. The spent steam condensate will be sampled and analyzed as described in Part IX-Decontamination, and will be removed by a portable vacuum unit and placed in 55-gallon drums or a tanker truck.
- c. After the catch basins are clean, the interior and exterior walls of the cargo containers will be steam cleaned as described in Part IX-Decontamination. The spent steam condensate will be sampled and analyzed as described in Part IX-Decontamination, and compared to the Closure Performance Standard. Rinsate will be removed by a portable vacuum unit, and placed in 55-gallon drums or a tanker truck.
- d. Approximately 614 gallons of cleaning effluent will be produced for each 20 foot long cargo container, and 1126 gallons for each 40 foot container, assuming a single cycle of washing and rinsing with steam cleaning equipment. The drums or trucks of cleaning effluent will be transported to 374 or 774 for treatment. The drums or trucks will be emptied, and the cleaning effluent will be treated through the process waste treatment system in either Building 374 or 774. Since the unit held low-level mixed waste, the emptied cleaning effluent drums will either be steam cleaned to ensure they are decontaminated, or they will be transported to Building 776 for size reduction and disposal as a low-level mixed waste.
- e. If parts of a cargo container cannot be decontaminated, these parts will be dismantled and shipped offsite to an approved facility.
- f. The vacuum unit and the drum hugger used for loading the drums will be cleaned using the same method described for the drums, with a portable cleaning unit.
- g. To determine if soil sampling is required, and the methods to be followed if soil sampling is required, refer to Part X-Soil Sampling.

3. Building 776: Drum Storage Area (Room 237) (Unit 12)
- a. The Building 776 Drum Storage Area (Unit 12) is located on the second floor of Building 776. The area manages low-level radioactive mixed wastes stored in drums. Removal of the waste inventory will follow normal operating procedures for the unit. A more detailed description of the operations at the unit and the wastes managed can be found in Part III of this permit.
 - b. The area will be vacuumed to remove dust and solids. An appropriate decontamination solution from Table 2 of Part IX-Decontamination will be used for steam cleaning of the area. The cleaning solution will be collected by a vacuum unit as decontamination proceeds. Used cleaning solution will be generated at a rate of 50 gallons while completing a wash and rinse cycle on 150 square feet. The used solutions will be compared to the Closure Performance Standard, and transferred to Building 374 or 774 for treatment.
 - c. If parts of the floor or pallets cannot be decontaminated, the floor will be broken up and the contaminated portions placed in containers for disposal at an approved site.
 - d. The vacuum unit and the drum hugger or tanker truck will be cleaned using a portable cleaning unit in accordance with Part IX-Decontamination procedures.

4. Building 884: Mixed Waste Storage Building (Unit 13)
 - a. Building 884 (Unit 13) is a mixed waste storage facility. Removal of the waste inventory will follow normal operating procedures for the unit. A more detailed discussion of the operating procedures and wastes managed in the area can be found in Part III of this permit.
 - b. The drummed wastes will be transported to Building 374, 774 or 776 for treatment. Boxes will be shipped offsite to an approved mixed waste facility. The empty drums will be transferred to a portable cleaning unit for cleaning.
 - c. Cleaning effluent will be generated at the rate of 50 gallons while completing a single wash and rinse cycle on 150 square feet of the building. The drums or trucks of cleaning effluent will be compared to the Closure Performance Standard, and transported to Building 374 or 774 for treatment. Auxiliary equipment, such as the drum hugger unit or truck used for loading the drums, will be cleaned using steam cleaning methods in accordance with the methods outlined in Part IX-Decontamination.
 - d. If parts of the floor or drip pans cannot be decontaminated, the contaminated portions will be shipped offsite as described in Part VIII (C)(11).
 - e. To determine if soil sampling is required, and the methods to be followed if soil sampling is required, refer to Part X-Soil Sampling.

5. Building 952: Gas Cylinder Storage Building (Unit 23)
- a. Gas cylinders containing lecture bottles of phosgene, nitric oxide, sulfur dioxide, trimethylamine, hydrogen sulfide, butane, iodine pentafluoride, bromine trifluoride, butene, carbon monoxide, ethylene, hydrogen bromide, chlorine, propane, and vinyl chloride, and 100 pound tanks of anhydrous ammonia may be stored in the Building 952 Gas Cylinder Storage Building (Unit 23).
 - b. Whenever possible, gas cylinders will be returned to the vendor for recycle. If all cylinders are not returnable, then disposal of gas cylinders will follow, CCR 261.7(b)(2). This regulation states that compressed gas cylinders are considered empty when the pressure in the container approaches atmospheric. An empty container, as specified in CCR 261.7(a)(1) is not subject to regulation under CCR Parts 261 through 266. Disposal of these empty containers will therefore take place in the Rocky Flats Plant sanitary landfill, or another approved facility.
 - c. The concrete floor in the storage building will be cleaned with an appropriate cleaning Solution from Table 2, Part IX-Decontamination, using procedures described in Part IX-Decontamination. As the floor is cleaned the cleaning solutions and rinsate will be collected by a vacuum unit.
 - d. Approximately 50 gallons of cleaning solution will be generated while completing a single wash and rinse cycle on 150 square feet.
 - e. The drum effluent will be sampled and analyzed, and compared to the Closure Performance Standard, and transferred to Building 374 or 774 for treatment.
 - f. If parts of the floor cannot be decontaminated, the floor will be broken up and the contaminated parts placed in containers for disposal at an approved off-site facility.
 - g. The vacuum unit and the drum hugger or truck will be cleaned using a portable cleaning unit, according to the methods detailed in Part IX-Decontamination.
 - h. Screening of soil beneath and adjacent this area will be done in accordance with Part X of this permit in order to confirm that no soil contamination is present.

6. Building 964: Mixed Waste Storage Building (Unit 24)
- a. Building 964 (Unit 24) is a mixed waste storage facility. Removal of the waste inventory from the unit will comply with normal operating procedures for the unit. A more detailed discussion of the operations of the unit and the wastes managed is found in Part III of this permit.
 - b. After removal of the waste, the concrete floors in the warehouse will be cleaned using the procedures described in Part IX-Decontamination, with an appropriate cleaning solution from Table 2, Part IX-Decontamination. The cleaning solutions, wash and rinsate will be collected with a vacuum unit. Cleaning solution will be generated at a rate of 50 gallons while completing a single wash and rinse cycle on 150 square feet of surface.
 - c. The cleaning agents and rinsate water will be collected and placed in 55-gallon drums or a tank truck. The effluent contained in the drums or tank will be compared to the Closure Performance Standard, and transferred to Building 374 or 774 for treatment.
 - d. If any part of the concrete floor cannot be decontaminated, that part will be removed and disposed at an appropriate site.
 - e. The empty drums, drum hugger vacuum unit, and tank truck will be cleaned using a portable cleaning unit in accordance with the procedures described in Part IX-Decontamination.

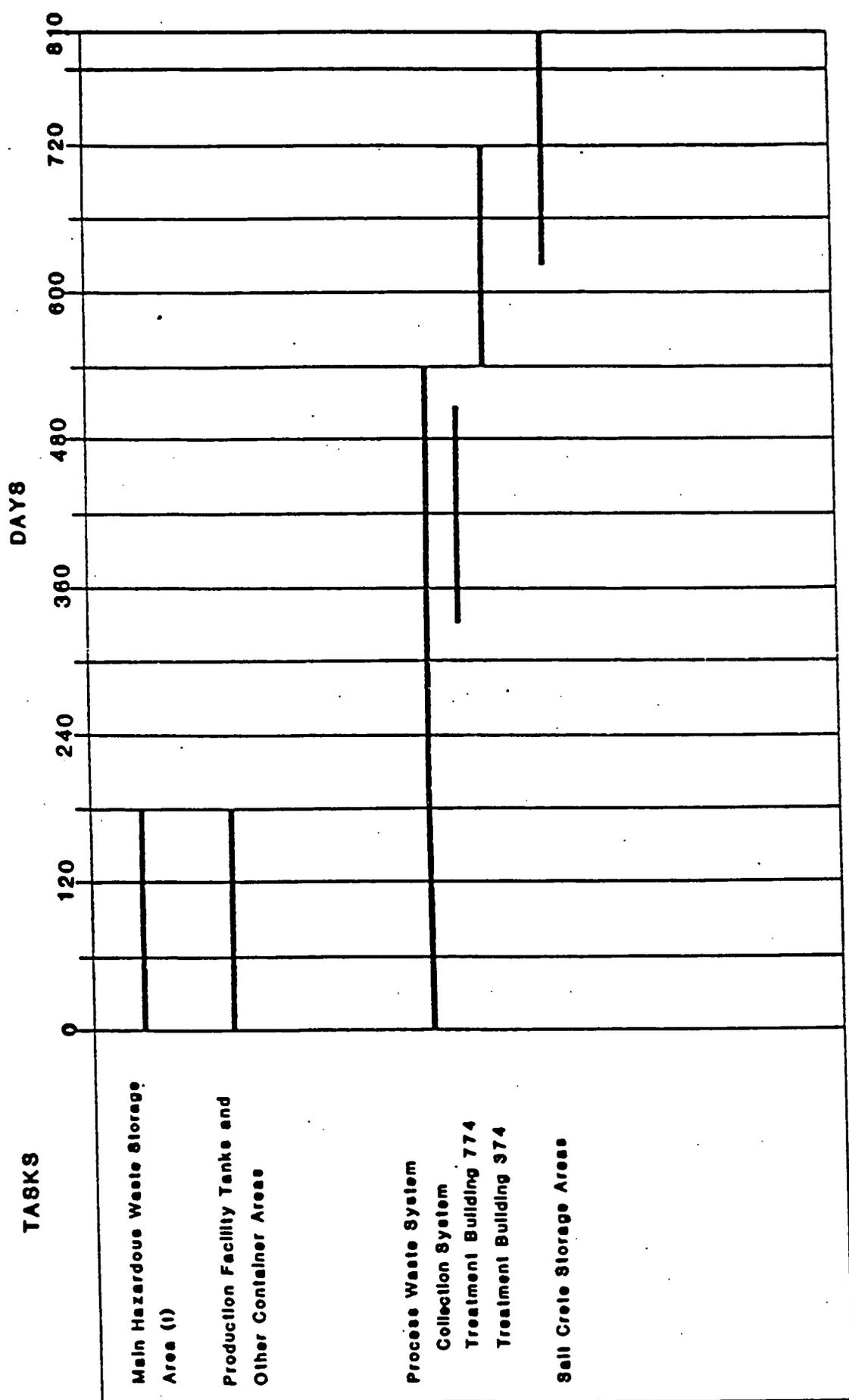
7. 904 Pad: Mixed Waste Storage Area (Unit 15-A)

- a. The Pad 904 Storage Area (15-A) is used for storage of low-level mixed wastes. Removal of the waste inventory will follow normal operating procedures for the area. A more complete description of the wastes managed at this area and the management methods can be found in Part III of this permit.
- b. After all drums and boxes have been removed, the cargo containers and catch basins within the cargo containers will be decontaminated. The catch basins will be washed down with appropriate cleaning solutions for the wastes stored in the cargo containers as described in Part IX-Decontamination. After washing, the catch basins will be rinsed and the rinsate sampled, as described in Part IX-Decontamination. The cleaning solutions and rinsate solutions will be removed by a portable vacuum unit, and placed in 55-gallon drums or a tanker truck for appropriate on-site or off-site treatment or disposal.
- c. The interior and exterior walls of the cargo containers will be steam cleaned as described in Part IX-Decontamination. The spent steam condensate will be sampled and analyzed as described in Part IX-Decontamination. The spent steam condensate will be removed by a portable vacuum unit and placed in 55-gallon drums or a tanker truck.
- d. Approximately 614 gallons of cleaning solution will be generated by a single wash and rinse cycle on each 20 foot cargo container, and 1126 gallons for each 40 foot cargo container.
- e. The cleaning solutions and rinsate solutions will be removed by a portable vacuum unit, and placed in 55-gallon drums or a tanker truck. The waste will then be compared to the Closure Performance Standard, and transferred to Building 374 or 774 for treatment in the process waste treatment system.
- f. If parts of a cargo container cannot be decontaminated as set forth in Part IX-Decontamination, those parts will be shipped offsite for disposal at an approved site.
- g. The asphalt pad area of this waste management area may require truck mounted equipment in order to decontaminate this pad in a timely manner.
- h. After cleaning, the asphalt pad will be screened for volatile organic compounds and radiological parameters in accordance with Part X of this permit. If the asphalt proves uncleanable, it will be broken and boxed for disposal at an approved facility.

- i. If the pad can be cleaned, it will be cleaned using procedures described in Part IX-Decontamination. The cleaning solutions, foam and rinsate will be collected by a vacuum unit.
- j. Cleaning solution will be generated at a rate of 50 gallons while completing a single wash and rinse cycle on 150 square feet of surface. The wash solution and rinse water will be collected and placed in a tank truck. This effluent will then be transferred to Building 374 or 774 for treatment.
- k. Closure of this area will involve collection of soil samples in areas potentially impacted by contaminated run-off from outside storage of hazardous waste. Soil sampling procedures and data analysis procedures will be as discussed in Part X-Soil Sampling.
- l. The vacuum truck, tank truck, drum hugger, and truck used for loading the drums will be washed or steam cleaned with a portable steam cleaning unit.

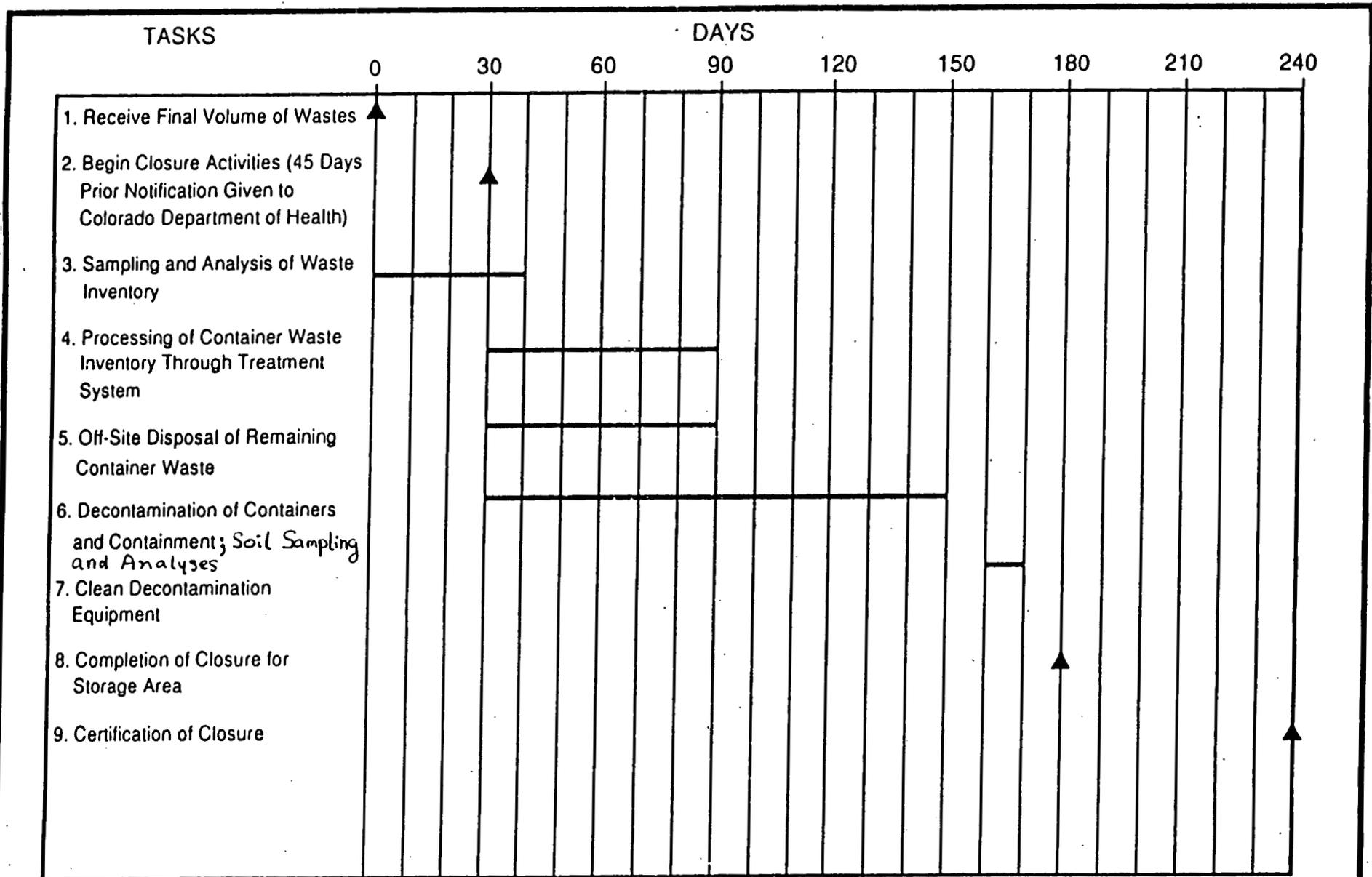
8. Building 777: Mixed Waste Storage Area (Unit 17)
- a. Unit 17 is a mixed waste storage facility. Removal of the waste inventory will follow normal operating procedures for the unit. A more complete discussion of the operations at the unit as well as the wastes managed can be found in Part III of this permit.
 - b. The containers present in this area will be transported to an approved facility.
 - c. The concrete floor will be vacuumed to remove dust and debris, and cleaned using an appropriate decontamination solution using procedures in Part IX-Decontamination. After washing, the rinsate will be sampled and analyzed as described in Part IX-Decontamination. The cleaning and rinsate solutions will be removed by a vacuum unit, and placed in 55-gallon drums for treatment in Building 374 or 774. Approximately 50 gallons of cleaning solution will be generated while completing a single wash and rinse cycle on 150 sq ft of the unit.
 - d. If any part of the floor cannot be decontaminated, it will be sent to an approved facility for disposal.
 - e. Drum hugger units, vacuum units, and related cleaning equipment will be cleaned using a portable cleaning unit.

9. Building 776: Mixed Waste Storage Area, (Room 201) (Unit 27)
- a. Unit 27 is a mixed waste storage facility. Removal of the final waste inventory from this unit will follow the same procedures as normal operation of the unit. A more complete description of operations at the unit and the wastes managed at the unit can be found in Part III of this permit.
 - b. The concrete floor of this area will be vacuumed to remove dust and debris prior to cleaning with Solution E from Table 2, Part IX, according to procedures described in Part IX. After washing, the floor will be rinsed, and the rinsate sampled, as described in Part IX-Decontamination. The washdown and rinsate solutions will be removed by a vacuum unit, and placed in 55-gallon drums for treatment in Building 374 or 774.
 - c. Used cleaning solution will be generated at a rate of 50 gallons while decontaminating 150 square feet with a single wash and rinse cycle.
 - d. If any part of the concrete floor cannot be decontaminated, that part will be removed and disposed at an approved facility. Drum hugger units, vacuum units, foaming cleaner units, and related equipment will be cleaned using a portable cleaning unit in accordance with the procedures described in Part IX-Decontamination.



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FIGURE 1
 MASTER CLOSURE SCHEDULE
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CONTAINER AREAS CLOSURE SCHEDULE

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FIGURE 2

TABLE 1.**HAZARDOUS AND LOW-LEVEL MIXED CONTAINER STORAGE WASTE UNITS RECEIVING PERMITTED STATUS IN THIS PERMIT**

UNIT NUMBER	BLDG NUMBER	UNIT NAME
1	Outside	Main Hazardous Waste Storage Area
10	Adj 561	Drum Storage Area
12	776	Drum Storage Area
13	884	Mixed Waste Storage
15	Outside	Mixed Waste Storage
17	777	Mixed Waste Storage
23	952	Gas Cylinder Storage
24	964	Mixed Waste Storage Building
27	776	Mixed Waste Storage (Room 201)

**TABLE 2
PERSONNEL REQUIRED FOR CLOSURE OF
CONTAINER STORAGE AREAS**

<u>Unit Number</u>	<u>Building Number</u>	<u>Unit Name</u>	<u>Typical Number of Personnel Required</u>
1	Outside	Main Hazardous Waste Storage Area	2
10	Adjacent to 561	Drum Storage	4
12	776	Drum Storage (Room 237)	4
13	884	Mixed Waste Storage Building	4
15	Outside	Mixed Waste Storage (Pad 904)	4
17	777	Mixed Waste Storage	4
23	952	Gas Cylinder Storage Building	4
24	964	Mixed Waste Storage Building	4
27	776	Mixed Waste Storage Building	4

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PART IX DECONTAMINATION

INTRODUCTION

The purpose of this Part is to provide a list of possible decontamination methods which are applicable to the closure of the permitted units listed in this permit. This Part also specifies which decontamination methods are appropriate for the hazardous and mixed waste types stored under this permit.

A. GENERAL CONSIDERATIONS.

Before commencing decontamination of a facility, consideration must be given to the disposal of the wastes which will be produced. This includes an assessment of the types and quantities of wastes, safety aspects, and handling, treatment and final disposal options. The waste volumes should be minimized as far as possible and the compatibility of wastes must be considered.

Categories of waste generated during decontamination may include:

- Cleaning materials, for example paper towels and swabs.
- Protective clothing and materials, for example, polyethylene sheeting, overalls, boots, and gloves.
- Organic solvents
- Aqueous liquids, for example:
 - | detergents and soapy wastes
 - | acid solutions, possibly with appreciable salt and
 - | solution containing complexing agents.
- Solids, for example:
 - | scrap structural materials
 - | spent abrasive materials
 - | accumulated corrosion products
 - | spent ion-exchange materials
 - | used ventilation filters
 - | temporary enclosure equipment.

B. COMMON DECONTAMINATION PROCEDURES.

1. Usefulness of Technique.

The usefulness of a particular decontamination technique is influenced by:

- a. the nature of the contamination
- b. the nature of the object contaminated
- c. size and shaped shape; roughness/porosity of surface; whether it has surficial coating, e.g., paint, general dirt, grease, etc.; nature of materials, e.g., hardness.
- d. history since contamination
- e. ability to handle, treat, or dispose of decontamination and treat wastes
- f. local restrictions and conditions, e.g., in use of solvents and acids.

- g. Although the aim of decontamination is to remove contamination, it sometimes is necessary to do so without damaging the item concerned so that it may be re-used. In this case, it is desirable to employ the least aggressive decontamination method to avoid surface deterioration.
- h. Decontamination can be accomplished by a variety of methods. The following general principles apply to decontamination by any method:
 - i. Wherever decontamination is carried out, all efforts must be made to "contain" the contamination. This principle is particularly important when decontamination is carried out "in situ." Containment may involve the use of temporary structures or other artifacts. For instance, when decontaminating an outdoor asphalt pad, plastic sheets will be placed along the edges of the pad in order to minimize the area potentially contaminated by any overspray of decontamination fluids.
 - ii. The decontamination process should be chosen to prevent redeposition and relocation of contamination. In general, items should be decontaminated from the upper surfaces downward. If lower surfaces are decontaminated first, there is a danger that they will become contaminated once again when the upper surfaces are cleaned.
 - iii. More highly contaminated areas should be decontaminated first.
 - iv. Methods leading to the roughening or gouging of surfaces should be avoided where possible.
 - v. Methods should be chosen that will minimize the decontamination wastes and be consistent with the decontamination process.

2. Standard Cleaning Methods

There are four methods that typically are used for decontamination of materials such as those found at the site. These are hydroblasting /waterwash, foam cleaning, steam cleaning and spalling. These methods are summarized in the following sections.

3. Hydroblasting

- a. In hydroblasting, a high pressure (500 to 5,000 psi) water jet is used to apply cleaning solutions to steel and concrete surfaces. Cleaning solutions may consist of cold or hot water with detergents, solvents, or abrasives. The combination of chemical and mechanical agitation is effective in removing contaminated debris from surfaces. The waste must be collected and promptly handled. Some erosion may occur during hydroblasting, and so hydroblasting may be a method of spalling.

- b. Depending on the pressure used, concrete surfaces may lose up to 1/4 to 1/2 inch of surface. Corrosion rates of steel surfaces depend primarily on the chemical action of the cleaning agent and are not usually apparent during the short times required for cleaning.
- c. The equipment required for hydroblasting includes high pressure pump hoses and nozzles, water collection sumps or vacuums, water storage tanks, and conventional water pumps.
- d. The time required for cleaning is directly proportional to the surface area to be treated. A rate of 40 square feet per hour is typical of average conditions. The amount of solution is approximately 12 gallons per square foot of surface.
- e. Waterwashing is similar to hydroblasting except that high pressure jets are not used. Foaming agents can be added to the water to facilitate decontamination with a minimum of wash water generated. The amount of solution used is estimated to be about the same as in hydroblasting.

4. Foam Cleaning

- a. Foam cleaning consists of suspending decontamination agents in a thick, dry foam that is applied onto surfaces to be cleaned. A variety of commercial decontamination agents are used for foam cleaning. Table 1 lists typical chemicals available from one manufacturer. Table 1 is not a comprehensive list of all chemicals suitable for use. Other chemicals that are more specific to a particular problem, or that have been recently developed, may be used at Rocky Flats.
- b. The foam holds the decontamination agents at the surface, permitting them to act on the contaminant, lifting it into the foam. The foam, with the suspended contaminant, can then be directly removed from the surface by vacuum techniques or by rinsing into other containment. Repeated application of this technique can reduce surface contamination by several orders of magnitude.
- c. Typical equipment consists of a 55-gallon drum to hold water with chemical additives, a water pump, a bottle for the foaming agent, a spray unit, connecting hoses, pressure regulators and valves. Compressed air is used to aspirate the foam. The amount of solution is approximately 1.5 gallons per square foot of surface.

TABLE 1.
TYPICAL FOAM PROCESS CHEMICALS

- (1) sulfonated detergents blended with synthetic wetting agents and coupling agents.
- (2) alkaline detergent cleaning powders
- (3) inhibited liquid phosphoric acid
- (4) a mixture of sodium hydroxide, chelating agents (gluconates) with wetting agents and inhibitors
- (5) a silicon anti-foaming agent emulsified in water
- (6) inhibited acidic powder containing oxalate, citrate and ammonium ions, as well as inhibitors, surfactant and a foam suppressant.

5. Steam Cleaning

- a. Steam cleaning is a mechanical method suitable for cleaning most surfaces. In this process, steam is applied to the surface by hand-held wands and the condensate is collected for treatment.
- b. The equipment required for steam cleaning includes steam generators, spray systems, collection sumps or vacuums, water storage tanks and conventional water pumps.
- c. The time required for steam cleaning is about the same as for hydroblasting, but the volume of waste water usually is less than for hydroblasting. Where steam cleaning is appropriate, volumes of cleaning solution may be 1/10 to 1/2 of that produced by hydroblasting depending on the effort required to steam clean a given waste residue.
- d. The steam cleaning equipment to be used at the Rocky Flats Plant will produce superheated water pressures of 250 psi with temperatures up to 300° Fahrenheit. The fluid discharge rate is in the range of 0.2 - 3.0 gpm. This equipment has an integral vacuum unit for collection of decontamination waters. This system minimizes the decontamination fluid runoff problems and makes for more efficient man-hour expenditures during closure. This vacuum and collection unit will also be fitted with High Efficiency Particulate Air (HEPA) Filters for greater protection of human health and the environment.
- e. Supplied pressures for steam are typically 6.1 to 6.8 atm; discharge of the steam through the equipment and out the nozzle usually results in a 15 percent reduction of the supply pressure. Rates for the discharge of detergents are approximately 200-300 liters/hr.
- f. Steam cleaning may not be appropriate for volatile contaminants. Steam cleaning under these conditions could create a hazardous condition for the personnel involved in closure, or for other nearby personnel. Hydroblasting may be a better decontamination technique in these situations. The use of steam cleaning for units contaminated with volatile organic compounds will be carefully scrutinized. An organic vapor detector will be used to monitor the breathing zone when steam cleaning is used on units contaminated with volatile organic compounds. The detector chosen will be capable of detecting those compounds suspected of being present in concentrations of concern.

g. Based on the results of the organic vapor detector readings various levels of personal protective equipment (PPE) will be deployed. The following is a list of the concentrations at which these levels of PPE will be used:

- 0 - Background - Level D
- Bkgnd - 5 ppmv - Level C
- 5 - 50 ppmv - Level B
- > 50 ppmv - Exit site and inform the Project Manager of the condition.

These levels of PPE are discussed in detail in Part IX (F).

h. In cases where an organic vapor detector detects no concentrations of volatile organics above background, steam cleaning will be used. For cases where readings above background are expected or are determined, hydroblasting will normally be used in place of steam cleaning. In any event, whenever steam cleaning equipment is used, the appropriate level of personal protection as listed above shall be used.

6. Spalling.

a. Porous surfaces such as wood, concrete, or asphalt may be difficult to clean because contamination may penetrate into the material through pores. Spalling is a method of cleaning such objects by removing a thin layer of the material from the surface. Objects may be spalled with a hydroblaster or grinder. Large power grinders are used for cleaning large areas. Smaller units generally are used for small objects and hard-to-clean areas such as corners.

C. STANDARD CLEANING SOLUTIONS

Standard cleaning solutions for the types of hazardous and mixed wastes to be found at the plant site are listed in Table 2. These solutions may be used in hydroblasting/waterwashing or steam cleaning to remove the specific contaminants listed in the closure plan.

1. Source and Rinse Water Sampling

In some applications, the effectiveness of decontamination will be measured by analyzing the rinsate solution. In those instances, the water used for cleaning will be sampled and analyzed for the indicator parameters listed in Table 3.

TABLE 2
GENERAL PURPOSE DECONTAMINATION SOLUTIONS
FOR HAZARDOUS, RADIOACTIVE MIXED WASTES

SOLUTION	PREPARATION DIRECTIONS	SUSPECTED WASTE COMPONENTS
1. A	TO 10 GALLONS OF WATER, ADD 4 POUNDS OF SODIUM CARBONATE AND 4 POUNDS OF TRISODIUM PHOSPHATE STIR UNTIL EVENLY MIXED.	INORGANIC ACIDS, IONIC METALS
2. B	TO 10 GALLONS OF WATER, ADD 8 POUNDS OF CALCIUM HYPOCHLORITE AND 1/2 POUND OF SODIUM HYDROXIDE STIR WITH WOODEN OR PLASTIC STIRRER UNTIL EVENLY MIXED.	CYANIDES, OTHER INORGANICS THAT ARE NOT ACIDIC
3. C	TO 10 GALLONS OF WATER, ADD 4 POUNDS OF TRISODIUM PHOSPHATE. STIR UNTIL EVENLY MIXED.	SOLVENTS ORGANIC COMPOUNDS
4. C	SAME AS ITEM 3	WASTE OIL
5. D	TO 10 GALLONS OF WATER, ADD 1 PINT OF CONCENTRATED SULFURIC ACID SLOWLY WHILE STIRRING.	CAUSTIC WASTE
6. E	USE A COMPOSITION OF 0.5% EDTA* 0.25M CITRIC ACID IN DEIONIZED WATER.	MIXED WASTE
7. F	USE FULL STRENGTH PETROLEUM ETHER OR SIMILAR ORGANIC SOLVENT	ORGANIC COMPOUNDS
8. G	USE WATER	DILUTE ORGANIC AND INORGANIC CONTAMINANTS

* EDTA IS ETHYLENEDIAMINETETRAACETIC ACID.

2. Verification/Comparison to the closure performance standard

- a. Verification of the success of decontamination is a critical component of the decontamination procedure. The procedures for decontamination verification discussed below are applicable to all surfaces requiring decontamination.
- b. The success of a decontamination procedure for hazardous materials will be measured by comparing the concentration of the appropriate substances in the "used rinsate" with the closure performance standard specified in Part VIII. Testing will be conducted using EPA approved methods and procedures and minimum detection limits. Other Director approved analytical methods, such as the L-Procedures in the Waste Analysis Plan, will be used in the case of analyses for which no approved EPA procedure exists.
- c. In verification tests, an "unused rinsate" sample will be collected for analysis of the applicable indicator parameters listed in Table 3. Indicator parameters will be based on the specific constituents, stored at or released from the unit. The results of the analyses will be used to determine a background concentration for each constituent. Following the decontamination efforts, "used rinsate" samples will be collected and analyzed for identical constituents to those analyzed for background determination. The results of the "used rinsate" will be compared to the closure performance standard, Part VIII of this permit.
- d. If the performance standard is achieved, the unit will be judged clean.

D. REGULATED WASTES AT THE ROCKY FLATS FACILITY

The Rocky Flats Plant generates hazardous waste and mixed low-level radioactive and hazardous waste. Table 4 lists the typical hazardous wastes generated at the Rocky Flats Plant along with the appropriate cleaning solutions.

Table 5 lists the typical mixed wastes stored at permitted units at the facility. Specific descriptions of the types of mixed waste stored at each permitted unit are presented in detail in Part III of this permit.

INDICATOR PARAMETERS

TABLE 3

ACIDS	pH PLUS APPROPRIATE ANION
METALS	APPROPRIATE METALLIC CATION
CYANIDES	CYANIDE
SOLVENTS	APPROPRIATE SOLVENT, TOTAL ORGANIC HALOGENS
OIL	TOTAL ORGANIC CARBON TOTAL ORGANIC HALOGENS
CAUSTICS	pH PLUS APPROPRIATE CATION
RADIOLOGIC	TOTAL ALPHA ACTIVITY

TABLE 4
TYPICAL HAZARDOUS WASTES GENERATED AT ROCKY FLATS

WASTE	EPA HW NUMBER(S)	CLEANING SOLUTIONS*
ACETONE	F003,U002	C
CARBON TETRACHLORIDE	F001,U211	C
METHYLENE CHLORIDE	F001,U080	C
ETHANOL	D001,U080	C
HYDROCHLORIC ACID	D002,D003	A
MAGNESIUM	D001	B
MERCURY	D009,U151	B
METHANOL	D001,F003,U154	C
NITRIC ACID	D002,D003	A
TETRACHLOROETHYLENE	F001	C
PHOSPHORIC ACID	D002,D003	A
SULFURIC ACID	D002,D003	A
SILVER	D011	B
TOLUENE	F005,U220	C
1,1,1-TRICHLOROETHANE	F001,U226	C
XYLENE	F003,U239	C
USED OIL	D001	C
SODIUM CYANIDE	D106	B
BARIUM CYANIDE	D005	B
SODIUM NITRATE/POTASSIUM NITRATE	D001	B
ETCHANT SOLUTION (ACID)	D002,D003,U134	A
USED O&M PAINT SOLVENTS/SLUDGE	D001	C
WASTE/SURPLUS O&M PAINT	D001	C
BROMINE TRIFLUORIDE	D002,D003	NOTE 1
CHLORINE TRIFLUORIDE	D002,D003	NOTE 1
HYDROGEN SULFIDE	D001,D002,D003	A
HYDROGEN CHLORIDE AND HYDROGEN SULFIDE	D001,D002,D003 U135	A
IODINE PENTAFLUORIDE	D002,D003	NOTE 1
TUNGSTEN HEXAFLUORIDE	D003	NOTE 1
DIOCTYL PHTHALATE	U028	F,G
ELECTROCHEMICAL MILLING (ECM) SLUDGE	D007	A

NOTE 1: MATERIALS TO BE HANDLED ACCORDING TO ESTABLISHED
ROCKY FLATS PROCEDURES, CHWA AND THIS PERMIT.

* SOLUTIONS ARE TO BE APPLIED INDIVIDUALLY IN THE ORDER GIVEN.

TABLE 5
TYPICAL MIXED WASTES STORED AT ROCKY FLATS
(LOW-LEVEL MIXED WASTE)

SPECIFIC MIXED WASTES	EPA HW NUMBER(S)	CLEANING SOLUTIONS*
CHROMIC ACID PLATING BATH SOLUTION	D002,D007	A,E
COOLANT/1,1,1-TRICHLOROETHANE	F001,U226	C,E
CADMIUM CYANIDE	F001,P030	B,E
DDT	U061	C,E
ETCHANT SOLUTION (10% ACID)	D002,U134	A,E
FIXER (RADIOGRAPHIC SOLUTION)	D011	F,C IF ORGANIC A OR C IF AQUEOUS
WASTE ACID MIXTURE (HCl,HF,HNO ₃)	D002	A,E
IODOMETHANE	U138	C
BARIUM CHLORIDE	D005	B,E
SODIUM NITRATE/POTASSIUM NITRATE		B,E
SODIUM HYDROXIDE	D002,D003D,	E
NIوبيUM DISELINDE	D010	B,E
OIL WITH HALOGENATED SOLVENTS	D001,F001,F002	C,E
OX OUT	F007	C
PENTACHLOROPHENOL	U242	C
PYRIDINE	D001,U196,P075	C,E
ALKALINE SLUDGE FROM HEAT EXCHANGER	D002	D,E
SULFURIC ACID	D002	A,E
TETRAETHYL AMMONIUM PERCHLORATE	D003	A
SCINTILLATION COCKTAIL	D001,D002,D003 F003,D005,U220 U239	F
SOLAR POND SLUDGE	D007	D,E
INTERCEPTED POND SEEPAGE WATER	U044,U228	D,E

* SOLUTIONS ARE APPLIED INDIVIDUALLY IN ORDER GIVEN.

E. DECONTAMINATING HAZARDOUS WASTE FACILITIES

1. Containers

- a. Drums containing wastes will be transported to the appropriate waste treatment area where they will be emptied and the waste treated. Alternatively, the drums may be emptied into tanker trucks or other suitable units at the pad and the waste transported to the treatment facility.
- b. If the empty drums had held strictly hazardous waste then they will be emptied to comply with the requirements of the empty container rule (6 CCR 1007-3, Part 261.7). These drums can then be disposed in a sanitary landfill. There are no acute hazardous wastes managed at the Rocky Flats Plant.
- c. Any drums not meeting the above requirements for empty containers, or any drums that held mixed wastes, will be decontaminated. This decontamination will be done at the storage unit with a steam cleaner or other suitable equipment, or will be done at a drum decontamination facility to be built at the Rocky Flats Plant.

2. Large Containers, Pads and Secondary Containment Areas

- a. Large containers (such as cargo containers, storage pads and secondary containment structures) that are to be decontaminated in place will require special attention to minimize and collect decontamination fluids. The steam cleaning units to be used will minimize the problems associated with the collection of these fluids; a vacuum unit for decontamination fluid collection is an integral part of the unit. In addition to the steam cleaning units, wet-vacuums will be present at the unit during decontamination activities in case additional collection of the decontamination fluids is necessary. Polyethylene sheets will also be spread around the exterior surfaces of these units to capture over-spray and splashes associated with the decontamination activities. These plastic sheets will be packaged and disposed as a hazardous or a low-level radioactive mixed waste as a portion of the closure actions.
- b. The object will be disassembled as necessary to provide access to all possible surfaces.
- c. Appropriate cleaning solutions listed in Table 2 will be applied to the surfaces with a steam cleaner or a foam applicator and then rinsed off. Cleaning and rinsing activities will continue until testing proves the rinsate to be clean. It is currently believed that a single cleaning and rinsing cycle will be adequate to decontaminate facilities at each unit.
- d. Decontamination will be verified according to the appropriate method described in this plan. The object will be recleaned as necessary. Should the object prove to be uncleanable, it will be disposed of in an authorized off-site hazardous or mixed waste facility.
- e. Liquids generated from cleaning will be collected and treated on-site or treated or disposed of off-site in the manner selected for the waste previously contained in the drum or storage area, or by other appropriate method.
- f. Linings used in the cleaning operation will be removed and disposed of in an appropriate approved disposal facility.

- g. Subsurface contamination of equipment can occur with equipment constructed of porous materials. Porous materials which have been in contact with hazardous or mixed waste during the operating life of the facility will be considered contaminated and decontamination will not be attempted. These materials will be dismantled and disposed at an approved off-site facility. This dismantling procedure may involve direct dismantling or hydroblasting of some materials.
- h. Other porous materials that have not been in direct contact with waste (i.e. secondary containment structures) will have wipes taken off the surface as well as direct sampling and analysis of the material. Secondary containment materials contaminated as identified above will be dismantled and disposed at an approved off-site facility. Subsurface contamination cannot occur on non-porous materials, unless cracked.

3. Equipment Decontamination

- a. Upon completion of each phase of decontamination required for closure, equipment will be decontaminated by steam cleaning at a designated wash down area before being sent to another decontamination site or before leaving the plant site.
- b. Rinsate will be collected in approved containers, and will be treated on-site or shipped to an authorized facility. Plastic sheets used in the decontamination area and all other disposable contaminated equipment accumulated during closure will also be shipped to an authorized off-site disposal facility.
- c. Decontamination will include:
 - i. a rinse with a steam cleaner using water free of volatile organics;
 - ii. scrubbing with brushes using a solution of water with Alconox detergent that is free of volatile organics;
 - iii. and a final rinse with the steam cleaner using water free of volatile organics.

F. HEALTH AND SAFETY

1. Personnel Protective Clothing and Equipment

This section summarizes health and safety procedures to be used during the closure of waste management facilities at Rocky Flats. General safety rules applicable to all worker activities are contained within the following documents:

- a. Nuclear Material Safety Manual
- b. Material Hazards Manual
- c. General Plant Rules
- d. Health, Safety and Environmental Manual

These documents provide an overall policy governing worker health and safety at the Rocky Flats Plant. Requirements specific to a particular facilities are presented in operating procedures for the facility. This well-established health and safety program will govern the closure of waste management facilities at the Rocky Flats plant.

2. Personal Protective Clothing and Equipment

- a. For ordinary activities, plant personnel are directed by Industrial Hygiene and Industrial Safety to wear the appropriate safety equipment for a specific working area. This procedure will be followed during facility closure.
- b. Coordination with Industrial Hygiene and Industrial Safety and the decontamination crews will be provided by the Hazardous Waste Coordinator or his designee. He will assess each decontamination activity and specify the required gear for each activity.
- c. A brief description of clothing for different levels of protection is presented in the following paragraphs.
- d. The health and safety policies in force at the Rocky Flats plant are based upon the following considerations:
 - i. Hard hats, safety shoes, protective clothing and safety glasses typically are required for all activities which involve handling of hazardous materials
 - ii. Chemical cartridge respirators are required to be available whenever the possibility for exposure to fumes or dust exists.

3. Level A Protection

- a. Level A protection is worn when the highest level of respiratory, skin, and eye contact protection is required. Level A protection may be required during decontamination activities such as cleaning the interiors of certain tanks.
- b. Personnel protective equipment required for Level A protection includes:
 - i. Positive pressure self-contained breathing apparatus (SCBA) operated in the positive pressure mode
 - ii. Totally encapsulating chemical resistant suit
 - iii. Gloves--inner (tight fitting and chemical resistant)
 - iv. Gloves--outer, chemical resistant
 - v. Boots--chemical resistant, steel toe and shank
 - vi. Hard Hat--optional.

4. Level B Protection

- a. Level B protection is worn when either exposure to the small unprotected areas of the body (i.e., neck and back of head) is unlikely, or toxicity concentrations are within acceptable exposure standards. Level B protection may be required during certain closure activities at the Plant such as cleaning the interiors of tanks.
- b. Personnel protective equipment required for Level B protection includes:
 - i. Positive pressure SCBA operated in the positive pressure mode
 - ii. Hooded, two-piece, chemical-resistant-type coverall suit
 - iii. Gloves (inner and outer)--chemical resistant
 - iv. Boots--chemical resistant, steel toe and shank
 - v. Hard hat--optional.

5. Level C Protection

- a. Level C protection is worn when the type and concentration of respirable material are known, the protection factors associated with air-purifying respirators is adequate, and exposure to the few unprotected areas of the body (i.e., neck and back of head) is unlikely to cause harm. Level C protection may be required during decontamination activities at Rocky Flats.
- b. Personnel protective equipment required for Level C protection includes:
 - i. Full-face, air-purifying canister or cartridge respirator (full-face respirator can be worn instead of non-vented goggles if eye irritants are present)
 - ii. Safety goggles (non-vented if not full face respirator)
 - iii. Chemical-resistant clothing
 - iv. Hooded, two-piece, chemical-resistant Tyvek coveralls
 - v. Gloves (inner and outer)--chemical resistant
 - vi. Escape mask
 - vi. Hard hat--optional
 - vii. Boots--chemical resistant, steel toe and shank.

6. Level D Protection

- a. Level D is the basic work uniform and should be worn for all decontamination operations not requiring greater protection.
- b. Personnel protective equipment required for Level D protection includes:
 - i. Chemical-resistant Tyvek coveralls
 - ii. Boots/shoes--safety or chemical-resistant, steel-toed boots
 - iii. Escape mask
 - iv. Safety glasses or safety goggles
 - v. Hard hat (face shield optional)
 - vi. Half-face canister or cartridge respirator (carried)
 - vii. Gloves (carried).

7. Personnel Decontamination Procedures

- a. Decontamination of personnel is typically intended to consist of the doffing of protective clothing as described in this document. This clothing will be discarded (for materials such as Tyvek), or decontaminated (for cloth coveralls).
- b. Personnel are then required to shower in one of the many shower facilities at the Rocky Flats Plant. These shower facilities consist of a locker room with multiple shower units, and are present in approximately 20 buildings throughout the Rocky Flats Plant. Clothing to be decontaminated rather than discarded will be laundered in the Rocky Flats laundry facility.

PART X SOIL SAMPLING

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PART X-SOIL SAMPLING

A. INTRODUCTION and GENERAL CONSIDERATIONS

1. Introduction

This part provides details on methods and activities associated with soil sampling in areas potentially contaminated by hazardous or mixed wastes from permitted container storage units at the Rocky Flats Plant. Criteria are also presented for determining the magnitude and areal extent of soil contamination resulting from through operation of each permitted unit. This volume includes the boundaries of the permitted unit plus the volume of soil contaminated by a release from or operation of the permitted unit. If this volume cannot be defined accurately due to the presence of soil or groundwater contamination resulting from other sources, the unit will be added to the list of Inactive Solid Waste Management Units, and investigated under the corrective action requirements of this permit. Criteria are also be presented for whether the area will undergo closure treatment of the contaminated soil, or leaving contamination in-place necessitating Post Closure Care and Post-Closure Care monitoring.

2. General Considerations

- a. Before commencing decontamination of a facility, consideration must be given to the disposal of the wastes which will be produced. This includes an assessment of the types and quantities of wastes, safety aspects, handling, treatment and final disposal options. The waste volumes should be minimized as far as possible and the compatibility of wastes must be considered. Categories of waste generated during decontamination may include:
 - b. Cleaning materials; for example, paper towels and swabs
 - c. Protective clothing and materials, for example, polyethylene sheeting, overalls, boots, and gloves
 - d. Organic solvents
 - e. Aqueous liquids, for example:
 - i. detergents and soapy wastes
 - ii. acid solutions, possibly with appreciable salt
 - iii. solution containing complexing agents.
 - f. Solids, for example:
 - i. scrap structural materials
 - ii. spent abrasive materials
 - iii. accumulated corrosion products
 - iv. spent ion-exchange materials
 - v. used ventilation filters and other temporary enclosure equipment
 - vi. contaminated soil.

3. Soil Decontamination Procedures

- a. For those soils determined, by methods presented in Part X(B)-Determination of Areas of Contaminated Soil, to be contaminated soils at Rocky Flats, the typical decontamination procedure will be excavation and offsite treatment and/or disposal. This method of decontamination is preferred due to the limited volume of contaminated material expected in areas undergoing CHWA closure. Inactive Solid Waste Management Units (SWMU's) as defined by RCRA 3004(u) are being investigated under Part XI-Corrective Action portion of this State RCRA permit, or under the terms of an Inter-Agency Agreement (IAG) negotiated by DOE, EPA, and CDH.
- b. If large areas of contaminated soil resulting from units addressed in this permit are found, or where ground-water contamination is present, these will be considered for on-site treatment, on-site containment and post-closure care monitoring rather than excavation and offsite disposal. This closure plan would be modified in accordance with the applicable sections of CHWR 264-Subpart G, and 100.6.
- c. A listing of possible treatment, capping, and containment methods is presented in the CEARP Phase 2a Documents (Feasibility Studies) of February 16, 1987. Additional treatment and containment methods may be developed in the future as a result of corrective or remedial actions at the facility and will be considered in the above evaluations.
- d. The following principles apply to soil excavation activities:
 - i. Wherever decontamination is carried out, all efforts must be made to "contain" the contamination. This principle is particularly important when decontamination is carried on "in situ." Containment may involve the use of temporary structures or other means.
 - ii. More highly contaminated areas should be decontaminated first.
 - iii. Methods should be chosen that will minimize the decontamination wastes consistent with the decontamination process.

B. DETERMINATION OF AREAS OF CONTAMINATED SOIL

This section addresses the method of identification of contaminated soils requiring decontamination during closure of the permitted unit. Generally, this determination will be based on contaminant concentrations in soil as they relate to the closure performance standard. The following sections detail the criteria that will govern collection of soil samples. In addition, screening methods used to select sampling locations for contamination assessment are also detailed.

1. Sampling of Background Soil

- a. Soil sampling of uncontaminated soil in the Rocky Flats Plant western buffer zone, for purposes of the west spray field sampling, have been conducted. The soil samples analyzed were taken from the surface, zero to six inches and six to twelve inches. Due to the limited background soil sampling done to date, these analyses may not adequately represent background soil characteristics. These preliminary results on background soil are being supplemented with additional analyses. These analyses represent the results of the "Background Hydrogeochemical Characterization and Monitoring Plan" being implemented at the facility. Additional analyses and characterization of background soils at the Rocky Flats Plant is being conducted in accordance with the above plan.
- b. The background characterization plan is intended to develop representative background data, with sufficient samples collected to characterize spatial background variations across the Rocky Flats Area. Background sampling and analytical procedures will be the same as those used for Environmental Restoration samples. This data set will be used to identify downgradient data that are significantly different from the background population. The approach used in this plan follows the recommendations of Doctor, Gilbert and Kinnison (1986); Loftis, Harris, and Montgomery (1987); Gilbert (1987); and EPA (1988) for establishing baseline monitoring and detection systems at hazardous waste facilities.
- c. The statistical distribution of this data will be compared with sampling data from contamination assessment monitoring at permitted units undergoing closure. The analytical parameters for background soil analyses are included in Table 1. The background plan assumes that background chemistry is a random statistical distribution of concentration levels, rather than a single concentration (Doctor, Gilbert, and Kinnison, 1986).

TABLE 1
BACKGROUND SOIL SAMPLING PARAMETERS

Metals

CLP Inorganic Target Analyte List

Aluminum
Antimony
Arsenic
Barium
Beryllium
Cadmium
Calcium
Chromium
Cobalt
Copper
Iron
Lead
Magnesium
Manganese
Mercury
Nickel
Potassium
Selenium
Silver
Sodium
Thallium
Vanadium
Zinc
Cesium
Lithium
Molybdenum
Strontium
Tin

Radionuclides

Gross Alpha
Gross Beta
Strontium 90
Cesium 137
Radium 226, 228
Uranium 233, 234,
Uranium 235, 238
Plutonium 239, 240
Tritium
Americium 241

Other

pH
Nitrates
Sulfide
Cyanide

C. Sampling of Potentially Contaminated Soil

1. Screening

- a. The objective of soil sampling is to determine whether contamination exists in the soil contained within the permitted area. Soil sampling will also be used to determine the extent and concentration of contaminants in soil if contamination does exist.
- b. Soil screening is used for two different purposes related to soil sampling.
 - i. First, soil screening will be used at units undergoing closure at which soil sampling is required. In these cases soil screening will be used to identify specific locations that will be sampled due to the possible presence of contaminants.
 - ii. Second, soil screening will be used at units undergoing closure which may require soil sampling. At these units soil screening will be used to help determine whether or not to sample soils. Any location that soil screening identifies as possibly contaminated, in these areas, will be sampled.
- c. Potentially contaminated soil is that soil for which a reasonable probability exists that contamination is present, as follows:
 - i. These are areas in which spills or leaks may have occurred prior to November 1986, or in which spills or leaks of less than a Reportable Quantity or other spills or leaks have occurred after November 1986.
 - ii. These areas will include outdoor areas of soil over which storage of hazardous waste took place without secondary containment.
 - iii. In addition, soil in areas that may have been affected by precipitation run-off originating from an area of non-secondarily contained outside hazardous waste storage will also be sampled.
 - iv. Secondarily contained units, constructed of coated concrete, either storage, treatment, or transfer, will not be sampled for soil contamination unless the secondary containment for the unit has been compromised.
 - v. These areas will include outdoor areas of soil over which storage of hazardous waste took place on an asphalt pad.

- d. The following criteria determine whether the secondary containment of a unit has been compromised:
 - i. Spills or leaks have occurred to soil outside the secondary containment.
 - ii. A hole, fracture, crack, or significant corrosion has been identified in the secondary containment of a unit, and leaks or spills have occurred near these areas of the unit.
 - iii. Secondary containment has been overtopped by a leak or spill resulting in soil contamination.
 - iv. Concrete secondary containment for a unit in which spills or leaks have occurred will be considered compromised if cracks are present in the concrete.
- e. Samples of potentially contaminated concrete may be taken by coring, cutting or breaking the concrete.
- f. However, these criteria apply only to areas in which secondary containment for the unit has always been present. Units to which secondary containment was added after operation of the unit for hazardous waste management began will require screening and soil sampling for contamination at a minimum, and possibly soil sampling.
- g. All asphalt pads used for storage of hazardous or mixed waste will be sampled for underlying soil contamination by coring through the asphalt.
- h. Indicator parameters will be chosen for soil sampling near any particular unit based upon the wastes managed at that facility.
- i. Indicator parameters for various hazardous waste types presented in Table 2 and will preliminarily be selected prior to initiation of site screening.
- j. A screening of the site will be conducted prior to soil sampling to ensure the safety of the workers and to indicate whether additional indicator parameters are required.
- k. If the historical data of which wastes were managed at a unit is incomplete, all of the indicator parameters will be used.
- l. A screening of the site will include the following assessment:

- i. visual survey
- ii. radiation survey
- iii. photoionization detection survey or equivalent
- iv. Soil gas survey

m. Visual Survey

The visual survey will be conducted to identify areas that are potentially contaminated. These areas can be identified by the presence of soil discoloration, the presence of waste materials on the soils, or debris present on the soil.

TABLE 2
INDICATOR PARAMETERS

<u>TYPE OF WASTE</u>	<u>INDICATOR PARAMETER</u>
ACIDS	pH PLUS APPROPRIATE ANION
METALS	APPROPRIATE METALLIC CATION
CYANIDES	CYANIDE
SOLVENTS	APPROPRIATE SOLVENT, TOTAL ORGANIC HALOGENS
OIL	TOTAL ORGANIC CARBON TOTAL ORGANIC HALOGENS
CAUSTICS	pH PLUS APPROPRIATE CATION
RADIOACTIVE	GROSS ALPHA, GROSS BETA, GAMMA RADIATION

- n. **Direct Alpha Survey**
The direct alpha survey will be conducted over the ground surface to detect above background levels of radioactivity. The assessment will be conducted in accordance with Rocky Flats' radiation monitoring procedures. The following parameters may be included in the radiological assessment:
 - i. Gross alpha,
 - ii. Gross beta, and
 - iii. Gamma.
- o. **Organic Vapor Survey**
The organic vapor survey or an equivalent method will be conducted to determine the presence of volatile organics in ambient air above the potentially contaminated area.
- p. **Soil Gas Survey**
Soil gas survey will be performed in order to provide more conclusive evidence than the organic vapor survey regarding the absence of organic compounds in the soil.
- q. The visual survey, the radiological survey and the organic vapor survey will be evaluated prior to collection of any soil samples. The preliminary list of indicator parameters will be reviewed for the site based upon the above screening activities, and revised if necessary. Soil sampling point locations will then be chosen.
- r. Any location which soil screening identifies as potentially contaminated will be sampled in addition to areas for which sampling is required due to other criteria specified in this plan.

2. Sampling Point Identification

- a. A typical area to be investigated at Rocky Flats will include sufficient sampling locations to characterize the area under investigation, that are sampled at various depths.
- b. These locations will be separately sampled and analyzed.
- c. No compositing of samples taken at the various sampling locations will be conducted.
- d. The location strategy for the samples per investigation site will include both target and random sampling.

- e. The allocation of sampling locations will first go to locations identified by soil screening as potentially contaminated. For instance, if a specific area of the investigation site has discolored soil, higher than background levels of radiation or volatile organics as detected by soil screening activities, the area will be targeted for sampling.
- f. In addition, target samples will be taken on the basis of historical operations data, such as known spill areas.
- g. If less than five target samples are taken at an investigation site, random samples will be taken to increase the total number of samples analyzed to five.
- h. An initial sampling grid will extend five feet beyond the edge of the expected area of contamination. The grid will contain 10 times the number of sampling locations (nodes) required to provide a total of five random and target samples.

TABLE 3
SOIL SAMPLING EQUIPMENT

Analytical Request Form
Chain of Custody Forms
Logbook/ink pens
Watch
Sample containers/labels
Hand auger
Split spoon sampler
Sledgehammer
Polyethylene sheeting
Paper towels
Shovels or trowels
Plastic or metal scoops
HPLC/ distilled water
Hand spade
Aluminum pans for temporary sample
placement and depth compositing
Neoprene gloves
Coolers with ice
Camera
Tape measure - 250'
Stakes
Survey tape

Sample/Equipment Decontamination

Wash bucket
Rinse bucket
Alkaline detergent
Brushes
Paper towels/plastic trash bags
Acetone
Tap water
Distilled water

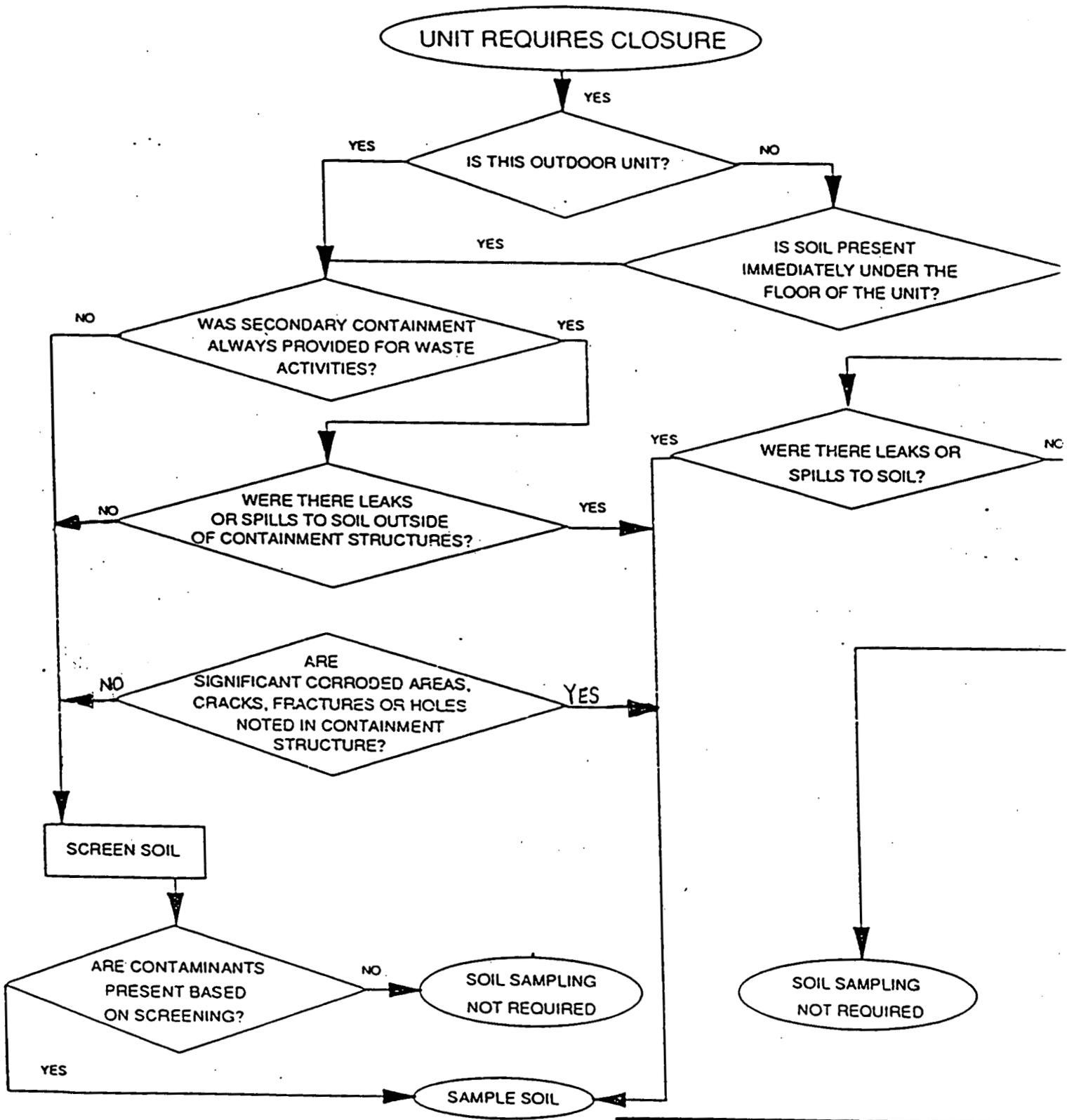
- h. Soil sampling procedures shall be in accordance with SW-846, or other procedures approved by the Director.
- i. Any nodes randomly chosen that are identical to a target sampling location will be excluded from sampling and another sampling location chosen.
- j. All sampling locations should be within the area of potential soil contamination resulting from the unit operation, plus five feet.
- k. Most areas currently identified for soil sampling related to closure activities are areas at which contamination is expected at the surface of the soil, or areas immediately underlying concrete or other containment structures.
- l. At identified soil sampling locations, soil samples will be taken as a surface scrape, a six to twelve inch composite, and an eighteen to twenty-four inch composite.
- m. These samples may be taken by hand-bucket augers, by drill rigs, or by hand d implements. Methods of soil sample collection will vary depending on the area and soil conditions. Typically, samples will be collected by a hand method.
- n. Drilling methods and procedures that may be used are presented in the CEARP Phase 2a Documents, February 16, 1987, or subsequent procedures developed as part of the Environmental Restoration Program.
- o. Field records of all sampling activities will be made, noting field conditions and color, texture, odor, or other items of interest concerning the site and soil.
- p. All soil samples will be collected in accordance with SW-846 procedures.
- q. A chain-of-custody record will be maintained on all samples.
- r. After sampling any soil, the sampling equipment and aluminum trays will be thoroughly decontaminated. These items will be scrubbed with a tap water and detergent solution, rinsed with tap water, rinsed with acetone, rinsed with distilled water, and allowed to air dry. Mixing trowels will also be decontaminated after each soil sampling location has been sampled.
- s. Required sampling equipment is given in Table 3.
- t. Samples will be analyzed for total concentrations of applicable indicator parameters.

3. Analysis of Data

- a. The analysis of soil data will be based on a statistically valid procedure, comparing concentrations of indicator parameters in background soil to concentrations of indicator parameters in the potentially contaminated soil.
- b. Results of soil sampling and analyses will be compared with the closure performance standard, as defined in Part VIII of this permit.
- c. If no areas of indicator parameter concentrations exceed the closure performance standard in the potentially contaminated area are identified, then the area will be considered clean and closure certified.
- d. Each soil concentration of metals or radionuclides will be compared with the range (where range is defined as a statistical tolerance interval) of concentrations in background stations.
- e. A tolerance interval defines, with a specified probability, a range of values that contain a discrete percentage of the population.
- f. Samples from potentially contaminated areas whose concentration fall outside the tolerance interval indicates the Closure Performance Standard for soils has been exceeded. These areas may be considered for excavation and offsite disposal, treatment in-place or for post-closure care.
- g. Appropriate statistical methods will be used to analyze the data obtained, and are subject to review and approval by the Director.
- h. High or low pH may indicate contamination. For pH, a contaminated value is defined as a value outside the mean background pH plus or minus two standard deviations.
- i. It is currently assumed that background soil data for indicator parameters will be normally distributed.
- j. If the data are not normally distributed, then the data will be transformed using appropriate methods to develop statistically valid means and standard deviations. A non-parametric test, such as the Kolmogorov-Smirnov test for normality, may be used to determine if the background soil data is normally distributed.
- k. If areas of soil contamination are identified by the previous methods, then further soil analyses will be required to define the full extent of contamination.

- l. If contaminated samples have uncontaminated soils identified in all directions (both vertically and horizontally) around the samples, then linear interpolation between points can be used to determine the approximate extent of contamination.
 - m. If uncontaminated soil is not identified in all directions around a contaminated area, then additional soil samples will be taken at approximately one yard intervals and analyzed until uncontaminated soil has been identified in all directions around contaminated soil areas.
 - n. Linear interpolation can be used between contaminated and uncontaminated soil sampling points to determine the approximate locations at which uncontaminated soil may be found. This guideline of one yard may be modified to greater or smaller distances depending on the history and operation of the particular unit.
 - o. Sampling for the identification of clean versus contaminated soils will continue until the extent of contamination resulting from operation of the permitted unit has been defined. If this volume cannot be defined accurately due to the presence of soil or groundwater contamination resulting from other sources, the unit will be added to the list of Inactive Solid Waste Management Units, and investigated under the corrective action requirements of this permit.
 - p. The RCRA Closure unit is defined as physical boundaries of the area on which waste was placed or managed during the life of the unit, plus the volume of contaminated soil resulting from operation of the unit, as qualified in o. (above).
 - q. The physical boundary of the unit is identified in Part III of this permit.
4. Decontamination or Post-Closure Care
- a. As previously explained, excavation and offsite disposal or treatment of contaminated soil, along with certification of clean closure of the unit, is the preferred method of decontamination.
 - b. Post-Closure care and monitoring will be considered as an alternative to (a.) above at a CHWA closure unit when groundwater contamination caused by that CHWA closure unit is identified.
 - c. These alternatives will include Post-Closure Care and monitoring unless the contaminated soil is entirely excavated for disposal, or excavated for treatment to meet the Closure Performance Standard.

- d. Post-Closure Care and monitoring must meet the requirements of the CHWR Part 264-Subpart G, must extend for a minimum of thirty years, and will require a minimum of one upgradient and three downgradient groundwater monitoring wells.
- e. If a unit undergoing closure requires post-closure care, DOE and its operating contractor will comply with the requirements of the Colorado Hazardous Regulations, 6 CCR 1007-3, Section 264.112(c)(3), and Sections 264.117-264.120.
- f. An outline for the implementation of feasibility studies, along with current treatment and containment options are presented in the CEARP Phase IIa Documents of February 16, 1987. Final option selection for Post-Closure Care will require the Director's approval.
- g. Whenever excavation and offsite disposal of contaminated soil is conducted, verifying soil samples must be collected for comparison to the Closure Performance Standard.
- h. These soil samples will be collected from approximately the middle of horizontal edges of the excavation, and from approximately the center of the bottom of the excavation.
- i. A minimum of five samples will be collected. These samples will be collected as previously outlined, and will be analyzed for the indicator parameters appropriate for that unit.
- j. If these samples meet the Closure Performance Standard, then clean closure can be certified.
- k. If these samples are found to exceed the Closure Performance Standard, then the maximum extent of contamination must be identified as outlined in the preceding sections.
- l. In the latter case verifying soil samples must again be taken when all contaminated soil is thought to be removed, and compared to the Closure Performance Standard.



CONTAINER AREAS SOIL SAMPLING FLOW CH
 U.S. DEPARTMENT OF ENERGY
 ROCKY FLATS PLANT
 GOLDEN, COLORADO
 FIGURE 1

PART XI- HSWA REQUIREMENTS

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PART XI-HSWA REQUIREMENTS

A. WASTE MINIMIZATION

The Permittee shall establish and maintain a Waste Minimization program composed of the following elements at a minimum.

A.1. PROGRAM ELEMENTS

The Permittee shall:

- a. Establish a written waste minimization policy signed by top management.
- b. Implement the formal policy via the program plan, which will establish specific goals for reduction of volume, mass, or toxicity of all hazardous and mixed waste streams.
- c. Implement waste minimization recommendations identified through assessments of waste management practices, evaluations of current waste minimization efforts, evaluation of employee suggestions or other means.
- d. Designate a waste minimization coordinator to ensure effective implementation of the program.
- e. Communicate successful waste minimization efforts to employees.
- f. Train all employees on aspects of waste minimization which relate to their job.

A.2. Characterization of Waste Generation

The Permittee shall maintain a waste accounting system to track the types, amounts, and hazardous constituents and characteristics of wastes and dates accumulated.

A.3. Periodic Waste Minimization Assessments

The Permittee shall:

- a. Implement a system that will track all materials that eventually end up as hazardous or mixed waste from receipt to waste generation, treatment, and disposal, by June 1992.
- b. Identify opportunities at all points in a process where materials can be prevented from becoming a waste through recycling, source reduction, or other methods.
- c. Determine total costs of managing the waste, including cost of materials, personnel required, regulatory compliance, recordkeeping, transportation, storage, treatment, and disposal.

A.4. Encourage Technology Transfer

The Permittee shall annually report on progress towards waste minimization goals. This annual report shall be distributed to all plant directors, as well as other DOE facilities. The Permittee must utilize the resources available in the private sector such as trade associations to augment the technology transfer program.

A.5. Program Evaluation

The Permittee shall conduct an annual review and assessment of program effectiveness, and use these reviews to provide feedback to program managers and top management to identify potential areas for program improvement.

A.6. Annual Progress Report

a. The Permittee shall submit an annual progress report to the Director which details waste minimization activities and accomplishments at the facility. This report is due on September 30 of each year.

b. The progress report must detail achievements in waste minimization by the facility, including: percentage reduction, and actual volumetric or mass reduction, for each major RCRA regulated wastestream using the previous year as a baseline, and through what means these were achieved (ie-treatment, source reduction, product substitution, other).

c. Where specific waste reduction goals have not been met, an explanation of the circumstances preventing achievement, and a strategy to achieve these goals in the next year, must be provided to the Director.

A.7. Compliance Schedule

Within 60 days of the effective date of this permit, the Permittee shall submit a Waste Minimization Program Plan and a copy of the signed Waste Minimization policy to the Director for review and approval.

A.8. The written Waste Minimization Program Plan is incorporated into this permit by reference.

A.9. Revision of Waste Minimization Policy

Revisions to the Waste Minimization Program Plan must be submitted as a Class 1 permit modification with prior approval of the Director.

B. LAND DISPOSAL RESTRICTIONS

B.1. The Permittee shall comply with the requirements of 6 CCR 1007-3, Part 268.

B.2. Specifically, the Permittee shall comply with the following requirements:

a. The storage prohibitions of Part 268, Subpart E.

b. The waste analysis and notification/certification requirements of Section 268.7.

C. LOW-LEVEL MIXED WASTE PLAN

C.1. The Permittee shall revise and update the Low-Level Mixed Waste Plan for the Rocky Flats Plant, and submit this revised report to the Director within 90 days of

the effective date of this permit.

- C.2. The report shall detail:
- (a) The treatment and disposal technologies and treatment capacity needed to manage these wastes at the Rocky Flats Plant based upon the quantity stored, and the projected annual waste generation rate;
 - (b) Whether and when any current or future commercial or government treatment storage capacity is or will be available to manage these wastes;
 - (c) Alternate technologies that are in development to manage these wastes, and an estimate of when these technologies may be available, and approximate dates of requests to add these technologies under interim status or this permit;
 - (d) For items (b) and (c) above, identification of the basis and assumptions utilized in making the assessments, and any contingencies (including permit reviews) that may affect the assumptions.
- C.3. Revisions to the report are due annually on November 30.
- C.4. The Low-Level Mixed Waste Plan for the Rocky Flats Plant is incorporated into this permit by reference.

D. CORRECTIVE ACTION SCHEDULE OF COMPLIANCE

D.1. Summary

There are 217 currently identified individual hazardous substance sites (IHSS) at the Rocky Flats Plant (RFP) which require investigation and potential corrective action under the Hazardous and Solid Waste Act Amendments (HSWA) provisions of RCRA, the Colorado Hazardous Waste Act, and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). A Federal Facility Agreement and Consent Order ("the Agreement") has been negotiated between the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), and the Colorado Department of Health (CDH) to address environmental and corrective action at the RFP. The Agreement was signed on January 22, 1991. The Agreement is designed to meet both CHWA corrective action and CERCLA remedial action requirements, and therefore contains language used in both statutes. The Statement of Work and Attachment 4 of the Agreement have been incorporated as the corrective portion of this State CHWA Permit without modification. See item 2. below for definitions of terms used in the Agreement and in this Part of the permit.

Specifically, Attachment 2 of the Agreement, the "Statement of Work" (SOW), sets forth the corrective action/remedial action process to be followed for all hazardous substance sites at the Rocky Flats Plant. The requirements and schedules established in the SOW constitute the first phase of the corrective action requirements of this permit. For the

purposes of this permit, the individual hazardous substance sites (also "site") listed in Table 1 of the SOW constitute SWMU's and refer to identical sites under investigation. "Operable Unit" (OU) and "SMWU group" will also refer to identical groupings of individual sites or SWMUs under investigation. OUs 1 through 16 are presented in Table 2 of the SOW. If additional sites are identified at the Rocky Flats Plant as specified in Section I.B.3. of the SOW, these will be incorporated into the corrective action requirements of this permit.

The Agreement assigns a lead regulatory agency (CDH,EPA, or joint EPA/CDH) to each of the sixteen OUs. For all OUs at which hazardous constituents are identified to be present at the end of the Feasibility Study/Corrective Measures study stage, the State will prepare a Corrective Action Decision (CAD) and modify this permit to incorporate the selected corrective action remedy. For OUs identified at the end of the FS/CMS stage as containing only radioactive constituents and no hazardous constituents, CDH will not prepare a CAD or modify this permit unless federal statutes provide State regulatory authority over radionuclides. The radioactive-only contaminated sites will be addressed under CERCLA authority by EPA. The details of this process are set forth in paragraphs 153-160 of the Agreement.

Table 3 of the SOW shows the lead regulatory agency designation for each OU. Table 4 lists the primary and secondary documents which may be required for a particular OU. Table 5 sets forth the minimum investigative work to be performed by the facility for each OU. Table 6 contains the milestone dates for major activities required by the Agreement. Attachment 4 of the Agreement is a list of the hazardous substances which have been released or pose a threat of release at the Rocky Flats Plant, and may be modified as the Site is more fully characterized.

D.2. Definitions

All terms used in the SOW, shall have the following meanings.

1. Except as noted below or otherwise explicitly stated, the definitions provided in CERCLA, RCRA, CHWA, and their implementing regulations, as appropriate, shall control the meaning of the terms used in the Agreement. If there is an inconsistency in any definition in CERCLA, RCRA or CHWA, the definitions in CERCLA shall apply. In Addition:
2. "Additional Work" within the context of the Agreement shall mean any new or different work outside 1) the originally agreed upon Statement of Work and 2) any subsequent Workplans incorporated into the Agreement.
3. "Administrative Record" shall refer to the compilation of documents which establishes the basis of all remedial action decision(s) for each OU at the Site, required pursuant to Part 44 (Public Participation) of the Agreement, the Statement of Work incorporated into the Agreement as Attachment 2, and section 113(k)(1)

4. "Agreement" shall refer to this document and shall include all submittals, Attachments, Addenda, Amendments, and Modifications to this document. All such Submittals, Attachments, Addenda, Amendments, and Modifications shall be incorporated into and become an enforceable part of this Agreement.
5. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. Section 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), Pub. L. 99-499, and the NCP.
6. Colorado Hazardous Waste Act (CHWA) shall refer to Section 25-15-101 et seq., C.R.S. (1982) as amended, and its implementing regulations.
7. "Corrective Action", (CA) shall refer to the CHWA or RCRA term for the cleaning up of releases of hazardous waste or hazardous constituents at treatment, storage, or disposal facilities subject to Subtitle C or RCRA or CHWA.
8. "Corrective Action Decision" (CAD) shall refer to the CHWA or RCRA term for the decision by the State or EPA selecting a corrective measure alternative or alternatives to remedy environmental concerns at a Site. Consideration will be given to health risks, environmental effects, and other pertinent factors. The selecting agency shall use technical, human health, and environmental criteria to justify the remedy selection.
9. "Corrective Measure Study", (CMS) shall refer to the CHWA or RCRA term for the study through which the owner/operator of a facility identifies and evaluates appropriate corrective measures and submits them to the regulatory agency.
10. "Days" shall mean calendar days unless business days are specified. Any submittal or Written Statement of dispute that under the terms of the Agreement would be due on a Saturday, Sunday, State of Colorado or Federal holiday shall be due on the following business day.
11. "Individual Hazardous Substance Site (Site)", shall refer to individual locations where hazardous substances have come to be located at a discrete area within the larger "Site".
12. "Interim Measure" (IM) shall refer to the CHWA/RCRA terms for corrective actions, generally of short term, that may be taken at any time during the RFI/CMS process, to respond to immediate threats, such as actual or potential exposure to hazardous waste or constituents, drinking water contamination, threats of fire and explosion, and other situations posing similar threats.
13. "Lead Regulatory Agency" is that regulatory agency (EPA or the State) which is assigned primarily administrative and technical responsibility with respect to actions under the Agreement at a particular Operable Unit pursuant to the Statement of Work attached hereto.

14. "Operable Unit" (OU) shall refer to those groupings of individual hazardous substance sites into a single management area, as detailed in the Statement of Work attached hereto.
15. "Radioactive Mixed Waste" or "Mixed Waste" shall refer to waste that contains both hazardous waste and material that DOE classifies as source, special nuclear, or byproduct material.
16. "Interim Remedial Action" (IRA) shall refer to the CERCLA term for an expedited response action done in accordance with remedial action authorities to abate an actual or potential threat to public health, welfare, or the environment at or from the Site.
17. "RCRA" means the Resource Conservation and Recovery Act, 42 U.S.C. Section 6901 et seq., as amended by the Hazardous and Solid Waste Amendments of 1984, and implementing regulations.
18. "RCRA Permit" means a permit issued under RCRA and/or CHWA for treatment, storage or disposal of hazardous waste.
19. "RCRA Facilities Investigation" shall refer to the RCRA and/or CHWA term for an investigation conducted by the owner/operator of a facility to gather data sufficient to fully characterize the nature, extent and rate of migration of contamination from releases identified at the facility.
20. "Site" shall refer to the federal enclave known as the Rocky Flats Plant, including the buffer zone, and shall also include all areas that are contaminated by hazardous substances, pollutants, or contaminants as those terms are defined in section 101(14) and (33) of CERCLA, and/or any hazardous waste or hazardous constituents as those terms are defined in section 1004 of RCRA or CHWA from sources at the federal enclave.
21. "Solid Waste Management Unit" (SWMU) means an individual location on the Rocky Flats Site where solid waste, including hazardous waste, has or may have been placed, either planned or unplanned, as identified in the Statement of Work.
22. "State" shall refer to the State of Colorado, its employees and authorized representatives.
23. "Submittal" shall mean every document, report, schedule, deliverable, Workplan, or other item to be submitted to EPA and the State pursuant to the Agreement.
24. "Timetables and deadlines" shall mean schedules for performance of tasks including Submittals and all work and actions which are to be completed and performed in

conjunction with such schedules (including performance of actions established pursuant to the dispute resolution procedures set forth in Parts 12, 16 or 27 of the Agreement). The "deadline(s)" established in the schedules shall reflect the dates by which documents are to be received by EPA or the State.

25. "TSD Unit" means a treatment, storage, or disposal unit which is required to be permitted and/or closed pursuant to RCRA and CHWA requirements as determined in the Statement of Work.
26. "U.S. DOE" or "DOE" shall mean the United States Department of Energy and/or any predecessor or successor agencies, their employees and authorized representatives.
27. "U.S. EPA" or "EPA" shall mean the United States Environmental Protection Agency, its employees and authorized representatives.

D.3. Corrective Action/Remedy Selection

- a. The Permittee shall ensure that the remedy/corrective action proposed for each OU, or SWMU as appropriate, shall meet the nine criteria set forth in Section IX.C.2 of the SOW.
- b. The Permittee and the Agencies will follow the process set forth in the SOW to reach a corrective action decision (CAD) and establish a corrective action/remedy for each OU, or SWMU as appropriate.

D.4. Permit Modification for Corrective Action

- a. Once a corrective action has been selected for each OU, or SWMU as appropriate, and a Draft Proposed Plan approved by the Agencies, the Director will initiate a draft permit modification for public comment pursuant to 6 CCR 1007-3, Section 100.6 which specifies the selected corrective action.
- b. Once a corrective action decision has been prepared for an OU, or SWMU as appropriate, the Director will issue a final permit modification decision in accordance with 6 CCR 1007-3, Section 100.511 incorporating the CAD.

D.5.

ATTACHMENT 2 - Rocky Flats Plant U.S.D.O.E.
FEDERAL FACILITY AGREEMENT STATEMENT OF WORK

I.A. Introduction

The purpose of this attachment is to set forth the elements of work required to be performed to respond to all hazardous substance releases or threat of releases at or from the U.S. DOE Rocky Flats Plant (DOE) which may cause harm to human health or the environment. This attachment outlines work to be performed during the investigatory and study phase, ie; Remedial Investigation/Feasibility Study (RI/FS)/RCRA Facility Investigation/Corrective Measures Study (RFI/CMS), of the response process. It does not completely describe the specifics of the Submittals required during the remedial design, remedial action, or other implementation phases of the response program. All response activities performed by DOE shall be consistent with CERCLA, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), RCRA, and applicable State law. At a minimum, all response activities shall also be consistent with:

- Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final, October 1988.
- RCRA Facility Investigation Guidance, Interim Final, May 1989.
- Guidance on Preparing Superfund Decision Documents: The Proposed Plan and Record of Decision, March 1988.
- Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, October 1986.
- Compendium of Superfund Field Operation Methods, September 1987.
- Superfund Public Health Evaluation Manual, October 1986.
- Community Relations in Superfund: A Handbook, Interim Final, June 1988.
- Federal Register, Volume 52, Number 53, Thursday, March 19, 1987, pp. 8704 - 8709.
- Risk Assessment Guidance for Superfund, Volume II-Environmental Evaluation Manual, Interim Final, March, 1989.

[The most recent version of the above citations published at least four months prior to the required submittal date for each document shall always be used.]

While this Statement of Work (SOW) provides details on specific response requirements that must be met during the investigatory and study phase of the response process, it is incumbent upon DOE to perform all response activities in compliance and consistent with this Federal Facility Agreement and Consent Order (Agreement) and applicable laws, regulations and guidance.

I.B. General Response Procedures

- I.B.1.** As described in the aforementioned guidance documents, the general response processes under CERCLA and RCRA during the investigatory and study phase of each Operable Unit (OU) call for: 1) Preparing initial overview of the project scope, 2) Identification of individual hazardous substance releases, or threats of release 3) Grouping the individual hazardous substance sites into OUs, 4) Characterizing the nature and extent of all releases, 5) Developing and screening remedial alternatives, performing treatability investigations, as required, 6) Determining the risks to human health or the environment posed by each release of hazardous substances, 7) Selecting and documenting remedies, and 8) Performing Interim Measures/Interim Remedial Actions (IM/IRAs), when required. These tasks shall be documented in various primary and secondary documents, as described in Table 4 of this SOW and in the Agreement. The timetables and deadlines for submittal of primary and secondary documents are presented within this SOW.
- I.B.2.** All individual hazardous substance sites (sites), defined as locations associated with a release or threat of release of hazardous substances which may cause harm to human health and/or the environment, and are known at the time of execution of this Agreement, are described in Table 1, Individual Hazardous Substance Sites¹. Each of the previously identified sites described in Table 1 has been grouped into one of sixteen OUs, as described in Table 2 of this Attachment.
- I.B.3. Notification.** DOE shall notify EPA and the State of any newly identified or suspected releases or threats of release from any or all of the sites, including the presence of soil gas; air emissions; contaminated ground water, surface water, or soil; or any spills which may threaten human health or the environment. This notification shall be in accordance with all applicable laws including the notification

¹ The definition and acknowledgement of these units as hazardous substance sites is a result of documentation submitted in: Appendix I, 3004(u) Waste Management Units, of the RCRA Part B Permit Application, Rev. No. 1, U.S.D.O.E. - Rocky Flats Plant, dated December 15, 1987 (Table 2 was revised by the Facility (Rev. No. 2) and is dated April 13, 1988); Appendix I, 3004(u) Waste Management Units, of the Transuranic Mixed Wastes RCRA Part B Permit Application, dated July 1, 1988; and the Comprehensive Environmental Assessment and Response Program, Phase I.

requirements of RCRA, CERCLA, and the Emergency Planning and Community Right to Know Act. DOE shall amend the Historical Release Report identified in I.B.5. below every three months to include the newly identified or suspected releases for which DOE has notified EPA and the State during the previous 3 months. Whenever a newly identified or suspected release of hazardous substance occurs or is discovered, it may be added to one of the sixteen existing OUs or it may become another OU, as agreed to by the Parties to the Agreement. RFI/RI Workplans shall be submitted or amended to reflect the incorporation of a newly identified release or suspected release into the Site investigation.

- I.B.4. Review and Comment on Draft and Final Reports. Whenever DOE prepares a document for submittal in accordance with the terms of this Agreement, the document shall be submitted to both EPA and the State. DOE shall complete and transmit each draft and final primary and secondary document to EPA and the State on or before the corresponding deadline established within this Agreement for issuance of each report. The Lead Regulatory Agency (LRA), or both EPA and the State in the case of joint lead OUs, shall consolidate all regulatory agency comments and shall submit them to DOE in accordance with paragraph 144 of the Agreement. Review of any document by the Lead Regulatory Agency (LRA) and Support Regulatory Agency (SRA), or EPA and the State in the case of joint lead OUs, may concern all aspects of the document including completeness, and should include, but is not limited to, technical evaluation of any aspect of the document, and consistency with RCRA, CERCLA, the NCP, and any applicable regulations, pertinent guidance or written policy. Comments shall be provided with adequate specificity so that DOE can make the necessary changes to the document. Comments shall refer to any pertinent sources of authority or references upon which the comments are based and, upon request of the DOE, the commenting agency shall provide a copy of the cited authority or reference.

Representatives of DOE shall make themselves readily available to EPA and/or the State during the comment period for the purposes of informally responding to questions and comments. Oral comments made during these discussions generally shall not require a written response by DOE.

Within 60 days of receiving written comments from the LRA, or EPA and the State in the case of joint lead OUs, DOE shall update the document and/or respond formally to the comments, through a written response or updated document. The updated document or response by DOE shall address all written comments. Upon receiving the updated document or responses to the comments, the LRA or EPA and the State in the case of a joint lead OU, shall evaluate the updated document and/or the response, and notify DOE of approval or disapproval of the updated document or response, and whether DOE is in compliance with the terms of the Agreement. All reviews, comments, and determinations made by EPA and the State shall be in writing and shall be directed to the person identified in Part 35 of

the Agreement to receive the notification.

If the LRA, or EPA and the State in the case of a joint lead OU, determines that the response by DOE to the written documents and/or the updated document is complete, or only minor modifications are necessary, DOE shall be notified in writing. If the LRA, or EPA and the State in the case of a joint lead OU, determines that the response by DOE to the written documents and/or the updated document is incomplete or inadequate, DOE shall be notified in writing. If such updated document or response is a final primary document, the decision is subject to dispute resolution. Decisions regarding secondary documents are not subject to dispute resolution, but deficiencies in secondary documents must be corrected prior to incorporating the secondary document into a primary Submittal.

Table 4 of this Attachment lists the primary and secondary documents to be submitted in accordance with this Agreement. Only Final Reports or final revisions of the primary documents identified within Table 4 shall be subject to dispute resolution. DOE shall complete and submit all primary documents in accordance with the schedules within Table 6 of this Attachment.

- I.B.5. Historical Release Report. DOE shall submit a Historical Release Report within 465 days of the effective date of this Agreement. This report shall provide a complete listing of all spills, releases and/or incidents involving hazardous substances occurring since the inception of the Rocky Flats Plant in 1951 and all spills, releases, and/or incidents requiring implementation of the contingency plan, the notification requirements of 40 CFR 265.56, 6CCR 1007-3, 265.56, or as required by the Community Right to Know Act. The listing shall be accompanied by complete documentation of the events including the description of the events, complete physical and chemical description of the constituents released, responses to the events and the fate of the constituents released into the environment. This information will be utilized by EPA and the State to determine if any of these sites are individual hazardous substance sites and to evaluate the need for initiating RCRA Facility Investigations/Remedial Investigations (RFI/RI) for any and/or all of the events. After review of the initial Historical Release Report and any subsequent amendments provided through the process described in I.B.3. above, EPA and the State shall notify DOE of the requirement to initiate the RFI/RI(s). If EPA and the State decide that an RFI/RI is required for a newly identified site, DOE shall be required to submit a Phase I RFI/RI Workplan for that site in accordance with Section VI.A. of this Attachment, or amend an existing OU RFI/RI Workplan to address the newly identified site. DOE shall also identify any additional sites meeting the definition of an individual hazardous substance site, herein referred to as "site", not identified above.
- I.B.6. As discussed in paragraph 141 of the Agreement, EPA and the State shall designate Lead and Support Regulatory Agencies for purposes of increased efficiency in the

oversight of response activities covered by this Agreement. In some cases, where agreed upon by EPA and the State, both agencies may jointly serve as Lead Regulatory Agency. In these instances, it shall also be agreed between EPA and the State, which agency shall serve as the final decision maker for the purposes of resolving disputes. The designation for the currently known releases is described in Table 3.

- I.B.7. For each OU as provided in more detail below, DOE shall characterize the area associated with each OU, and determine the nature and extent of contamination, pursuant to a Workplan submitted to and approved by EPA and the State. The characterization and determination of nature and extent of contamination shall become part of a RCRA Facility Investigation/Remedial Investigation (RFI/RI). DOE shall complete and submit Baseline Risk Assessments (RA) and shall also conduct Treatability Studies, and Corrective Measures/Feasibility Studies (CMS/FS) as required by EPA and/or the State. In accordance with the provisions within paragraph 156 of this Agreement, DOE and EPA in consultation with the State, and the State in consultation with EPA, shall select the appropriate Remedial and Corrective Actions respectively.
- I.B.8. Project Scoping. Prior to the development and submittal of the RFI/RI Workplans for each OU, DOE may request a meeting to be held between EPA, the State and DOE in order to preliminarily coordinate the requirements of the RCRA Facility Investigation guidance documents with those requirements specified within the Remedial Investigation guidance. The purpose of the meeting is to discuss the requirements and agree on the content of the RFI/RI Workplans to be submitted for each OU. At the meeting, EPA and the State shall inform DOE of the specific requirements to be addressed within the RFI/RI Workplans. Following notification, DOE shall develop and submit as a chapter of the RFI/RI Workplans, potential remedial action objectives, preliminary applicable or relevant and appropriate requirements (ARARs), and potential data quality objectives.
- I.B.9. Investigatory Phase Documentation. It is intended that each OU shall proceed through serial phases of investigation dependent on the information gathered to characterize each OU. OU 1 has progressed through two phases of investigation prior to the finalization of this Agreement. OU 2 has progressed through one phase of investigation prior to the finalization of this Agreement. Pursuant to this Agreement, OUs 3 - 16 have not undergone Phase I field investigation.

For OUs 3 - 16, DOE shall submit draft Phase I RFI/RI Workplans in accordance with the requirements for RFI/RI Workplans specified below. For OUs 1 and 2, DOE shall submit draft Phase III and draft Phase II RFI/RI Workplans, respectively, in accordance with the requirements for RFI/RI Workplans specified below and to address the comments provided to DOE by EPA and the State regarding the previous RFI/RI submittals for these OUs.

The draft RFI/RI Workplans for all OUs shall be submitted to EPA and the State for review and comment. DOE shall revise the draft RFI/RI Workplans to address all comments submitted by EPA and the State, and resubmit the RFI/RI Workplans to EPA and the State for review and joint written approval. DOE shall not commence any work or response activity prior to receiving the appropriate approvals from EPA and the State. The EPA and the State approved RFI/RI Workplans shall be submitted in accordance with the schedules within Table 6 of this Attachment. The approved RFI/RI Workplans shall, at a minimum, implement the activities required in Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites. The work performed as a result of the approval of the RFI/RI Workplans shall be completed, documented and submitted in accordance with the schedule requirements stipulated within Table 6 of this Attachment.

The results of the Phase I RFI/RI work, for OUs 3 - 16, shall be documented within draft Phase I RFI/RI Reports. The results of the Phase III and Phase II RFI/RI work, for OUs 1 and 2, shall be documented within draft Phase III and draft Phase II RFI/RI Reports, respectively. For each OU, the draft RFI/RI Reports shall include a Preliminary Site Characterization, containing information, which is, at a minimum, in accordance with section VII.A. below. Subsequent phases of RFI/RI Workplans for all OUs shall be reviewed and approved consistent with the process identified above for Phase I RFI/RI Workplans.

The draft Phase I RFI/RI Reports for OUs 3 - 16 shall also recommend work to be performed for each Phase II investigation. EPA and the State shall review these draft Phase I RFI/RI Reports for OUs 3 - 16 in accordance with the provisions of paragraphs 144 and 145 of the Agreement. DOE shall revise the draft Phase I RFI/RI Reports for OUs 3 - 16 to address the comments received from EPA and/or the State, and resubmit Final Phase I RFI/RI Reports for EPA and/or the State review and approval. DOE shall not commence the next investigatory phase prior to receiving approval of the Final Phase I Reports for OUs 3 - 16 and approval of Phase II RFI/RI Workplans. The Phase II RFI/RI investigations for the sites within OUs 4, 7, 9, 10, and 11 shall be conducted in accordance with the schedules within Table 6 of this Attachment and in accordance with section I.B.11.b. of this Attachment. The Phase II RFI/RI investigations for OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16 shall be prioritized, scheduled and conducted after evaluation of the Final Phase I RFI/RI Reports for OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16, as specified within section VII.B. of this Attachment. If EPA and/or the State determine that no further investigatory work is required for each OU within OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16 after the Phase I investigation is complete, EPA and/or the State shall approve the Final Phase I RFI/RI Report as a Final RFI/RI Report for that specific OU. The investigatory phase for each OU within OUs 3 - 16 shall be considered complete after approval of a Final RFI/RI Report.

The draft Phase III and Phase II RFI/RI Reports for OUs 1 and 2 respectively

shall be submitted for EPA and State review and comment. If EPA and the State determine that no further investigatory work is required, DOE shall revise the reports to address the comments received and shall submit the Final Phase III and Phase II RFI/RI Reports to EPA and the State for review and approval as Final RFI/RI Reports. If EPA and the State determine that further investigatory work is required, DOE shall not commence the next investigatory phase prior to receiving EPA and State comments concerning the draft Phase III and draft Phase II RFI/RI Reports for OUs 1 and 2, respectively, and receipt of approval for the next phase of the RFI/RI Workplans for OUs 1 and 2. The investigatory phases for OUs 1 and 2 shall be considered complete after approval of Final RFI/RI Reports for OU 1 and for OU 2.

Alternatives Analysis Documentation. For each OU, DOE shall submit a draft Corrective Measures Study/Feasibility Study (CMS/FS) Report in accordance with the schedule requirements stipulated within Table 6 of this Attachment, or within 90 days of EPA and/or State approval of the Final RFI/RI for each OU, in the event the submittal date is not specified within Table 6 of this Attachment. The reports shall contain all information as outlined in section IX. below. The draft CMS/FS Report for each OU shall be submitted for review and comment by EPA and/or the State. DOE shall revise the draft reports for each OU to address the comments received and shall resubmit Final CMS/FS Reports for EPA and/or State review and approval. The alternative analysis phase of each investigation shall not be complete prior to approval of a Final CMS/FS Report.

Remedy Selection Documentation. DOE shall submit a draft Proposed Plan (PP) for EPA and/or the State review and comment simultaneously with the submittal of the Final CMS/FS Report. After receiving and addressing comments from EPA and/or the State on the draft Proposed Plan, DOE shall respond formally to the EPA and State comments prior to issuance of the final Proposed Plan. EPA and State comments must be summarized in the final Proposed Plan and DOE must also summarize responses to those comments in the final Proposed Plan. The EPA and State comments and DOE responses to comments must be placed in the Administrative Record and incorporated in the final Proposed Plan prior to the public comment period. DOE shall subsequently submit the final Proposed Plan for EPA, State and public comment. The final Proposed Plan shall be submitted in accordance with the schedules within Table 6 of this Attachment, or within 60 days of receipt of comments from EPA and the State on the draft Proposed Plan, for OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16. Concurrently, the State shall prepare a proposed RCRA permit modification and open a public comment period. DOE shall submit a draft Responsiveness Summary for each OU, in accordance with the schedules within Table 6 of this Attachment or within 60 days of the end of the public comment period, for OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16, for EPA and/or State review and comment. DOE shall submit the Final Responsiveness Summary simultaneously with a draft Corrective Action Decision/Record of Decision

(CAD/ROD) for EPA and State approval in accordance with the schedules within Table 6 of this Attachment or within 60 days of receipt of EPA and/or State comments on the draft Responsiveness Summary for OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16. Upon modification of the State RCRA permit and approval of the draft CAD/ROD in accordance with paragraph 156 of this Agreement, DOE shall implement the Corrective Action/Remedial Action (CA/RA) for each OU in accordance with section XIV of this Attachment.

- I.B.10. Interim Measures/Interim Remedial Actions. For emergency removals that require response activities to begin onsite within several hours of discovery, DOE shall notify EPA and the State as soon as possible, but no later than 12 hours after discovery of the release or threat of release requiring emergency response. For those emergency removals that require activities to begin onsite within several hours of discovery, DOE shall coordinate the emergency removal action taken with EPA and the State.

All other expedited response actions contemplated by DOE shall be addressed as Interim Measures/Interim Remedial Actions (IM/IRAs) pursuant to paragraphs 15 and 150 of this Agreement, and consistent with guidance for implementing interim actions under remedial authority provided in the preamble to the NCP (55 FR 8704, March 8, 1990). For the purposes of the guidance cited above, the IM/IRA Final Decision Document shall be considered the equivalent of a Record of Decision. IM/IRAs shall, to the greatest extent practicable, be consistent with and contribute to the efficient performance of final response actions consistent with sections 104 and 121 of CERCLA. IM/IRAs shall include provisions which will eliminate, or minimize to the extent possible, the spread of contaminants or resuspension of contaminants as a result of implementing the IM/IRA. DOE shall prepare and submit a draft Proposed IM/IRA Decision Document for EPA and the State review and comment. As a chapter of the draft Proposed IM/IRA Decision Document, DOE shall provide to EPA and the State a draft ARAR Analysis. After receiving and addressing comments from EPA and/or the State on the draft Proposed IM/IRA Decision Document, DOE shall respond formally to the EPA and State comments prior to submittal of the Proposed IM/IRA Decision Document. EPA and State comments and DOE responses to these comments must be summarized in the Proposed IM/IRA Decision Document. The EPA and State comments and DOE responses to comments must be placed in the Administrative Record and incorporated in the Proposed IM/IRA Decision Document prior to submittal of the Proposed IM/IRA Decision Document for public comment. DOE shall subsequently submit a Proposed IM/IRA Decision Document for EPA, State and public comment. DOE shall open a public comment period in accordance with applicable schedules within Table 6 of this Attachment. The public comment period on the Proposed IM/IRA Decision Document shall be at least 60 days. DOE shall hold a public hearing on each Proposed IM/IRA Decision Document, if requested to do so by the public, EPA or the State. The Proposed IM/IRA

Decision Document shall be a concise document that (a) indicates the objective of the IM/IRA; (b) discusses alternatives, if any, that were considered; (c) provides the rationale for the alternative selected; (d) presents EPA approved ARAR analyses and; (e) discusses how the interim remedy selected will be consistent with the final remedy for the OU. After receipt of EPA, State and/or public comments concerning the Proposed IM/IRA Decision Document, DOE shall prepare a Final IM/IRA Decision Document for EPA and State review and approval in accordance with paragraph 150 of this Agreement, which shall include a response to all comments received. DOE shall not commence any remedial/corrective activities associated with an IM/IRA until EPA and the State have approved the Final IM/IRA Decision Document and Responsiveness Summary.

DOE shall make the EPA and State approved Final IM/IRA Decision Document and Responsiveness Summary available to all interested parties 10 days prior to commencing any field remedial/corrective activities associated with the IM/IRA.

The Final Decision Document for each IM/IRA shall include deadlines for implementation of the IM/IRA and shall be supported by the Administrative Record. The supporting Administrative Record shall be consistent with CERCLA and shall include, but not be limited to, significant facts and studies supporting the initial decision to conduct the IM/IRA, all comments received concerning the final decision on the action, EPA and State comments concerning the IM/IRA, and the DOE response to those comments.

Following completion of the design work specified in an IM/IRA Decision Document, DOE shall issue an IM/IRA Implementation Document, that shall include the appropriate drawings and specifications and the appropriate design analysis and cost estimate for implementation of the IM/IRA. The IM/IRA Implementation Document shall provide design documents consistent with the purpose and requirements of the Final IM/IRA Decision Document. If either EPA or the State believes that any IM/IRA is being designed or implemented in a way that will not meet the objectives for the IM/IRA set forth in the Final IM/IRA Decision Document, EPA and the State shall recommend how the IM/IRA should be properly designed and implemented or shall invoke dispute resolution.

DOE shall keep EPA and the State apprised of the progress of the activities required for implementation of the IM/IRA, through inclusion in the monthly progress reports to be submitted to EPA and the State, pursuant to Part 34 of the Agreement. The monthly progress reports shall provide information regarding status of work performed during the previous month, consisting of action specific details including, but not limited to; number of wells drilled, samples taken, status of construction work for all remedial/corrective actions taken, problems encountered and their resolution, status of analytical results, and results of environmental monitoring related to remedial/corrective action.

If EPA and the State determine that an IM/IRA will not fully address the threat posed by a release and further response is required, DOE shall ensure an orderly transition from the IM/IRA to final response actions. At the time of implementation of the final response action(s), IM/IRAs shall either end or be incorporated as part of the final response action.

I.B.11. Administrative Process for CHWA/RCRA Interim Status Closures.

I.B.11.a. Interim status closure units inside buildings (OU 15).

DOE shall submit closure plans to the State for all interim status units undergoing closure within buildings in accordance with the CHWA, 6 CCR 1007-3, Part 265. Closure of these units shall proceed in accordance with these regulations and the approved closure plans.

For all interim status units undergoing closure within buildings, DOE shall also submit a Phase I RFI/RI Workplan to EPA and the State for review, comment and approval in accordance with section I.B.9. of this attachment. The RFI/RI Workplan shall specify the activities required to characterize the nature and extent of contamination at, or resulting from, each unit, in accordance with section VI of this attachment.

DOE shall submit a Phase I RFI/RI Report to EPA and the State for review, comment and approval in accordance with section I.B.9. of this attachment. The RFI/RI Report shall provide adequate documentation concerning the nature and extent of the contamination at, or from each interim status closure unit within OU 15. The RFI/RI Report shall contain sufficient information for EPA and the State to determine the need for further action at any of the interim status closure units within buildings as addressed within OU 15.

If for all interim status closure units inside of a building, EPA and the State determine that: 1) there has not been a release of hazardous constituents or hazardous substances to the environment external to the unit, and 2) that there is no threat of post-closure escape of hazardous waste, hazardous constituents, leachates, run-off, hazardous waste decomposition products or hazardous substances, then EPA and the State will require no further action at OU 15.

If, for any interim status closure unit inside of a building, EPA and the State determine that: 1) there has been a release of hazardous constituents or hazardous substances to the environment external to the unit, or 2) that there is threat of post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, hazardous waste decomposition products or hazardous substances, then further action may be required by EPA and the State at OU 15 through the investigatory and response processes described in sections I.B.9. and/or I.B.10 of this attachment, and/or through the CHWA.

.B.11.b. Interim status closure units external to buildings (OUs 4, 7, 9, 10 and, 11) shall be addressed in two phases.

Phase I. For those interim status closure units external to buildings for which DOE has submitted Closure Plans, DOE shall resubmit and/or amend the source characterization sections of the Closure Plans as individual draft Phase I RFI/RI Workplans for review and comment by EPA and the State. DOE shall also submit OU specific draft Phase I RFI/RI Workplans for conducting field work necessary to characterize the sources of those sites for which DOE has not submitted interim status Closure Plans. DOE shall revise the draft Phase I RFI/RI Workplans to reflect comments submitted to DOE by the State, and shall resubmit the Phase I RFI/RI Workplans for joint approval by EPA and the State in accordance with the schedule set forth within Table 6 of this Attachment. The work required within each approved Phase I RFI/RI Workplan shall be completed in accordance with schedules within Table 6 of this Attachment. The approved Phase I RFI/RI Workplans for interim status closure units external to buildings shall implement field work designed to characterize the sources/soils of each interim status unit, which shall provide the information necessary to determine the risk associated with the source of contamination at each interim status closure unit external to buildings. Draft Phase I RFI/RI Reports shall be submitted to EPA and the State for review and comment in accordance with the scheduled submittal dates stipulated within Table 6 of this Attachment. The draft Phase I RFI/RI Reports shall be used by the State to identify additional work to be performed and shall provide information to support draft Baseline Risk Assessments to be submitted as a chapter of each draft Phase I RFI/RI Report for interim status closure units external to buildings. After revising the draft Phase I RFI/RI Reports to address all comments, DOE shall submit a Phase I RFI/RI Report for each interim status closure unit external to buildings to the State for review and approval.

Subsequent to approval by the State of the Final Phase I RFI/RI Reports for OUs 4, 7, 9, 10 and, 11, DOE shall submit draft Proposed Phase I IM/IRA Decision Documents for review and comment by EPA and the State. The draft Proposed Phase I IM/IRA Decision Documents shall be prepared in accordance with paragraphs 15 and 150 of this Agreement, and consistent with guidance for implementing interim actions under remedial authority provided in the preamble to the NCP (55 FR 8704, March 8, 1990) and the CHWA Closure requirements. The draft Proposed Phase I IM/IRA Decision Documents shall provide the information required to recommend an alternative consistent with the States closure regulations. The draft Proposed Phase I IM/IRA Decision Document shall address all hazardous substance source areas with risk levels greater than 10^{-6} evaluated at the source, and shall require the cleanup of all source areas exhibiting risk levels greater than 10^{-6} evaluated at

the source. Following EPA and State review and comment on the draft Proposed Phase I IM/IRA Decision document, DOE shall incorporate EPA and State comments and shall submit a Proposed IM/IRA Decision document for EPA, State and public comment. The State shall concurrently open a public comment period for the Proposed IM/IRA Decision Document to satisfy the public comment requirements for draft closure plans. The comment period on the Proposed IM/IRA Decision Document shall be at least 60 days. DOE shall hold a public hearing on each Proposed IM/IRA Decision document, if requested to do so by the public, EPA or the State. The Proposed IM/IRA Decision document shall be a concise document that (a) indicates the objective of the IM/IRA; (b) discusses alternatives, if any, that were considered; (c) provides the rationale for the alternative selected and; (d) presents EPA approved ARAR analyses and; (e) discusses how the interim remedy selected will be consistent with the final remedy for the OU. After receipt of EPA, State and/or public comments concerning the Proposed IM/IRA Decision document, DOE shall submit a Final IM/IRA Decision Document and Responsiveness Summary for EPA and State review and approval in accordance with paragraph 150 of this Agreement.

Phase II. In accordance with the schedules provided within Table 6 of this Attachment, DOE shall submit draft Phase II RFI/RI Workplans to EPA and the State for review and comment, to evaluate the nature and extent of contamination resulting from the release of hazardous substances from the interim status closure units external to buildings. DOE shall revise the draft Phase II RFI/RI Workplans in accordance with the comments received from EPA and the State, and shall resubmit the Final Phase II RFI/RI Workplans for EPA and the State review and approval in accordance with the schedules within Table 6 of this Attachment. The approved Final Phase II RFI/RI Workplans shall implement field work designed to evaluate the impact of each interim status closure unit on surface water, ground water, air, the environment and biota.

If the State, in consultation with EPA and DOE, determines that the Phase II RFI/RI for a specific interim status closure unit would be expedited or more efficiently conducted through incorporation into an investigation for another OU, then the State shall inform EPA and DOE that the Phase II investigation for the specific OU will be conducted through amending the affected OU Workplan. The CAD/ROD for the specific OU will reflect that the specific unit has been incorporated into another OU.

The draft Phase II RFI/RI Reports shall evaluate the IM/IRA implemented at each source, as appropriate, and shall include draft comprehensive Baseline Risk Assessments. The draft comprehensive Baseline Risk Assessments shall evaluate risk associated with both the sources and the resultant environmental

contamination. The draft Phase II RFI/RI Reports shall be used by the State to evaluate the need for conducting further field work and shall provide the information to be used to support the draft Phase II CMS/FS Reports. If no further work is required by EPA or the State, the State shall approve the draft Phase II RFI/RI Reports as Final Phase II RFI/RI Reports for the specific OU.

In accordance with the schedules within Table 6 of this Attachment, DOE shall submit the draft Phase II CMS/FS Reports for EPA and State review and comment. The draft Phase II CMS/FS Reports shall evaluate corrective/remedial measures to address both the sources and contamination resulting from the sources. DOE shall revise and submit the Phase II CMS/FS Reports for EPA and State review and approval in accordance with the schedules within Table 6 of this Attachment after addressing the comments received. If no further work or revision is required by EPA and the State, the Phase II CMS/FS Reports shall be approved as Final CMS/FS Reports for that specific OU. Remedy Selection subsequent to the completion of an EPA and State approved CMS/FS for each closure external to buildings shall proceed in accordance with the schedules within Table 6 of this Attachment and in accordance with the process specified in LB.9. above.

II. Community Relations Plan (CRP). DOE shall submit a draft CRP according to the schedules within Table 6 of this Attachment to EPA and the State for review and joint approval. The CRP shall document the community relations history and issues of community concern. The CRP shall describe the techniques and procedures which shall be utilized by DOE to address community concerns and incorporate community involvement in all phases of the Site restoration process. The CRP shall include EPA and State approved mechanisms allowing non-confidential information generated by activities set forth in this Agreement to be readily available to the public. The CRP shall require DOE to notify the community when disputes between DOE, EPA and/or the State are taken to the SEC level for resolution. The CRP shall provide a mechanism for monthly progress reports submitted by DOE and oversight reports generated by EPA and the State, to be made available to the public. The CRP shall provide a mechanism for considering the public concerns regarding workplan development prior to finalization of the workplans. The CRP shall require DOE to make Responsiveness Summaries available to the public for review at least 10 days prior to the commencement of remedial/corrective action work and, at least at the same time as the final decision document. The CRP shall require that DOE news releases will be made available to interested parties at the same time as the news release is made available to the news media. The CRP shall provide a mechanism for DOE to notify the public of extensions and other changes to the schedules within the Agreement. The CRP shall provide a mechanism for DOE to provide concise summaries of major activities to the public. DOE shall consider allowing editorials to be placed in informational materials generated by DOE concerning issues directly related to the

activities governed by this Agreement as part of CRP development. Publishing periodic updates will be considered by DOE in development of the CRP. The CRP shall provide a mechanism for involving local governments in the cleanup process. The CRP shall delineate public comment opportunities. The CRP shall require DOE to provide public access to all non-confidential documents within the Administrative Record. DOE shall be required to interview community groups that focus on Rocky Flats environmental issues during the development of the CRP. The CRP shall provide a mechanism requiring DOE to make public meeting or hearing records available to the public. The CRP shall explore mechanisms to enhance public access to information within the public repositories. The CRP shall develop criteria for determining when and where public meetings will be held.

The CRP preparation methods, elements, and a recommended format shall be based on Community Relations in Superfund: A Handbook (U.S. EPA, Interim Final, June 1988). The CRP shall be periodically updated as required by CERCLA, the NCP, EPA national and regional policy and guidance. All DOE involvement in community relations shall be subject to oversight by the State and EPA.

II.A. Community Relations Activities

DOE shall, in consultation with EPA and the State, develop and implement a community relations plan responding to public concerns and interests as identified through community outreach, public comment on this Agreement, and/or community interviews. The activities to be conducted under this plan, at a minimum, shall be those set forth in CERCLA, the NCP, and national and regional EPA guidance and policy.

II.A.1. Public Repositories

Information shall be made readily available to the public to ensure meaningful participation. One mechanism for accomplishing this goal is the establishment of public information repositories. Locations of the repositories shall, at a minimum, be as follows:

US/EPA Region VIII Library 999 18th St., Suite 215 Denver, CO 80202-2405 (303) 293-1444	Rocky Flats Environmental Monitoring Council 1536 Cole Blvd Suite 150 Golden, CO 80220 (303)232-1966
Colorado Department of Health 4210 East 11th Avenue, Room 351 Denver, CO 80220 (303) 331-4830	Front Range Community College Library 3645 West 112th Ave Westminster, CO 80030 (303)469-4435

All documents as listed in Table 4 of this attachment shall be sent by DOE to the repositories at the time of document release. In addition, copies of documents when submitted for public comment shall be placed in repositories. Any additional

information or documents shall be placed in repositories by DOE in a timely manner as deemed necessary by EPA, the State, and DOE.

II.A.2. Mailing Lists and Newsletter

DOE shall maintain a Rocky Flats mailing list. EPA, the State, or DOE may periodically distribute information in the form of a direct mailing to those persons on the DOE Rocky Flats mailing list. Any person may be placed on the Rocky Flats mailing list by contacting the community relations personnel for DOE.

A direct mailing may be in the form of a news release, fact sheet, or public information update. An update includes, but is not limited to, a summary of the status of completed, ongoing, or upcoming activities. In some instances, fact sheets or updates will be used in conjunction with a public notice (newspaper or radio) to announce an event such as a public meeting, a public hearing, or a formal comment period on a certain document.

II.A.3. News Releases

Except in the case of an emergency or the need for the public to receive information immediately, any party issuing a formal news release to the media regarding any of the work required by this Agreement shall advise the other parties of such news release and the contents thereof at least 48 hours before the issuance of such a news release. The CRP shall provide a mechanism for making such news releases available to interested citizen groups in conjunction with release to the media.

II.A.4. Public Meetings

II.A.4.a. Regular Public Information Meetings

EPA, the State, and DOE shall conduct regular, at least quarterly, public information meetings. The format for these meetings will be established by EPA, the State and DOE. The meetings will update the public on significant CERCLA/RCRA permitting and cleanup activities. The meetings will also provide a forum for advising the public of anticipated upcoming events.

II.A.4.b. Other Public Meetings

Additional public meetings relating to progress and compliance with the Agreement will be scheduled on an as-needed basis, as determined by EPA or the State. Situations involving complex issues or a high level of public interest may require a separate public meeting.

At least one public meeting shall be held during the public comment period for each draft Proposed Plan and concomitant draft Permit (or permit modification). All public comments received on these documents, including

those of the LRA and SRA, will be placed in the Administrative Record and will be sent to the public information repositories.

II.A.5. Public Notification, Location, and Records

DOE, at the request of EPA and/or the State, or as required by this Agreement, shall arrange for all public meetings and shall place a public notice display advertisement announcing the meeting in a newspaper of general circulation and a major radio station in the area where the meeting is to be held. DOE shall also distribute a direct mail notice to all persons on the Rocky Flats mailing list. All such notices shall be made at least 2 to 3 weeks prior to the date of the public meetings.

The location of each public meeting shall be decided by EPA, DOE and the State. Public meetings shall be held at times and locations convenient to the public affected by the Rocky Flats Plant as determined through development of the CRP. In some cases, the agencies may decide to hold an additional public meeting on a subsequent day at another location.

DOE shall provide an individual to accurately record the events and dialogue at each public meeting. This individual shall provide a written record of the public meeting for review to EPA, State, and DOE project coordinators, and the community relations contacts within 14 days following the meeting. The meeting record will then be distributed to each of the public information repositories. Any individual may obtain a copy of the meeting record by submitting a request, in writing, to the DOE community relations contact.

II.A.6. Public Comment Opportunities

DOE, EPA and/or the State will make the documents as listed below available for public comment. These documents will be placed in the public information repositories.

- Draft Colorado Hazardous Waste Act/RCRA Permits for Treatment, Storage and Disposal Units.
- Draft Hazardous and Solid Waste Amendment Act Permits for Corrective Action at Solid Waste Management Units.
- Closure Plans.
- Interim Measures and Interim Remedial Actions.
- Community Relations Plan.
- Final Proposed Plans.
- Plan for the Prevention of Contaminant Dispersion.
- Workplan Designed to Implement Discharge Limits for Radionuclides.

Copies of all public comments received and the agencies' responses to comments shall become part of the Administrative Record and shall be sent to the public information

repositories listed above. Additionally, copies of all public comments and agency responses shall be made available to any person upon written request to any of the community relations contacts within EPA, the State, or DOE. Copy charges may be required of persons interested in obtaining additional copies.

The public notice for availability of these documents for comment shall be published by DOE in a display advertisement in publications of general circulation as determined through development of the CRP and announced on a major radio station in the areas of significant public interest and through the direct mailing list.

II.A.7. Public Hearing Opportunities

Pursuant to State law, draft RCRA permits are subject to public hearings upon determination of a significant degree of public interest, receipt of a written notice of opposition, and a request for a public hearing, or as necessary to clarify permit decision issues in accordance with 6 CCR 1007-3, 100.508. Public notice for a public hearing shall be made at least 30 days before the hearing. Modifications to State RCRA Permits under 6 CCR 1007-3, 100.63 require public meetings to be held for class 2 or class 3 modifications. Public meetings must be held no earlier than 15 days after the opening of the public comment period and no later than 15 days before the end of the public comment period. Notice of the time, date and place of the public meeting will be included in the notice of public comment.

DOE shall, upon request, assist EPA and the State with public hearings in the same manner as with public meetings, as previously described. Transcripts of the public hearing shall be distributed in the same manner as those for the public meetings. Any individual may obtain a copy of the transcript by submitting a request, in writing, to the Community Relations Office for DOE. DOE shall be responsible for providing the transcript copies.

A public hearing shall be held at a location convenient to the nearest population centers, and determined by the State. Public meetings shall be held in the vicinity of the facility.

II.A.8. Technical Assistance Grants

The provision for Technical Assistance Grants (TAG) is found in Section 117(e) of CERCLA. The TAG is a mechanism by which the Federal government provides reimbursement to the public for a level of effort spent on CERCLA document review. In this way, the public can be directly involved in the review process of various CERCLA documents in more depth than otherwise might be possible. As of the date of execution of this Agreement, a TAG has been awarded to the Rocky Flats Clean-up Commission. DOE shall cooperate with the Rocky Flats Clean-up Commission by providing the information requested by that group as long as the information is not

classified as identified in Part 47 of the Agreement.

- III. Health and Safety Plan (HSP). DOE shall submit a HSP which will document specific health and safety procedures to be followed ensuring the health and safety of the investigative team and others (including the general public) during all phases of response actions. This HSP and all other pertinent documentation developed by DOE or its contractor defining work procedures and safety precautions to be taken during environmental investigations or response actions shall be distributed to all contractors or subcontractors involved in the investigations or response actions.

The HSP shall be submitted by DOE to EPA and the State for review and comment, within 30 days of the effective date of this Agreement. The plan shall support field efforts, conform to DOE's health and safety program(s) and be in compliance with OSHA. Specific information required in a Site HSP is listed in 29 CFR 1910.120 and shall at a minimum include: the names of key personnel responsible for Site safety and health; health and safety risk analyses for existing Site conditions, and for each type of Site task and operation; employee training assignments; descriptions of personnel protective equipment to be used by employees for each type of Site task and operation to be conducted; medical surveillance requirements; descriptions of the types and frequency of air monitoring, personnel monitoring and environmental sampling techniques and instrumentation to be used for each type of task and/or operation to be conducted; Site control measures; decontamination procedures; standard operating procedures for the Site; a contingency plan that meets the requirements of 29 CFR 1910.120(1)(1) and (1)(2); and entry procedures for confined spaces.

- IV. Sampling and Analysis Plan (SAP). The SAP shall be submitted by DOE to EPA and the State for review and approval within 120 days of the effective date of this Agreement. The SAP shall consist of two parts: a quality assurance project plan (QAPP) that describes the policy, organization, functional activities, and quality assurance protocols necessary to achieve the data quality objectives dictated by the intended use of the data for each OU; and standard operating procedures (SOP) which detail the field techniques to be utilized during the investigation of the Site, and provide guidance for the performance of all fieldwork. The SOP shall be written by DOE to reflect EPA guidance to ensure that work required by this Attachment is performed in accordance with EPA approved methods. The SOP shall provide a mechanism for planning and approving field activities.

- IV.A. The QAPP shall consist of at least the following elements: project description; project organization and responsibilities; data quality objectives (DQOs); sampling procedures; detection limits; sample custody; calibration procedures; analytical procedures; data reduction, validation and reporting procedures; internal quality control and quality assurance procedures; performance and system audits; preventative maintenance requirements; data assessment procedures; corrective actions; and quality assurance reports (see Guidance for Conducting Remedial Investigations and Feasibility

activities governed by this Agreement as part of CRP development. Publishing periodic updates will be considered by DOE in development of the CRP. The CRP shall provide a mechanism for involving local governments in the cleanup process. The CRP shall delineate public comment opportunities. The CRP shall require DOE to provide public access to all non-confidential documents within the Administrative Record. DOE shall be required to interview community groups that focus on Rocky Flats environmental issues during the development of the CRP. The CRP shall provide a mechanism requiring DOE to make public meeting or hearing records available to the public. The CRP shall explore mechanisms to enhance public access to information within the public repositories. The CRP shall develop criteria for determining when and where public meetings will be held.

The CRP preparation methods, elements, and a recommended format shall be based on Community Relations in Superfund: A Handbook (U.S. EPA, Interim Final, June 1988). The CRP shall be periodically updated as required by CERCLA, the NCP, EPA national and regional policy and guidance. All DOE involvement in community relations shall be subject to oversight by the State and EPA.

II.A. Community Relations Activities

DOE shall, in consultation with EPA and the State, develop and implement a community relations plan responding to public concerns and interests as identified through community outreach, public comment on this Agreement, and/or community interviews. The activities to be conducted under this plan, at a minimum, shall be those set forth in CERCLA, the NCP, and national and regional EPA guidance and policy.

II.A.1. Public Repositories

Information shall be made readily available to the public to ensure meaningful participation. One mechanism for accomplishing this goal is the establishment of public information repositories. Locations of the repositories shall, at a minimum, be as follows:

US/EPA Region VIII Library
999 18th St., Suite 215
Denver, CO 80202-2405
(303) 293-1444

Rocky Flats Environmental Monitoring Council
1536 Cole Blvd Suite 150
Golden, CO 80220
(303)232-1966

Colorado Department of Health
4210 East 11th Avenue, Room 351
Denver, CO 80220
(303) 331-4830

Front Range Community College Library
3645 West 112th Ave
Westminster, CO 80030
(303)469-4435

All documents as listed in Table 4 of this attachment shall be sent by DOE to the repositories at the time of document release. In addition, copies of documents when submitted for public comment shall be placed in repositories. Any additional

information or documents shall be placed in repositories by DOE in a timely manner as deemed necessary by EPA, the State, and DOE.

II.A.2. Mailing Lists and Newsletter

DOE shall maintain a Rocky Flats mailing list. EPA, the State, or DOE may periodically distribute information in the form of a direct mailing to those persons on the DOE Rocky Flats mailing list. Any person may be placed on the Rocky Flats mailing list by contacting the community relations personnel for DOE.

A direct mailing may be in the form of a news release, fact sheet, or public information update. An update includes, but is not limited to, a summary of the status of completed, ongoing, or upcoming activities. In some instances, fact sheets or updates will be used in conjunction with a public notice (newspaper or radio) to announce an event such as a public meeting, a public hearing, or a formal comment period on a certain document.

II.A.3. News Releases

Except in the case of an emergency or the need for the public to receive information immediately, any party issuing a formal news release to the media regarding any of the work required by this Agreement shall advise the other parties of such news release and the contents thereof at least 48 hours before the issuance of such a news release. The CRP shall provide a mechanism for making such news releases available to interested citizen groups in conjunction with release to the media.

II.A.4. Public Meetings

II.A.4.a. Regular Public Information Meetings

EPA, the State, and DOE shall conduct regular, at least quarterly, public information meetings. The format for these meetings will be established by EPA, the State and DOE. The meetings will update the public on significant CERCLA/RCRA permitting and cleanup activities. The meetings will also provide a forum for advising the public of anticipated upcoming events.

II.A.4.b. Other Public Meetings

Additional public meetings relating to progress and compliance with the Agreement will be scheduled on an as-needed basis, as determined by EPA or the State. Situations involving complex issues or a high level of public interest may require a separate public meeting.

At least one public meeting shall be held during the public comment period for each draft Proposed Plan and concomitant draft Permit (or permit modification). All public comments received on these documents, including

those of the LRA and SRA, will be placed in the Administrative Record and will be sent to the public information repositories.

II.A.5. Public Notification, Location, and Records

DOE, at the request of EPA and/or the State, or as required by this Agreement, shall arrange for all public meetings and shall place a public notice display advertisement announcing the meeting in a newspaper of general circulation and a major radio station in the area where the meeting is to be held. DOE shall also distribute a direct mail notice to all persons on the Rocky Flats mailing list. All such notices shall be made at least 2 to 3 weeks prior to the date of the public meetings.

The location of each public meeting shall be decided by EPA, DOE and the State. Public meetings shall be held at times and locations convenient to the public affected by the Rocky Flats Plant as determined through development of the CRP. In some cases, the agencies may decide to hold an additional public meeting on a subsequent day at another location.

DOE shall provide an individual to accurately record the events and dialogue at each public meeting. This individual shall provide a written record of the public meeting for review to EPA, State, and DOE project coordinators, and the community relations contacts within 14 days following the meeting. The meeting record will then be distributed to each of the public information repositories. Any individual may obtain a copy of the meeting record by submitting a request, in writing, to the DOE community relations contact.

II.A.6. Public Comment Opportunities

DOE, EPA and/or the State will make the documents as listed below available for public comment. These documents will be placed in the public information repositories.

- Draft Colorado Hazardous Waste Act/RCRA Permits for Treatment, Storage and Disposal Units.
- Draft Hazardous and Solid Waste Amendment Act Permits for Corrective Action at Solid Waste Management Units.
- Closure Plans.
- Interim Measures and Interim Remedial Actions.
- Community Relations Plan.
- Final Proposed Plans.
- Plan for the Prevention of Contaminant Dispersion.
- Workplan Designed to Implement Discharge Limits for Radionuclides.

Copies of all public comments received and the agencies' responses to comments shall become part of the Administrative Record and shall be sent to the public information

repositories listed above. Additionally, copies of all public comments and agency responses shall be made available to any person upon written request to any of the community relations contacts within EPA, the State, or DOE. Copy charges may be required of persons interested in obtaining additional copies.

The public notice for availability of these documents for comment shall be published by DOE in a display advertisement in publications of general circulation as determined through development of the CRP and announced on a major radio station in the areas of significant public interest and through the direct mailing list.

II.A.7. Public Hearing Opportunities

Pursuant to State law, draft RCRA permits are subject to public hearings upon determination of a significant degree of public interest, receipt of a written notice of opposition, and a request for a public hearing, or as necessary to clarify permit decision issues in accordance with 6 CCR 1007-3, 100.508. Public notice for a public hearing shall be made at least 30 days before the hearing. Modifications to State RCRA Permits under 6 CCR 1007-3, 100.63 require public meetings to be held for class 2 or class 3 modifications. Public meetings must be held no earlier than 15 days after the opening of the public comment period and no later than 15 days before the end of the public comment period. Notice of the time, date and place of the public meeting will be included in the notice of public comment.

DOE shall, upon request, assist EPA and the State with public hearings in the same manner as with public meetings, as previously described. Transcripts of the public hearing shall be distributed in the same manner as those for the public meetings. Any individual may obtain a copy of the transcript by submitting a request, in writing, to the Community Relations Office for DOE. DOE shall be responsible for providing the transcript copies.

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The HSP shall be submitted by DOE to EPA and the State for review and comment, within 30 days of the effective date of this Agreement. The plan shall support field efforts, conform to DOE's health and safety program(s) and be in compliance with OSHA. Specific information required in a Site HSP is listed in 29 CFR 1910.120 and shall at a minimum include: the names of key personnel responsible for Site safety and health; health and safety risk analyses for existing Site conditions, and for each type of Site task and operation; employee training assignments; descriptions of personnel protective equipment to be used by employees for each type of Site task and operation to be conducted; medical surveillance requirements; descriptions of the types and frequency of air monitoring, personnel monitoring and environmental sampling techniques and instrumentation to be used for each type of task and/or operation to be conducted; Site control measures; decontamination procedures; standard operating procedures for the Site; a contingency plan that meets the requirements of 29 CFR 1910.120(l)(1) and (l)(2); and entry procedures for confined spaces.

- IV. Sampling and Analysis Plan (SAP). The SAP shall be submitted by DOE to EPA and the State for review and approval within 120 days of the effective date of this Agreement. The SAP shall consist of two parts: a quality assurance project plan (QAPP) that describes the policy, organization, functional activities, and quality assurance protocols necessary to achieve the data quality objectives dictated by the intended use of the data for each OU; and standard operating procedures (SOP) which detail the field techniques to be utilized during the investigation of the Site, and provide guidance for the performance of all fieldwork. The SOP shall be written by DOE to reflect EPA guidance to ensure that work required by this Attachment is performed in accordance with EPA approved methods. The SOP shall provide a mechanism for planning and approving field activities.

- IV.A. The QAPP shall consist of at least the following elements: project description; project organization and responsibilities; data quality objectives (DQOs); sampling procedures; detection limits; sample custody; calibration procedures; analytical procedures; data reduction, validation and reporting procedures; internal quality control and quality assurance procedures; performance and system audits; preventative maintenance requirements; data assessment procedures; corrective actions; and quality assurance reports (see Guidance for Conducting Remedial Investigations and Feasibility

Studies under CERCLA, Interim Final, October, 1988, Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, OAM-005/80, U.S. EPA, 1983, as amended, and OSWER Directive 9355.0-14, Quality Assurance/Field Operations Method Manual, April, 1986).

IV.B. The SOP shall describe in detail, specific sampling techniques for a given objective, sampling equipment and procedures and general sample handling and analysis procedures. The SOP shall incorporate the sampling objectives of the Workplan for each OU as required by this Attachment and Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites, and shall anticipate investigations beyond the work specified in this Attachment.

V. Plan for the Prevention of Contaminant Dispersion. In order to minimize the potential for windblown dispersion of dusts containing hazardous substances or other harmful materials from all sites, DOE shall within 180 days of the effective date of this Agreement, prepare and submit a plan to EPA and the State for joint approval. The Plan for the Prevention of Contaminant Dispersion shall provide for the management of wastes associated with sites in such a manner as to prevent windblowing of hazardous or dangerous materials through techniques such as soil cover over hazardous and dangerous materials and/or use of appropriate wetting techniques during high wind conditions. High wind conditions are defined as winds blowing in excess of 15 mph or where visible particulate emissions leave the respective site(s).

DOE shall also include as part of the Plan, a proposal to evaluate the potential for and risk of windblown inorganic, radioactive and organic hazardous constituents released from sites at the Rocky Flats Plant. EPA and the State may require the installation of air monitoring systems for evaluating windblown releases from the sites, or require further corrective measures.

VI. RFI/RI Workplans. DOE shall prepare RFI/RI Workplans for each OU that assure that each site identified in Table 1 is fully characterized and that a Baseline Risk Assessment is performed, as set forth below. The Workplans shall implement as initial steps the measures provided for in Table 5 of this Attachment. The RFI/RI Workplans shall be submitted to EPA and the State in accordance with schedules within Table 6 of this Attachment. The RFI/RI Workplans required by this Agreement shall meet the requirements as outlined in Section VI.B. of this Attachment and shall be implemented immediately upon joint approval by EPA and the State.

VI.A. DOE shall prepare or amend RFI/RI Workplans to ensure that each spill and/or release described within the Historical Release Report, and within any amendments to the Historical Release Report, and identified by EPA and the State as requiring an RFI/RI, is investigated to establish site characteristics and nature and extent of contamination as set forth below. EPA and the State shall review the Historical

Release Report as required in paragraph I.B.5. above and shall notify DOE in writing that an RFI/RI Workplan is required. DOE shall submit the RFI/RI Workplan(s) to EPA and the State for review and approval as required by EPA and the State. The RFI/RI Workplan(s) required by this condition shall meet the requirements as outlined in section VI.B. of this Attachment and shall be implemented as required through the written approval by EPA and the State.

- VI.B. DOE shall develop RFI/RI Workplans for those sites as specified in Sections VI. and VI.A. above. The Workplans shall include a summary of the existing data in terms of physical and chemical characteristics of the contaminants identified, and their distribution among the environmental media at each site. The plans shall also include a conceptual "model" describing the contaminant sources, and potential migration and exposure pathways and receptors. In addition, the plans will include a description of each site investigation and management strategy developed by DOE during scoping; a preliminary identification of remedial alternatives and data needs for evaluation of remedial alternatives. The plans will reflect coordination with the treatability study requirements as outlined in this Attachment, and any additional treatability studies required through the CMS/FS process. The plans shall include processes, schedules for, and manner of, identifying Federal and State requirements (chemical-specific, location-specific, and action specific applicable or relevant and appropriate requirements) (ARARs).

The Workplans shall include detailed descriptions of the tasks to be performed, information needed for each task (e.g., for health and environmental risk evaluation), information to be produced during and at the conclusion of each task, and a description of the work products that will be submitted to EPA and the State. The RFI/RI Workplans shall include a Field Sampling Plan (FSP) which shall describe in detail, specific OU background information, sampling objectives for each site within each OU, sample location, and minimum frequency for each task and/or operation for a given objective, sample designation procedures, sampling equipment and procedures and sample handling and analysis protocol. The FSP shall incorporate the sampling objectives of Table 5, and shall anticipate investigations beyond the work specified in this Attachment. DOE will refer to Appendix B of the October 1988 Interim Final RI/FS Guidance for a comprehensive description of the contents of the required Workplans.

Because of the unknown nature of many of the sites and the iterative nature of the RFI/RI and CMS/FS, additional data requirements and analyses may be identified throughout the process. DOE shall submit technical memorandums to EPA and the State documenting the need for additional data, and identifying the data quality objectives (DQOs) whenever such requirements are identified. These technical memorandums shall be attached as an amendment to the approved Workplans for each OU after approval by EPA and the State. In any event, DOE is responsible for fulfilling additional data and analysis needs identified by EPA and the State,

consistent with the general scope and objectives of each RFI/RI and CMS/FS. The Workplans shall provide for the activities in subparagraphs VI.B.1.- VI.B.5.b. below.

- VI.B.1. Investigate and define site physical characteristics. DOE shall collect data on the physical characteristics of each site and its surrounding areas including the physiography, geology, and hydrology, and specific physical characteristics identified in the Workplans. This information will be ascertained through a combination of physical measurements, observations, and sampling efforts and shall be utilized to define potential transport pathways and receptor populations. In defining each site's physical characteristics, DOE shall also obtain sufficient engineering data (such as pumping characteristics) for the projection of contaminant fate and transport, and the development and screening of corrective/remedial action alternatives, including information to assess treatment technologies.
- VI.B.2. Define sources of contamination. DOE shall locate each source of contamination. For each location, the areal extent and depth of contamination shall be determined by sampling at incremental depths of a sampling grid. The physical characteristics and chemical constituents and their concentrations shall be determined for all known and discovered sources of contamination. DOE shall conduct sufficient sampling to define the boundaries of the contaminant sources to the level established in the QA/QC plan and DQOs. Defining the source of contamination shall include analyzing the potential for contaminant releases (e.g., long term leaching from soil), contaminant mobility and persistence, and characteristics important for evaluating corrective/remedial actions, including information to assess treatment technologies.
- VI.B.3. Describe the nature and extent of contamination. DOE shall gather information to describe the nature and extent of contamination as a final step during the field investigation. To describe the nature and extent of contamination, DOE shall utilize the information on each site's physical characteristics and sources of contamination to give a preliminary estimate of the contaminants that may have migrated. DOE shall then implement an iterative monitoring program and any study program identified in the Workplan or SAP such that by using analytical techniques sufficient to detect and quantify the concentration of contaminants, the migration of contaminants through the various media at each site can be determined. In addition, DOE shall gather data for calculations of contaminant fate and transport. This process is continued until the area and depth of contamination are known to the level of contamination established in the QA/QC plan and DQOs. Information on the nature and extent of contamination shall be utilized to determine the level of risk presented by each site and shall help to determine aspects of the appropriate remedial action alternatives to be evaluated.
- VI.B.4. Evaluate site characteristics. DOE shall analyze and evaluate the data to describe: 1) each site's physical characteristics, 2) contaminant source characteristics and, 3)

nature and extent of contamination, and 4) contaminant fate and transport. Results of each site's physical characteristics, source characteristics, and nature and extent of contamination analyses are utilized in the analysis of contaminant fate and transport. The evaluations shall include the actual and potential magnitude of releases from the sources, and horizontal and vertical spread of contamination as well as mobility and persistence of contaminants. Where modeling is appropriate, such models shall be identified to EPA and the State in a technical memorandum prior to their use. All data and programming, including any proprietary programs, shall be made available to EPA and the State together with a sensitivity analysis. Also, this evaluation shall provide any information relevant to each site's characteristics necessary for evaluation of the need for Corrective/Remedial Action in the Baseline Risk Assessment and for the development and evaluation of remedial alternatives. Analyses of data collected for each site's characterization shall meet the DQOs developed in the QA/QC plan stated in the SAP (or revised during the RFI/RI).

VI.B.5. Data Management Procedures. DOE shall consistently document the quality and validity of field and laboratory data compiled during the RFI/RI.

VI.B.5.a. Document field activities. Information gathered during each characterization shall be consistently documented and adequately recorded by DOE in well maintained field logs and laboratory reports. The method(s) of documentation shall be specified in the Workplans and/or the SAP. Field logs shall be utilized to document observations, measurements, and significant events that have occurred during field activities. Laboratory reports shall document sample custody, analytical responsibility, analytical results, adherence to prescribed protocols, nonconformity events, corrective measures, and/or data deficiencies.

VI.B.5.b. Maintain sample management and tracking DOE shall maintain field reports, sample shipment records, analytical results, and QA/QC reports to ensure that only validated analytical data are reported and utilized in the development and evaluation of corrective/remedial alternatives. Analytical results developed under the Workplans shall not be included in any characterization reports unless accompanied by or cross-referenced to a corresponding QA/QC report which shall be submitted. In addition, DOE shall establish a data security system to safeguard chain-of-custody forms and other project records to prevent loss, damage, or alteration of project documentation.

VII. OU Characterization Deliverables. DOE shall prepare and submit Phase I RFI/RI Reports for OUs 3 - 16, including the Preliminary Site Characterization (PSC), the Phase III RFI/RI Report for OU 1, and the Phase II RFI/RI Report for OU 2, as required by the schedules within Table 6 of this Attachment. If further characterization of an OU is required by EPA and/or the State, additional phases of investigation shall be conducted by DOE. Once the Baseline Risk Assessment is completed for each OU and each OU has been characterized as approved, the

Final RFI/RI Report for each OU shall be approved.

- VII.A. Preliminary Site Characterization Summary. The Phase I RFI/RI Report(s) required for OUs 3 - 16 shall include a "Preliminary Site Characterization Summary" (PSC) as a chapter of the Phase I RFI/RI Reports. These PSC summaries shall present the investigative activities which have taken place, and describe and display OU data documenting the location and characteristics of surface and subsurface features and contamination at each site within each OU including the affected media, location of contaminants, types of contaminants, physical state of contaminants, concentration of contaminants and quantity of contaminants. In addition, the location, dimensions, physical condition and varying concentrations of each contaminant throughout each source and the extent of contaminant migration through each of the affected media shall be documented. The data developed for the PSC summary(s) shall be used by DOE to develop the Baseline Risk Assessment for each OU. The PSC summaries shall provide EPA and the State with a preliminary reference for evaluating the Baseline Risk Assessment for each OU, evaluating the development and screening of corrective/remedial alternatives and the determination and evaluation of ARARs. EPA and the State will evaluate these documents for adequacy, to direct DOE to conduct further investigation and to evaluate the Baseline Risk Assessments for each OU. The PSC summaries will also be used by EPA and the State to initiate parallel Corrective Measures Studies/Feasibility Studies (CMS/FS) to be conducted by DOE and/or to effect Corrective/Remedial Action, including Interim Measures/Interim Remedial Actions, by DOE at each site or OU as EPA and the State deem appropriate. The initial investigations and submittals required by Table 5 and implemented through the Phase I RFI/RI Workplans to be submitted and approved are considered preliminary and shall not limit the EPA or the State from requiring DOE to conduct further activities pursuant to this Agreement. Such additional investigation or reporting shall not be considered a modification to this Agreement, but shall be considered part of the original requirements of this Agreement.
- VII.B. Prioritization of OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16. After DOE has completed all work stipulated within Table 5 as implemented through the EPA and the State approved Phase I Workplans, for OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16, EPA and the State, in consultation with DOE, shall identify and prioritize the remaining work to be performed for the Site characterization. After EPA and the State have agreed upon priority for further investigation of OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16, EPA and the State shall notify DOE of the Site characterization priorities within OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16. Upon receipt of this notification, DOE shall have 30 days to submit a proposal for implementation of the EPA and the State determined priorities. EPA and the State shall review the proposal and determine adequacy. If the proposal by DOE is determined to be acceptable, EPA and the State shall approve the proposal. Within 60 days of approval of the DOE proposal

by EPA and the State, DOE shall submit draft Phase II RFI/RI Workplans for each affected OU, for EPA and State review and comment. Within 60 days of receipt of EPA and/or State comments concerning the draft Phase II RFI/RI Workplans, DOE shall submit Final Phase II RFI/RI Workplans for EPA and State review and approval. The work required of DOE by EPA and the State, documented within the approved Final Phase II Workplans, shall be completed within the timeframes stipulated within the approved Final Phase II RFI/RI Workplans.

DOE shall submit draft Phase II RFI/RI Reports upon completion of the required work, and in accordance with the schedules within the approved Final Phase II RFI/RI Workplans, to reflect the EPA and the State requirements, for review and comment. EPA and the State shall continue to require DOE to submit subsequent phase Workplans to reflect EPA and State requirements, as appropriate, until DOE has collected sufficient information pursuant to the RFI/RI Workplans to prepare the Final RFI/RI Reports for approval.

- VII.C. RCRA Facility Investigation/Remedial Investigation (RFI/RI) Reports. DOE shall prepare and submit draft RFI/RI Reports to EPA and the State for review and comment, after completion of the required investigatory work, and in accordance with the schedules within Table 6 of this Attachment. The draft RFI/RI Reports shall include the draft Baseline Risk Assessments. These reports shall summarize results of field activities to characterize the sites, characterize sources of contamination, define the nature and extent of contamination, define the fate and transport of contaminants, characterize the environmental setting, identify areas threatened by releases from each site, determine the short and long-term threats to human health and the environment, and present the results of the draft Baseline Risk Assessments. DOE shall use the RCRA Facility Investigation Guidance, (Interim Final), May 1989 [or as amended], and the Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, Interim Final, October 1988, for an outline of the report format and contents. Following comment by EPA and the State on the draft RFI/RI Reports, and completion of all work required by EPA and/or the State, DOE shall prepare Final RFI/RI Reports for EPA and/or State review and approval, which address all comments.
- VII.D. Baseline Risk Assessment. Baseline Risk Assessments shall be prepared for each OU and shall identify and characterize the toxicity and levels of all hazardous substances present, contaminant fate and transport, the potential for human and/or environmental exposure, and the risk of potential impacts or threats on human health and the environment. The Baseline Risk Assessments shall provide the basis for determining whether or not Corrective/Remedial Action is necessary, and a justification for performing Corrective/Remedial Actions. DOE shall use the procedures in EPA's Superfund Public Health Evaluation Manual (SPHEM), or superceding EPA documents to perform a Baseline Risk Assessment for human

health and the environment. These procedures are outlined below and must be followed by DOE. Other resources to be used when performing the Baseline Risk Assessment include: EPA's Superfund Exposure Assessment Manual (SEAM), the Integrated Risk Information System (IRIS), the Public Health Risk Evaluation Database (PHRED), the Interim Final Risk Assessment Guidance for Superfund - Environmental Evaluation Manual, and the Federal Register, Volume 52, Number 53, Thursday, March 19, 1987, pp. 8704 - 8709.

In the event EPA and the State determine that a Comprehensive Risk Assessment of the Site is required, as provided for in paragraph 154 of the Agreement, DOE shall submit the Comprehensive Risk Assessment for EPA and State review and approval, in accordance with submittal schedules agreed to by EPA, the State and DOE.

- VII.D.1. Human Health and Risk Assessment Components. The health risk assessment process is divided into the four components listed below. During the scoping of the Baseline Risk Assessment, DOE shall discuss with EPA and the State the format of the Baseline Risk Assessment report as well as the references to be utilized during the Baseline Risk Assessment.
- VII.D.1.a. Contaminant identification and documentation. DOE shall review the information that is available on the hazardous substances present at each site within an OU and shall identify the contaminants of concern. The indicator chemicals, or contaminants of concern, are not chosen solely on the basis of chemical-specific requirements. Rather, they are selected based on quantity, the concentration of contaminants at each site within an OU as compared to levels that pose a risk, or critical exposure pathways, such as drinking water. When selecting the indicator chemicals, DOE shall also consider the additive and synergistic effect of risks, to the extent possible. DOE shall submit to EPA and the State for review and approval a technical memorandum listing the hazardous substances present at each site or OU and the indicator chemicals to be evaluated with the known corresponding ambient concentrations of these contaminants. This memorandum shall be submitted prior to the required submittal of the Baseline Risk Assessment for each OU. Chemical-specific requirements shall also be identified at this time.
- VII.D.1.b. Exposure assessment and documentation. Using the information in the SEAM, DOE shall identify actual and potential exposure points and pathways. Exposure assumptions must be supported with validated data and must be consistent with EPA and State policy. Data utilized shall be validated. For each exposure point, the release source, the transport media (e.g., ground water, surface water, air) and the exposure route (oral, inhalation, dermal) shall be clearly delineated. The current number of people at each exposure point shall be estimated, and both sensitive and potentially exposed populations shall

be characterized. Both present and future potential risks at each site and OU shall be considered, and both current and maximum reasonable use scenarios shall be considered, including evaluation of risk at the source. DOE shall submit for review and approval, a technical memorandum describing the present, future, potential and reasonable use exposure scenarios with a description of the assumptions made and the use of data. This memorandum shall be submitted prior to the required submittal of the Baseline Risk Assessment for each OU. In addition, DOE shall submit for review and approval a description of the fate and transport models that will be utilized, including a summary of the data that will be used with these models. Representative data shall be utilized and the limitations, assumptions and uncertainties associated with the models shall be documented.

VII.D.1.c. Toxicity assessment and documentation. DOE shall utilize the information in IRIS to provide a toxicity assessment of the indicator chemicals. This assessment shall include the types of adverse health and/or environmental effects associated with chemical exposures (including potential carcinogenicity), the relationships between magnitude of exposures and adverse effects, and the related uncertainties for contaminant toxicity (e.g., the weight of evidence for a chemical's carcinogenicity). For those substances lacking an EPA toxicity value for which DOE wishes to develop its own toxicity value, DOE shall submit for review and approval a technical memorandum listing the toxicological and epidemiological studies that will be utilized to perform the toxicity assessment. This memorandum shall be submitted prior to the required submittal of the Baseline Risk Assessment. All data utilized in the toxicity assessment must be validated and go through EPA and the State review.

VII.D.1.d. Risk Characterization. DOE shall integrate the ambient concentrations and reasonable worst case assumptions with the information developed during the exposure and toxicity assessments, to characterize the current and potential risk to human health and the environment posed by each site or OU. This risk characterization must identify any uncertainties associated with contaminants, toxicities, and/or exposure assumptions.

VIII. Baseline Risk Assessment Deliverables. DOE shall prepare the individual technical memoranda listed in paragraph VII.D.1.a., and VII.D.1.c., or one consolidated technical memorandum addressing all components listed above, which shall be incorporated into this Agreement by reference when approved. The Baseline Risk Assessment reports shall be submitted with the RFI/RI reports, as required above.

VIII.A. Baseline Risk Assessment Chapter of the RFI/RI Report. The draft reports shall include a comprehensive description of the four components of the risk assessment and shall follow the principles established in the SPHEM. A discussion of sources of uncertainty, data gaps, incomplete toxicity information, and modeling

characteristics, limitations and assumptions must be included. DOE shall refer to the SPHEM for an outline of the report format.

VIII.B. Environmental Evaluation and Deliverables. In addition to the human health risk assessment, the risks to the environment from exposure to the contaminants shall be addressed.

VIII.C. Environmental Evaluation Plan. DOE shall submit a plan for the evaluation of the environmental risk, within each OU RFI/RI Workplan. This plan shall specify the objectives of the evaluation and the information necessary to adequately characterize the nature and extent of environmental risk or threat resulting from each site and OU. At a minimum, this plan shall demonstrate how the environmental evaluation will address: 1) any critical habitats affected by site contamination; and 2) any endangered species or habitats of endangered species affected by the contamination. DOE shall utilize the Interim Final Risk Assessment Guidance for Superfund - Environmental Evaluation Manual in preparing this plan.

VIII.D. Environmental Evaluation Report. An environmental evaluation report shall be submitted to EPA and the State, as a chapter of the Baseline Risk Assessment for each OU. This evaluation shall be included in the draft Baseline Risk Assessment reports as a chapter separate from the human health risk assessment. At a minimum, the environmental evaluation report shall include an assessment of any critical habitats, and any endangered species or habitats of endangered species affected by the contamination.

IX. Development and Screening of Corrective/Remedial Alternatives (CMS/FS). DOE shall submit a draft CMS/FS for each OU, in accordance with the schedules provided within Table 6 of this Attachment, or within 90 days of approval of the Final RFI/RI, for OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16. The studies shall include the analyses identified below and shall be submitted to EPA and the State for review and comment. The draft CMS/FS Report(s) shall identify the ARARs which will be utilized to evaluate and select the Corrective/Remedial Action at each OU and/or site within an OU. The draft CMS/FS shall also contain projected time schedules for implementation and completion of actions and for interim milestone activities, if these timetables are not already specified. If the time necessary for implementation exceeds one [1] year the schedule shall specify interim dates for submission of interim deliverables. A draft CMS/FS may be submitted with the Final RFI/RI Reports for each OU in order to expedite the review of the CMS/FS Reports.

IX.A. For each OU, or as approved, an individual site within an OU, that is required to be the subject of a CMS/FS, DOE shall perform the activities in this section IX.A. through IX.D., as required by paragraph 153 of this Agreement. The development and screening of corrective/remedial alternatives shall consider

an appropriate range of Corrective/Remedial Action options to evaluate. The range of alternatives shall include, at a minimum: options in which treatment is used to reduce the toxicity, mobility, or volume of wastes, but which vary in the types of treatment, the amount of wastes treated, and the manner in which long-term residuals or untreated wastes are managed; options involving containment with little or no treatment; options involving both treatment and containment; and a no-action alternative. DOE shall develop and evaluate a range of appropriate Corrective/Remedial Action options that, at a minimum, ensures protection of human health and the environment. The following activities shall be performed by DOE as a function of the development and screening of corrective/remedial alternatives.

- IX.A.1. Refine and Document Corrective/Remedial Action Objectives. DOE shall propose and, if necessary, refine the specific Corrective/Remedial Action objectives. The revised Corrective/Remedial Action objectives shall be documented in a technical memorandum to be submitted to EPA and/or the State for review. These objectives shall specify the contaminants and media of interest, exposure pathways and receptors, and EPA and State accepted levels or ranges of levels for each exposure route.
- IX.A.2. Develop General Response Actions. DOE shall develop general response actions for each medium of interest defining containment, treatment, excavation, pumping or other actions, singly or in combination, to satisfy the Corrective/Remedial Action objectives.
- IX.A.3. Identify Areas or Volumes of Media. DOE shall identify areas or volumes of media to which general response actions may apply, taking into account requirements for protectiveness as identified in the Corrective/Remedial Action objectives. The chemical and physical characterization of each site and OU shall also be taken into account.
- IX.A.4. Identify, Screen, and Document Corrective/Remedial Technologies. DOE shall identify and evaluate technologies applicable to each general response action to eliminate those that cannot be implemented at each site or OU. General response actions shall be refined to specify corrective/remedial technology types. Technology process options for each of the technology types shall be identified either concurrent with the identification of technology types, or following the screening of the considered technology types. Studies in Section XI shall be taken into account. Process options shall be evaluated on the basis of effectiveness, implementability, and cost factors to select and retain one or, if necessary, more representative processes for each technology type. The technology types and process options shall be summarized for inclusion in a technical memorandum to be submitted to EPA and/or the State. The reasons

for eliminating alternatives must be specified.

IX.A.5. Assemble and Document Alternatives. DOE shall assemble selected representative technologies into alternatives for each affected medium or OU. Together, all of the alternatives shall represent a range of treatment and containment combinations that will address either each site or an OU as a whole. A summary of the assembled alternatives and their related action-specific ARARs shall be prepared by DOE for inclusion in a technical memorandum to be submitted to EPA and/or the State for review. The reasons for eliminating alternatives during the preliminary screening process must be specified.

IX.A.6. Refine Alternatives. DOE shall refine the corrective/remedial alternatives to identify the contaminant volume addressed by the proposed process and the sizing of critical unit operations, as necessary. Sufficient information shall be collected for an adequate comparison of alternatives. Corrective/Remedial Action objectives for each medium shall also be refined, as necessary, to incorporate any new risk assessment information being generated from the Corrective/Remedial investigation. Additionally, action-specified ARARs shall be updated as the corrective/remedial alternatives are refined.

IX.A.7. Conduct and Document Screening Evaluation of Each Alternative. DOE may perform a final screening process based on short and long term aspects of effectiveness, implementability, and relative cost. Generally, this screening process is only necessary when there are many feasible alternatives available for detailed analysis. If necessary, the screening of alternatives shall be conducted to assure that only the alternatives with the most favorable composite evaluation of all factors are retained for further analysis.

As appropriate, the screening shall preserve the range of treatment and containment alternatives that was initially developed. The range of remaining alternatives shall include options that use treatment technologies and permanent solutions to the maximum extent practicable. DOE shall prepare a technical memorandum to be submitted to EPA and/or the State for review, summarizing the results and reasoning employed in screening, arraying alternatives that remain after screening, and proposing the action-specific ARARs for the alternatives that remain after screening.

IX.B. Alternatives Development and Screening Deliverables. The technical memoranda required in sections IX.A.1. - IX.A.7. above may be submitted to EPA and the State as individual memoranda or as one consolidated memorandum, prior to the required submittal date of each OU specific draft CMS/FS Report. DOE shall prepare these memoranda to summarize the work performed in and the results of each task above, including an alternatives array summary. These shall be modified

by DOE, if required by EPA or State comments, to assure identification of a complete and appropriate range of viable alternatives which are considered in the detailed analysis. This deliverable shall document the methods, rationale, and results of the alternatives screening process.

- IX.C. Detailed Analysis of Remedial Alternatives (CMS/FS). The detailed analysis shall be conducted by DOE to provide EPA and the State with the information needed to allow for the selection of a remedy. This analysis is the final task to be performed by DOE during the CMS/FS.
- IX.C.1. Detailed Analysis of Alternatives. DOE shall conduct a detailed analysis of alternatives which will consist of an analysis of each option against a set of nine evaluation criteria and a comparative analysis of all options using the same evaluation criteria as a basis for comparison.
- IX.C.2. Apply Nine Criteria and Document Analysis. DOE shall apply nine evaluation criteria to the assembled corrective/remedial alternatives to ensure that the selected remedial alternative will be protective of human health and the environment; will be in compliance with ARARs; will be cost-effective; will utilize permanent solutions and alternative treatment technologies, of resource recovery technologies, to the maximum extent practicable; and will address the preference for treatment as a principal element. The nine evaluation criteria to be used are: 1) overall protection of human health and the environment, taking into account relevant and appropriate requirements of CERCLA and RCRA and other federal and State health and environmental laws, rules, regulations and criteria; 2) compliance with other ARARs; 3) long-term effectiveness and permanence; 4) reduction of toxicity, mobility, or volume; 5) short-term effectiveness; 6) implementability; 7) cost; 8) State (or support agency) acceptance; and 9) community acceptance. (Note: criteria 9 is considered after the RFI/RI, CMS/FS reports have been released to the general public.) For each alternative, DOE shall provide: 1) a description of the alternative that outlines the waste management strategy involved and identifies the key ARARs associated with each alternative, and 2) a discussion of the individual criterion assessment. Cost effectiveness shall not be a limiting factor in remedy selection until alternatives under consideration are determined to be equally protective.
- IX.C.3. Compare Alternatives Against Each Other and Document the Comparison of Alternatives. DOE shall perform a comparative analysis between the corrective/remedial alternatives. That is, each alternative shall be compared against the others using the evaluation criteria as a basis of comparison. The preferred alternative shall be selected according to the procedures in Part 23 of the Agreement.

IX.D. Detailed Analysis Deliverables. DOE shall submit draft CMS/FS Reports for each OU to EPA and the State for review and comment. Once EPA and the State comments have been addressed by DOE, to the satisfaction of the LRA, or EPA and the State in the event of a joint lead OU, the Final CMS/FS Report shall be submitted for review and approval.

IX.D.1. Corrective Measures Study/Feasibility Study Report (CMS/FS). DOE shall prepare draft CMS/FS Reports for each OU for review and comment. These reports, as ultimately adopted or amended, provide a basis for remedy selection by EPA and/or the State and document the development and analysis of corrective/remedial alternatives. DOE shall refer to Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, Interim Final, October 1988 [or as amended] for an outline of the report format and the required report content. DOE shall prepare Final CMS/FS Reports which incorporate and address EPA and/or State comments in a manner satisfactory to EPA and/or the State, for EPA and/or State review and approval.

X. Background Study. The Background Study Plan submitted January, 1989, shall be reviewed by EPA and the State. As the Background Study is presently ongoing, the Background Study shall be modified if necessary, after joint review and approval of the January, 1989 Background Study Plan by EPA and the State. The Background Study shall be used by EPA, the State and DOE to evaluate contaminant release. DOE shall submit the Background Study Reports detailing the preliminary results of the approved background study in accordance with the schedules within Table 6 of this Attachment. DOE shall also submit updated Background Study Reports at least annually and in accordance with the schedules provided within Table 6 of this Attachment.

XI. Treatability Study. Within 180 days of the effective date of this Agreement, DOE shall submit a Treatability Study Plan for joint approval by EPA and the State, detailing the study of methods potentially available for use in Corrective/Remedial action for each type of waste/waste matrix in sites at the Rocky Flats Plant. The Treatability Study Plan shall identify candidate technologies for evaluation in a treatability studies program and shall cover the range of technologies required for alternative analysis during the CMS/FS. In the event site characteristics require the evaluation of additional treatability studies, DOE shall perform the EPA and the State required treatability studies in addition to the work defined within the Treatability Study Plan required by this paragraph. Within the Treatability Study Plan, DOE shall submit information on performance, relative costs, applicability, removal efficiencies, operation and maintenance requirements, and implementability of candidate technologies in addressing the below listed general types of wastes. If practical candidate technologies have not been sufficiently demonstrated, or cannot be adequately evaluated by EPA and the State on the basis of existing information, the Treatability Study Plan shall propose a Treatability Study for the candidate technology(s). To this end, the Treatability Study Plan will propose a statement of work for the specific Treatability Study(s) to be performed. The Treatability Study Plan will

outline the steps and data necessary to evaluate and initiate the treatability testing program, test objectives, data quality objectives, experimental procedures, treatability conditions to be tested, measurements of performance, analytical methods, data management and analysis, health and safety, and residual waste management. If the quality assurance project plan (QAPP) and/or the field sampling plan (FSP) required in Attachment condition VI.B. do not adequately define or address the investigations to be conducted during the Treatability Study, then the Treatability Study Plan will incorporate an amended QAPP and FSP specific to the Treatability Study. The treatability study program shall not be initiated until EPA and the State have reviewed and jointly approved, in writing, the Treatability Study Plan.

The Treatability Study shall be initiated within 30 days of joint approval by EPA and the State. This study shall evaluate applicable technologies for the general types of wastes anticipated at the Rocky Flats Plant. The general types of wastes/waste matrices to be included in the study include: volatile and semi-volatile contaminated wastes, soils, surface water and ground water; metal contaminated wastes, soils, surface water and ground water; radioactive wastes, soils, surface water and ground water and; any combination of the above listed general types of wastes.

The Treatability Study shall be completed and the results shall be submitted to EPA and the State within 36 months of the approval of the Treatability Study Plan by EPA and the State. Additional Treatability Studies may be proposed by DOE, or required by EPA and the State if, at any time it is determined that additional studies are required. Additional studies shall be initiated by submission of amendments to the Treatability Study Plan, for EPA and State review and approval.

- XII. Discharge Limits for Radionuclides. The June 19, 1989, Agreement in Principle between DOE and CDH requires that DOE provide a full set of samples for radionuclides before discharging from onsite ponds, for CDH to determine the safety of such discharges. Accordingly, DOE will prepare and submit a Workplan designed to control the release of radionuclides as specified herein. The Workplan will require DOE to sample before any offsite discharges from onsite ponds occur. In accordance with the Agreement in Principle, the Workplan will require that split samples be made available to EPA and CDH. The Workplan will require that DOE assess the water quality with respect to the recently promulgated Colorado Water Quality Control Commission (CWQCC) standards. The standards adopted for radionuclides are:

<u>Parameter</u>	<u>Standard</u>	
	Woman Creek	Walnut Creek
Gross Alpha	7 pCi/l	11 pCi/l
Gross Beta	5 pCi/l	19 pCi/l
Americium	0.05 pCi/l	0.05 pCi/l
Curium 244	60 pCi/l	60 pCi/l

Neptunium 237	30 pCi/l	30 pCi/l
Plutonium	0.05 pCi/l	0.05 pCi/l
Uranium	5 pCi/l	10 pCi/l
Cesium 134	80 pCi/l	80 pCi/l
Radium 226 and 228	5 pCi/l	5 pCi/l
Strontium 90	8 pCi/l	8 pCi/l
Thorium 230 and 232	60 pCi/l	60 pCi/l
Tritium	500 pCi/l	500 pCi/l

The Workplan will establish validated analytical methods as identified by EPA and the State, including, as appropriate, the methods delineated in 40 CFR 141.25, to determine concentrations of the parameters listed above. For parameters for which no validated standard analytical method exists, DOE will propose an analytical method for EPA and State approval. DOE will report the results of the sampling and analyses to EPA and the State.

The Workplan will require DOE to identify potential treatment technologies to be utilized in the event that water quality for the terminal ponds exceeds the State standards. If no existing technologies adequate to achieve the standards are identified, DOE will use reasonable efforts to develop and implement such technologies. If achieving water quality that does not exceed the standards requires additional treatment or development of additional technologies, the parties agree to negotiate appropriate modifications to the Workplan, including schedules.

For purposes of this Agreement, future changes to these standards shall be addressed through the provisions in paragraph 9 of this Agreement. Any disputes between DOE and CDH over the interpretation or implementation of this section shall be resolved pursuant to the provisions of Part 12. The parties acknowledge that there is currently a disagreement among them regarding the legal enforceability of the radionuclide standards. Nothing in this agreement shall be interpreted as restricting any party's ability to pursue its available legal options regarding this enforcement issue.

XIII. Corrective and Remedial Action Proposed Plan (PP) and Corrective Action Decision/Record of Decision (CAD/ROD). DOE shall submit a draft Proposed Plan (PP) for EPA and State review and comment simultaneously with the Final CMS/FS Report submitted for review and approval by EPA and/or the State. After receiving and addressing the comments from EPA and the State on the draft Proposed Plan, DOE shall respond formally to the EPA and State comments prior to issuance of the final Proposed Plan. EPA and State comments and DOE responses to those comments must be summarized in the final Proposed Plan. The EPA and State comments and DOE responses to comments must be placed in the Administrative Record and incorporated in the final Proposed Plan prior to the public comment period. DOE shall subsequently submit the final Proposed Plan for EPA, State and public comment. The public comment on the final Proposed Plan may include review and comment on any

supporting documents included in the Administrative Record. The final Proposed Plan shall be submitted in accordance with the schedules within Table 6 of this Attachment, or within 60 days of receipt of comments from EPA and the State on the draft Proposed Plan, for OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16. In conjunction with submitting the final Proposed Plan, DOE shall comply with all public participation requirements, including CERCLA 117. Concurrently, the State shall prepare a proposed RCRA permit modification and open a public comment period in accordance with 6 CCR 1007-3, Part 100. After close of the public comment period on the final Proposed Plan, DOE shall submit a draft Responsiveness Summary for each OU, in accordance with the schedules within Table 6 of this Attachment or within 60 days of the end of the public comment period, for OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16, for EPA and State review and comment.

DOE shall submit the Final Responsiveness Summary simultaneously with the required submittal of a draft Corrective Action Decision/Record of Decision (CAD/ROD) for EPA and State approval in accordance with the schedules within Table 6 of this Attachment or within 60 days of receipt of EPA and/or State comments on the draft Responsiveness Summary for OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16. Upon approval of the draft CAD/ROD by EPA and the State in accordance with the terms of the Agreement, and following a final decision by the State on the RCRA permit modification, DOE shall publish notice of the remedy selected in the CAD/ROD, including any significant changes made to the PP based on any comments received.

DOE shall implement the CAD/ROD in accordance with section XIV of this Attachment immediately upon approval of the CAD/ROD by EPA and the State in accordance with paragraph 156 of this Agreement, and following final modification of the State RCRA permit in accordance with the schedules within Table 6 of this Attachment and as required by EPA and the State after publication of the CAD/ROD for OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16.

XIV. Implementation of the Corrective Action Decision/Record of Decision. In accordance with the decision of EPA and the State as embodied in the CAD/ROD, DOE shall implement the required action in accordance with the schedules within Table 6 of this Attachment or as specified within the CD/RD Workplan for OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16. All plans, designs and schedules shall be subject to approval by EPA and the State in accordance with the terms of the Agreement, prior to implementation.

XIV.1. DOE shall implement the CAD/ROD required by this Attachment upon EPA and State approval of the CAD/ROD and upon modification of the State RCRA permit.

XIV.2. In accordance with the schedules within this Agreement or concurrently with the submittal of the Final CAD/ROD for OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16, DOE shall

submit the Corrective/Remedial Design Workplans (CD/RD Workplans) required to implement the CAD/ROD to EPA and the State for review and approval in accordance with the terms of this Agreement. The CD/RD Workplans shall include schedules delineating the development of the Corrective/Remedial Design (CD/RD) and shall include schedules for the submittal of the CD/RD. The CD/RD Workplans shall provide a detailed discussion of the specific CD/RD tasks necessary to implement the approved remedy, including a description of the technical approach, and plans and specifications to be produced.

Should DOE determine that additional studies are necessary to supplement the technical data available from the RFI/RI, CMS/FS activities so that optimum treatment or disposal methods may be determined, DOE shall notify EPA and the State, in writing, of the need for such additional studies. If EPA and the State concur, DOE shall schedule and detail the work necessary to accomplish the additional studies in the CD/RD Workplan. DOE shall include a SAP consisting of a QAPP and FSP for any such additional studies with the CD/RD Workplan submittal.

DOE shall provide the results of any additional studies to EPA and the State and describe their effect upon the work in a technical memorandum submitted to EPA and the State for review and approval. The submittal date for this technical memorandum shall be scheduled within the approved CD/RD Workplan. After making any required corrections or modifications based on EPA or State comment, DOE shall incorporate the information contained in these technical memoranda into the CD/RD.

XIV.3. The CD/RD shall be submitted for EPA and State review and approval in accordance with the approved schedule within the CD/RD Workplan. The CD/RD shall provide design information necessary to implement the approved CAD/ROD. The CD/RD shall include a detailed schedule defining all activities critical to the start and completion of construction of the Corrective/Remedial Action. The CD/RD shall include provisions for the long term operation and maintenance of the remedy as required by CERCLA.

XIV.3. Within 60 days of completion of Corrective/Remedial Action for a site or OU, DOE shall submit to EPA and the State by registered mail, a certification of completion of Corrective/Remedial Action for the site or OU.

XV. Units requiring permits pursuant to the CHWA. All units at the facility which treat, store, or dispose of hazardous and/or mixed waste generated by facility operations are subject to the substantive and procedural requirements of the CHWA including permitting requirements.

XV.1. The following units require permits under the CHWA:

XV.1.A. EXISTING UNITS

Unit 1	Unit 23	Unit 49(*)
Unit 10	Unit 24	Unit 55
Unit 11	Unit 27	Unit 56
Unit 12	Unit 30	Unit 57
Unit 13	Unit 39	Unit 59
Unit 15 Partial	Unit 40	Unit 61
Unit 17	Unit 41	Unit 62
Unit 19	Unit 42	Unit 63
Unit 20	Unit 43	Unit 69
Unit 44	Unit 73	

Permit applications have been submitted for these units. They have not in all cases been reviewed by the Colorado Department of Health. Any additional information, requirements and schedules for submittal will be specified in subsequent correspondence to the Department of Energy.

XV.1.B. NEW UNITS

Unit 74
Unit 75
Unit 76
Unit 77

Requests for changes to Interim Status have been submitted for units 74 and 75. Permit applications will be submitted for these new units as required by the State. Any additional information, requirements and schedules for submittal will be specified in correspondence to DOE after review of the permit applications.

XV.2. Any new units identified as a result of characterization studies being conducted pursuant to the Agreement in Principle of 6/28/89, Federal Facility Compliance Agreement and Compliance Order on Consent No. (3008)VIII-89-25, Settlement Agreement and Compliance Order on Consent No. 89-10-30-01, or any other future determinations are also subject to the CHWA. Permit applications or modification requests must be submitted pursuant to the requirements of 6 CCR 1007-3, Part 100.

(*) Part A application only

Table 1:
INDIVIDUAL HAZARDOUS SUBSTANCE SITES

<u>REF. NO.</u>	<u>SITE NAME</u>
101	207 SOLAR EVAPORATION PONDS
102	OIL SLUDGE PIT
103	CHEMICAL BURIAL
104	LIQUID DUMPING
105	OUT-OF-SERVICE FUEL TANKS
	105.1 - WESTERNMOST TANK
	105.2 - EASTERNMOST TANK
106	OUTFALL
107	HILLSIDE OIL LEAK
108	TRENCH T-1
109	TRENCH T-2
110	TRENCH T-3
111	TRENCHES T-4 TO T-11
	111.1 : TRENCH T-4
	111.2 : TRENCH T-5
	111.3 : TRENCH T-6
	111.4 : TRENCH T-7
	111.5 : TRENCH T-8
	111.6 : TRENCH T-9
	111.7 : TRENCH T-10
	111.8 : TRENCH T-11
112	903 DRUM STORAGE AREA
113	MOUND AREA
114	PRESENT LANDFILL
115	ORIGINAL LANDFILL
116	MULTIPLE SOLVENT SPILLS
	116.1 : WEST LOADING DOCK AREA
	116.2 : SOUTH LOADING DOCK AREA

Note: This information is based on the administrative record including the information submitted in the hazardous and low-level mixed waste Part B application dated November 1, 1985, as modified by the subsequent revision dated November 28, 1986, as modified by the subsequent revision dated December 15, 1987, and the transuranic mixed waste Part B application submitted July 1, 1988, [hereafter referred to as the applications]. This information is also based on independent review of historical aerial photographs of the facility and independent review of facility submittals.

Table 1:
INDIVIDUAL HAZARDOUS SUBSTANCE SITES

<u>REF. NO.</u>	<u>SITE NAME</u>
117	CHEMICAL STORAGE 117.1 : NORTH SITE 117.2 : MIDDLE SITE 117.3 : SOUTH SITE
118	MULTIPLE SOLVENT SPILLS 118.1 : WEST OF BUILDING 730 118.2 : SOUTH END OF BUILDING 776
119	MULTIPLE SOLVENT SPILLS 119.1 : WEST AREA 119.2 : EAST AREA
120	FIBERGLASSING AREAS 120.1 : NORTH OF BUILDING 664 120.2 : WEST OF BUILDING 664
121	ORIGINAL PROCESS WASTE LINES
122	UNDERGROUND CONCRETE TANK
123	VALVE VAULT 7 123.1 : VALVE VAULT 7 123.2 : VALVE VAULT WEST OF BUILDING 707
124	RADIOACTIVE LIQUID WASTE STORAGE TANK 124.1 : 30,000 GALLON TANK (T-68, Unit 55.14) 124.2 : 14,000 GALLON TANK (T-66, Unit 55.15) 124.3 : 14,000 GALLON TANK (T-67, Unit 55.16)
125	HOLDING TANK
126	OUT-OF-SERVICE PROCESS WASTE TANKS 126.1 : WESTERNMOST TANK 126.2 : EASTERNMOST TANK
127	LOW-LEVEL RADIOACTIVE WASTE LEAK
128	OIL BURN PIT NO. 1
129	OIL LEAK
130	RADIOACTIVE SITE - 800 AREA SITE #1
131	RADIOACTIVE SITE - 700 AREA SITE #1
132	RADIOACTIVE SITE - 700 AREA SITE #4
133	ASH PITS 133.1 : ASH PIT 1-1 133.2 : ASH PIT 1-2 133.3 : ASH PIT 1-3 133.4 : ASH PIT 1-4 133.5 : INCINERATOR 133.6 : CONCRETE WASH PAD
134	LITHIUM METAL DESTRUCTION SITE
135	COOLING TOWER BLOWDOWN

Table 1:
INDIVIDUAL HAZARDOUS SUBSTANCE SITES

<u>REF. NO.</u>	<u>SITE NAME</u>
136	COOLING TOWER PONDS 136.1 : NORTHEAST CORNER OF BUILDING 460 136.2 : WEST OF BUILDING 460 136.3 : S. OF BLDG. 460, W. OF BLDG. 444
137	COOLING TOWER BLOWDOWN - BLDG. 774
138	COOLING TOWER BLOWDOWN - BLDG. 779
139	CAUSTIC/ACID SPILLS 139.1 : HYDROXIDE TANK AREA 139.2 : HYDROFLUORIC ACID TANKS
140	REACTIVE METAL DESTRUCTION SITE
141	SLUDGE DISPERSAL
142	RETENTION PONDS (A,B,C-SERIES) 142.1 : A-1 POND 142.2 : A-2 POND 142.3 : A-3 POND 142.4 : A-4 POND 142.5 : B-1 POND 142.6 : B-2 POND 142.7 : B-3 POND 142.8 : B-4 POND 142.9 : B-5 POND 142.10: C-1 POND 142.11: C-2 POND 142.12 NEWLY IDENTIFIED A-5 POND
143	OLD OUTFALL
144	SEWER LINE BREAK
145	SANITARY WASTE LINE LEAK
146	CONCRETE PROCESS WASTE TANKS 146.1 : 7,500 GALLON TANK (#31) 146.2 : 7,500 GALLON TANK (#32) 146.3 : 7,500 GALLON TANK (#34W) 146.4 : 7,500 GALLON TANK (#34E) 146.5 : 3,750 GALLON TANK (#30) 146.6 : 3,750 GALLON TANK (#33)
147	PROCESS WASTE LEAKS 147.1 : MAAS AREA 147.2 : OWEN AREA
148	WASTE SPILLS
149	EFFLUENT PIPE
150	RADIOACTIVE LIQUID LEAKS (8) 150.1 : NORTH OF BUILDING 771 150.2 : WEST OF BUILDING 771 150.3 : BETWEEN BUILDINGS 771 and 774 150.4 : EAST OF BUILDING 750 150.5 : WEST OF BUILDING 707 150.6 : SOUTH OF BUILDING 779 150.7 : SOUTH OF BUILDING 776

Table 1:
INDIVIDUAL HAZARDOUS SUBSTANCE SITES

<u>REF. NO.</u>	<u>SITE NAME</u>
151	150.8 : NORTHEAST OF BUILDING 779 FUEL OIL LEAK
152	FUEL OIL TANK
153	OIL BURN PIT NO. 2
154	PALLET BURN SITE
155	903 LIP AREA
156	RADIOACTIVE SOIL BURIAL 156.1 : BUILDING 334 PARKING LOT 156.2 : SOIL DUMP AREA
157	RADIOACTIVE SITE 157.1 : NORTH AREA 157.2 : SOUTH AREA
158	RADIOACTIVE SITE - BLDG. 551
159	RADIOACTIVE SITE - BLDG. 559
160	RADIOACTIVE SITE - BLDG. 444 PK LOT
161	RADIOACTIVE SITE - BLDG. 664
162	RADIOACTIVE SITE - 700 AREA SITE #2
163	RADIOACTIVE SITE - 700 AREA SITE #3 163.1 : WASH AREA 163.2 : BURIED SLAB
164	RADIOACTIVE SITE - 800 AREA SITE #2 164.1 : CONCRETE SLAB 164.2 : BUILDING 886 SPILLS 164.3 : BUILDING 889 STORAGE PAD
165	TRIANGLE AREA
166	TRENCHES 166.1 : TRENCH A 166.2 : TRENCH B 166.3 : TRENCH C
167	SPRAY FIELDS - THREE SITES 167.1 : NORTH AREA 167.2 : POND AREA 167.3 : SOUTH AREA
168	WEST SPRAY FIELD
169	WASTE DRUM PEROXIDE BURIAL
170	P.U.& D. STORAGE YARD - WASTE SPILLS
171	SOLVENT BURNING GROUND
172	CENTRAL AVENUE WASTE SPILL
173	RADIOACTIVE SITE - 900 AREA
174	P.U.&D. CONTAINER STORAGE FACILITIES (2)
175	S&W BLDG. 980 CONTAINER STORAGE FACILITY
176	S&W CONTRACTOR STORAGE YARD
177	BUILDING 885 DRUM STORAGE AREA
178	BUILDING 881 DRUM STORAGE AREA
179	BUILDING 865 DRUM STORAGE AREA
180	BUILDING 883 DRUM STORAGE AREA

Table 1:
INDIVIDUAL HAZARDOUS SUBSTANCE SITES

<u>REF NO.</u>	<u>SITE NAME</u>
181	BUILDING 334 CARGO CONTAINER AREA
182	BUILDING 444/453 DRUM STORAGE AREA
183	GAS DETOXIFICATION AREA
184	BUILDING 991 STEAM CLEANING AREA
185	SOLVENT SPILL
186	VALVE VAULT 12
187	ACID LEAKS (2)
188	ACID LEAK
189	MULTIPLE ACID SPILLS
190	CAUSTIC LEAK
191	HYDROGEN PEROXIDE SPILL
192	ANTIFREEZE DISCHARGE
193	STEAM CONDENSATE LEAK
194	STEAM CONDENSATE LEAK
195	NICKEL CARBONYL DISPOSAL
196	WATER TREATMENT PLANT BACKWASH POND
197	SCRAP METAL SITES
198	(Deleted)
199	CONTAMINATION OF THE LAND SURFACE
200	GREAT WESTERN RESERVOIR
201	STANDLEY RESERVOIR
202	MOWER RESERVOIR
203	INACTIVE HAZARDOUS WASTE STORAGE AREA
204	ORIGINAL URANIUM CHIP ROASTER
205	BLDG. 460 SUMP #3 ACID SIDE
206	INACTIVE D-836 HAZARDOUS WASTE TANK
207	INACTIVE 444 ACID DUMPSTER
208	INACTIVE 444/447 WASTE STORAGE AREA
209	SURFACE DISTURBANCE SOUTHEAST OF BLDG. 881
210	UNIT 16, BUILDING 980 CARGO CONTAINER
211	UNIT 26, BUILDING 881 DRUM STORAGE
212	UNIT 63, BUILDING 371 DRUM STORAGE
213	UNIT 15, 904 PAD PONDCRETE STORAGE
214	UNIT 25, 750 PAD PONDCRETE AND SALTCRETE STORAGE
215	UNIT 55.13 - TANK T-40
216	EAST SPRAY FIELDS
	216.1 : NORTH AREA
	216.2 : CENTER AREA
	216.3 : SOUTH AREA
217	UNIT 32, BUILDING 881, CN ⁻ BENCH SCALE TREATMENT

Table 2: Organization of Individual Sites Into Operable Units (OU)

<u>Operable Unit</u>	<u>Individual Sites</u>
1	102, 103, 104, 105.1, 105.2, 106, 107, 119.1, 119.2, 130, 145
2	108, 109, 110, 111.1, 111.2, 111.3, 111.4, 111.5, 111.6, 111.7, 111.8, 112, 113, 140, 153, 154, 155, 183, 216.2, 216.3
3	199, 200, 201, 202
4	101
5	115, 133.1, 133.2, 133.3, 133.4, 133.5, 133.6, 142.10, 142.11, 209
6	141, 142.1, 142.2, 142.3, 142.4, 142.5, 142.6, 142.7, 142.8, 142.9, 142.12, 143, 165, 166.1, 166.2, 166.3, 167.1, 167.2, 167.3, 216.1
7	114, 203
8	118.1, 118.2, 123.1, 123.2, 125, 126.1, 126.2, 127, 132, 135, 137, 138, 139.1, 139.2, 144, 146.1, 146.2, 146.3, 146.4, 146.5, 146.6, 149, 150.1, 150.2, 150.3, 150.4, 150.5, 150.6, 150.7, 150.8, 151, 159, 163.1, 163.2, 172, 173, 184, 188
9	121
10	124, 124.1, 124.2, 124.3, 129, 170, 174, 175, 176, 177, 181, 182, 205, 206, 207, 208, 210, 213, 214
11	168
12	116.1, 116.2, 120.1, 120.2, 136.1, 136.2, 136.3, 147.1, 147.2, 157.2, 187, 189
13	117.1, 117.2, 117.3, 122, 128, 134, 148, 152, 157.1, 158, 169, 171, 186, 190, 191
14	131, 156.1, 156.2, 160, 161, 162, 164.1, 164.2, 164.3
15	178, 179, 180, 204, 211, 212, 215, 217
16	185, 192, 193, 194, 195, 196, 197

Table 3: Lead Regulatory Agency Designation for Each Operable Unit and Specific Site-Wide Submittals

<u>Operable Unit</u>	<u>Lead Regulatory Designation</u>
1	Joint EPA and CDH (goes through CDH Dispute Resolution process)
2	Joint EPA and CDH (goes through EPA Dispute Resolution process)
3	EPA
4	CDH
5	EPA
6	EPA
7	CDH
8	Joint EPA and CDH (goes through CDH Dispute Resolution process)
9	CDH
10	CDH
11	CDH
12	CDH
13	CDH
14	EPA
15	CDH
16	CDH

Table 3 (cont'd): Lead Regulatory Agency
Designation for Each Operable Unit and
Specific Site-wide Submittals

<u>Submittal</u>	<u>Lead Regulatory Designation</u>
QAPP	EPA
SAP	EPA
Plan for the Prevention of Contaminant Dispersion	CDH
Community Relation Plan	EPA
Workplan to Implement Discharge Limits for Radionuclides	Joint EPA and CDH (goes through CDH Dispute Resolution process)
Treatability Study Plan	EPA
Treatability Study Report	EPA
Background Study Plan	EPA

Table 4: Listing of Primary
and Secondary Documents

Primary

RFI/RI Workplans (draft and final)
RFI/RI Reports (draft, all phases, and final)
CMS/FS Reports (draft, all phases and final)
Proposed Plan (draft and final)
IM/IRA Decision Documents (draft, proposed, and final)
Responsiveness Summaries
Corrective Action Decisions/ Records of Decisions (draft and final)
Corrective/Remedial Design Plans
Corrective Design/Remedial Design Workplans
Community Relations Plans
Sampling and Analysis Plan
Plan for Prevention of Contaminant Dispersion
Background Study Plan
Treatability Study Plan
Workplan to Implement Discharge Limits for Radionuclides
IM/IRA Implementation Document
Certification of Completion

Secondary

Historical Release Report
Monthly Progress Reports
Health & Safety Plan
Baseline Risk Assessment Technical Memoranda
CMS/FS Technical Memoranda
RFI/RI Workplan Technical Memoranda
Priority Proposal for OUs 3, 5, 6, 8, 12, 13, 14, 15, and 16

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

Operable Unit 1-881 Hillside

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
102	Oil Sludge Pit	1. Continue with 881 Hillside RFI/RI CMS/FS process in progress.	1. Submit an RFI/RI Workplan in accordance with section VI. of the Statement of Work. Submit a revised 881 RI/FS (RFI/CMS) in accordance with the schedules within Table 6 of the SOW. The revised RI/FS (RFI/CMS) shall incorporate and address all issues and comments by CDH and EPA in the comment letter sent by EPA and CDH to the facility dated 8/31/88, the comment letter sent by EPA to the facility dated 8/13/87 and the CDH comment letter sent to the facility dated 10/14/87.
103	Chemical Burial		
104	Liquid Dumping		
105.1	Western Most Out-of-Service Fuel Tank		
105.2	Eastern Most Out-of-Service Fuel Tank		
106	Outfall		
107	Hillside Oil Leak		
119.1	Multiple Solvent Spills:		
119.2	West and East Areas		
130	Radioactive Site #1 - 800 Area		
145	Sanitary Waste Line Leak		

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

Operable Unit 2-903 Pad, Mound & East Trenches

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
108	Trench T-1	1. Continue with 903 Pad, Mound and East Trenches Areas RI/FS process in progress.	1. Submit an RFI/RI Workplan in accordance with section VI. of the Statement of Work. The RFI/RI Workplan shall incorporate a revised 903 Pad, Mound and East Trenches Phase II Sampling Plan. The revised 903 Pad, Mound and East Trenches RI (RFI) must be submitted in accordance with the schedules in Table 6 of this SOW. The revised Phase II Sampling Plan shall incorporate and address comments made by EPA and CDH concerning the Plan, dated 11/30/88. The revised 903 Pad, Mound and East Trenches RI (RFI) to be submitted shall incorporate and address comments made by EPA and CDH dated 3/1/88 and 3/22/88 respectively.
109	Trench T-2		
110	Trench T-3		
111.1	Trench T-4		
111.2	Trench T-5		
111.3	Trench T-6		
111.4	Trench T-7		
111.5	Trench T-8		
111.6	Trench T-9		
111.7	Trench T-10		
111.8	Trench T-11		
112	903 Drum Storage Area		
113	Mound Area		
140	Reactive Metal Destruction		
153	Oil Burn Pit No. 2		
154	Pallet Burn Site		
155	903 Lip Area		
183	Gas Detoxification Area		
216.2	East Spray Field, Cntr Area	1. Submit all historical information regarding the use of the east spray fields and all information gathered to date resulting from any field investigations of the sites.	
216.3	East Spray Field, South Area		

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

Operable Unit 3-Off-site Areas

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
198	VOC's in the Groundwater	1. Deleted. This site was misidentified as an individual site.	
199	Contamination of the Land's Surface	1. Submit a report detailing the history of the remedy ordered by the U.S. District Court pursuant to the land owner's suit settled July 10, 1985, the implementation of the remedy, and the effectiveness of the remedy. Within this report include a health assessment identifying the public health risk associated with potential exposure to the public prior to completing any site remediation, during implementation of the remedy, and after completion of the Settlement Agreement imposed remedy. This report must detail the effectiveness of the remedy and the risks associated with a no action alternative as well as detailing the risks associated with plausible exposure during implementation of the remedy and after completion of the remedy.	1. Submit the required report in accordance with the schedules in Table 6 of the SCW.
200	Great Western Reservoir	1. Submit all known and accumulated data describing, detailing or defining contamination within the reservoir and tributarys of the reservoir including surface and groundwater sources. 2. Submit a health risk assessment documenting the risks derived from all potential exposures associated with a no action alternative for remediation of the contamination.	1. Submit the required reports in accordance with the schedules in Table 6 of the SOW.

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
201	Standley Reservoir	<ol style="list-style-type: none"> 1. Submit all known and accumulated data describing, detailing or defining contamination within the reservoir and tributarys of the reservoir including surface and groundwater sources. 2. Submit a health risk assessment documenting the risks derived from all potential exposures associated with a no action alternative for remediation of the contamination. 	<ol style="list-style-type: none"> 1. Submit the required reports in accordance with the schedules in Table 6 of the SOW.
202	Mower Reservoir	<ol style="list-style-type: none"> 1. Submit all known and accumulated data describing, detailing or defining contamination within the reservoir and tributarys of the reservoir including surface and groundwater sources. 2. Submit a health risk assessment documenting the risks derived from all potential exposures associated with a no action alternative for remediation of the contamination. 	<ol style="list-style-type: none"> 1. Submit the required reports in accordance with the schedules in Table 6 of the SOW.

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

Operable Unit 4-Solar Ponds

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
101	207 Solar Evaporation Ponds	<ol style="list-style-type: none"> 1. Close the regulated units in accordance with this Agreement and the regulations. 2. Submit Phase I and Phase II RFI/RI reports documenting investigations for each site in accordance with the schedules within Table 6 of this Attachment. The Phase I and Phase II reports shall at a minimum contain information to characterize the nature, rate and extent of contamination; define pathways and methods of migration; identify areas threatened by releases from the facility; and determine short and long-term threats to human health and the environment. 3. Submit all Phase I and Phase II Closure/Interim Measure/Interim Remedial Action reports as required by section I.B.11. of the SOW, and in accordance with the schedule requirements within Table 6 of the SOW. 	<ol style="list-style-type: none"> 1. As required by section I.B.11 of the SOW. 2. Submit RFI/RI Workplans in accordance with section I.B.11. and Table 6 of the SOW. Submit the required reports and close the units in accordance with the schedules in Table 6 of the SOW.

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
115	Original Landfill	<p>1. Perform a Radiological Survey over the area of the landfill utilizing a side-shielded field instrument for detection of low energy radiation (FIDLER) and a shielded Geiger-Mueller (G-M) pancake detector. Readings will initially be taken on an offset 100 foot grid. If hotspots are detected the grid will be tightened to pinpoint the radiological source. The results will be plotted on a map and contoured. This investigation shall also be conducted at the solid waste disposal areas located to the east of the identified location of the old landfill as depicted in the 10/15/64, and 8/7/69 aerial photographs.</p> <p>2. Complete a real time soil gas analysis over the entire area of the landfill on offset 100 foot centers. The soil gas analysis will also be conducted over the area east of the identified location of the landfill as stated in (1) above. The soil gas analysis will utilize a portable GC. The detection limits for the following compounds shall be proposed in the Workplan. The soil gas survey shall analyze for the volatiles 1,1,1 TCA, dichloromethane, benzene, carbon tetrachloride, PCE and TCE. The analysis will note analytical peaks for compounds not calibrated for on the GC. Soil cores will be taken at the location of the soil gas analysis on a random basis after every 50 soil gas surveys to verify the presence or non-presence of volatiles at the specific location. If positive soil gas results are indicated, boreholes will also be placed to transect the plume(s). The soil borings will be drilled at least three feet into weathered bedrock. The boreholes transecting plumes at the site will be completed as groundwater monitoring</p>	<p>1. Submit an RFI/RI Workplan in accordance with section VI. of the Statement of Work. Submit the Phase I RFI/RI Report in accordance with the schedules in Table 6 of the SOW. The Phase I RFI/RI Report will include all data collected as a result of and required by this preliminary workplan for this group of sites.</p>

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
115 cont'd		<p>wells. Composite samples will be collected from every 2 foot interval and analyzed for HSL volatiles and semi-volatiles using calibrated GC/MS. Composite samples will also be taken from each six foot interval and analyzed for HSL metals, uranium 233/234, uranium 235, uranium 238, plutonium 239/240, americium 241, cesium 137, strontium 89/90, and beryllium.</p> <p>3. Install three downgradient ground water monitoring points between the landfill and the interceptor ditch. These points must monitor alluvial groundwater quality. The geology shall be characterized prior to determining the type of groundwater monitoring point to construct at each location. The first point will be placed between the western leg of the landfill and the interceptor ditch. This first point will collect water from the saturated interval of the alluvial groundwater system. The second point will be placed in the surface drainage north of well 57-86 between the landfill and the interceptor ditch within the area of the old embankment and will intercept groundwater from the saturated thickness of the alluvial groundwater system. The third point will be placed between the southeastern corner of the unit boundary and the interceptor ditch, downgradient of the outfall identified on the southeast side of the landfill. This point will be screened to intercept groundwater from the saturated thickness of the alluvial groundwater system. The groundwater will be sampled quarterly and analyzed for HSL volatiles, HSL metals, HSL semivolatiles, soluble cesium 137 and strontium 89/90, insoluble beryllium, soluble and insoluble uranium, soluble and insoluble plutonium, and dissolved lead and chromium.</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
115 cont'd		<ol style="list-style-type: none"> 4. Confirm the piping interconnections and sources of water alluded to in section 3.1.1. of Volume I, Remedial Investigation and Feasibility Study Plans for Low Priority Sites. If water is found to be flowing through the two corrugated pipes protruding from the landfill, sample the effluent and analyse the effluent for the same constituents as outlined in (3) above. The effluent shall be sampled quarterly. 5. Sample the sediments and surface water of the interceptor ditch and Woman Creek immediately downgradient of the original landfill. Analyze the sediments for the same constituents as outlined in (3) above. 	
133.1 133.2 133.3 133.4 133.5 133.6	Ash Pits 1 - 4, Incinerator and Concrete Wash Pad	<ol style="list-style-type: none"> 1. Reevaluate and investigate the extent of the disposal areas for this site in light of the 1953, 1964, 1969, and 1978 through 1988 aerial photographs of the site. These include an area north of the west access road and waste areas beyond the boundaries sites 133.1 and 133.6. 2. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of all areas associated with site 133. The survey shall be conducted using 10 foot grids and will cover all areas affected by site 133. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation. 3. Conduct a soil sampling survey of site 133 utilizing soil borings drilled five feet into weathered bedrock. Boreholes on 25 foot centers will transect each site and will also be placed over hotspots detected during the radiometric survey of the sites. All samples will be 	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
133 cont'd		<p>composited to represent 2 foot intervals and will be analyzed for total uranium, gross alpha and gross beta. Prior to drilling the boreholes, 2" surface scrape samples will be taken at "hotspots" as indicated by the radiation survey and analyzed for the same constituents as listed above.</p> <p>4. Install three downgradient ground water monitoring points between site 133 and Woman Creek. These points must monitor alluvial groundwater quality. The geology shall be characterized prior to determining the type of groundwater monitoring point to construct at each location. The groundwater monitoring locations will be proposed to EPA and CDH after the geological characterization has been completed. The groundwater points will monitor the saturated interval of the alluvial groundwater system. The groundwater will be sampled quarterly and analyzed for HSL volatiles, HSL metals, HSL semivolatiles, soluble cesium 137 and strontium 89/90, soluble and insoluble beryllium, soluble and insoluble uranium, and soluble and insoluble plutonium.</p>	
141	Sludge Dispersal	<p>1. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of the areas affected by site 141. The survey shall be conducted using 25 foot grids and will cover all areas affected by site 141. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation.</p> <p>2. Conduct a soil sampling survey of site 141 utilizing surface soil scrapings to a depth of 2 inches. The scrapings will be collected using 25 foot grids and will</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
141 cont'd		<p>also be taken from "hotspots" located during the radiometric survey. The samples will be analyzed for total plutonium, total americium, beryllium, total chromium, HSL metals, total nitrate, uranium 233/234, uranium 235, uranium 238, gross alpha and gross beta.</p>	
		<p>3. Complete a monitoring well downgradient of site 141. The location shall be proposed to EPA and CDH for review and approval. The well shall monitor alluvial groundwater. Quarterly samples shall be taken and analyzed for HSL volatiles, HSL semi-volatiles, gross alpha and gross beta. Results of these first analyses shall be submitted in the PSC.</p>	
142	<p>Retention Ponds; A-1, A-2, A-3, A-4, A-5, B-1, B-2, B-3, B-4, B-5; C-1, C-2</p>	<p>1. Submit the Rockwell International, 1986 report, "Trends in the Rocky Flats Surface Water Monitoring". Submit all data pertaining to these ponds and their respective water and sediment quality.</p> <p>2. Collect five surface water and five sediment samples from five locations in all A, B and C series retention ponds. At least one of the five water samples for each pond shall be taken from the deepest part of each pond. Stratification of the water column shall be identified through temperature or dissolved oxygen measurements. Water samples shall be taken from each vertically stratified zone of the pond, if applicable. One of the five water samples to be taken from each pond shall be taken within 5 feet of the inlet of the pond. One of the five water samples to be taken from each pond shall be taken within five feet of the pond spillway. One of the five sediment samples shall be taken from the bank of each pond presently below waterline. One of the five sediment samples shall be taken from the</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
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142 cont'd

bank of each pond above high waterline. One of the sediment samples will be taken within five feet of the pond inlet. Two of the sediment samples will be taken from the deepest parts of each pond. All sediment samples shall represent the entire vertical column of sediment present at each specific location within each pond. One sediment sample and one water sample shall be taken within the confines of the pond located between the confluence of North and South Walnut Creek and Indiana Street. All of the sediment samples shall be analyzed for total plutonium 239/240, total americium 241, total uranium 233/234, total uranium 235, total uranium 238, tritium, beryllium, total chromium, total strontium 89/90, total cesium 137, gross alpha, gross beta, HSL metals, HSL volatiles, HSL semi-volatiles, and total nitrate. The aqueous samples shall be analyzed for the same constituents, but will analyze for soluble and insoluble phases for HSL metals and radionuclides.

3. Collect sediment samples from seven locations upstream of pond A-1. Collect sediment samples from four locations upstream of pond B-1. The locations for the sediment samples upstream of ponds A-1 and B-1 should be approximately equally spaced and located within the stream channel conducive to the collection of sediment. The upstream sediment samples should be located between the PSZ and pond A-1 and B-1. Collect sediment samples from 10 locations upstream of pond C-1. The locations for the C-1 upstream sediment samples should be approximately equally spaced and located within the stream channel and conducive to the

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
142 cont'd		<p>collection of sediment. The sediment samples upstream of pond C-1 shall be located between pond C-1 and site 133.6. Four sediment samples should be taken approximately equally spaced and located between pond C-2 and pond C-1 within the stream channel and conducive to sediment collection. Ten sediment samples shall be taken within the south interceptor ditch, approximately equally spaced between pond C-2 and the southwest corner of the original landfill. One sediment sample shall be collected between each A and B series pond within the channel and conducive to the collection of sediment. All sediment samples shall be analyzed for the same constituents as stated in number (2) above. All samples shall represent the entire vertical column of sediment present at each sampling location. If the sediment depth is greater than two feet, individual two foot composites shall be collected.</p>	
		<p>4. Collect sediment samples from four locations immediately downstream of ponds A-4 and B-5, prior to the confluence of North and South Walnut Creek. An additional four samples shall be collected approximately equally spaced and located between the plant and Indiana Street within Walnut Creek at locations conducive to the collection of sediment. Collect sediment samples from 4 locations downstream of pond C-2. The locations for the C-2 downstream samples shall be approximately equally spaced and located between the pond and Indiana Street within the channel and conducive to the collection of sediment. These samples shall be analyzed for the same constituents as stated in number (2) above. All sediment samples shall represent the vertical column of sediments present at the location being</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
142 cont'd		<p>sampled. If the sediment depth is greater than two feet, individual two foot composites shall be collected.</p> <p>5. Construct two groundwater wells immediately downgradient of each dam at ponds A-4, B-5, C-2, and C-1. These wells will be constructed within the the original stream channel and will monitor the alluvial groundwater downgradient of each dam/pond. Samples of the groundwater will be collected upon completion of the well and quarterly thereafter. The groundwater samples will be analyzed for constituents as for the aqueous samples in (2) above. Results of the analyses will be presented in the PSC to be submitted in accordance with the schedules as outlined in this Statement of Work.</p>	
143	Old Outfall	<p>1. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of the areas affected by site 143. The survey shall be conducted using 10 foot grids and will cover all areas affected by site 143. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation.</p> <p>2. Conduct a soil sampling survey of site 143 utilizing surface soil scrapings to a depth of 2 inches and 2 foot cores composited to represent 2 feet of soil. The surface and core samples will be collected using a 20 foot grid and will also be taken from "hotspots" located during the radiometric survey. The grid will extend along the drainage of the old outfall to the PSZ. The samples will be analyzed for total plutonium, total americium, beryllium, total chromium, tritium, total nitrate,</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
143 cont'd		uranium 233/234, uranium 235, uranium 238, gross alpha, gross beta, and HSL metals.	
165	Triangle Area	<ol style="list-style-type: none"> 1. Reevaluate the extent of the disposal area in light of the 1953, 1964, 1969, and 1971 aerial photographs which indicate that the site extends farther to the north, east and west than is presently acknowledged. 2. Submit the report(s) documenting the radiometric survey conducted from 1975 - 1983 and any cleanup activities for this site. 3. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of the areas affected by site 165. The survey shall be conducted using 25 foot grid intervals and will cover all areas affected by this site. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation. 4. Complete a real time soil gas analysis over the entire area of site 165 using 50 foot grid intervals. The soil gas analysis will utilize a portable GC. Detection limits for the following compounds shall be proposed in the Workplan. The soil gas survey shall analyze for the volatiles carbon tetrachloride, TCE, methylene chloride, acetone, 2-butanone, PCE, 1,2 DCA, chloroform, and toluene. The analysis will note analytical peaks for compounds not calibrated for on the GC. Soil cores will be taken at the location of the soil gas analysis on a random basis every 25 soil gas surveys to verify the presence or non-presence of volatiles and semi-volatiles at the specific location and to determine the radioactive constituent concentration in the soils at this site. At least three borehole transects will be located to delineate VOC or 	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
165 cont'd		<p>radioactive plume gradient. Prior to drilling the boreholes, 2" surface scrapes will be taken and analyzed for total plutonium, uranium 233/234, uranium 235, uranium 238, gross alpha, gross beta and beryllium. The soil borings will be drilled three feet into weathered bedrock. Composite samples will be taken from every 2 foot interval and analyzed for HSL volatiles and HSL semivolatiles utilizing calibrated GC/MS. Six foot composite samples will be analyzed for total plutonium, uranium 233/234, uranium 235, uranium 238, gross alpha, gross beta, and beryllium.</p>	
		<p>5. Two groundwater monitoring wells shall be completed to monitor the alluvial groundwater within this site. One well shall be located east of the PSZ within the site and one shall be located within the PSZ, within the site. Groundwater shall be sampled immediately upon completion of the wells and quarterly thereafter. The groundwater shall be monitored for HSL volatiles, HSL semi-volatiles, HSL metals, gross alpha, and gross beta. Initial results of the groundwater sampling and analysis shall be submitted with the PSC for this group.</p>	
<p>166.1 Trench A 166.2 Trench B 166.3 Trench C</p>		<p>1. Conduct a geophysical survey to locate and determine the extent of the 166 trenches. Reevaluate the location of this site after reviewing the aerial photographs dated 10/15/64 and 8/7/69.</p> <p>2. Conduct a soil sampling survey of all areas affected by sites 166.1, 166.2 and 166.3. The investigation shall consist of transecting the trenches with soil boreholes placed every 25' longitudinally along each trench. Soil cores shall be drilled to a depth five feet below the bottom of each pit. Soil cores shall be</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
166 cont'd		<p>composited to represent 2 feet of soil and analyzed for HSL volatiles. Core samples shall also be composited to represent six feet of soil and analyzed for total plutonium, total americium, uranium 233/234, uranium 235, uranium 238, gross alpha, gross beta, and HSL metals.</p>	
167.1 167.2 167.3	<p>North Area Spray Field Pond Area Spray Field South Area Spray Field</p>	<ol style="list-style-type: none"> 1. Reevaluate the extent and location of the 167.2 spray field in light of the 1988 aerial photographs. 2. Conduct a soil sampling survey of all areas affected by sites 167.1, 167.2 and 167.3 utilizing surface scrapes representing the top 2" of soil and soil cores drilled to a depth of 4 feet. Composites shall be sampled to represent 2 feet of soil. The core samples will be collected at grid locations 50 feet apart. The samples will be analyzed for total plutonium, total americium, uranium 233/234, uranium 235, uranium 238, gross alpha and gross beta, tritium, and HSL metals. 3. Two alluvial groundwater monitoring wells shall be placed immediately downgradient of sites 167.1 and 167.3 within the surface drainages flowing to North Walnut Creek. These wells shall be screened as near the surface as possible through to weathered bedrock to intercept the saturated thickness of soil within the alluvium. The groundwater will be sampled quarterly and analyzed for HSL volatiles, soluble and insoluble uranium, soluble and insoluble plutonium, HSL metals and tritium. 	
209	<p>Surface disturbance Southeast of Bldg. 881</p>	<ol style="list-style-type: none"> 1. Determine and submit all historical use information pertaining to this site. Determine the nature of what appear to be trenches in the aerial photograph taken 10/15/64, 8/7/69, and 8/6/71. Determine 	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
209 (cont'd)		the nature of what appears to be a pond in the aerial photograph taken 10/5-83.	
216.1	East Spray Fields North Area	1. Submit all historical information regarding the use of the east spray fields and all information gathered to date resulting from any field investigation of the site.	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

Operable Unit 7-Present Landfill and Inactive Hazardous Waste Storage Area, Sites 114, 203

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
114	Present Landfill	1. Close the regulated units in accordance with this Agreement and the regulations.	1. As required by section I.B.11 of the SOW.
203	Inactive Waste Storage Area	<p>2. Submit Phase I and Phase II RFI/RI reports documenting investigations for each site in accordance with the schedules within Table 6 of this Attachment. The Phase I and Phase II reports shall at a minimum contain information to characterize the nature, rate and extent of contamination; define pathways and methods of migration; identify areas threatened by releases from the facility; and determine short and long-term threats to human health and the environment.</p> <p>3. Submit all Phase I and Phase II Closure/Interim Measure/Interim Remedial Action reports as required by section I.B.11. of the SOW, and in accordance with the schedule requirements within Table 6 of the SOW.</p>	<p>2. Submit RFI/RI Workplans in accordance with section I.B.11. and Table 6 of the SOW. Submit the required reports and close the units in accordance with the schedules in Table 6 of the SOW.</p>

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

Operable Unit 8-700 Area

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
118.1	Multiple Solvent Spills West	1. Submit the results of the Aerial Radiological Measuring System (ARMS) survey which documented the elevated gamma-radiation exposure rates for sites 118.1 and 118.2.	1. Submit an RFI/RI Workplan in accordance with section VI. of the Statement of Work. Submit the Phase I RFI/RI Report in accordance with the schedules in Table 6 of the SOW. This RFI/RI Report will include all data collected as a result of and required by this preliminary workplan for this group of sites.
118.2	of Building 730 and in the South End of Building 776	2. Complete a real time soil gas analysis over the entire area of site 118.1 and 118.2 using 25 and 30 foot grid intervals, respectively. The soil gas analysis shall utilize a portable GC. The detection limits for the following compounds shall be proposed in the Workplan. The soil gas survey shall analyze for the volatiles 1,1,1 TCA, benzene, carbon tetrachloride, methylethyl ketone, dichloromethane, PCE, and TCE. The analysis shall note analytical peaks for compounds not calibrated for on the GC. Soil cores shall be taken at the location of the soil gas analysis on a random basis every 25 soil gas survey locations to verify the presence or non-presence of volatiles at the specific location. Transects of each site shall also be constructed longitudinally through each site. Four boreholes shall be constructed transecting site 118.1 and two boreholes shall be constructed to transect site 118.2. Prior to drilling each borehole, 2" soil surface scrapes shall be collected and analyzed for total plutonium, tritium, total uranium, gross alpha and gross beta. The soil boreholes shall be drilled three feet into weathered bedrock. Composite samples shall be taken from each two foot interval and shall be analyzed for HSL volatiles utilizing calibrated GC/MS.	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
123.1 123.2	Valve Vault 7 and West of Bldg. 707	<ol style="list-style-type: none"> 1. Submit the report(s) documenting the radiometric survey conducted from 1975 - 1983. 2. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of sites 123.1 and 123.2. The survey method shall be proposed within the Workplan for this OU. If "hotspots" are detected the grid must be tightened to locate the source of the radiation. 3. Conduct a soil sampling survey of the areas affected by site's 123.1 & 123.2. Four soil bores will be placed around each vault associated with site 123, and shall be drilled to a depth 10 feet below the bottom of each vault. Soil samples shall be composited to define each 2 foot interval of soil and analyzed for HSL volatiles. Soil samples shall also be composited to define six foot intervals, and will be analyzed for nitrates, flourides, beryllium, total uranium, total plutonium, gross alpha, and gross beta. 	
125	Holding Tank	<ol style="list-style-type: none"> 1. Submit the report(s) documenting the radiometric survey conducted from 1975 - 1983. 2. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of site 125. If the releases occurred after surfacing was in place, then the survey should be conducted without removing the surfacing. If the surfacing was placed after the spills occurred, 	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
125 (cont'd)		<p>then the top 2" of the soil surface shall be sampled and analyzed for radiation prior to drilling the boreholes. The survey shall be conducted using 10 foot grids and will cover all areas affected by site 125. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation.</p> <p>3. Conduct a soil sampling survey of the areas affected by sites 125. Soil bores will be placed around each tank associated with site 125 and will be drilled to a depth 10 feet below the bottom of each tank. The soil samples shall be composited to define each 2 foot interval and will be analyzed for HSL volatiles. In addition, the soils shall be composited to represent six foot intervals and shall be analyzed for nitrates, total americium, beryllium, total uranium, total plutonium, gross alpha and gross beta. In addition to the soil bores, surface scrapes 2 inches deep will be taken at the same location as the soil borings and analyzed for the same constituents as required for the soil boring composites. At least two of the boreholes shall be completed as down-gradient alluvial monitoring wells. The location and number of these wells shall be proposed in the RFI/RI Workplan to be submitted in accordance with section I.B.9. of the Statement of Work. These wells shall be sampled immediately upon completion and quarterly thereafter. Groundwater samples shall be analyzed for total nitrate, HSL volatiles, gross alpha, gross beta, total plutonium, total uranium, tritium and HSL metals.</p>	
126.1 Out-of-Service Process 126.2 Waste Tanks		<p>1. Determine and document the types of wastes stored in these tanks during use.</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
126 cont'd		<p>2. Conduct a soil sampling survey of the areas affected by sites 126.1 and 126.2. One soil bore will be placed downgradient of each tank associated with site 126 and will be drilled to a depth 10 feet below the bottom of each tank. The soil samples shall be composited to define each 2 foot interval and will be analyzed for HSL volatiles. In addition, the soils shall be composited to represent six foot intervals and shall be analyzed for nitrates, total americium, beryllium, total uranium, total plutonium, gross alpha and gross beta. In addition to the soil bores, surface scrapes 2 inches deep will be taken at the same location as the soil borings and analyzed for the same constituents as required for the soil boring composites. The most downgradient borehole shall be completed as a down-gradient alluvial monitoring well. The location of this well shall be proposed in the RFI/RI Workplan to be submitted in accordance with section I.B.9. of the Statement of Work. This well shall be sampled immediately upon completion and quarterly thereafter. Groundwater samples shall be analyzed for total nitrate, HSL volatiles, gross alpha, gross beta, total plutonium, total uranium, tritium and HSL metals. Initial results of the groundwater sampling and analysis shall be submitted with the PSC report for this group of sites.</p>	
127	Low Level Radioactive Waste Leak	<p>1. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of site 127. The survey shall be conducted using 10 foot grids and will cover the entire area affected by site 127. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation. If surfacing has been placed over the soils affected</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
127 cont'd		<p>by releases from this site, 2" surface scrapes will be taken prior to constructing the required boreholes for this site.</p> <p>2. Conduct a soil sampling survey of the areas affected by site 127. Place 5 soil borings 20 feet apart within the boundaries of the site. Collect a 2" surface scrape of the soils before constructing the soil borings. The surface scrape sample shall be analyzed for total plutonium, total uranium, gross alpha, gross beta, HSL metals and total nitrate. The soil borings will extend to 10 feet below the pipe invert carrying low level waste between 995 and 774 or three feet into weathered bedrock, whichever is greater. The soil samples will be composited to represent each 2 foot increment of depth and will be analyzed for total plutonium, total uranium, gross alpha, gross beta, and total nitrate.</p>	
132	Radioactive Site #4 - 700	<p>1. Conduct a soil sampling survey of the areas affected by site 132. Soil bores will be placed around each tank associated with site 132 and will be drilled to a depth 10 feet below the bottom of each tank or 3 feet into weathered bedrock, whichever is greater. The soil samples shall be composited to define each six foot interval and will be analyzed for total americium, total beryllium, total uranium, total plutonium, total alpha and total beta.</p>	
135	Cooling Tower Blowdown	<p>1. Verify the location of site 135 as either north or south of building 374.</p> <p>2. Conduct a soil sampling survey of site 135 utilizing soil borings drilled to a depth of 6 feet. Borings will be</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
135 cont'd		placed on 50 foot centers. Samples will be composited to represent 2 foot intervals and will be analyzed for total chromium. A 2 inch surface scrape will be taken prior to drilling at each grid location and will be analyzed for total chromium.	
137	Cooling Tower Blowdown Building 774	1. Conduct a soil sampling survey of site 137 utilizing soil borings drilled six feet deep. Borings will be placed on 50 foot centers. Samples will be composited to represent 2 foot intervals and will be analyzed for total chromium. A 2 inch surface scrape will be taken prior to drilling at each grid location and will be analyzed for total chromium.	
138	Cooling Tower Blowdown Building 779	1. Conduct a soil sampling survey of site 138 utilizing soil borings drilled to a depth of 6 feet. Borings will be placed on 25 foot centers. Samples will be composited to represent 2 foot intervals and will be analyzed for total chromium. A 2" surface scrape will be taken prior to drilling at each grid location and will be analyzed for total chromium.	
139.1 139.2	Caustic/Acid Spills	1. Collect soil samples from the top six inches of soil at sites 139.1 and 139.2. These samples shall be taken from soils directly surrounding the source tanks and from soils affected by the sites. The soils affected by sites 139.1 and 139.2 will be sampled using 25 foot grids and shall be analyzed for sodium, potassium, and fluoride.	
144	Sewer Line Break	1. Submit the report(s) documenting the radiometric survey conducted from 1975 - 1983. 2. Conduct a radiation survey using a G-M	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
144 cont'd		<p>shielded pancake detector and side-shielded FIDLER of the areas affected by site 144. The survey shall be conducted using 10 foot grids and will cover all areas affected by site 144 including the hillside referred to in the CEARP Phase I: Installation Assessment, Rocky Flats Plant. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation.</p> <p>3. Conduct a soil sampling survey of all areas affected by site 144 including the hillside 500 feet north, utilizing surface soil scrapings collected at "hotspot" locations identified through the radiation survey and prior to construction of each borehole. Two boreholes shall be located adjacent to the sewer line and shall be drilled to 5 feet below the invert of the pipe or three feet into weathered bedrock, whichever is deeper. Four boreholes shall be located on the affected hillside and shall be drilled three feet into weathered bedrock. The soil cores shall be composited to represent 2 feet of soil and analyzed for total plutonium, total americium, beryllium, total chromium, tritium, total nitrate, uranium 233/234, uranium 235, uranium 238, gross alpha, gross beta, HSL metals, and total sulfate.</p>	
146.1 146.2 146.3 146.4 146.5 146.6	Concrete Process Waste Tanks	<p>1. Submit the report(s) documenting the radiometric survey conducted from 1975 - 1983.</p> <p>2. Verify the location of these tanks.</p> <p>3. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of the areas affected by site 146. The survey</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
146 cont'd		<p>shall be conducted using 10 foot grids and will cover all areas affected by site 146 including the road and ground surfaces affected by the overflows of these tanks. If concrete or asphalt surfacing exists over affected soils, the surface soils will be sampled prior to constructing the required boreholes. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation.</p> <p>4. Conduct a soil sampling survey of all areas affected by site 146 including the areas affected by the tank overflows, utilizing surface soil scrapings to a depth of 2 inches and soil cores composited to represent each 2 feet of soil. The boreholes will be drilled to a depth of 10 feet below the tank inverts or to below the bottom of the building, whichever is required to assess the contamination of the soils related to this site. The location of six boreholes shall be proposed in the Workplan after verifying the location of these tanks. For three of the six boreholes, the core samples shall be composited to represent two foot intervals. These two foot composites shall be analyzed for HSL volatiles and HSL semi-volatiles. For all six boreholes the soils shall be composited to represent six foot intervals. The borehole composites and surface scrapes shall be analyzed for total plutonium, total americium, beryllium, total chromium, tritium, total nitrate, uranium 233/234, uranium 235, uranium 238, gross alpha, gross beta, total sodium, total sulfate and HSL metals.</p>	
149	Effluent Pipe	<p>1. Submit the report(s) documenting the radiometric survey conducted from 1975 - 1983 and any cleanup activities</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
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149 cont'd

for this site.

2. Submit all soil survey information pertinent to this site acquired during the investigations of the solar ponds.
3. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of the areas affected by site 149. The survey shall be conducted using 10 foot grids and will cover all areas affected by site 149 including the ground surfaces affected by the leakages of this line. If concrete or asphalt surfacing exists over affected soils, the surface soils shall be sampled prior to constructing the boreholes required for this site. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation.
4. Conduct a soil sampling survey of the soils affected by site 149 utilizing cores drilled to a depth of 5 feet below the invert of the waste line(s) which resulted in the release at this site or three feet into weathered bedrock, whichever is greater. Eleven boreholes shall be located on 50' centers along the downgradient side of the effluent pipe. The soil core samples shall be composited to represent 2 feet of soil. The two foot composite core samples will be analyzed for HSL volatiles. The soil cores shall also be composited to represent six foot intervals. The six foot cores and the surface scrapes shall be analyzed for total plutonium, total americium, beryllium, total chromium, tritium, total nitrate, uranium 233/234, uranium 235, uranium 238, gross alpha, gross beta, and HSL metals.

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
150	Radioactive Liquid Leaks	1. Submit the report(s) documenting the radiometric survey conducted from 1975 - 1983 and any cleanup activities for these sites.	
150.1	North of Bldg. 771, West		
150.2	of Bldg. 771, Between Bldgs.		
150.3	771 and 774, East of Bldg.		
150.4	750, West of Bldg. 707,		
150.5	South of Bldg. 779, South		
150.6	of Bldg. 776, Northeast of	2. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of the areas affected by site 150. The survey shall be conducted using 25 foot grids and will cover all areas affected by site 150 including the ground surfaces affected by runoff and spillage. If surfacing exists over affected soils, surface samples shall be taken prior to constructing the boreholes required for this site. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation.	
150.7	Bldg. 779		
150.8			
		3. Conduct a soil sampling survey of all areas affected by site 150 utilizing surface soil scrapings to a depth of 2" and soil cores drilled three feet into weathered bedrock. Soil cores shall be composited to represent two foot intervals and shall be analyzed for HSL volatiles. Soil cores shall also be composited to represent six foot intervals. The six foot soil core composites and the 2" surface scrapes for all boreholes shall be analyzed for total plutonium, total americium, beryllium, total chromium, tritium, total nitrate, uranium 233/234, uranium 235, uranium 238, gross alpha, gross beta, total sodium, total sulfate and HSL metals. Nine boreholes constructed on 50' centers shall be located to transect site 150.1. Twenty boreholes constructed on 50' centers shall be located to transect site 150.2. Two rows of three boreholes shall be constructed to characterize site 150.3.	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
150 cont'd		<p>Two rows of four boreholes shall be constructed to characterize site 150.4. Ten boreholes constructed on 75' centers shall be located to transect site 150.5. Two rows of four boreholes shall be constructed to characterize site 150.6. Ten boreholes constructed on 50' centers shall be located to transect site 150.7. Three boreholes constructed on 40' centers shall be located to transect site 150.8. The surface and core samples will also be collected from "hotspots" located during the radiometric survey.</p>	
151	Fuel Oil Leak	<ol style="list-style-type: none"> 1. Complete a real time soil gas analysis over the entire area of site 151 using 10 foot grid intervals. The soil gas analysis will utilize a portable GC. The detection limits for the following compounds shall be proposed in the Workplan. The soil gas survey will analyze for the volatiles benzene, toluene and xylene. The analysis will note analytical peaks for compounds not calibrated for on the GC. Four boreholes shall be constructed to characterize the soils on all sides of the fuel oil tank. The boreholes shall be drilled to a depth five feet below the bottom of the tank or three into weatered bedrock, whichever is deeper. Composite samples shall be taken from every 2 foot interval and analyzed for HSL volatiles utilizing calibrated GC/MS. 	
159	Radioactive Site-Bldg. 559	<ol style="list-style-type: none"> 1. Submit the report(s) documenting the radiometric survey conducted from 1975 - 1983 and any cleanup activities for this site. 2. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of the areas affected by site 159. The survey shall be conducted using 10 foot grids and will cover all the areas affected by site 159. 	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
159 cont'd		<p>If "hotspots" are detected, the grid must be tightened to located the source of the radiation.</p> <p>3. Conduct a soil sampling survey of the soils affected by site 159 utilizing cores drilled to a depth of 5 feet below the invert of the waste line(s) or three feet into weathered bedrock, whichever is deeper. Borehole core samples will be composited to represent 2 feet of soil. The two foot composites shall be analyzed for HSL volatiles. Borehole core samples shall also be composited to represent six foot intervals of soil. The 2" surface scrapes and the six foot composites shall be analyzed for total plutonium, total americium, beryllium, total chromium, tritium, total nitrate, uranium 233/234, uranium 235, uranium 238, gross alpha, gross beta, and HSL metals. Two inch surface scrapes shall be sampled prior to constructing all boreholes and where surfacing exists to prevent the radiation survey.</p>	
163.1 163.2	<p>Radioactive Sites #3: Wash Area and Buried Slab</p>	<p>1. Submit the report(s) documenting the radiometric survey conducted from 1975 - 1983 and any cleanup activities</p> <p>2. Investigate and determine the nature of the soil/soil mounds north of 163.1 and east of 163.2 which are identified in the 1969 and 1971 aerial photographs.</p> <p>3. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of the areas affected by site 163.1. The survey shall be conducted using 25 foot grids and shall cover all areas affected by site 163.1. If surfacing exists over affected soils, the 2" surface samples shall be taken prior to construction of the required boreholes. If "hotspots"</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
163 cont'd		are detected, the grid must be tightened to locate the source of the radiation.	
		<p>4. Conduct a soil sampling survey of all areas affected by site 163.1 utilizing surface soil scrapings to a depth of 2 inches and boreholes drilled four feet deep. The borehole soil cores shall be composited to represent each 2 foot interval of soil. The surface and core samples will be collected at locations indicated as radioactive after conducting the radioactive survey. The samples will be analyzed for total plutonium, total americium, uranium 233/234, uranium 235, uranium 238, gross alpha and gross beta.</p>	
172	Central Avenue Waste Spill	<p>1. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of the areas affected by site 172. The survey shall be conducted along the Central avenue and 6th Street roadsides and all other roadsides utilized to transport the wastes from the 903 Pad Area to Bldg. 771. The survey shall also examine the surface water drainages next to the north and westbound lanes of the roads utilized. Both the roadside and surface water drainage surveys shall utilize 50 foot grid intervals. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation. The survey shall utilize 5 foot grid intervals within 50 feet of stopping and unloading points.</p> <p>2. Conduct a soil and asphalt sampling survey. Soil and asphalt sampling shall be conducted at locations indicated as radioactive during the radiometric survey and at stopping and unloading points along the route. The soil samples shall be analyzed for HSL metals</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
172 cont'd		<p>carbon tetrachloride, bis(2-ethylhexyl) phthalate, total plutonium, uranium 233/234, uranium 235, uranium 238, beryllium, gross alpha and gross beta. The asphalt samples shall be taken at areas indicated as radioactive during the radiometric survey and on 5 foot grid intervals within 50 feet of stopping and unloading points along the route. These asphalt samples shall be analyzed for the same constituents as for the soil samples, with the exception of the carbon tetrachloride and bis(2-ethylhexyl) phthalate.</p>	
173	Radioactive Site-900 Area	<ol style="list-style-type: none"> 1. Submit information substantiating the characterization of this unit as a SWMU subject to HSWA corrective action. 2. Submit the results of the Aerial Radiological Measuring System (ARMS) survey which documented the elevated gamma-radiation exposure rates for site 173. Submit the results of the routine radiation surveys conducted in Bldg. 991. 3. Conduct radiation surveys using a G-M shielded pancake detector and a side-shielded FIDLER, device of all areas affected by site 173. The survey shall be conducted using 25 foot grid intervals and will cover all areas external to Bldg. 991. At radiation survey sites indicating radioactive contamination, soil samples, surfacing (i.e. asphalt or concrete) samples or surface wipes will be taken to determine the radioactive constituents responsible for the positive radiation reading. The type of sample taken will be dependent on whether the radiation survey site is located on the soil, or on surfacing. Soils shall be grab sampled. Asphalt, concrete and/or structural surfaces shall be wipe samples. All samples will be analyzed for total plutonium, total uranium. 	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
173 cont'd		total americium, total cesium, total strontium, beryllium, tritium, gross alpha and gross beta.	
184	Bldg. 991 Steam Cleaning	<ol style="list-style-type: none"> 1. Submit the report(s) documenting the radiometric survey(s) conducted which indicate that the radioactivity is not above background for this site. 2. Investigate the spillage identified as emanating from site 184 in the 8/6/71 aerial photograph. 3. Incorporate the investigation of site 184 into the radiometric investigation to be conducted at site 173. 	
188	Acid Leak	<ol style="list-style-type: none"> 1. Submit documentation describing the nature of the acid leak (i.e. describe whether the acid mixture is a waste acid, and whether it contained any other metals or dissolved constituents, etc.?). 2. Document any cleanup activity which took place at the time of the incident or after the incident to minimize environmental degradation. 	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

Operable Unit 9-Original Process Waste Lines

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
121	Original Process Waste Lines	<ol style="list-style-type: none"> 1. Close the regulated units in accordance with this Agreement and the regulations. 2. Submit Phase I and Phase II RFI/RI reports documenting investigations for each site in accordance with the schedules within Table 6 of this Attachment. The Phase I and Phase II reports shall at a minimum contain information to characterize the nature, rate and extent of contamination; define pathways and methods of migration; identify areas threatened by releases from the facility; and determine short and long-term threats to human health and the environment. 3. Submit all Phase I and Phase II Closure/Interim Measure/Interim Remedial Action reports as required by section I.B.11. of the SOW, and in accordance with the schedule requirements within Table 6 of the SOW. 	<ol style="list-style-type: none"> 1.. As required by section I.B.11 of the SOW. 2. Submit RFI/RI Workplans in accordance with section I.B.11. and Table 6 of the SOW. Submit the required reports and close the units in accordance with the schedules in Table 6 of the SOW.

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

Operable Unit 10-Other Outside Closures

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
124 124.1 124.2 124.3	Radioactive Liquid Waste Storage Tanks	1. Close the regulated units in accordance with this Agreement and the regulations.	1. As required by section I.B.11 of the SOW.
129	Oil Leak	2. Submit Phase I and Phase II RFI/RI reports documenting investigations for each site in accordance with the schedules within Table 6 of this Attachment. The Phase I and Phase II reports shall at a minimum contain information to characterize the nature, rate and extent of contamination; define pathways and methods of migration; identify areas threatened by releases from the facility; and determine short and long-term threats to human health and the environment.	2. Submit RFI/RI Workplans in accordance with section I.B.11. and Table 6 of the SOW. Submit the required reports and close the units in accordance with the schedules in Table 6 of the SOW.
174	P&UD Container Storage		
175	S&W Bldg. 980 Container		
176	S&W Contractor Storage Yard		
177	Bldg. 885 Drum Storage Area		
181	Bldg. 334 Cargo Container		
182	Bldg. 444/453 Drum Storage		
170	P&UD Storage Yard Waste Spills		
205	Bldg. 460 Sump #3 Acid Side		
206	Inactive Tank D-836		
207	Inacative 444 Acid Dumpster	3. Submit all Phase I and Phase II Closure/Interim Measure/Interim Remedial Action reports as required by section I.B.11. of the SOW, and in accordance with the schedule requirements within Table 6 of the SOW.	
208	Inactive 444/447 Waste Storage Area		
210	Unit 16, Bldg. 980 Cargo Container		
213	Unit 15, 904 Pad Pondcrete Storage		
214	Unit 25, 750 Pad Pondcrete and Saltcrete Storage		

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

Operable Unit 11-West Spray Field

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
168	West Spray Field	<ol style="list-style-type: none"> 1. Close the regulated units in accordance with this Agreement and the regulations. 2. Submit Phase I and Phase II RFI/RI reports documenting investigations for each site in accordance with the schedules within Table 6 of this Attachment. The Phase I and Phase II reports shall at a minimum contain information to characterize the nature, rate and extent of contamination; define pathways and methods of migration; identify areas threatened by releases from the facility; and determine short and long-term threats to human health and the environment. 3. Submit all Phase I and Phase II Closure/Interim Measure/Interim Remedial Action reports as required by section I.B.11. of the SOW, and in accordance with the schedule requirements within Table 6 of the SOW. 	<ol style="list-style-type: none"> 1. As required by section I.B.11 of the SOW. 2. Submit RFI/RI Workplans in accordance with section I.B.11. and Table 6 of the SOW. Submit the required reports and close the units in accordance with the schedules in Table 6 of the SOW.

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

Operable Unit 12-400/800 Area Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
116.1 116.2	Multiple Solvent Spills at West and South Loading Dock Areas	<ol style="list-style-type: none"> 1. Submit the results of the Aerial Radiological Measuring System (ARMS) survey which documented the elevated gamma-radiation exposure rates for sites 116.1 and 116.2. 2. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of sites 116.1 and 116.2. The survey must be conducted using 25 foot grid intervals and will cover the entire areas of sites 116.1 and 116.2. If surfacing exists over affected soils, 2" surface scrapes shall be collected prior to construction of the boreholes required for this site. The 2" inch surface scrapes shall be analyzed for total uranium, gross alpha and gross beta. Submit all previously collected radiation data pertinent to this site. 3. Complete a real time soil gas analysis over the entire area of both sites using 25 foot grid intervals. The soil gas analysis will utilize a portable GC. The detection limits for the following compounds shall be proposed in the Workplan. The soil gas survey will analyze for the volatiles 1,1,1 TCA, benzene, carbon tetrachloride, PCE, and TCE. The analysis will note analytical peaks for compounds not calibrated for on the GC. Boreholes will be constructed to transect any plume defined during the soil gas analysis. These boreholes shall be completed as groundwater monitoring wells constructed to collect alluvial groundwater. These alluvial groundwater monitoring wells shall be sampled immediately upon completion and analyzed for HSL volatiles, gross alpha and gross beta. The groundwater shall continue to be sampled and analyzed for the above constituents 	<ol style="list-style-type: none"> 1. Submit an RFI/RI Workplan in accordance with section VI. of the Statement of Work. Submit the Phase I RFI/RI Report in accordance with the schedules within Table 6 of the SOW. This agreement. This report shall include all data collected as a result of and required by this preliminary workplan for this group of sites.

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
116 cont'd		<p>on a quarterly basis. Boreholes shall also be constructed on a random basis after every 20 soil gas surveys to verify the presence or non-presence of HSL volatiles and HSL semi-volatiles at the specific location. The soil borings shall be drilled three feet into weathered bedrock. 2" surface scrapes shall be collected prior to constructing the boreholes and analyzed for total uranium, gross alpha and gross beta. Composite samples shall be collected from every 2 foot interval and analyzed for HSL volatiles and HSL semi-volatiles utilizing calibrated GC/MS. The uppermost two foot composite shall be analyzed for total uranium, gross alpha and gross beta.</p>	
120.1 Building 664 Fiberglassing 120.2 Areas		<ol style="list-style-type: none"> 1. Submit the results of the Aerial Radiological Measuring System (ARMS) survey which documented the elevated gamma-radiation exposure rates for sites 120.1 and 120.2. 2. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of sites 120.1 and 120.2. The survey must be conducted utilizing 25 foot grid intervals. If the affected soils have been covered by asphalt or concrete, 2" surface scrapes shall be taken at borehole locations required to be constructed by this workplan. 2" surface scrapes shall also be taken at all radiation survey locations indicating a positive radiation finding. The 2" surface scrapes shall be analyzed for total plutonium, total uranium, gross alpha and gross beta. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation. 	

Table 5: Preliminary RFI/RJ Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
120 cont'd		<p>3. Complete a real time soil gas analysis over the entire area of sites 120.1 and 120.2 using 25 foot grid intervals. The soil gas analysis will utilize a portable GC. The detection limits for the following compounds shall be proposed in the Workplan. The soil gas survey will analyze for benzene, carbon tetrachloride, methylethyl ketone peroxide, styrene and TCE. The analysis will note analytical peaks for compounds not calibrated for on the GC. Boreholes shall be constructed to transect plumes identified by the soil gas analysis and on a random basis every 25 soil gas surveys to verify the presence or non-presence of volatiles at the specific location. The boreholes shall be drilled three feet into the weathered bedrock. Composite samples shall be taken from every 2 foot interval and analyzed for HSL volatiles and HSL semi-volatiles utilizing calibrated GC/MS.</p>	
136.1	Cooling Tower Ponds	<p>1. Submit the results of the aerial radiological survey conducted in August 1981 and documented by E,G&G, 1982.</p>	
136.2	Northeast, South and West	<p>2. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of the areas associated with sites 136.1, 136.2 and 136.3. If these sites are presently covered by an asphalt or concrete surfacing, 2" surface scrapes must be collected prior to constructing the required boreholes for these sites. The survey must be conducted using 10 foot grids and will cover the entire area affected by sites 136.1, 136.2, and 136.3. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation.</p>	
136.3	of Building 460	<p>3. Conduct a soil sampling survey of sites 136.1, 136.2 & 136.3 utilizing soil borings drilled three feet into weathered bedrock. The borings shall be</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
136 cont'd		located as close to the unit sources as possible. Borings shall be placed on 20 foot centers and shall be composited to represent 2 foot intervals. 2" surface scrapes shall be collected prior to constructing the boreholes. The borehole composites and the 2" surface scrapes shall be analyzed for total chromium, total uranium, total lithium, gross alpha, and gross beta.	
147.1 Process Waste Leaks; 147.2 Maas and Owen Areas		<ol style="list-style-type: none"> 1. Submit the report(s) documenting the radiometric survey conducted from 1975 - 1983 and any cleanup activities for these sites. 2. Investigate and report the nature of the seeping to the ditch identified in the 1978 aerial photograph shown east of site 147.1 at the road entering the PSZ. This seep shall be investigated as for item (3) below. Clarify what "conversion" processes were conducted at site 147.2. 3. Conduct a soil sampling survey of the soils affected by site 147.1 utilizing cores drilled to a depth of 5 feet below the invert of the waste line(s) which resulted in the release at this site or three feet into weathered bedrock, whichever is deeper. Prior to constructing the boreholes, 2" surface scrapes shall be collected and analyzed for total plutonium, beryllium, uranium 233/234, uranium 235, uranium 238, gross alpha, gross beta and HSI metals. Ten boreholes shall be located immediately downgradient of the pipeline within the site boundary, spaced on 20' centers. Three boreholes shall be located within the spill area identified in the 1978 aerial photograph. The boreholes samples shall be composited to represent 2 feet of soil. The two foot composites shall be analyzed for 	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
147 cont'd		HSL volatiles. The borehole cores shall also be composited to represent six foot intervals. The six foot composites shall be analyzed for total plutonium, total americium, beryllium, total chromium, tritium, total nitrate, uranium 233/234, uranium 235, uranium 238, gross alpha, gross beta, and HSL metals.	
157.2 Radioactive Site South Area		<ol style="list-style-type: none"> 1. Submit the report(s) documenting the radioactive survey conducted from 1975 - 1983 and any cleanup activities for these sites. 2. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of the areas affected by site 157.2. The survey shall be conducted using 25 foot grids and will cover all areas affected by site 157.2. If surfacing exists over affected soils, 2" surface scrapes shall be collected prior to constructing the boreholes required for this site. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation. 3. Conduct a soil sampling survey of all areas affected by site 157.2 utilizing surface soil scrapings to a depth of 2 inches and boreholes drilled three feet into weathered bedrock. Boreholes and surface scrapes shall be located at "hotspots" located during the radiometric survey of this site. The workplan to be submitted for this group of sites shall also propose locations for boreholes to be located near loading docks and storage areas previously and presently used at this site. The boreholes shall be composited to represent 2 feet of soil. The two foot composites shall be analyzed for HSL volatiles. The boreholes shall also be 	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
157.2 cont'd		<p>composited to represent six foot intervals. The six foot composite samples and 2" surface scrapes shall be analyzed for total plutonium, beryllium, uranium 233/234, uranium 235, uranium 238, gross alpha, gross beta and bis(2-ethylhexyl) pthalate.</p>	
187	Acid Leaks (2)	<p>1. Submit documentation describing the nature of the acid leaks (identify whether these were waste acids, product acids, and whether they contained any other metals or dissolved constituents, etc.?).</p>	
189	Multiple Acid Spills	<p>1. Submit documentation describing the nature of the acid spills (identify whether these waste acids, product acids, and whether they contained any other metals or dissolved constituents, etc.?).</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

Operable Unit 13-100 Area

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
117.1 117.3	Chemical Storage, North and South Sites	1. Provide information documenting the kinds of material/chemicals stored at these two sites. Provide the information utilized to preliminarily determine whether these sites require further investigation.	1. Submit an RFI/RI Workplan in accordance with section VI. of the Statement of Work. Submit the Phase I RFI/RI Report in accordance with the schedules within Table 6 of the SOW. This Phase I RFI/RI report shall include all data collected as a result of and required by this workplan for this group of sites.
117.1 117.2 117.3	Chemical Storage, North Middle and South Sites	1. Complete a real time soil gas analysis over the entire area of the 117 sites using 100' offset grid intervals. The soil gas analysis will utilize a portable GC. The detection limits for the following compounds shall be proposed in the Workplan. The soil gas survey shall analyze for TCA, benzene, carbon tetrachloride, dichloromethane, PCE and TCE. The analysis will note analytical peaks for compounds not calibrated for on the GC. Boreholes shall be constructed to transect the plumes identified during the soil gas analysis. The transecting boreholes shall be completed as alluvial ground water monitoring wells. The alluvial groundwater shall be sampled immediately upon completion and quarterly thereafter, and analyzed for HSL volatiles and HSL semi-volatiles, as well as gross alpha and gross beta. Boreholes shall be constructed at the location of the soil gas analysis on a random basis after every 25 soil gas surveys to verify the presence or non-presence of HSL volatiles and HSL semi-volatiles at the specific location. All soil borings shall be drilled three feet into weathered bedrock. Borehole composite samples shall be taken from every 2 foot interval and analyzed for HSL volatiles	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
117 cont'd		and HSL semi-volatiles utilizing calibrated GC/MS. The 2 foot composites shall also be analyzed for gross alpha and gross beta.	
122	Underground Concrete Tank(s)	<ol style="list-style-type: none"> 1. Locate and describe all underground tanks associated with site 122, including the specific waste streams handled by these tanks. 2. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of site 122. The survey shall be conducted using 10 foot grids and shall cover the entire area of site 122. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation. If the affected soils are covered with surfacing, 2" surface scrapes shall be collected prior to constructing the boreholes required for this site. 3. Conduct a soil sampling survey after locating the underground tanks. Four boreholes shall be placed around each tank associated with site 122 and shall be drilled to a depth 10 feet below the bottom of each tank or three feet into weathered bedrock, whichever is deeper. The soil samples shall be composited to define each 2 foot interval and shall be analyzed for HSL volatiles and nitrates. The soil samples shall also be composited to represent six foot intervals. The 2" surface scrapes and six foot composites shall be analyzed for total uranium, total plutonium, gross alpha and gross beta. 	
128	Oil Burn Pit No. 1 Waste Leak	<ol style="list-style-type: none"> 1. Reevaluate the location of site 128 in light of the 7/2/55 aerial photograph of the facility. 2. Conduct a radiation survey using a G-M shielded pancake detector and side- 	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
128 cont'd		<p>shielded FIDLER of site 128. The survey shall be conducted using 10 foot grids and shall cover the entire area affected by site 128. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation.</p> <p>3. Complete a real time soil gas analysis over the entire area of site 128 using 25 foot grid intervals. The soil gas analysis will utilize a portable GC. The detection limits for the following compounds will be proposed in the Workplan. The soil gas survey shall analyze for the volatiles benzene, toluene, and xylene. The analysis will note analytical peaks for compounds not calibrated for on the GC. Boreholes shall be constructed to transect plumes identified by the soil gas analysis or the radiation survey. At least three boreholes shall be constructed to verify the presence or non-presence of volatiles or radioactive materials at specific locations within the site. The boreholes shall be drilled three feet into the weathered bedrock. Composite samples shall be collected from every 2 foot interval and analyzed for HSL volatiles and HSL semi-volatiles utilizing calibrated GC/MS. The two foot composite samples shall also be analyzed for total uranium and total lithium.</p>	
134	Lithium Metal Destruction Site	1. To be investigated in same manner as for site 128 above.	
148	Waste Spills	<p>1. Submit the report(s) documenting the radiometric survey(s) conducted which have found radioactivity levels to be consistent with background levels.</p> <p>2. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of site 148. The survey shall be conducted using 10 foot spacing</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
148 cont'd		<p>around building 123 and will cover the entire area affected by site 148. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation. If surfacing exists over grid locations, 2" surface scrapes shall be collected prior to constructing the boreholes required for this site.</p> <p>3. Conduct a soil sampling survey of site 148 utilizing soil borings drilled to a depth of 2 feet. The soil borings shall be drilled at locations proposed in the workplan for this group and at sites found to be radioactive after completion of the radiation survey. Soil cores shall be composited to represent 6" of soil. The 2" surface scrapes and the 6" composites shall be analyzed for total plutonium, total americium, uranium 238, uranium 235, uranium 233/234, gross alpha and gross beta.</p>	
152	Fuel Oil Tank	<p>1. Complete a real time soil gas survey over the entire area of site 152 using 20 foot spacing around the fuel oil tank. The soil gas analysis will utilize a portable GC. The detection limits for the following compounds shall be proposed in the Workplan. The survey shall analyze for benzene, toluene and xylene. The analysis will note analytical peaks for compounds not calibrated for on the GC.</p> <p>2. Conduct a soil sampling survey of the area affected by site 152 utilizing 6 foot cores composited to represent 6 feet of soil. Three boreholes shall be located around the fuel oil storage tank to characterize the source soils and to determine the downgradient release of contaminants from this site. The samples will be analyzed by GC/MS for HSL volatiles. The report will note analytical peaks found which were not calibrated for on the GC/MS.</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
157.1	Radioactive Site North Area	<ol style="list-style-type: none"> 1. Submit the report(s) documenting the radiometric survey conducted from 1975 - 1983 and any cleanup activities for this site. 2. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of the areas affected by site 157.1. The survey shall be conducted using 25 foot grids and shall cover the areas affected by site 157.1. If surfacing exists over the affected soils, 2" surface scrapes shall be collected prior to constructing the boreholes required for this site. If "hotspots" are detected, the grid must be tightened to locate the source of contamination. 3. Conduct a soil sampling survey of all areas affected by site 157.1 utilizing surface soil scrapings to a depth of 2 inches and 6 foot boreholes. The boreholes shall be composited to represent the entire six foot interval and three two foot intervals. The surface scrape and borehole locations shall be proposed in the workplan for this group. Boreholes and surfate scrapes shall also be constructed and collected at "hotspots" located during the radiometric survey. The 2' foot composites shall be analyzed for HSL volatiles. The six foot composite shall be analyzed for total plutonium, beryllium, uranium 238, uranium 235, uranium 233/234, gross alpha, gross beta. 	
158	Radioactive Site-Bldg. 551	<ol style="list-style-type: none"> 1. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of the areas affected by site 158. The survey shall be conducted using 25 foot grids and shall cover all areas affected by site 158. If surfacing exists over 	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
158 cont'd		<p>affected soils, 2" surface scrapes shall be collected prior to construction of boreholes required at this site. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation.</p> <p>2. Complete a real time soil gas analysis over the entire area of site 158 using 25 foot grid intervals. The soil gas analysis will utilize a portable GC. The detection limits for the following compounds shall be proposed in the Workplan. The soil gas survey shall analyze for the volatiles 1,1,1 TCA, PCE, carbon tetrachloride, acetone, toluene and benzene. The analysis shall note analytical peaks for compounds not calibrated for on the GC. Boreholes shall be constructed to transect plumes identified by the soil gas analysis or the radiation survey. At least three boreholes shall be constructed to verify the presence or non-presence of volatiles or radioactive materials at specific locations within the site as determined by the radiation and soil gas surveys of the site. The boreholes shall be drilled three feet into the weathered bedrock. Composite samples shall be collected from every 2 foot interval and analyzed for HSL volatiles and HSL semi-volatiles utilizing calibrated GC/MS. Prior to constructing the boreholes, 2" surface scrapes shall be collected and analyzed for total uranium, total plutonium, gross alpha and gross beta.</p>	
169	Waste Peroxide Drum Burial	1. Locate the drum containing waste peroxide.	
171	Solvent Burning Ground	1. This site shall be investigated in the same manner as for sites 128 and 134. The soil gas survey shall also include capability to detect PCE, 1,2 DCA, chloroform, carbon tetrachloride, TCE,	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
171 cont'd		and methylene chloride. One borehole shall be located within this site to verify the presence or non-presence of solvents and radioactive constituents at this site.	
186	Valve Vault 12	<ol style="list-style-type: none"> 1. Submit documentation describing the cleanup operations completed and those described as continuing in Appendix I, 3004(u) Waste Management Units, Volume I. 2. Conduct a soil sampling survey of all areas affected by site 186 utilizing soil cores drilled to 5 feet below the invert of the waste line(s) which leaked, or three feet into weathered bedrock, whichever is deeper. The core samples shall be composited to represent 2 feet of soil and shall be analyzed for HSL volatiles. The boreholes shall also be composited to represent six foot intervals shall be analyzed for total plutonium, total americium, uranium 233/234, uranium 235, uranium 238, gross alpha, gross beta and HSL metals. The boreholes shall be located using 25 foot spacing. 	
190	Caustic Leak	<ol style="list-style-type: none"> 1. Submit documentation describing the nature of the caustic leaks (i.e. describe whether these were waste or product solutions, and whether they contained any other metals or dissolved constituents). 	
191	Hydrogen Peroxide Spill	<ol style="list-style-type: none"> 1. Submit documentation describing the nature of the hydrogen peroxide (i.e. describe whether the peroxide was waste or product solution, and whether it contained any other dissolved constituents). 	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

Operable Unit 14-Radioactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
131	Radioactive Site #1 700 Area	<ol style="list-style-type: none"> 1. Submit the results of the Aerial Radiological Measuring System (ARMS) survey which documented the elevated gamma-radiation exposure rates for site 131. 2. Investigate and document the location of this site. CEARP phase I and II locate this area north of building 776, while the RI/FS Plans for Low Priority Sites suggests that the area to be investigated is north and west of building 776. 3. Conduct a soil sampling survey of site 131 utilizing soil borings drilled two feet below the natural surface on 25 foot centers. Borehole samples shall be composited to represent the two foot interval. 2" surface scrapes shall be collected prior to constructing the boreholes required for this site. The surface scrapes and borehole composites shall be analyzed for total plutonium, total americium, uranium 238, uranium 235, uranium 233/234, gross alpha and gross beta. If the natural soils are covered by an artificial surface, a 2" surface scrape of the soil below the artificial surfacing will also be collected and analyzed for the same constituents as are required above for the soil borings at this site. 	<ol style="list-style-type: none"> 1. Submit an RFI/RI Workplan in accordance with section VI. of the Statement of Work. Submit the Phase I RFI/RI Report in accordance with the schedules in Table 6 of the SOW. This Phase I RFI/RI report shall include all data collected as a result of and required by this workplan for this group of sites.
156	Radioactive Soil Burial	<ol style="list-style-type: none"> 1. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of the areas affected by site 156.2. The survey shall be conducted using 25 foot grids and will cover the all areas affected by site 156.2. Site 156.1 shall be surveyed for radiation during the soil sampling survey. If "hotspots" are 	
156.1	Bldg. 334 Parking Lot		
156.2	Soil Dump Area		

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
156 cont'd		detected, the grid must be tightened to locate the source of the radiation.	
		<p>2. Conduct a soil sampling survey of all areas affected by site 156.1 utilizing undisturbed surface soil scrapings to a depth of 2". Conduct a soil sampling survey of site 156.2 utilizing surface scrapings of undisturbed soil to a depth of 2" and boreholes drilled three feet into the undisturbed soils beneath the waste piles of the soil dump area. The soil cores shall be composited to represent 2 feet of soil. The surface scrapes for site 156.1 shall be collected using 50 foot grids. The surface scrapes and boreholes for site 156.2 shall be located on 50' centers around the perimeter of the site where dumping has occurred. The boreholes and surface scrapes for site 156.2 shall also be taken from "hotspots" located during the radiometric survey. All samples will be analyzed for total plutonium, total americium, uranium 233/234, uranium 235, uranium 238, gross alpha and, gross beta.</p>	
160 161	Bldg. 444 Parking Lot Bldg. 664	<p>1. Submit the report(s) documenting the radiometric survey conducted from 1975 - 1983 and any cleanup activities for these sites.</p> <p>2. Submit the results of the Aerial Radiological Measuring System (ARMS) survey which documented the elevated gamma-radiation exposure rates for site 161.</p> <p>3. Complete a real time soil gas analysis over the entire areas of sites 160 and 161 using 50" offset grid intervals. The soil gas analysis will utilize a portable GC. The detection limits for the following compounds shall be proposed in the Workplan. The soil gas survey shall analyze for the volatiles</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
160/161 cont'd		<p>1,1,1 TCA, PCE, carbon tetrachloride, acetone, toluene and benzene. The analysis shall note analytical peaks for compounds not calibrated for on the GC. Boreholes shall be constructed to transect plumes identified by the soil gas analysis. Boreholes shall be constructed, on a random basis, to investigate one of every 25 soil gas survey locations to verify the presence or non-presence of volatiles or radioactive materials at specific locations within the site. Boreholes shall also be constructed to transect any plume identified after conducting the soil gas survey. All boreholes shall be drilled three feet into the weathered bedrock. Composite samples shall be collected from every 2 foot interval and analyzed for HSL volatiles and HSL semi-volatiles utilizing calibrated GC/MS. A six foot composite shall also be collected from the uppermost interval of soil. Prior to constructing the boreholes, 2" surface scrapes shall be collected. The upper six feet and the 2" surface scrape shall be analyzed for total uranium, total plutonium, gross alpha and gross beta. The transecting boreholes shall be completed as alluvial groundwater monitoring wells. The wells shall be sampled and analyzed immediately upon completion and quarterly thereafter. The groundwater samples shall be analyzed for HSL volatiles, HSL semi-volatiles, HSL metals, total plutonium, total uranium, gross alpha and gross beta.</p> <p>4. Determine and verify the destination of the soils excavated during the removal activities described as occurring in the early 1970s.</p>	
162	Radioactive Site 700 Area Site #2	<p>1. Submit all documentation identifying where the radioactive areas are and what</p>	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
162 cont'd		was done to 8th street.	
		2. Locate, sample and mark the radioactive portions of 8th Street which were covered by road surfacing.	
164	Radioactive Sites-800 Area	1. Submit the results of the Aerial Radiological Measuring System (ARMS) survey which documented the elevated gamma-radiation exposure rates for site 164.1.	
164.1	Concrete Slab		
164.2	Bldg. 886 Spills		
164.3	Bldg. 889 Storage Pad	2. Conduct a radiation survey using a G-M shielded pancake detector and side-shielded FIDLER of the areas affected by sites 164.1, 164.2 and 164.3. The survey shall be conducted using 25 foot grids and will cover the all areas affected by these sites. If surfacing exists over affected soils, 2" surface scrapes shall be collected prior to constructing boreholes required for this site. If the surfacing has been affected the surfacing shall be sampled and analyzed for radioactive constituents. If "hotspots" are detected, the grid must be tightened to locate the source of the radiation.	
		3. Conduct a soil sampling survey of all areas affected by sites 164.1, 164.2 and 164.3 utilizing surface soil scrapings to a depth of 2 inches and 6 foot boreholes composited to represent 2 feet of soil and six feet of soil. The surface and borehole composite samples shall be collected at locations indicated as radioactive after conducting the radioactive survey. The workplan to be submitted for this group of sites shall propose borehole locations for those radiation survey grid locations which are presently covered with surfacing. The six foot borehole composite and surface scrape samples shall be analyzed	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
164 cont,d		for total plutonium, total americium, uranium 233/234, uranium 235, uranium 238, gross alpha, and gross beta. The two foot composites shall be analyzed for HSL volatiles and HSL semi-volatiles.	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

Operable Unit 15-Inside Building Closures

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
178	Bldg. 881 Drum Storage Area	1. Close the regulated units in accordance with this Agreement and the regulations.	1. As required by section I.B.11 of the SOW.
179	Bldg. 865 Drum Storage Area	2. Submit Phase I and Phase II RFI/RI reports documenting investigations for each site in accordance with the schedules within Table 6 of this Attachment. The Phase I and Phase II reports shall at a minimum contain information to characterize the nature, rate and extent of contamination; define pathways and methods of migration; identify areas threatened by releases from the facility; and determine short and long-term threats to human health and the environment.	2. Submit RFI/RI Workplans in accordance with section I.B.11. and Table 6 of the SOW. Submit the required reports and close the units in accordance with the schedules in Table 6 of the SOW.
180	Bldg. 883 Drum Storage Area		
204	Original Uranium Chip Roaster		
211	Unit 26, Bldg. 881 Drum Storage		
212	Unit 63, Bldg. 371 Drum Storage		
215	Tank T-40, Unit 55.13		
217	Unit 32, Bldg. 881 Cyanide Bench Scale Treatment	3. Submit all Phase I and Phase II Closure/Interim Measure/Interim Remedial Action reports as required by section I.B.11. of the SOW, and in accordance with the schedule requirements within Table 6 of the SOW.	

Table 5: Preliminary RFI/RI Workplan for Previously Identified Inactive Sites

Operable Unit 16-Low Priority Sites

SITE NUMBER	SITE NAME	REQUIRED ACTION	REQUIRED COMPLETION/SUBMITTAL DATE
185	Solvent Spill	1. Submit documentation required to substantiate the cleanup of this site and justify whether further action is required for this site.	1. Submit the documentation and data required to justify whether further action is
192	Antifreeze Discharge	1. Submit documentation justifying whether further action is appropriate for this site.	required for the sites within this site group. If
193 194	Steam Condensate Leaks	1. Submit documentation justifying whether further action is appropriate for this site.	the data submitted does not allow a no further action determination to
195	Nickel Carbonyl Disposal	1. Submit documentation justifying whether further action is appropriate for this site.	be made, then further action shall be required
196	Water Treatment Plant Backwash Pond	1. Submit documentation justifying whether further action is appropriate for this site.	by EPA and CDH. The documentation must be submitted
197	Scrap Metal Sites	1. Submit documentation justifying whether further action is appropriate for this site.	in accordance with the schedules in Table 6 of the SOW.

TABLE 6
FEDERAL FACILITY AGREEMENT AND CONSENT ORDER
MILESTONE SCHEDULE

OU 1
881 HILLSIDE

OU 1 PHASE III RCRA FACILITY INVESTIGATION/REMEDIAL
INVESTIGATION (RFI/RI)

Submit Draft Phase III RFI/RI Work Plan	February 6, 1990
Submit Final Phase III RFI/RI Work Plan	October 30, 1990
Submit Draft Phase III RFI/RI Report	July 30, 1992
Submit Final Phase III RFI/RI Report	January 4, 1993

OU 1 CORRECTIVE MEASURES STUDY/FEASIBILITY
STUDY (CMS/FS)

Submit Draft CMS/FS Report	March 31, 1993
Submit Final CMS/FS Report	September 27, 1993

OU 1 CORRECTIVE AND REMEDIAL ACTION PROPOSED PLAN (PP)

Submit Draft PP	September 27, 1993
Submit Final PP	January 4, 1994
Submit Responsiveness Summary	May 6, 1994
Submit Final Responsiveness Summary	August 3, 1994

OU 1 CORRECTIVE ACTION DECISION AND RECORD OF
DECISION (CAD/ROD)

Submit Draft CAD/ROD	August 3, 1994
Submit Final CAD/ROD	November 1, 1994

OU 1 CORRECTIVE/REMEDIAL DESIGN (CD/RD)

Submit CD/RD Work Plan	November 1, 1994
Submit Draft Title II Design	July 5, 1995
Submit Final Title II Design	October 3, 1995

TABLE 6
FEDERAL FACILITY AGREEMENT AND CONSENT ORDER
MILESTONE SCHEDULE

OU 2
903 PAD, MOUND, & EAST TRENCHES

OU 2 PHASE II RCRA FACILITY INVESTIGATION/REMEDIAL
INVESTIGATION (RFI/RI)

Submit Draft Phase II RFI/RI Work Plan (Alluvial)	December 21, 1989
Submit Final Phase II RFI/RI Work Plan (Alluvial)	April 12, 1990
Submit Draft Phase II RFI/RI Work Plan (Bedrock)	February 5, 1991
Submit Final Phase II RFI/RI Work Plan (Bedrock)	July 2, 1991
Submit Draft Phase II RFI/RI Report	March 12, 1993
Submit Final Phase II RFI/RI Report	August 9, 1993

OU 2 CORRECTIVE MEASURES STUDY/FEASIBILITY STUDY (CMS/FS)

Submit Draft CMS/FS Report	November 4, 1993
Submit Final CMS/FS Report	May 10, 1994

OU 2 CORRECTIVE AND REMEDIAL ACTION PROPOSED PLAN (PP)

Submit Draft PP	May 10, 1994
Submit Final PP	August 9, 1994
Submit Responsiveness Summary	December 13, 1994
Submit Final Responsiveness Summary	March 16, 1995

OU 2 CORRECTIVE ACTION DECISION/RECORD OF DECISION (CAD/ROD)

Submit Draft CAD/ROD	March 16, 1995
Submit Final CAD/ROD	June 15, 1995

OU 2 CORRECTIVE/REMEDIAL DESIGN (CD/RD)

Submit CD/RD Work Plan	June 15, 1995
Submit Draft Title II Design	February 15, 1996
Submit Final Title II Design	June 14, 1996

OU 2 CORRECTIVE/REMEDIAL ACTION

Begin Corrective/Remedial Action Construction	January 20, 1997
Complete Corrective/Remedial Action Construction	July 20, 1998
Submit Performance Assessment Report	October 15, 1998

OU 2 INTERIM MEASURE/INTERIM REMEDIAL ACTION (IM/IRA)

Submit Draft Proposed IM/IRA Decision Document	June 19, 1990
Submit Proposed IM/IRA Decision Document	September 18, 1990
Submit Draft Responsiveness Summary	December 13, 1990
Submit Final Responsiveness Summary and Final IM/IRA Decision Document	January 11, 1991
Field Treatability Test System Installation Complete	March 8, 1991
Begin Field Treatability Testing	March 11, 1991
Submit Draft Treatability Test Report	April 1, 1992
Submit Final Treatability Test Program Report	June 2, 1992
Complete IM/IRA Construction	September 30, 1991
Begin Field Treatability Testing (Entire System)	October 30, 1991

TABLE 6
FEDERAL FACILITY AGREEMENT AND CONSENT ORDER
MILESTONE SCHEDULE

OU 3
OFF-SITE RELEASES

OU 3 DRAFT REMEDY REPORT

Submit Draft Past Remedy Report	October 26, 1990
Submit Final Past Remedy Report	April 2, 1991

OU 3 HISTORICAL INFORMATION AND PRELIMINARY
HEALTH RISK ASSESSMENT

Submit Draft Historical Information and Preliminary Health Risk Assessment Report	November 9, 1990
Submit Final Historical Information and Preliminary Health Risk Assessment Report	April 16, 1991

OU PHASE I RCRA FACILITY INVESTIGATION/REMEDIAL
INVESTIGATION (RFI/RI)

Submit Draft Phase I RFI/RI Work Plan	May 16, 1991
Submit Final Phase I RFI/RI Work Plan	October 11, 1991
Submit Draft Phase I RFI/RI Report	July 16, 1993
Submit Final Phase I RFI/RI Report	December 13, 1993

DISCHARGE LIMITS FOR RADIONUCLIDES (Work Plan)

Submit Draft Work Plan for Discharge Limits for Radionuclides	March 18, 1991
Submit Final Work Plan for Discharge Limits for Radionuclides	August 13, 1991
Submit Responsiveness Summary Discharge Limits for Radionuclides	December 17, 1991

SAMPLING AND ANALYSIS PLAN

Submit Draft Quality Assurance Project Plan	August 29, 1990
Submit Final Quality Assurance Project Plan	February 1, 1991
Submit Draft Standard Operating Procedures	August 29, 1990
Submit Final Standard Operating Procedures, Volume 1 - Field Operations, Volume 2 - Groundwater, Volume 3 - Geotechnical	February 1, 1991
Submit Final Standard Operating Procedures, Volume 4 - Surface Water, Volume 5 - Ecology	January 25, 1991
Submit Final Standard Operating Procedure, Volume 6 - Air	February 1, 1991
Submit Final Standard Operating Procedure Addendum for OU 2 Phase II RFI/RI Workplan	February 1, 1991
Submit Final Standard Operating Procedure Addendum for OU 1 Phase III RFI/RI Workplan	January 25, 1991

TREATABILITY STUDY

Submit Draft Treatability Study Plan	September 21, 1990
Submit Final Treatability Study Plan	February 25, 1991
Submit Draft Treatability Study Report	May 26, 1993
Submit Final Treatability Study Report	October 20, 1993

OU 4 SOLAR PONDS PHASE II CORRECTIVE MEASURES STUDY/
FEASIBILITY STUDY

Submit Draft Phase II CMS/FS Report December 5, 1996

Submit Final Phase II CMS/FS Report June 9, 1997

OU 4 SOLAR PONDS PHASE II CORRECTIVE AND REMEDIAL
ACTION PROPOSED PLAN (PP)

Submit Draft Phase II PP June 9, 1997

Submit Final Phase II PP September 5, 1997

Submit Phase II Responsiveness Summary January 16, 1998

Submit Final Phase II Responsiveness Summary April 14, 1998

OU 4 SOLAR PONDS PHASE II CORRECTIVE ACTION DECISION/
FINAL ACTION DECISION (CAD/FAD)

Submit Draft Phase II CAD/FAD April 14, 1998

Submit Final Phase II CAD/FAD July 14, 1998

OU 4 SOLAR PONDS PHASE II CORRECTIVE/REMEDIAL
DESIGN (CD/RD)

Submit CD/RD Work Plan July 14, 1998

Submit Draft Title II Design March 15, 1999

Submit Final Title II Design June 14, 1999

OU 4 SOLAR PONDS PHASE II CORRECTIVE/REMEDIAL
ACTION (CA/RA)

Begin CA/RA Construction January 18, 2000

TABLE 6
FEDERAL FACILITY AGREEMENT AND CONSENT ORDER
MILESTONE SCHEDULE

OU 6
WALNUT CREEK

OU 6 PHASE I RCRA FACILITY INVESTIGATION/REMEDIAL
INVESTIGATION (RFI/RI)

Submit Draft Phase I RFI/RI Work Plan	April 19, 1991
Submit Final Phase I RFI/RI Work Plan	September 16, 1991
Submit Draft Phase I RFI/RI Report	August 4, 1993
Submit Final Phase I RFI/RI Report	January 7, 1994

OU 7 PRESENT LANDFILL PHASE II CMS/FS

Submit Draft Phase II CMS/FS Report

May 9, 1997

Submit Final Phase II CMS/FS Report

November 4, 1997

OU 7 PRESENT LANDFILL PHASE II CORRECTIVE AND
REMEDIAL ACTION PP

Submit Draft Phase II PP

November 4, 1997

Submit Final Phase II PP

February 10, 1998

Submit Phase II Responsiveness Summary

June 15, 1998

Submit Final Phase II Responsiveness Summary

September 10, 1998

OU 7 PRESENT LANDFILL PHASE II CAD/FAD

Submit Draft Phase II CAD/FAD

September 10, 1998

Submit Final Phase II CAD/FAD

December 10, 1998

OU 7 PRESENT LANDFILL PHASE II CD/RD

Submit CD/RD Work Plan

December 10, 1998

Submit Draft Title II Design

August 11, 1999

Submit Final Title II Design

November 9, 1999

OU 7 PRESENT LANDFILL PHASE II CA/RA

Begin CA/RA Construction

June 14, 2000

TABLE 6
FEDERAL FACILITY AGREEMENT AND CONSENT ORDER
MILESTONE SCHEDULE

OU 9
ORIGINAL PROCESS WASTE LINES

OU 9 ORIGINAL PROCESS WASTE LINES PHASE I RFI/RI

Submit Draft Phase I RFI/RI Work Plan	June 8, 1990
Submit Final Phase I RFI/RI Work Plan	November 26, 1991
Submit Draft Phase I RFI/RI Report	April 11, 1994
Submit Final Phase I RFI/RI Report	September 6, 1994

OU 9 ORIGINAL PROCESS WASTE LINES PHASE I IM/IRA

Submit Draft Phase I Proposed IM/IRA Decision Document	May 1, 1995
Submit Final Phase I Proposed IM/IRA Decision Document	September 27, 1995
Submit IM/IRA Responsiveness Summary	February 8, 1996
Submit Final Phase I IM/IRA Decision Document and Responsiveness Summary	May 7, 1996
Submit CD/RD Work Plan	June 7, 1996
Submit Phase I IM/IRA Implementation Document	February 7, 1997
Submit IM Title II Design	June 9, 1997
Begin Phase I IM/IRA Construction	January 13, 1998

OU ORIGINAL PROCESS WASTE LINES PHASE II RFI/RI

Submit Draft Phase II RFI/RI Work Plan	March 10, 1995
Submit Final Phase II RFI/RI Work Plan	August 7, 1995
Submit Draft Phase II RFI/RI Report	July 9, 1997
Submit Final Phase II RFI/RI Report	December 4, 1997

TABLE 6
FEDERAL FACILITY AGREEMENT AND CONSENT ORDER
MILESTONE SCHEDULE

OU 10
OTHER OUTSIDE CLOSURES

OU 10 OTHER OUTSIDE CLOSURES PHASE I RFI/RI

Submit Draft Phase I RFI/RI Work Plan	November 27, 1991
Submit Final Phase I RFI/RI Work Plan	May 1, 1992
Submit Draft Phase I RFI/RI Report	August 25, 1994
Submit Final Phase I RFI/RI Report	January 30, 1995

OU 10 OTHER OUTSIDE CLOSURES PHASE I IM/IRA

Submit Draft Phase I Proposed IM/IRA Decision Document	May 26, 1995
Submit Final Phase I Proposed IM/IRA Decision Document	October 24, 1995
Submit IM/IRA Responsiveness Summary	March 6, 1996
Submit Final Phase I IM/IRA Decision Document and Responsiveness Summary	June 4, 1996
Submit CD/RD Work Plan	July 5, 1996
Submit Phase I IM/IRA Implementation Document	March 6, 1997
Submit IM Title II Design	July 7, 1997
Begin Phase I IM/IRA Construction	February 9, 1998

OU 10 OTHER OUTSIDE CLOSURES PHASE II RFI/RI

Submit Draft Phase II RFI/RI Work Plan	June 27, 1995
Submit Final Phase II RFI/RI Work Plan	November 21, 1995
Submit Draft Phase II RFI/RI Report	October 23, 1997
Submit Final Phase II RFI/RI Report	March 30, 1998

TABLE 6
FEDERAL FACILITY AGREEMENT AND CONSENT ORDER
MILESTONE SCHEDULE

OU 11
WEST SPRAY FIELD

OU 11 WEST SPRAY FIELD PHASE I RFI/RI

Submit Draft Phase I RFI/RI Work Plan	June 8, 1990
Submit Final Phase I RFI/RI Work Plan	January 2, 1992
Submit Draft Phase I RFI/RI Report	September 20, 1994
Submit Final Phase I RFI/RI Report	February 22, 1995

OU 11 WEST SPRAY FIELD PHASE I IM/IRA

Submit Draft Phase I Proposed IM/IRA Decision Document	October 10, 1995
Submit Final Phase I Proposed IM/IRA Decision Document	March 14, 1996
Submit Phase I IM/IRA Responsiveness Summary	July 22, 1996
Submit Phase I Final IM/IRA Decision Document and Final Responsiveness Summary	October 17, 1996
Submit IM Design CD/RD Work Plan	November 18, 1996
Submit Phase I IM/IRA Implementation Document	July 22, 1997
Submit IM Title II Design	November 18, 1997
Begin Phase I IM/IRA Construction	June 24, 1998

OU 11 WEST SPRAY FIELD PHASE II RFI/RI

Submit Draft Phase II RFI/RI Work Plan	August 21, 1995
Submit Final Phase II RFI/RI Work Plan	January 24, 1996
Submit Draft Phase II RFI/RI Report	August 13, 1997
Submit Final Phase II RFI/RI Report	January 16, 1998

TABLE 6
FEDERAL FACILITY AGREEMENT AND CONSENT ORDER
MILESTONE SCHEDULE

OU 12
400/800 AREA

OU 12 400/800 AREA PHASE I RCRA FACILITY INVESTIGATION/
REMEDIAL INVESTIGATION (RFI/RI)

Submit Draft Phase I RFI/RI Work Plan	May 8, 1992
Submit Final Phase I RFI/RI Work Plan	October 5, 1992
Submit Draft Phase I RFI/RI Report	April 20, 1994
Submit Final Phase I RFI/RI Report	September 15, 1994

TABLE 6
FEDERAL FACILITY AGREEMENT AND CONSENT ORDER
MILESTONE SCHEDULE

OU 14
RADIOACTIVE SITES

OU 14 RADIOACTIVE SITES PHASE I RCRA FACILITY INVESTIGATION/
REMEDIAL INVESTIGATION (RFI/RI)

Submit Draft Phase I RFI/RI Work Plan	May 22, 1992
Submit Final Phase I RFI/RI Work Plan	October 19, 1992
Submit Draft Phase I RFI/RI Report	December 20, 1994
Submit Final Phase I RFI/RI Report	May 23, 1995

TABLE 6
FEDERAL FACILITY AGREEMENT AND CONSENT ORDER
MILESTONE SCHEDULE

OU 16
LOW-PRIORITY SITES

OU 16 NO FURTHER ACTION JUSTIFICATION

Submit Draft No Further Action Justification
Document

March 4, 1992

Submit Final No Further Action Justification
Document

July 30, 1992