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COMPANY

RMRS Rocky Mountain
Remediation Services, L.L.C.
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Corrective Action Management Unit Interim Measure/Interim Remedial Action Decision Document and Application Support Document for Containerized Storage at the Rocky Flats Environmental Technology Site

DRAFT

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Draft
Corrective Action Management Unit
Interim Measure/Interim Remedial Action
Decision Document and Application Support
Document for Containerized Storage
at the Rocky Flats Environmental Technology Site

Rocky Mountain Remediation Services, L.L.C.

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ABBREVIATIONS AND ACRONYMS

ALARA	As Low As Reasonably Achievable
CAMU	Corrective Action Management Unit
CCR	Code of Colorado Regulations
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CHWA	Colorado Hazardous Waste Act
CSF	Containerized Storage Facility
cy	cubic yards
Decision Document	Interim Measure/Interim Remedial Action Decision Document
DOE	United States Department of Energy
ER	Environmental Restoration
ERDA	Energy Research and Development Administration
ft	feet or foot
PPE	Personal Protective Equipment
HW	Hazardous Waste
IA	Industrial Area
IA-East	Industrial Area-East
IA-West	Industrial Area-West
IDM	Investigation-Derived Material
IHSS	Individual Hazardous Substance Site
IM/IRA	Interim Measure/Interim Remedial Action
in.	inch or inches
nCi/g	nanocuries per gram
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NTS	Nevada Test Site
OU	Operable Unit
QA/QC	Quality Assurance/Quality Control
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethene
pCi	Picocuries
PPRG	Programmatic Preliminary Remediation Goals
Pu	Plutonium
RCRA	Resource Conservation and Recovery Act

RFCA	Rocky Flats Cleanup Agreement
RWSF	Remediation Waste Storage Facility
SE Quad	Southeast Quadrant
Site	Rocky Flats Environmental Technology Site
Site Vision	Rocky Flats Conceptual Vision
SW Quad	Southwest Quadrant
TCE	Trichloroethene
U.S.	United States
WAC	Waste Acceptance Criteria

EXECUTIVE SUMMARY

The Department of Energy is requesting that the State of Colorado designate a Corrective Action Management Unit (CAMU) for containerized storage of remediation wastes at the Rocky Flats Environmental Technology (RFETS). This facility, proposed to be located within the CAMU, would be known as the Containerized Storage Facility (CSF). This CSF CAMU designation is being requested to facilitate remedial activities in support of site closure at RFETS and may be used along with a separate bulk storage CAMU to provide a range of options for management of remediation waste. The remedy at RFETS for cleanup of contaminated areas is source removal, including treatment if appropriate, followed by offsite disposal of remediation waste. This is embodied in the strategy for Site closure. Planning assumptions in the site closure baseline, as described in the Ten Year Plan (DOE 1996b), call for offsite shipment for disposal of remediation waste as it is generated. This CAMU designation would serve as a contingency to this assumption, ensuring risk reduction activities could continue in the event immediate offsite shipment is not possible. The assumptions of site closure will be reviewed on a periodic basis along with funding profiles and risk reduction priorities to determine if or when implementation of this contingency would be appropriate.

The most cost effective approach to site closure is to ship remediation waste offsite as it is generated. The decision of whether or not to implement the CAMU contingency would need to balance cost issues with the ability to achieve timely risk reduction.

The lack of complete site characterization data for RFETS environmental media and decommissioning waste results in significant data gaps that impact waste volume estimates. Current remediation waste volume estimates range from approximately 54,000 cubic meters to over 300,000 cubic meters. These uncertainties with respect to waste volume estimates, as well as the unknown future availability of offsite disposal facilities underscore a need for a flexible waste management strategy in order to achieve cost effective and timely site closure. In addition to remediation waste storage, the CSF would also serve as a staging facility to support offsite shipment of the remediation waste.

This CSF CAMU designation request is presented as an Interim Measures/Interim Remedial Action (IM/IRA) Decision Document and Application Support Document. The CSF would support a cost-effective, flexible, and achievable remediation waste management strategy for RFETS. The overall objective of this designation request is to provide a proposed alternative and rationale that supports the goals of the Rocky Flats Cleanup Agreement (RFCA DOE 1996a) and site closure strategy. The CSF CAMU would support the RFCA goal (Preamble, B2(a)) of initially controlling sources of

contamination as a priority over offsite shipment. The CSF CAMU would allow early cleanup to proceed by providing interim onsite storage for remediation wastes in the event offsite shipment is delayed. The CSF would store waste ready to be shipped in the near-term to an available offsite disposal or treatment facility and waste not amenable for bulk storage.

Only remediation wastes would be managed in this facility. Remediation waste types include contaminated soil collected from cleanup actions, treated and untreated sludge and sediments, treatment by-products from groundwater, surface water, and/or soil remedial actions, investigation-derived materials (IDM) and contaminated building decommissioning debris. It is the intent of DOE to request a CSF CAMU for storage only. The period of operation would be consistent with the 25 year term of RFCA preamble definition of the intermediate site condition. Closure of the facility would be consistent with cleanup levels established in the RFCA and in accordance with 6 CCR 1007-3 264.552 (e) (4).

This decision document details how the CSF CAMU designation supports risk reduction and eventual site closure in the following ways:

- The CSF CAMU shall facilitate the implementation of reliable, effective, protective, and cost-effective remedies. This remedy is source removal coupled with offsite disposal. This would be implemented in accordance with the requirements of the RFCA, as a contingency to support site closure.

- The CSF CAMU designation would support a flexible waste management strategy that emphasizes near-term offsite remediation waste disposal, as emphasized in the site closure strategy included in the Draft Ten Year Plan, while recognizing the uncertainties associated with current remediation waste volume estimates and the timely availability of offsite disposal locations.

- The CSF CAMU would focus resources on immediate risk reduction by facilitating actual cleanup and source removal and deferring treatment not necessary to protect human health or the environment.

- The CSF CAMU may allow DOE to achieve economies of scale by consolidating remediation waste, making treatment and offsite disposal less costly and addressing long-term liability and safety issues.

This document demonstrates how the CSF meets all regulatory requirements for CSF CAMU designation by the CDPHE and supports the selected location and design concepts. It also contains

preliminary waste acceptance criteria, closure requirements, a timeline and a discussion of National Environmental Policy Act (NEPA) values.

Based on the waste management objectives of the RFCA and Draft Ten Year Plan, the best approach for an interim storage CSF CAMU was determined to be a metal building, e.g., a "Butler" type building, which would be constructed upon a concrete pad. The CSF CAMU would be located near the existing rail lines in the southwest quadrant of the Industrial Area. The design would incorporate features compliant with the Resource Conservation and Recovery Act (RCRA) Subtitle "C" requirements, as stated in the Code of Colorado Regulations (CCR) 6 CCR 1007-3, Part 264. The facility would consist of a maximum of four separate structures. Each structure would be able to store up to 25,000 cubic yards of remediation waste in containers for a maximum capacity of 100,000 cubic yards.

1. INTRODUCTION

This is an application for designation of a Resource Conservation and Recovery Act (RCRA) Corrective Action Management Unit (CAMU) and a Rocky Flats Cleanup Agreement (RFCA) Decision Document. The storage unit within the proposed CAMU area would be known as the Containerized Storage Facility (CSF). This Decision Document provides the United States Department of Energy's (DOE) technical justification and decision-making process for the option of siting and construction of a CSF for storage of remediation waste including decommissioning wastes, at the Rocky Flats Environmental Technology Site (RFETS) (Figure 1-1). The CSF CAMU designation is available as a regulatory alternative to facilitate the implementation of reliable, effective, protective, and cost-effective remedies.

The CAMU designation of a CSF is a necessary contingency to achieve the accelerated closure strategy that includes an aggressive schedule for near-term offsite shipment. The need for the CSF is dependent on the waste volumes generated during Environmental Restoration (ER) and Decommissioning activities and the ability to ship these wastes offsite. The estimated volumes are uncertain because characterization is not yet complete for the Industrial Area (IA). Final disposal sites will be dependent on waste volumes and contaminant characteristics, which have not yet been determined, and may not be available on an as needed basis to support RFETS cleanup. In addition, the overall process of offsite shipment and disposal may not be able to keep up with waste volume generation, thus, impacting risk reduction capabilities. The flexibility provided by the CSF contingency enhances DOE's ability to ensure timely and cost-effective site closure in support of the aggressive offsite waste shipment strategy embodied in the Site Draft Ten Year Plan (DOE 1996b).

This CSF CAMU designation will be used along with a separate bulk storage CAMU designation to provide a range of options for waste management. The specific options used will depend on several factors, or uncertainties, as described above. In general, both CAMUs are intended to support two different needs at RFETS; bulk storage and containerized storage. Bulk storage considerations include:

- Ease of management of large volumes of remediation waste;

- Storage of waste for a period of several years (5 to 20) for logistical or budgetary reasons or to achieve economies of scale for treatment or disposal; and

- High cost of containers, and large number required due to the large volumes of waste.

Containerized storage considerations include:

- Remediation waste not amenable to bulk storage, such as types of metal building debris;
- Near-term offsite shipment within approximately one year; and
- Areas where very small volumes of waste are generated and bulk removal is not efficient or necessary.

The designation of the CSF CAMU may provide an option for quick and effective handling of a larger volume of waste in a safer manner than would occur from multiple smaller storage and shipping areas spread across RFETS. Instead of managing waste from each contaminated area individually, the CSF CAMU contingency allows for remediation waste to be brought to one centralized facility for storage and preparation for offsite shipment, treatment, and disposal.

The type of wastes to be managed in the facility would consist of low-level, low-level mixed, and hazardous remediation waste which is not amenable to bulk handling and storage or not desirable for bulk storage since near term offsite shipment is planned. RFCA paragraph 25, definition bf. states:

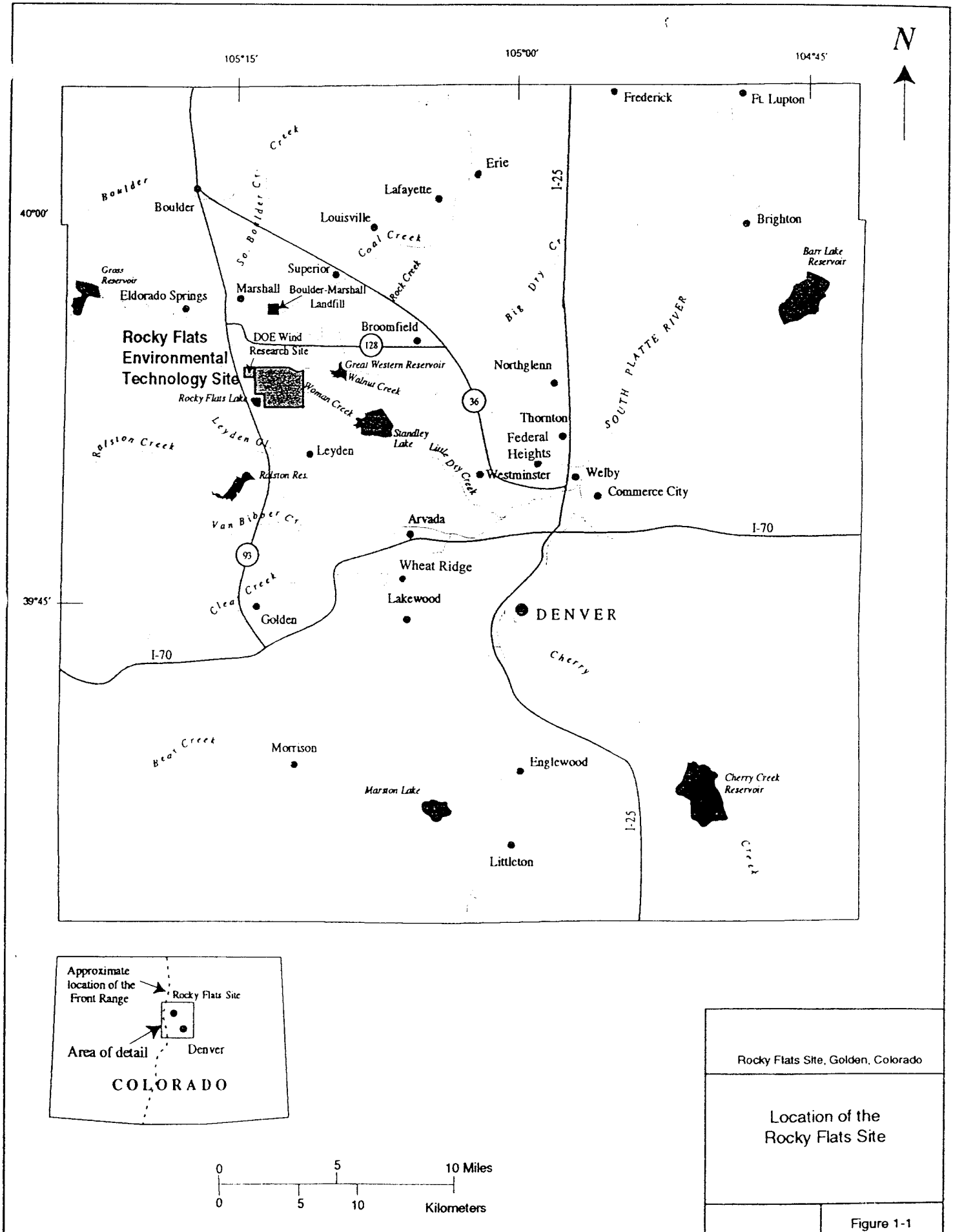
" Remediation waste means all:

(1) solid, hazardous, and mixed wastes;

(2) all media and debris that contain hazardous substances, listed hazardous or mixed wastes or that exhibit a hazardous characteristic; and

(3) all hazardous substances

generated from activities regulated under this Agreement as RCRA corrective actions or CERCLA response actions, including decommissioning. Remediation waste does not include wastes generated from other activities. Nothing in this definition confers RCRA or CHWA authority over source, special nuclear, or byproduct material as those terms are defined in the Atomic Energy Act."



Rocky Flats Site, Golden, Colorado

Location of the Rocky Flats Site

Figure 1-1

This Decision Document contains the information necessary for the Colorado Department of Public Health and Environment (CDPHE) to designate a CSF used for containerized storage. By having a CSF CAMU designation, the DOE can meet the waste management objectives consistent with the recently signed RFCA (DOE, 1996a). With the schedules proposed in the Draft Ten Year Plan, the flexibility provided by the CSF CAMU approach will provide contingency for facilitation of RFETS cleanup.

In addition to RFCA, the Draft Ten Year Plan has been developed to describe how accelerated cleanup and closure of RFETS would be achieved. The Draft Ten Year Plan addresses the management of remediation waste without a CSF CAMU. Included in the Draft Ten Year Plan, as Major Decision 4, are assumptions for waste storage and offsite disposal capabilities. The CSF CAMU designation is a contingency in the event a waste storage alternative is needed to support accelerated cleanup of the RFETS if offsite shipment of remediation waste cannot meet waste generation demands.

The CSF CAMU area is proposed to be located within the Industrial Area in the southwestern quadrant. The CSF would consist of metal storage buildings with chemically resistant sealed concrete floors, internal leak stops, and would be constructed to store containerized remediation waste. The facility would be modular in design and consist of several buildings so that facility size can be adjusted according to need. The facility is intended to support storage of up to 100,000 cubic yards of waste stored in 20 cubic yard " top loading containers".

It is the intent of the DOE to request a CSF CAMU for storage only, and that all waste would be removed from the CSF prior to Site closure.

1.1 DECISION DOCUMENT ORGANIZATION

This document is divided into six sections and is structured to provide the information required to support the technical justification for a CSF CAMU designation in sequence. This includes the following:

- Section 1.0.
- Section 2.0 identifies the need for a CSF CAMU based upon the criteria defined in 6 CCR 1007-3 Part 264 subpart S.

- Section 3.0 identifies the additional requirements that a CSF CAMU at RFETS would need to meet.
- Section 4.0 is a discussion of the alternatives considered for the CSF.
- Section 5.0 which is a description of the recommended design and a discussion of how the design meets the previously identified criteria. This section also includes facility specific details such as waste characteristics, waste acceptance criteria, and closure requirements.
- Section 6.0 is the proposed CSF Schedule.
- Section 7.0 lists references cited in the document.

1.2 CSF CAMU DECISION DOCUMENT SCOPE AND OBJECTIVES

The following two sections discuss the scope and objectives for this Decision Document.

1.2.1 Scope Description

The scope of this document includes the following sequential decision process: first, this document identifies a need for a CSF CAMU designation for containerized waste storage; second, this document identifies the requirements a CSF CAMU at RFETS would need to satisfy; and third, this document describes the recommended CSF alternative and how it meets the requirements identified above. The following facility-specific issues are described:

- Waste characteristics and source volume estimates;
- Conceptual waste acceptance criteria (WAC);
- General design requirements; and
- General monitoring requirements.

Pretreatment requirements of remediation waste, other than the general requirements included as part of the WAC, are not included in the scope of this document except for the purpose of cost estimating. The reason for this approach is that pretreatment is very specific to an individual action and specific waste types. Pending changes within the regulatory environment such as the proposed Hazardous Waste Identification Rule (HWIR), area-specific cleanup levels based upon future land use agreed to in the RFCA may influence treatment requirements on an action specific basis. The

pretreatment discussion for each accelerated cleanup action will be included in the project-specific Proposed Action Memorandum, Interim Measures/Interim Remedial Action Decision Documents, and Proposed Plans, or Remedial Action Plans for each specific IHSS, group of IHSS or building; allowing treatment to be tailored to the specific action.

Specific plans and documents detailing environmental monitoring, waste acceptance criteria, and closure are not in the scope of this document; however, the need for these plans is identified as a requirement under 6 CCR 1007-3 264.552. The approval process for a CSF CAMU is a three-step process as follows:

1. The first step is the IM/IRA Concept Validation/CAMU Designation, which consists of this IM/IRA Decision Document;

2. The second step is Design/Preparation for Construction, which consists of Title II design, Groundwater Monitoring Plan, Construction Quality Assurance Plan, Test Fill Plan, and Closure Plan preparation.

3. The third step, Construction/Preparation for Operations, will include Inspection, Operation, Waste Acceptance, Emergency, and Security Plans.

All phases would have State and public input with final State approval.

1.2.2 Decision Document Objectives

In order to meet the primary objective of designating a CSF CAMU, this document provides information on how a CSF CAMU at RFETS meets each of the seven decision criterion identified in the CSF CAMU regulations (6 CCR 1007-3, Part 264, Subpart S) as well as requirements defined in RFCA. This document also addresses how this facility would support the overall RFETS cleanup strategy described in the Draft Ten Year Plan.

The supporting objectives which lead to the determination that a CSF CAMU option is necessary include the following:

- In support of the RFCA and the Draft Ten Year Plan, the management of low-level, low-level mixed, and hazardous remediation waste must ensure the safety of the public, RFETS workers,

and the environment through reliable, effective, protective, and cost-effective implementation of interim and final remedies at the RFETS.

- The solution must support a flexible waste management policy combining contingencies for both long-term storage and shorter term staging/storage for offsite disposal as necessary. The solution must recognize the uncertainties surrounding waste volume estimates, future offsite disposal availability, and final disposal locations. A flexible policy would ensure that the most timely and cost-effective strategy that supports RFCA and Draft Ten Year Plan objectives can be implemented.

- The management of low-level, low-level mixed, and hazardous remediation waste must result in a cost-effective remedy that supports RFETS closure schedules.

- A means of consolidating remediation waste in one location must support near-term risk reduction and offsite waste shipment goals while addressing long-term liability and safety issues and remaining compatible with future land uses for the RFETS.

1.2.3 Site Justification for Designation

There are several considerations specific to RFETS that support the need for a CSF CAMU. The primary reason is to support timely risk reduction by providing an option that allows risk reduction to occur without slowdowns or impacts to cleanup capabilities. These considerations include:

- Cleanup of RFETS under the Ten Year Plan is completed within a much shorter time frame than previously considered. The Draft Ten Year Plan assumes:

  — all low-level and low-level mixed wastes will be shipped offsite for disposal;

  — low-level and low-level mixed waste generated in excess of shipping capacity will be managed in new onsite facilities; and

  — when ER and Decommissioning activities begin in earnest, storage facilities will be available to support remediation operations.

- The objective listed in the RFCA Preamble, Section (B)(2)(a) states "Initially, controlling the sources of contamination will take priority over offsite waste shipments to maximize risk reduction".

- Placement of remediation waste in existing permitted units is limited due to of a lack of storage capacity.
- Unresolved uncertainties associated with the waste volume estimates and timely offsite disposal availability for remediation wastes create a need for a flexible waste management strategy that incorporates a CSF CAMU contingency.

1.3 SITE DESCRIPTION

The RFETS is a government-owned, contractor-operated facility, that is part of the nationwide Nuclear Weapons Complex. The Rocky Flats Environmental Technology Site (RFETS) was operated for the United States Atomic Energy Commission from its inception in 1951 until the it was dissolved in January 1975. At that time, responsibility for RFETS was assigned to the Energy Research and Development Administration (ERDA), which was succeeded by DOE in 1977.

From 1953 through 1989, RFETS was used to produce components for nuclear weapons from materials such as plutonium, uranium, beryllium, and various alloys of stainless steel. Non-nuclear production continued through 1995 in Building 460. Additional plant missions included plutonium recovery and reprocessing, and waste management. Production activities included metal fabrication and assembly, chemical recovery and purification of process-produced transuranic radionuclides. The consequence of these various activities over nearly 40 years was the contamination of some of RFETS soils, groundwater, buildings, process pipelines, and associated waste management equipment.

The Rocky Flats Environmental Technology Site (RFETS) is located in northern Jefferson County, Colorado, approximately 16 miles northwest of Denver (see Figure 1-1). Boulder to the northwest, Broomfield and Superior to the northeast, Westminster to the east, and Arvada to the southeast, are all located within 10 miles of RFETS. RFETS consists of approximately 6,550 acres with most of the structures located within a central "protected area" of approximately 400 acres.

The majority of residential development within five miles of RFETS is located immediately northeast, east, and southeast of RFETS. Commercial development is concentrated near residential developments north and southwest of Standley Lake as well as around Jefferson County Airport, approximately three miles northeast of RFETS. Industrial land use within five miles of RFETS currently includes quarrying and mining operations. Open space lands are located northeast of RFETS, near the City of Broomfield, in small parcels adjoining major drainages and in small neighborhood parks in the cities of Westminster and Arvada. The west, north, and east sides of

Standley Lake are encompassed by Standley Lake Park open space. Irrigated and non-irrigated croplands, producing primarily wheat and barley, are located north and northeast of RFETS near the cities of Superior, Broomfield, Lafayette, Louisville, Boulder, and in scattered parcels adjacent to the eastern boundary of RFETS. Several horse operations and small hay fields are located south of RFETS. Future land use in the vicinity of RFETS could involve continued urban expansion, increasing the density of residential, commercial, and industrial land use in the area.

2. VERIFICATION OF CSF CAMU DESIGNATION CRITERIA

Designation of a CSF CAMU shall be in accordance with 6 CCR 1007-3 264.552 (c), Corrective Active Management Units. Each of the seven CAMU criteria listed below as numbers 1 through 7 is followed by a description of how the selected CSF demonstrates compliance with the criterion.

1) The CAMU shall facilitate the implementation of reliable, effective, protective, and cost-effective remedies (264.552 [c] [1]).

The CSF would ensure that RFETS can facilitate the implementation of reliable, effective, protective, and cost-effective remedies by:

The CSF CAMU provides reliability and effectiveness by allowing the remedy of source removal coupled with offsite disposal to continue in the event offsite disposal capabilities cannot support near term waste generation during remedy implementation. This allows contaminant sources to be removed sooner rather than remain exposed in the environment because no storage or offsite shipment is available. The CSF CAMU would be implemented to support continued risk reduction and mitigate delays to cleanup schedules in the event offsite disposal cannot occur in a timely manner, thereby facilitating remedy implementation.

The CSF CAMU would be protective by supporting timely removal of contaminant sources from the environment, reducing risk to human health and the environment.

This CAMU is cost effective from both location and design standpoints. This location provides a single location for storage and shipment since it is close to the RFETS rails spur and it has fewer security restrictions than other areas at RFETS. This reduces overall handling, inspection, and shipment costs. The design includes containment, retrievability, and inspection features which supports protectiveness of human health and the environment.

2) Waste management activities associated with the CAMU shall not create unacceptable risks to humans or to the environment resulting from exposures to hazardous waste or hazardous waste constituents (264.552[c][2]).

A CSF CAMU would not create unacceptable risks and eliminates potential risks that might be associated with alternative storage options, or leaving waste sources exposed in the environment because offsite disposal is not available. The CSF CAMU minimizes risks to human health and the environment in the following ways:

- Remediation waste removed from the environment would be put into an effective and protective facility. Contaminant sources would not be exposed to natural transport phenomena that could spread the contamination.

- Safety precautions would be taken during construction of the facility. All activities would be performed within the safety and radiological protection standards that exist at RFETS. Individuals with expertise specific to construction safety would ensure that construction activities are carried out in a safe manner. Construction quality assurance efforts would ensure that the CSF would meet all design criteria and performance standards for protectiveness.

- Onsite transportation of the wastes would be performed in a controlled environment over short distances on non-public roads with minimal or controlled traffic. Operations would be closely monitored and safely controlled. Because the distances would be short and the process would be tightly controlled, the risk of transportation accidents would be minimized. Administrative and engineered controls would be used to ensure that high winds do not mobilize the contamination during packaging or transporting. These measures may include precautions such as covered loads, spraying water or other dust suppressants on the loads, high wind shut downs, and other appropriate precautions.

- Indirect effects and cumulative impacts of the ER and decommissioning programs at RFETS would be reduced by utilizing the centralized CSF, and disposing of all low-level and low-level mixed remediation wastes in offsite permitted facilities. Impacts to the environment would be minimized because the footprint of contaminated areas would be reduced to one facility compared to multiple IHSSs that now exist, and the CSF would be constructed in areas that have already been disturbed, and thus will not impact previously undisturbed areas of RFETS.

3) The CAMU shall include uncontaminated areas of the facility, only if including such areas for the purposes of managing remediation waste is more protective than management of such wastes at contaminated areas of the facility (264.552 [c][3]).

The proposed area is not within an IHSS or thought to be an area of major contamination. Still, this site was selected for the following reasons.

- The area is near the RFETS rail spur and other offsite shipment facilities. This location reduces the waste handling requirements and enhances the ease of offsite shipment, thereby reducing potential exposure to RFETS workers and enhancing ease of shipment.

- The area is relatively free of obstructions such as buildings, utilities, and process waste lines which facilitates more rapid construction.

- The area is not within the Protected Area. This location, therefore, enhances the ease of use of the facility and reduces potential exposure to workers during waste transport. Waste transportation, inspection and handling requirements are less for areas outside the PA due to security restrictions. This reduces risk to workers.

- The area is within a previously disturbed industrial setting which limits the impacts to endangered species habitat.

- The area is relatively isolated from other areas of the site and it is not near major building clusters or environmental restoration sites. This offers some degree of additional protectiveness to workers supporting site cleanup tasks.

4) Areas within the CAMU, where remediation wastes remain in place after closure of the CAMU, shall be managed and contained so as to control, minimize, or eliminate future releases to the extent necessary to protect human health and the environment (264.552 [c][4]).

This criterion is not applicable. The designated use of this facility is for monitored, retrievable waste storage

5) The CAMU shall expedite the timing of remedial activity implementation, unless to do so would be inconsistent with 264.552 (c)(1) or (c)(2). See criteria 1 and 2 above.

This CSF CAMU is intended to be used as a contingency to the strategy in the Ten Year Plan. As previously mentioned, the Ten Year Plan assumes wastes can be shipped and disposed offsite as they are generated. In the event this assumption fails, contaminant sources would either be stored at the point of generation or left exposed in the environment. This would delay implementation of the remedy of source removal and offsite disposal. Implementation of this contingency would ensure that the timing of remedial activities would not be impacted. This allows expedited cleanup schedules to continue as planned.

6) The CAMU shall enable the use, when appropriate, of treatment technologies (including innovative technologies) to enhance the long-term effectiveness of remedial actions by reducing the toxicity, mobility, or volume of remediation waste that will remain in place after closure (264.552 [c][6]).

This criterion is not applicable. The designated use of this facility is for monitored, retrievable waste storage.

7) The CAMU shall minimize the land area of the facility upon which remediation wastes will remain in place after closure of the CAMU unless to do so would be inconsistent with 264.552 (c)(1) or (c)(2). See criteria 1 and 2 above.

This criterion is not applicable. The designated use of this facility is for monitored, retrievable waste storage

3. IDENTIFICATION OF SUBSTANTIVE CRITERIA

The approval of this IM/IRA Decision Document by the State of Colorado shall constitute approval of a CAMU designation for storage of containerized remediation waste. This section identifies the applicable requirements considered to be met upon approval of this decision document.

3.1 CSF CAMU OBJECTIVES

The designation of a Corrective Action Management Unit must be performed in accordance with the seven criteria enumerated in 6 CCR 1007-3, Part 264.552(c). Section 2 discusses how the CSF would meet these criteria.

3.2 DESIGN REQUIREMENTS

The following design and operating requirements will be addressed and implemented:

- Double containment (containers and secondary containment integral with concrete slab);
- Waste storage in inspectable containers ready for offsite shipment;
- Spill collection;
- Visual inspection;
- A groundwater monitoring system;
- Corrective action for releases; and
- A waste acceptance criteria, consistent with design and operation, that provides treatment of wastes where necessary.

Seven areas of consideration were used in the alternatives analysis. These include the following:

- Worker safety;
- Protection of human health and the environment;
- Transportation;

- Facility design, containment, and monitoring;
- Institutional controls;
- Cost; and
- Community acceptance.

These requirements are discussed in the alternatives analysis in Section 4 and are summarized in Table 4-1. Conceptual level cost estimates for the containerized storage alternatives are summarized in Table 4-2.

3.3 CAMU REQUIREMENTS

Additional requirements for designation are enumerated in Part 264.552(e) of the CAMU rule. The following are the additional CAMU requirements:

- Specification of the area configuration, Part 264.552 (e) (1);
- Specification of the design, operation, closure, and post-closure requirements Part 264.532 (e) (2) and (4); and
- Specification of groundwater monitoring requirements Part 264.552 (e) (3).

If implementation of this CSF CAMU becomes necessary to meet risk reduction goals, documentation and plans meeting the above requirements will be provided during the CSF design/preparation for construction phase.

4. ANALYSIS OF ALTERNATIVES AND SELECTION BASIS

A variety of alternatives were considered ranging from No Action to highly engineered storage vaults. Four alternatives were selected to represent the spectrum of technologies available. These alternatives serve as a contingency to the Draft Ten Year Plan should waste volume, storage, or shipping assumptions in the Draft Ten Year Plan prove invalid. These four alternatives are:

- No-Action - Remediation waste would be treated and shipped to an offsite disposal facility as soon as it is generated, or would remain in storage in containers at the point of generation, or cleanup would be delayed until removal and shipment would be possible.

- Slab on Grade - Waste is stored in containers placed on an above grade concrete slab; Secondary containment would be built into the slab. The facility would have no roof or walls.

- Metal Buildings - Waste would be enclosed in containers placed inside engineered metal buildings on concrete slabs; Secondary containment would be built into the floor slabs. This is current practice at the centralized waste storage facility at RFETS.

- Hardened Concrete Vault - Waste in containers would be placed in an above grade freestanding concrete structure. The floor of this structure would serve as a secondary containment system. This is a current practice at the DOE Savannah River Site.

All of the alternatives except No-Action, would provide handling and shipping capabilities for offsite transport. A summary of the alternatives analysis using the seven RFCA criteria is presented in Table 4-1. The following text discusses each of the alternatives.

The No Action Alternative was rejected because it would not support timely risk reduction for the following reasons:

- The current permitted storage capacity at RFETS would not likely support storage for the waste volumes estimated in the Draft Ten Year Plan in the event offsite shipment cannot keep pace with generation thus delaying cleanup

- If risk reduction activities do not occur in a timely fashion, more resources will be necessary to continue maintenance, monitoring, and inspection for areas not cleaned up, which limits the resources that can be applied towards actual risk reduction.

The Slab On Grade alternative was rejected because this design is not as protective of human health and the environment as other storage alternatives. This alternative would not protect the waste containers from corrosion due to the weather, or contaminants from dispersal by the wind if containers leaked. Waste containers may be exposed to the environment for unknown duration due to the uncertainties associated with offsite disposal resources. This would increase costs for maintenance, monitoring, and inspection. For these reasons, this alternative would not as adequately address worker safety; protection of public health and the environment; or facility design, containment and monitoring criteria as well as the Hardened Concrete Vault or Metal Building alternatives.

The Hardened Concrete Vault was rejected primarily due to cost. It would adequately address worker safety, protection of public health and the environment, and containment requirements. For short-term storage, it would not provide any more protectiveness than the Metal Buildings. If the facility needed to be utilized for more than 30 years, the Hardened Concrete Vault might be the best alternative. However, the CSF facility is intended for short-term use consistent with the 25 year time limit for the intermediate site condition as defined in the RFCA preamble. The added durability of the Hardened Concrete Vault, therefore, was not a factor in the selection process. The Hardened Concrete Vault also might not offer the flexibility needed for changing waste volumes or transportation requirements. Once constructed, the facility would be difficult to reconfigure. When the facility is no longer needed, its closure would be more complicated and costly than the other alternatives since by design, this type of structure is more permanent by design.

The Metal Buildings alternative was selected as the best alternative for short-term storage consistent with the intermediate site condition as defined in the RFCA preamble (12 to 20-25 years). The Metal Buildings would provide adequate protectiveness at a lower cost. Other advantages that Metal Buildings offer include:

- Containers would be protected from the elements and potential airborne dispersal should any of the containment units fail. . Existing RFETS air compliance programs will incorporate the CSF facility.

- The use of a modular building design allows flexibility in addressing changing storage requirements, i.e. buildings could be constructed as needed.

- The level of containment would be protective of workers, the public, and the environment. The combination of strong tight containers, an enclosed building, a leak collection system, chemical resistant materials where applicable, and secondary containment would provide protectiveness to surface water and ground water.

- Metal buildings would offer the same protection as more sophisticated designs, and at a lower cost. The use of pre-engineered buildings would further reduce cost and expedite the schedule. Lower costs allows more resources to be directed towards risk reduction activities.

- Use of the Metal Buildings alternative for the storage of waste is an established and implementable technology currently in use at RFETS and elsewhere.

- Closure of the facility would be less complicated and more cost effective than the hardened concrete vault.

Table 4-1 Summary of Analysis of Alternatives

RFCA CRITERIA				
Final Design Alternatives	**Worker Safety**	**Protection of Public Health and the Environment**	**Transportation**	**Facility Design, Containment and Monitoring**
No Action	Cleanup schedules might be impacted if offsite shipment cannot occur. Exposure could result if sources are not contained or if waste leaked from containers left at project site.	Visual inspections would allow leaks to be detected before release to the environment. However, Exposed containers could eventually pose a risk. Lack of adequate storage capacity could delay some remediation work.	The necessity of immediate shipping could limit transportation options and cleanup schedules. Loading and unloading could be hampered by the lack of a waste handling facility. No centralized facility to routinely handle large volumes increases risk of spills from multiple small operations with less handling ability.	Waste will not be consolidated. Sources removals may not be conducted in a timely fashion. Site monitoring requirements would not be reduced through cleanup activities.
Slab on Grade	Exposure via wind dispersal could result if waste leaked from containers. Construction of the facility poses minimal risk. More maintenance on containers would be needed.	Visual inspections would allow leaks to be detected before release to the environment. Containerized waste would be stored uncovered prior to shipment. Exposed containers could eventually pose a risk to the human health and the environment, if not maintained.	The Slab on Grade would facilitate transportation. Facility could double as a loading and unloading facility. Facility could be accessed from many different sides. Facility would not be expected to have a detrimental impact to traffic flow onsite.	Containers and structure would be exposed to the elements which could accelerate deterioration and leakage. The slab itself is a containment and collection system. Exposed contaminants could be subject to airborne migration.
Metal Buildings	Waste would be isolated from workers. Construction of the facility poses minimal risk. Less container maintenance would be needed.	Visual inspections would allow leaks to be detected before release to the environment. Waste containers would be sheltered from the elements.	The metal buildings would allow coordination of transportation and more ease of transportation than vaults. CSF would double as a loading and unloading facility. Facility is not expected to have a detrimental impact to traffic flow.	Secondary containment would be incorporated into the building design. Monitoring would be accomplished through visual inspection and secondary containment system.
Hardened Concrete Storage Vault	Waste would be isolated from workers. Construction of the facility poses minimal risk. Destruction and decommissioning of facility would be more difficult than other alternatives.	Visual inspections would allow leaks to be detected before release to the environment. Vault would provide better long-term protection than other alternatives. Waste containers would be sheltered from the elements.	Access to facility would be more limited. Facility would not be expected to have a detrimental impact to traffic flow.	Secondary containment would be incorporated into the building design. Monitoring would be accomplished through visual inspection and secondary containment system.

Table 4-1 Summary of Analysis of Alternatives (continued)

	RFCA CRITERIA		
	Institutional Controls	**Cost**	**Community Acceptance**
No Action	The current RFETS access limitations and procedures would be institutional controls for waste stored at remedial action and D&D sites prior to shipment off site. Each site with waste stored pending shipment would require regularly scheduled inspections. Once shipped, institutional controls would exist offsite; the nature of those institutional controls would be dependent on the selected disposal facility.	Least expensive of alternatives. Some cost savings could be realized by not constructing a storage unit. Delayed source removals could increase inspection and monitoring costs for RFETS.	Waste containers would continue to be exposed to the environment prior to shipment. Supports desire for offsite disposal.
Slab on Grade	Institutional controls requiring continued maintenance, inspection and monitoring of the facility would be required. Since the use of the facility is for short-term storage, controls beyond existing controls are not necessary.	Least expensive storage facility to construct and operate at least in the short term. Cost savings come at the expense of protectiveness due to lack of an enclosed facility. Cost higher for maintenance and inspection. Final disposal costs would still apply.	This alternative provides less protective measures to the public than the other two facilities evaluated. The Slab on Grade supports the overall RFETS strategy of offsite shipment. It is easy to retrieve waste and transport it. Supports desire for offsite disposal.
Metal Buildings	. Institutional controls requiring continued maintenance, inspection and monitoring of the facility would be required. Since the use of the facility is for short-term storage, controls beyond existing controls are not necessary.	Metal Buildings were in the mid-range of costs for the storage facilities evaluated. Final disposal costs would still apply.	The metal buildings provide better monitoring and retrieval capabilities. The metal buildings support the overall RFETS strategy of offsite shipment. It is easy to retrieve waste and transport it. Supports desire for offsite disposal.
Hardened Concrete Storage Vault	Institutional controls requiring continued maintenance, inspection and monitoring of the facility would be required. Since the use of the facility is for short-term storage, controls beyond existing controls are not necessary.	Most expensive of the storage facility alternatives to construct due to expense of constructing hardened concrete shell. Less resources would be available for risk reduction. Final disposal costs would still apply. Decommissioning costs higher.	This alternative is protective. Facility is more permanent than other facilities considered but still can support Draft Ten Year Plan goals. Waste is more difficult to retrieve. Closure of this alternative would be more difficult. Supports desire for offsite disposal.

Table 4-1 Summary of Analysis of Alternatives (continued)

Final Design Alternatives	NEPA VALUES SHORT-TERM EFFECTIVENESS	NEPA VALUES LONG-TERM EFFECTIVENESS
No Action	Additional effort would be needed for inspecting waste left at cleanup sites until shipment. The limited ability to store large quantities of waste on site could limit risk reduction activities in the short term.	All offsite disposal facilities under consideration have been designed for long-term use. The No Action alternative would not be effective if it causes significant delay of source term removals.
Slab on Grade	Rapid construction due to modular design would accelerate the availability of the facility. Un-enclosed transport containers could be subject to weather damage. Slab drainage and leak collection system could be impacted by heavy rains. This alternative would not be suitable for volumes over 100,000 cy, because of space restrictions. Allows timely risk reduction to continue.	Not designed as a long-term facility. No long-term protection. All offsite disposal facilities under consideration have been designed for long-term use.
Metal Buildings	Rapid construction due to modular design would accelerate the availability of the facility. This alternative would not be suitable for volumes over 100,000 cy, because of space restrictions. Allows timely risk reduction to continue.	Not designed as a long-term facility. All offsite disposal facilities under consideration have been designed for long-term use.
Hardened Concrete Storage Vault	Rapid construction due to modular design would accelerate the availability of the facility. Containerized waste storage inside a concrete vault would not be suitable for volumes over 100,000 cy, because of space restrictions. Allows timely risk reduction to continue.	Designed as a long-term, permanent facility to support long-term waste placement.

Table 4-2 Alternative Costs for the Containerized Waste Storage Facility

Alternative	Hardened Concrete Vault	Slab On Grade	Metal Buildings	No Action
Cost Element				
Containers	$ 69,700,000	$ 69,700,000	$ 69,700,000	N/A*
Packaging	$ 920,000	$ 920,000	$ 920,000	N/A*
Characterization	$ 3,920,000	$ 3,920,000	$ 3,920,000	N/A*
Transportation to Facility	$ 770,000	$ 770,000	$ 770,000	N/A
Design, Construction Management, & Project Management	$ 3,750,000	$ 1,228,000	$ 3,690,000	N/A
Preconstruction Activities	$ 76,000	$ 76,000	$ 76,000	N/A
Site Preparation	$ 1,460,000	$ 1,210,000	$ 1,210,000	N/A
Construction	$ 33,540,000	$ 2,180,000	$ 9,310,000	N/A
Operations	$ 6,320,000	$ 7,100,000	$ 6,320,000	N/A*
Monitoring & Inspections	$ 13,420,000	$ 10,970,000	$ 13,420,000	N/A*
Closure	$ 4,520,000	$ 2,320,000	$ 3,350,000	N/A
Total Estimated Cost	$ 138,396,000	$ 100,394,000	$ 112,686,000	N/A*

** Some costs for this element would be incurred if any cleanup were to occur under this alternative. These costs were applied to the storage alternatives for the purposes of supporting selection of the most cost effective containerized storage alternative.*

5. FACILITY DESCRIPTION

This section describes the conceptual design of the CSF proposed for the management of remediation wastes. The CSF is proposed to be located in the southwest corner of the Industrial Area (Figure 5-1). The CSF would be a series of engineered metal buildings, as shown on Figure 5-2, to serve as a staging facility for the receiving, storage, and ultimate shipment of remediation waste. The proposed location benefits from minimal site preparation costs, and the presence of an adjacent rail spur for offsite shipment. A footprint of 6.8 acres would include up to four modular buildings which could store 5,000, 20-cu-yd-capacity containers, for a total capacity of up to 100,000 cy. The modular design would allow the final configuration and storage capacity to be flexible in order to meet changing waste-storage requirements. The metal buildings would be constructed on reinforced sealed concrete foundations. The remediation waste would be effectively isolated from the environment by the following barrier systems:

- Containers and
- Structural concrete floor slab with chemical resistant coating and an integral leak collection system designed to minimize clogging.

The CSF would have a design life of up to twenty-five years (e.g. consistent with the intermediate site condition as defined in the RFCA preamble) at which time the remediation waste would have been transported to an offsite facility for treatment and disposal.

5.1 DESIGN CONSIDERATIONS

Specific design requirements have been incorporated into the conceptual design such as leak collection. Details of how these requirements will be met will be submitted during the design phase.

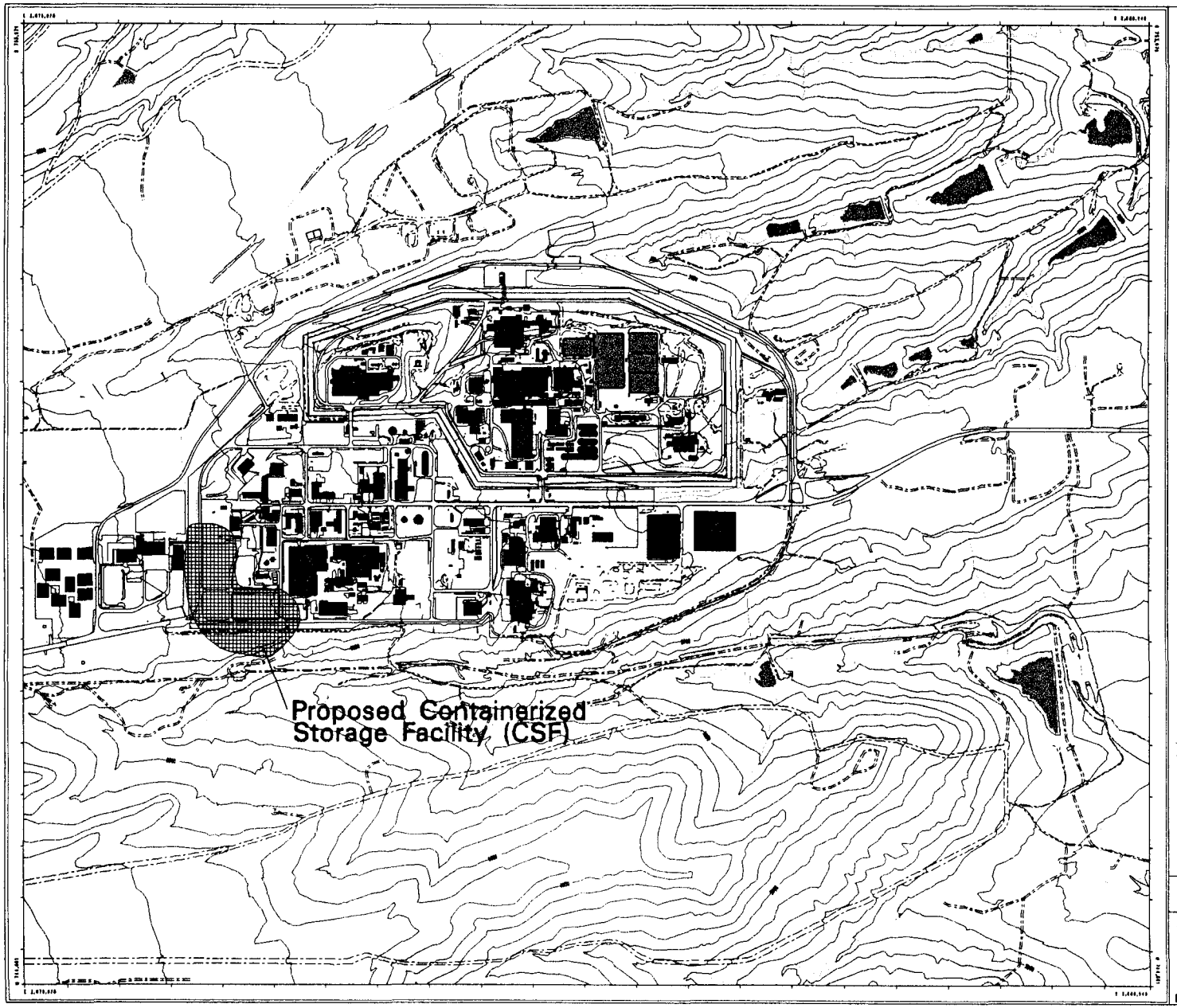


Figure 5-1
Location Map for Containerized Storage Facility (CSF)

EXPLANATION

Containerized Storage Facility (CSF)

Standard Map Features

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' intervals)
- Rocky Flats boundary
- Paved roads
- Dirt roads

Data sources:
Buildings, roads, and fences provided by Kaiser-Hill Company, LLC, 1996 Rocky Flats, Inc. - 1995.
Hydrology provided by [illegible] - [illegible]

Scale = 1 : 17620
1 inch represents approximately 1468 feet

400 0 800 1600 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
RMRS Rocky Mountain Remediation Services, L.L.C.
Geographic Information Systems Group
Rocky Flats Environmental Technology Site
P.O. Box [illegible]
Golden, CO [illegible]

MAP ID: 97-0009 November 25, 1996

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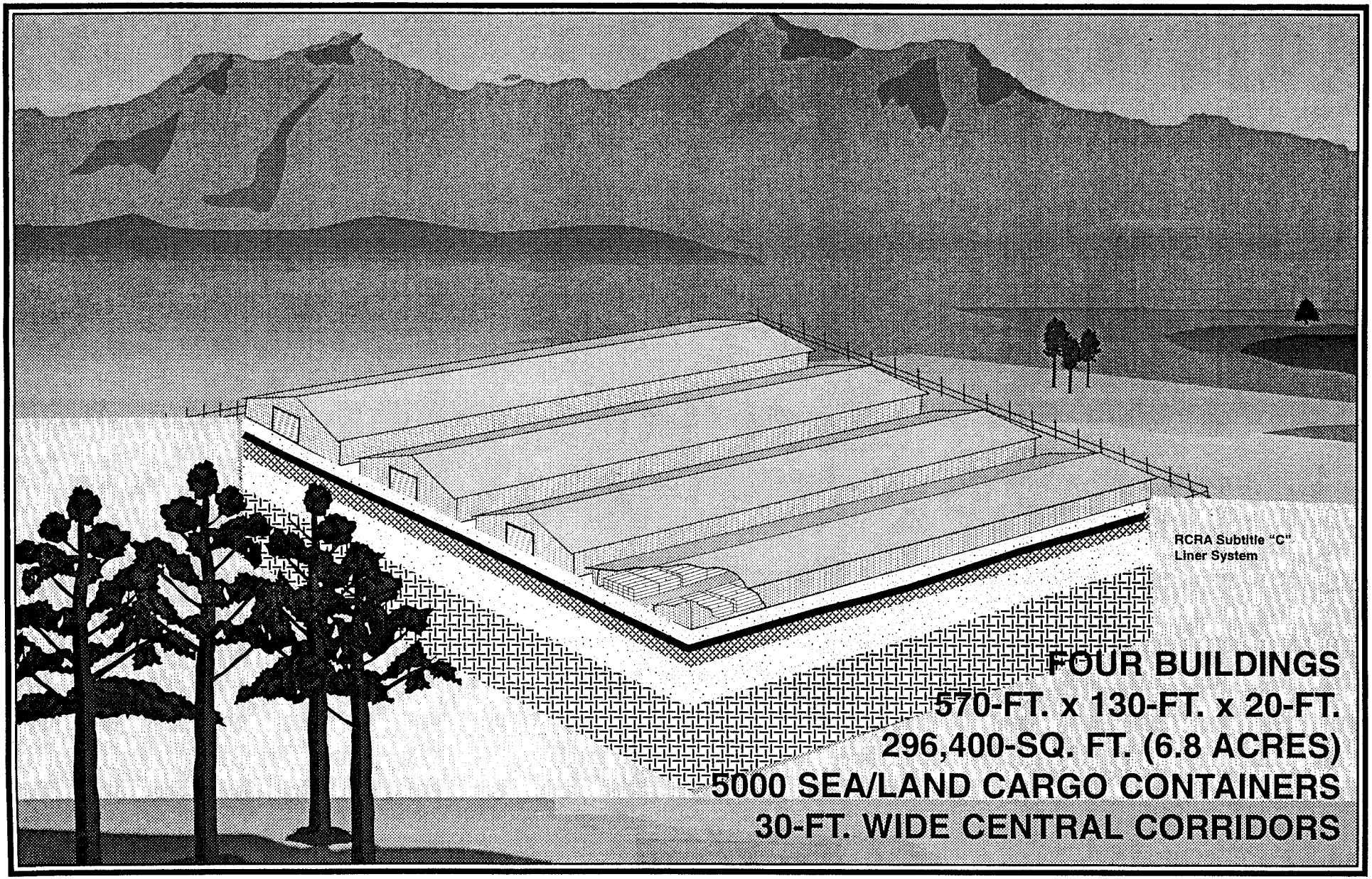


Figure 5-2

CONTAINERIZED STORAGE FACILITY

The following features were used to develop a conceptual cost estimate (see Table 5-1):

- Four metal buildings, each 570 ft. long by 130 ft. wide and 20 ft. eave height;
- Each building would be constructed, when required, dependent upon waste volumes;
- Buildings would be constructed over a reinforced concrete floor;
- A maximum storage capacity total of 5,000 - 20 cu yd containers for the entire four building CSF;
- Containers would be stacked up to four high in the buildings;
- Each building would have a thirty foot wide central corridor and personnel access aisles for routine monitoring and inspection;
- A twenty-five-year design life ;
- 5,000 stackable, reinforced bathtub style metal containers with over-under lids and fork tubes; and
- Groundwater monitoring wells (six total maximum) would be installed both hydraulically up gradient and hydraulically down gradient and would be monitored through the life cycle of the CSF (20 years).

TABLE 5-1 SUMMARY OF CONSTRUCTION COSTS FOR THE CSF

TASK DESCRIPTION	ESTIMATED COST
Containers	$69,700,,000
Site Preparation	$ 1,210,000
Engineering Design / Project & Const. Mgmt.	$ 3,690,000
Construction	
A. Four Metal Buildings	$ 9,275,000
B. Leak Collection System	$ 35,000
Total Construction Cost [1]	**$82,413,000**

Notes:
1. A 25% contingency cost is included in the estimate.

The integral leak collection and retrieval system designed to minimize clogging and built into the chemically resistant coated concrete floor would collect any potential leakage which would be transferred to a facility for treatment.

5.2 WASTE CHARACTERISTICS AND CONCEPTUAL WASTE ACCEPTANCE CRITERIA

The following sections describe the waste and associated acceptance criteria for the CSF. Section 5.2.1 gives a brief identification of the waste characteristics which could be received at the CSF. Section 5.2.2 gives estimates of the waste volumes and section 5.2.3 briefly explains what the Waste Acceptance Criteria (WAC) would address for the CSF.

5.2.1 Remediation Waste Characterization

This section describes the general waste types characteristics which may be placed in the CSF. Identification of waste characteristics, sources and projected volumes for the CSF clarify and substantiate the need for a contingency to existing waste storage. Only remediation and decommissioning waste would be considered for management in this facility.

RFCA defines remediation waste in paragraph 25, bf as "all:

> (1) solid, hazardous, and mixed wastes; (2) all media and debris that contain hazardous substances, listed hazardous or mixed wastes or that exhibit a hazardous characteristic; and (3) all hazardous substances generated from activities regulated under this Agreement as RFCA corrective actions or CERCLA response actions, including decommissioning. Remediation waste does not include wastes generated from other activities. Nothing in this definition confers RCRA or CHWA authority over source, special nuclear, or byproduct material as those terms are defined in the Atomic Energy Act."

In addition, low-level waste, as defined by RFCA, is radioactive waste that is not high-level waste, spent nuclear fuel, by-product material, or transuranic waste (although it may contain small amounts of transuranic elements). The majority of the low-level waste managed at the CSF would have an average radionuclide activity less than ten nanocuries per gram (nCi/g) based on the Hazard Categorization Analysis (Kaiser Hill, 1996a).

Remediation waste types for the CSF are expected to include the following:

- Contaminated soil collected from remedial actions, usually treated to remove volatile organics;
- Treated and untreated sludge and sediments;
- Treatment by-products from groundwater, surface water, and/or soil remediation actions;
- IDM from characterization activities, such as wells and borings, if the IDM is characterized as hazardous, low-level, or low-level mixed remediation waste;
- Decommissioning waste which has been characterized as hazardous, low-level, or low-level mixed waste. Decommissioning includes all wastes generated after deactivation. This waste would include contaminated building rubble, equipment, protective equipment, and utilities .

5.2.2 Remediation Waste Volume

Waste volume estimates were based on planned risk reduction activities. A preliminary estimate of remediation waste volumes that may require storage prior to ultimate disposal is presented in Table 5-2 below. The total volume of remediation waste is estimated to range from 54,000 cubic yards up to 300,000 cubic yards. These estimates were based on current information and were obtained from the Draft Ten Year Plan waste volumes. These volume estimates are not intended to limit the size of the facility, but serve as a tool for the decision making process.

Table 5-2 Remediation Waste Volumes for the Containerized Storage Facility

Remediation Waste Types	Total Estimated Volume (m^3)	Total Estimated Volume (cu yd)	Volume Ranges (m^3)
Low-Level Waste	40,716	53,293	32,573 m^3 to 81,432 m^3
Low-Level Mixed Waste	53,438	69,945	42,750 m^3 to 106,876 m^3
Total[1]	94,000	123,200	75,323 m^3 to 188,308 m^3

Notes:
1. These waste volumes have an error range of -50% to +100% based on available data.

The actual volume of soil defined by the Tier I and Tier II in RFCA Action Levels and Standards Framework could be larger or smaller because volume estimates were made using preliminary data from limited characterization.

5.2.3 Conceptual Waste Acceptance Criteria

The purpose of the CSF is to provide ER and Decommissioning activities the services of a staging facility for the receiving, interim storage, and ultimate shipping of remediation waste. A detailed Waste Acceptance Criteria (WAC) will be developed during the design phase of the CSF. WAC would be developed for the CSF to ensure remediation wastes comply with applicable regulatory and site requirements. The CSF would accept remediation waste in transportable containers which have accompanying documentation that meets the waste acceptance criteria of the anticipated target disposal facility. The WAC would be specific for the CSF and may not address specific requirements as required by other offsite disposal facilities which ultimately would receive the waste. For criteria which can be quantified, specific levels would be identified.

The following objectives would be achieved in compliance with the WAC:

- Remedial wastes are effectively isolated from potential natural environmental pathways to protect the public health and the environment;

- Operating personnel of the CSF ensure continuous protection to the public health and the environment;

- Remediation waste is routinely monitored and inspected; and

- Characterization data of the remediation waste is documented to the extent necessary to support project specific waste management objectives and WAC requirements for the CSF.

As previously mentioned, the CSF would receive remediation waste from ER and decommissioning activities which would be handled as bulk wastes in customized containers versus crates or drums.

The WAC would provide physical and chemical limitations and requirements for the proper management of remediation waste. Historical knowledge including previous analytical data and/or current chemical and radiological analyses would become the tools to document accurate characterization of the remedial waste.

5.2.4 Physical Requirements

A summarized list of physical requirements which the WAC would address are listed below:

- Physical properties of bulk wastes such as soils, sediments, and treated sludge (e.g. maximum size range, specific weight, moisture content);
- Physical properties of wastes classified as debris (e.g. maximum size range, specific weight, moisture content, non-biodegradable);
- No free liquids (e.g. 6 CCR 1007-3 Subpart N 264.314; EPA Paint Filter Test);
- Conditions for filled and emptied containers (6 CCR 1007-3 Subpart N 264.315); and
- Prohibitions of containerized gases, ignitable or reactive wastes (6 CCR 1007-3 Subpart N 264.312, 313).
- Lack of free liquids shall be demonstrated by EPA Test Method 9095 (Paint Filter Test).

5.2.5 Chemical Requirements

A summarized list of chemical requirements which the WAC would address are listed below:

- Chemical analyses, acceptable analytical methods, and detection ranges;
- Prohibited constituents and chemical characteristics including reactive or ignitable substances (e.g. pyrophoric uranium; 6 CCR 1007-3 Subpart N 264.312);
- Prohibition of incompatible waste (6 CCR 1007-3 Subpart N 264.313);
- pH limitations; and
- Composition of wastes.

5.2.6 Health and Safety Issues

The primary health and safety concerns for the CSF are itemized as follows:

- Operations involving heavy equipment (e.g. large forklifts/cranes) for the handling of containers;
- Health and safety issues for the industrial worker;
- Threshold limits for radionuclides and organic compounds for the CSF; and

The CSF would require operating and administrative procedures for the assurance of safe operations involving heavy equipment and protective measures for the industrial worker.

The WAC would address the following radiological requirements:

- Radiological analyses for characterization; and
- Threshold limits of radionuclides for the CSF.

The majority of low-level remediation waste to be managed at the CSF would have an average radionuclide activity less than ten nanocuries per gram (nCi/g) as mentioned previously under section 5.2.1. A preliminary hazard category analysis was performed for the CSF. The CSF was categorized as less than a Category 3 facility and designated as a Radiological Non-nuclear Facility based on preliminary threshold quantities of plutonium and other radioactive isotopes (Kaiser-Hill, 1996). This categorization analysis was based on sampling data from some of the more radioactive IHSSs at RFETS (e.g., 903 Pad and Lip Area, and the Original Process Waste Lines). To be conservative in the hazard analysis, the highest activity concentrations were used from these IHSSs.

5.3 TECHNICAL AND ADMINISTRATIVE CONTROLS

Technical and administrative controls would be implemented in order to ensure that human health and the environment would be protected from areas where present or past activities preclude unrestricted access or use. Discussion of these controls for the CSF are grouped into four major elements:

- Engineering Controls (leak collection/detection system);
- Facility Monitoring (e.g. groundwater monitoring plan);
- Operational Controls (e.g. waste acceptance criteria, visual inspection, Health and Safety plan, contingency/spill response plan); and
- Administrative Controls (e.g. limited access; institutional controls).

Engineering controls - There would be specific engineering controls designed into the facility in order to support protection of human health and the environment throughout the operational life of the facility. The following engineering controls for the CSF are:

- Double containment (e.g., containers and secondary containment by concrete floor slab);
- Leak collection/removal is an integral collection/removal system constructed in the floor slab with sumps and piping; and
- An internal infrastructure designed to facilitate retrieval of wastes.

Facility Monitoring - An extensive monitoring network would ensure no releases pass undetected from the unit boundary. This would include both air and surface water monitoring stations and groundwater monitoring wells positioned hydraulically upgradient and hydraulically downgradient of the CSF. A groundwater monitoring plan in compliance with CCR 1007-3 264.552 (e) (3) would be developed. These requirements would also be integrated into the overall RFETS monitoring program to ensure that a comprehensive network was in place to help protect human health and the environment.

Operational Controls - Operational controls would be put in place to ensure that waste management operations were conducted in such a way as to minimize the risk of release from the facility or exposure to personnel:

- An agency-approved waste acceptance criteria specifying a safety envelope for chemical and physical waste parameters including appropriate treatment requirements;

- An operational health and safety plan approved by the agencies designed to provide operational constraints for personnel protection, weather conditions, decontamination procedures, training requirements, emergency response, and health and safety monitoring;

- Standard operating procedures that establish clear, repeatable, guidelines for conduct of operations, including packaging and transporting of waste from decommissioning activities or IHSS remediation locations to the CSF;

- Numerous quality assurance procedures from construction quality assurance, to procedural audits, all designed to ensure the facility and operations meet designated performance standards and approved, as appropriate, by the State;

- Closure plans that define how the facility would be decommissioned after the life of the operations and the performance standards for closure per 6 CCR 1007-3 264.552 (e) (4); and

- Agency approved contingency/spill response plans would define how the facility responds to a release of waste or constituents from the CSF.

Administrative Controls - Administrative controls are defined to ensure that risk of exposure during construction, operations, and closure are minimized. These may include:

- Appropriate institutional controls (e.g. warning signs, fences);

- Security plans which define site restriction requirements throughout the life of the project; and

- Cleanup standards which define the level of cleanup necessary to certify closure.

In summary, numerous technical and administrative controls would be in place to insure that all aspects of this effort were conducted in such a way that risks to human health and the environment would be minimal.

5.4 NEPA VALUES

The proposed CSF would be authorized using a single, integrated Decision Document that would be signed by the DOE and the State of Colorado when approved. The Decision

Document and review process would satisfy the documentation and procedural requirements of the RFCA. The National Environmental Policy Act (NEPA) process was integrated into the RFCA documentation and procedure, especially public involvement and decision-making, to reduce duplication and paperwork, and streamline the combined NEPA/CERCLA/RCRA process. In accordance with the DOE Secretarial Policy issued in June 1994, integrated CERCLA/RCRA documents for environmental clean up activities are to incorporate NEPA values to the extent practical. This policy is intended to minimize the cost and time for document preparation and review while meeting the requirements of both acts.

The CSF would be anticipated to minimize cumulative effects on the environment by being placed in the Western Industrial Area because of the following:

- The proposed area in the industrial area has been already disturbed and consolidation of waste is achieved;
- Existing infrastructure already exists which would support the CSF; and
- The proposed area was selected based on a detailed siting study which screened out sensitive areas (e.g. areas populated by the endangered species, the Preble's Meadow Jumping Mouse, steep slopes, wetlands, etc., were avoided).

The analyses required by NEPA have been integrated throughout the decision process. Based on the analyses, the decision-making process requires no further documentation to complete the NEPA process.

5.4.1 ANTICIPATED DAMAGES TO NATURAL RESOURCES

The alternatives analyzed, excepting the No Action alternative, would not result in irreversible damage to natural resources because releases to the environment would be averted through the use of double containment and leak collection systems for waste storage preceding shipment. In addition, none of the alternatives analyzed will result in irreversible and irretrievable damages to natural resources because the remediation waste stored in the proposed CSF CAMU is to be shipped offsite to a disposal facility.

5.5 CONTAINERIZED WASTE STORAGE FACILITY OPERATIONS

The CSF would be operated and maintained under a number of administrative requirements, as previously mentioned in section 5.3 "Technical and Administrative Controls,". Administrative controls would be administered for activities of waste operations in the following areas:

- WAC documents and forms - These would be required to demonstrate compliance with the CSF WAC requirements previously mentioned in section 2.2;
- Operating procedures - Procedures for handling and placement of waste, facility maintenance and documentation to ensure safe and efficient operation of CSF;
- Training plan - A plan to administer required training for operating personnel in procedures, safety, and quality assurance;
- Health & Safety Plan - The health and safety requirements for operating personnel to conduct operations in a safe manner;
- Contingency/spill response plan would define, per Subpart 264.304, how the facility would respond to a release of waste or constituents from the CSF;
- Limiting operating conditions - Identification of abnormal events which would require operations to temporarily stop activities (e.g. excessive wind velocities, and other weather conditions) to ensure safety to the public, the workers, and the environment
- Administrative procedure and plans - Additional procedures and plans to ensure compliance with RFCA, DOE orders, and RFETS rules and policies;
- Control of fugitive dust emissions - Facility Monitoring Plan as cited in section 5.3 to reduce dust emissions and monitor results to protect the public and worker; and
- Closure and Post-Closure Plan - This would include the requirements and performance standards for closure per 6 CCR 1007-3 264.552 (e) (4) to close the facility after the end of its operational life.

Additional requirements addressed in the WAC or Facility Operations Plan for compliance would be administrative controls. The following requirements would ensure the CSF to be operated in a safe manner:

- Recordkeeping and documentation;
- Waste information from process knowledge and/or sampling and analysis data for waste characterization;
- Quality assurance/quality control (QA/QC) certification program and verification;
- Status reports and waste forecasts;
- Shipment notification;
- Packaging and labeling requirements.

5.6 CONCLUSION

The CSF is proposed as a contingency to meet the accelerated risk reductions described in the Draft Ten Year Plan. The Draft Ten Year Plan assumes remediation waste can be shipped offsite at the same rate it is generated. The CAMU is proposed to address the contingency that offsite waste shipment and disposal are not available when the wastes are generated. This CAMU will support the final remedy of source removal followed by offsite disposal.

The CSF will consist of one or more metal buildings constructed on concrete pads with a chemically resistant coating and an integral leak collection system designed to minimize clogging. The facility will have a storage capacity of up to 100,000 cubic yards of containerized remediation waste.

The length of operations for the CSF will be consistent with the intermediate site condition as defined in the RFCA preamble (12 to 20-25 years).

6. SCHEDULE

The Parties have agreed to the following time frames:

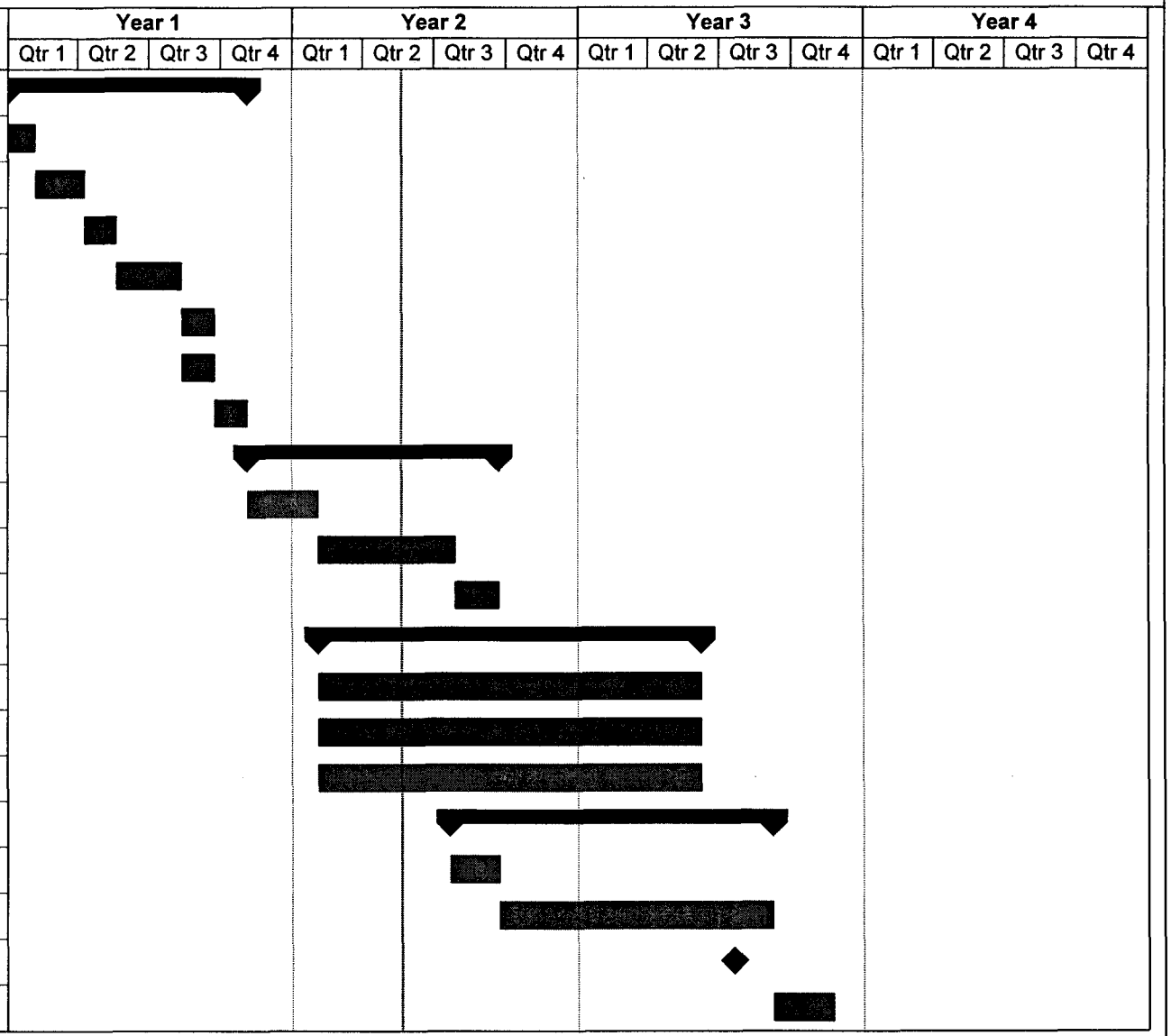
Within 45 days of receipt of DOE's draft IM/IRA, CDPHE shall determine that the IM/IRA meets or fails to meet the criteria for designation. If CDPHE determines that the draft fails to meet the criteria, it shall, at the end of its 45 day review, explain with specificity the necessary modifications and allow DOE to resubmit within 30 days or to invoke dispute resolution within 14 days. If CDPHE determines that the application meets the criteria described in subparagraph (a) , it shall issue the draft IM/IRA for public comment for a period of 60 days.

Within 30 days of the close of the public comment period, CDPHE shall review the comments received and modify the draft if appropriate. The agency shall also prepare a response to significant public comments at this time. At the end of this 30 day period, if CDPHE still agrees that the IM/IRA as modified meets the regulatory criteria for designation, CDPHE shall designate the storage (CSF) CAMU. If CDPHE has determined that the IM/IRA does not meet these same criteria, it shall state the changes that DOE must make to receive approval.

Once the CSF CAMU designation is complete, design and construction of the facility would occur only as a contingency action and would take a little more than two years (Figure 6-1). The facility would then be tested and opened for use. Placement of remediation waste in the facility would be dependent on the progress of decommissioning and remediation activities. The schedule for eventual shipment of the waste offsite has not been determined; nonetheless the Draft Ten Year Plan assumes that all low level mixed waste would be disposed offsite.

FIGURE 6-1: PROPOSED CONTAINERIZED STORAGE FACILITY SCHEDULE

Task Description	Dur
DECISION DOCUMENT	221d
PREPARE DECISION DOCUMENT (DD)	26d
CDPHE REVIEW DD	45d
MODIFY DD BASED ON CDPHE COMMENTS	30d
PUBLIC COMMENT PERIOD ON THE DD	60d
MODIFY DD BASED ON PUBLIC COMMENT	30d
PREPARE RESPONSIVENESS SUMMARY	30d
FINAL APPROVAL OF DD	30d
DESIGN	230d
PREPARE CONCEPTUAL DESIGN	65d
PREPARE DETAILED DESIGN	125d
PUBLIC COMMENT PERIOD	40d
OPERATIONAL AND MONITORING PLAN DEVELOPMENT	350d
PREPARE OPERATIONAL DOCUMENTATION	350d
PREPARE MONITORING PLAN	350d
OPERATIONAL PROCEDURES & TESTING	350d
CONSTRUCTION	295d
PREPARE SITE FOR CONSTRUCTION	45d
CONSTRUCTION OF PREFERED ALTERNATIVE	250d
BEGIN OPERATIONS	0d
PROJECT CLOSE-OUT	55d



PROPOSED CONTAINERIZED STORAGE FACILITY SCHEDULE

Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress

7. REFERENCES

DOE, 1996a, *Final Rocky Flats Cleanup Agreement*, July 19.

DOE, 1996b, *Draft Ten Year Plan*, July 30.

Kaiser-Hill, 1996, Hazard Categorization Analysis for Waste Management Facility, January.

Appendix A

Appendix A-1: Facility Drawings

Appendix A-2 : Preconceptual Design Narrative

Appendix A-3: Designation Support Documentation

Appendix A-4: Siting Study Figures

APPENDIX A-1

Facility Drawings

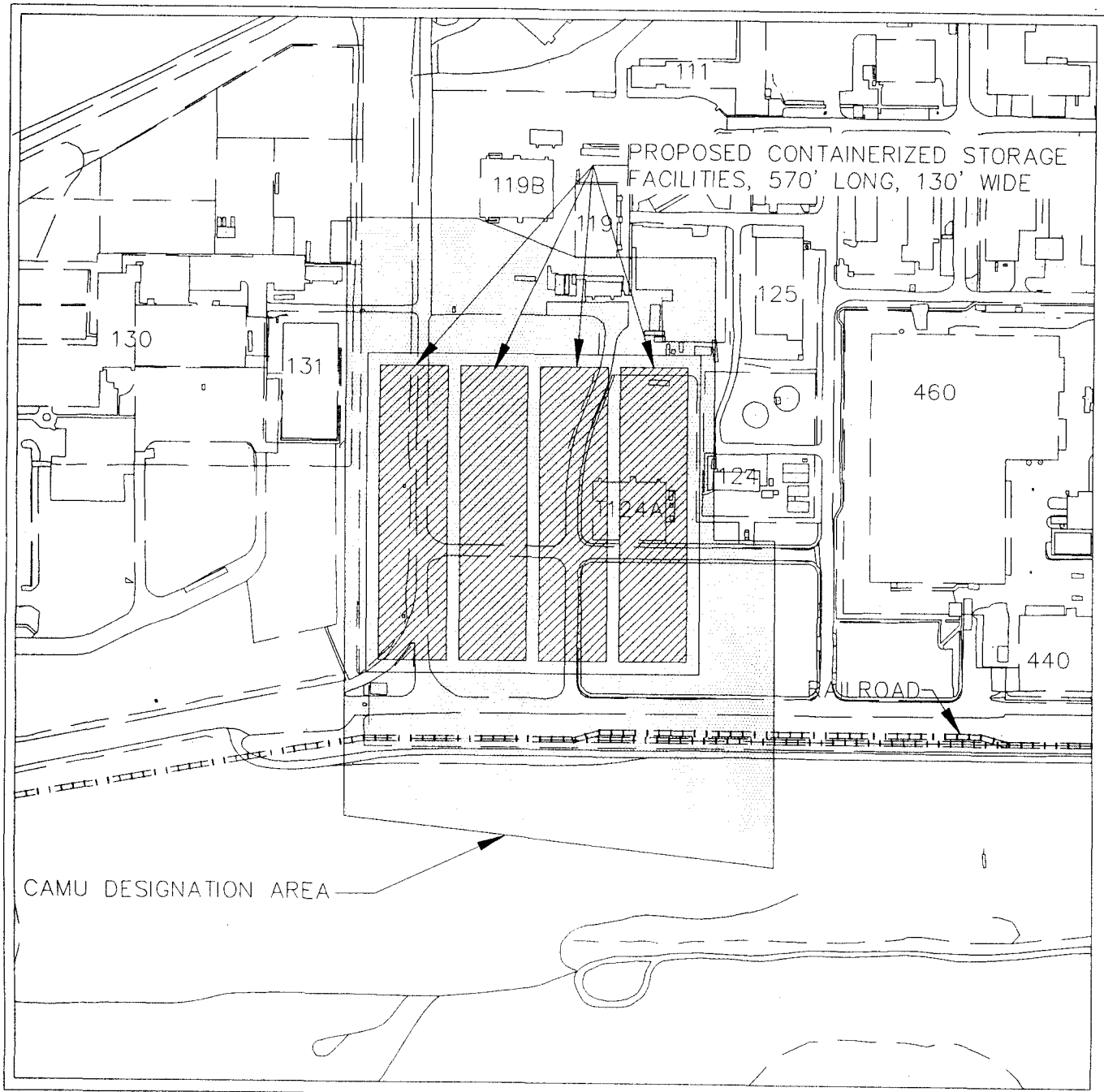


FIGURE A-1

CONTAINERIZED STORAGE FACILITY SITE PLAN

LEGEND

PROPOSED FEATURE

EXISTING FEATURE

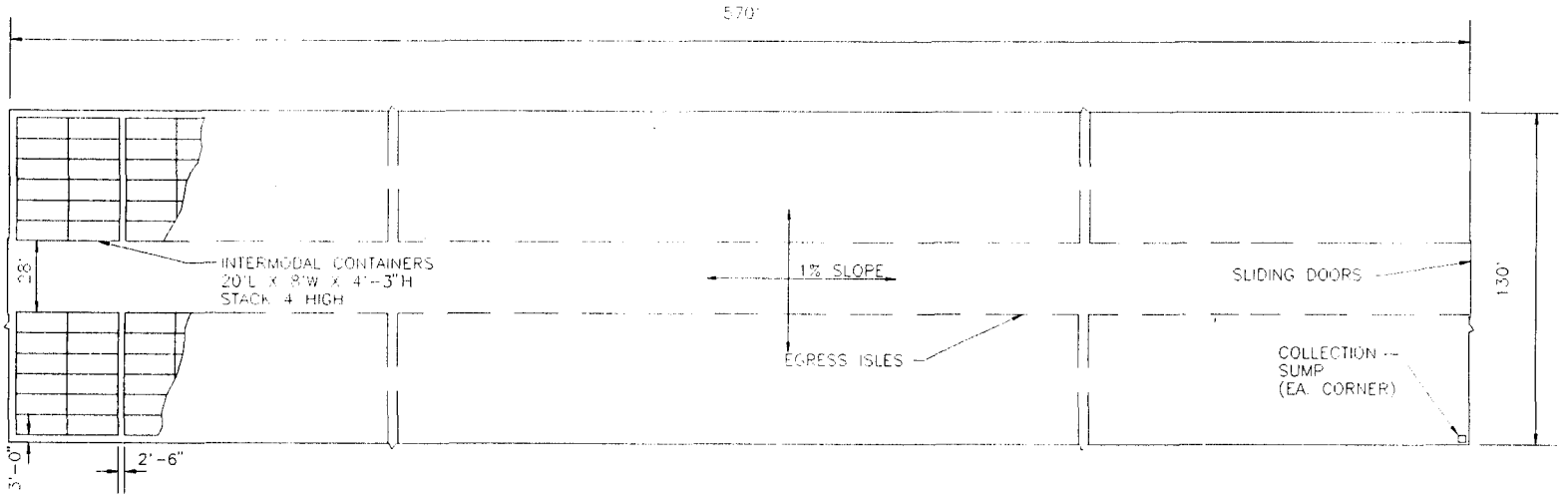
U.S. DEPARTMENT OF ENERGY

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

RMRS

300 200 100 0 300

GRAPHIC SCALE
1"=300'



FLOOR PLAN
SCALE: 1"=70'-0"

NOTES:

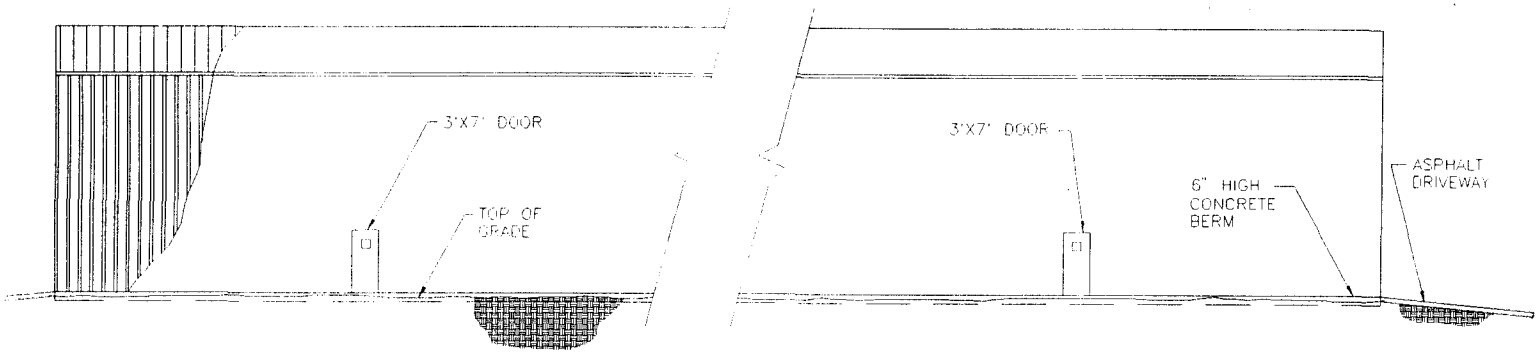
1. WIDESPAN BUILLDING WITH NO INTERIOR COLUMNS.
2. CONCRETE FLOOR TO HAVE IMPERMEABLE EPOXY COATING. ALL CONCRETE JOINTS SHALL HAVE WATERSTOPS.
3. LIGHTING SHALL BE 75 FT-CANDLES MINIMUM AT 3 FT ABOVE FLOOR.
4. EMERGENCY EXIT LIGHTS SHALL BE PROVIDED.
5. MECHANICAL VENTILATION SHALL BE PROVIDED IN ACCORDANCE WITH UNIFORM BUILDING AND MECHANICAL CODES.
6. INSULATION AND HEATING WILL NOT BE PROVIDED.
7. AUTOMATIC FIRE-EXTINGUISHING SYSTEM WILL NOT BE PROVIDED.

CONTAINERIZED STORAGE FACILITY
FLOOR PLAN

U.S. DEPARTMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

RMRS

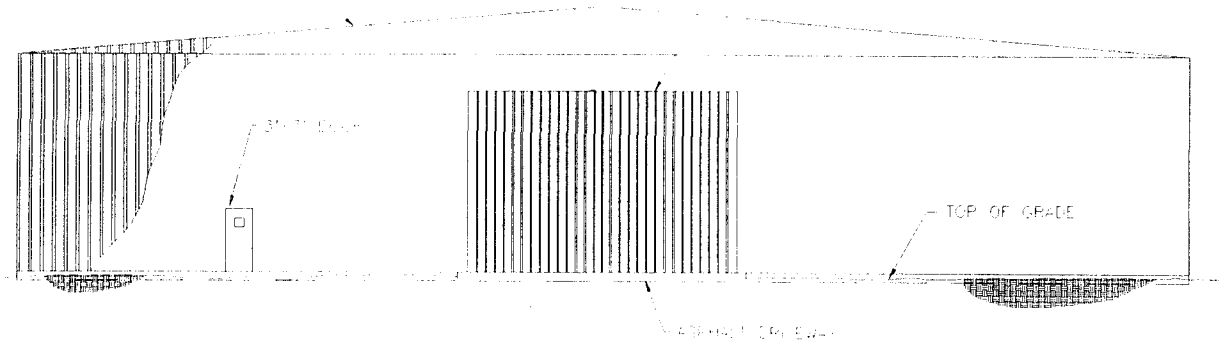
Figure A-2



EAST ELEVATION (West Similar)
SCALE: 1"=20'-0"

PREFABRICATED METAL STORAGE BUILDING

30'x20' SLIDING DOORS



NORTH ELEVATION (South Similar)
SCALE: 1"=20'-0"

CONTAINERIZED STORAGE FACILITY
ELEVATIONS

U.S. DEPARTMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

RMRS

Figure A-3

APPENDIX A-2

Preconceptual Design Narrative

APPENDIX A-2

DRAFT PRECONCEPTUAL DESIGN NARRATIVE

CORRECTIVE ACTION MANAGEMENT UNIT FOR CONTAINERIZED STORAGE OF REMEDIATION WASTE

Rocky Flats Environmental Technology Site
Golden, Colorado

Prepared by
Rocky Mountain Remediation Services, L.L.C.

for the

U.S. Department of Energy
Rocky Flats Field Office
Golden, Colorado

June, 1997

Preconceptual Design Narrative
Corrective Action Management Unit for Containerized Storage of Remediation Waste

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Attachment II - Preliminary Design Parameters for CAMU for Containerized Storage
Attachment III - Preliminary List of Applicable Codes, Standards, and Guidelines
Attachment IV - Key Material Specifications and Requirements
Attachment V - Specifications for Roll-off Containers Used as a Design Basis

EXECUTIVE SUMMARY

The Containerized Storage Facility (CSF) will be implemented as a Resource Conservation and Recovery Act (RCRA) Corrective Action Management Unit (CAMU). It will provide onsite retrievable, monitorable storage for hazardous, low-level, and low-level mixed remediation wastes at the Rocky Flats Environmental Technology Site (RFETS). Only remediation wastes generated at RFETS will be placed in the CSF. The CSF will be located west of building 440/460 in the CAMU Designation Area shown on Figure A-1 of Appendix A-1 of this decision document. The CSF will be designed and constructed per state and national codes and requirements of 6 CCR 1007-3, Part 264, Subpart S. CAMUs are exempted from the unit specific minimum technology requirements of Part 264. As an enhancement, the CSF will use the following as a guidance; Part 264, Subpart I, Use and Management of Containers and Subpart DD, Containment Buildings.

This Preconceptual Design Narrative evaluates geotechnical considerations, preconceptual design parameters, and preliminary specifications for the CSF. More detailed design specification and drawings will be prepared as part of the Title II design. A more thorough evaluation of geotechnical parameters will be also be incorporated into Title II design documentation.

1.0 INTRODUCTION

1.1 PURPOSE OF PROJECT

The purpose of the Containerized Storage Facility (CSF) is to provide an onsite, retrievable and monitorable waste storage facility for low-level, low-level mixed, and hazardous waste generated by remediation activities at the Rocky Flats Environmental Technology Site (RFETS). Currently there is limited onsite storage capacity for these wastes. The CSF will provide a new facility with the initial capacity of 25,000 cubic yards (yd^3) expandable to 100,000 yd^3 through the construction of additional metal buildings.

The CSF may consist of four metal buildings within the Corrective Action Management Unit (CAMU) Designation Area. The preconceptual design described in this narrative would be utilized on the first metal building and any subsequent buildings in the CAMU designation area.

1.2 GENERAL DESIGN CONCEPT

The CSF will have a gross capacity of approximately 25,000 yd^3 per metal building and 100,000 yd^3 for the whole CSF complex. Twenty cubic-yard "Intermodal" roll-off containers were used as the initial basis for the facility design. These are 20 cu yd containers which are specially designed for materials of higher density such as soils. The CSF would be capable of accepting other types of containers and the capacity of the facility is dependent on the type of containers utilized. Each metal building, 570 feet long by 130 feet wide and with a 24 feet eave height, would store 1250 Intermodal roll-off containers for a total of 5000 containers for four metal buildings.

Construction of each metal building would be sequenced to match storage needs and to provide the greatest degree of flexibility in remediation waste management. The metal buildings would be constructed over a reinforced concrete floor which would be sealed with a polyurethane sealant. The metal buildings would have a central corridor, thirty foot wide, for accessing the roll-off containers. The containers are designed to be stacked four high in the facility. The metal building is designed to provide containment and leakage collection with a continuous curb around the perimeter of the building. In addition, the concrete slab would slope to the corners of the building which will have containment sumps. Liquids, if any, would be collected and transferred from the sumps for final treatment.

Because the Waste Acceptance Criteria (WAC) requires no free liquids and the fact remedial waste for storage will only be solids, a minimal quantity of liquids are anticipated. Liquids will be transferred by tanker truck to a treatment facility.

1.3 GENERAL DESIGN CRITERIA

All equipment and facility sizes, capacities and ratings, etc. listed in this preconceptual design narrative are preliminary, and are intended only to relay the general intent and scope of the project. Final sizing will be performed during the design phase and incorporated into subsequent submittals. All equipment

will be sized to operate at the RFETS elevation of 6,000 ft above sea level. Design criteria are given in Attachment I, Preliminary Design Parameters for CAMU for Containerized Storage.

The CSF will be designed according to state and national codes and the requirements of the appropriate regulatory agencies and their permit conditions. The regulatory decision and approval process for the CSF will be conducted as a CAMU under the Rocky Flats Cleanup Agreement (RFCA) (DOE, 1996).

2.0 SITE CHARACTERISTICS

2.1 SURFICIAL FEATURES

2.1.1 Surface Water Features

Surface water features of RFETS include three intermittent streams, several interceptor ditches, springs, several ponds (including stormwater storage ponds), and scattered wetlands. There are no surface water features on the CSF site itself.

The primary surface water features near the CAMU designation area is Woman Creek. Woman Creek flows into the RFETS C-1 pond but is diverted around pond C-2 and flows offsite to Mower Reservoir. The South Interceptor Ditch (SID) collects groundwater from the Industrial Area on the south side of RFETS and flows to pond C-2. Currently most of the surface water flows to the SID or to drains that flow into North Walnut Creek. North Walnut Creek flows into the "A" ponds.

2.1.2 Wetlands and Floodplains

The CAMU Designation Area is not within any wetlands or any 100 year floodplains based on the Rocky Flats Plant Drainage and Flood Control Master Plan (EG&G 1992a). See Figure 2 of Appendix A-4, Hydrogeological Conditions.

2.2 SITE GEOLOGY AND HYDROGEOLOGY

A detailed discussion of the RFETS Geology and Hydrogeology is provided in the Sitewide Geosciences Characterization Study consisting of the following:

Volume I	Geologic Characterization Report (EG&G 1995a)
Volume II	Hydrologic Characterization Report (EG&G 1995b)
Volume III	Groundwater Geochemistry Report (EG&G 1995c)

2.2.1 Site Geology

The CAMU designation area for the CSF is covered by the Rocky Flats Alluvium. The composition of the Rocky Flats Alluvium at the site is typical of most areas at RFETS, with clayey and silty sand and gravels comprising the bulk of the underlying unconsolidated material. Bedrock materials consist chiefly of weathered and unweathered claystone and silty claystone. The depth to bedrock ranges from approximately 25 feet along the eastern edge of the CSF to approximately 45 feet at the northwest corner. The thickness of the weathered bedrock at the site ranges from 25 to 40 feet. Figure 5 of Appendix A-4 of this decision document shows the surficial deposit thickness at the site.

2.2.2 Site Hydrogeology

Ground water has been found in all hydrostratigraphic units underlying the site, however only the unconsolidated surficial deposits (Rocky Flats Alluvium and colluvium) and bedrock weathered zone are considered permeable enough to facilitate contaminant transport from the site. Ground water movement in the surficial deposits occurs mainly as intergranular flow, while fracture flow is assumed to predominate in weathered claystones and other consolidated fine-grained media.

The Rocky Flats Alluvium underlies the entire site, but is variably saturated. The lateral extent of saturated alluvium is seasonal, being more extensive during late spring and least extensive during late winter. Weathered bedrock is expected to play an increasingly important role as a contaminant pathway in areas of limited or no alluvial saturation. The weathered bedrock is assumed to be partially saturated and laterally continuous. Flow in fractured claystones is probably minimal due to low hydraulic conductivities and low horizontal hydraulic gradients.

The saturated thickness for surficial deposits at the CSF site area ranges from 10 to 30 feet. The depth to groundwater ranges from 2 feet to 30 feet.

Ground water at the CSF site flows predominantly to the east, with some flow to the northeast and northwest towards the Walnut and Woman Creek drainages.

3.0 GEOTECHNICAL EVALUATION

3.1 GEOTECHNICAL INVESTIGATIONS

Numerous boreholes and monitoring wells have been drilled at the site. Most of these have been installed for environmental sampling and monitoring, rather than assessment of soil properties for geotechnical design. Attachment II to the Preconceptual Design Narrative provides a summary of existing geotechnical data. Geotechnical investigations performed for other projects in the vicinity of the CSF provided information on expected soil properties and conditions for the Preconceptual Design Narrative. The location of existing boreholes and monitoring wells are shown in Attachment II.

3.2 FAULTS AND SEISMICITY

The closest major fault to the RFETS is the Golden Fault , which is approximately two miles southwest of RFETS. Trenching across the Golden Fault by the Colorado Geological Survey (CGS) has shown that the Golden Fault has offset the Verdos Alluvium (approximately 610,000 years in age), as well as an overlying colluvium layer (believed to be older than 70,000 years) (Kirkham and Rogers, 1981). The Golden Fault is classified by the CGS as a potentially active fault.

Other possible faults in the area include the Walnut Creek "Fault" and the Rock Creek "Fault", both identified as lineaments on aerial photographs. Drilling has indicated subsurface faulting in the Walnut Creek area, which may or may not be linked with the surface lineament feature. The Walnut Creek Fault crosses the southeast corner of RFETS and the Rock Creek feature is located approximately 1/2 mile to the north of RFETS. Additional information on faults, landslides and mining activity is provided in the Sitewide Geosciences study (EG&G 1995a).

A series of bedrock faults have been inferred across RFETS, based on drill hole subsurface lithologic and geophysical logs and interpretation. One of these bedrock faults runs across the southeast corner of the CSF site (see Figure 3 of Appendix A-4). Trenching across the bedrock fault north of Building 371 in the Buffer Zone showed no deformation of the Rocky Flats Alluvium across the fractured area of the bedrock. Since the Rocky Flats Alluvium is believed to be approximately 1 million years in age, it is apparent that this particular fault has not suffered movement in at least this time.

RCRA 6 CCR 1007-3, Part 264.18 states that new hazardous waste treatment, storage, or disposal facilities cannot be located within 1000 feet of a fault which has had displacement in Holocene time (within the last 10,000 years). There is no evidence that the inferred fault has experienced movement in Holocene time.

3.3 EROSION

The CSF site is relatively flat with little evidence of severe wind or water erosion. The potential for severe water erosion during rare major storm events exists adjacent to the purported CSF site near the Woman Creek drainage. Adequate clearances or building setbacks and/or engineering controls will be provided to prevent unacceptable erosion. A drainage and erosion control plan will be prepared during

Title II design to ensure storm water will be managed properly. The facility will be monitored and maintained during operations and prior to shipping waste offsite to correct any erosion potential.

3.4 SLOPE STABILITY

Landslide deposits exist directly south of the CSF site on the north slope of Woman Creek, (EG&G 1995a). These deposits include earth flows, earth slumps, debris flows, debris slumps, rock block slides, and complex landslides (Schroba and Cararra, 1994). Some of the landslide deposits are composed of both bedrock and overburden material (alluvium, colluvium, and soil). Those deposits derived from the bedrock may contain expansive clays. Landslides or soil slumps occur on the sides of valleys due to the hydration and lubrication of bedrock clay, especially in areas of seepage. Figure 3 of Appendix A-4 of this decision document shows areas adjacent to the site with slopes of greater than 15%. The site for the CSF is relatively flat and there is no evidence of landslides or slumps. The CSF will be located a sufficient distance from the Woman Creek drainage to avoid areas of potential slope instability.

3.5 SWELLING SOILS

The presence of expansive clay within the Rocky Flats Alluvium is highly variable across the RFETS. The Arapahoe and Laramie formations contain expansive clays (Van Horn, 1976), which have the potential to damage the CSF over time. Soil samples at Buildings 460 and 124 swelled less than 0.5% when wetted. Soil samples at Building 131 swelled up to 6%. Buildings 460, 124, and 125 were constructed with spread footings, and have not experienced any problems related to foundation heaving. Due to the high swell test results during the geotechnical investigation, Building 131 was constructed using drilled piers. While it was assumed spread footing will be used, the use of drilled piers would not present any problems if required to prevent potential damage from swelling or settlement. A more thorough investigation during Title II design will evaluate the soil conditions and the possible presence of expansive soils to recommend the best foundation structure for the metal buildings.

3.6 BEARING CAPACITY

The bearing capacity of the CSF site is estimated to be a minimum of 4,000 pounds per square foot (psf) based on previous geotechnical investigations in the vicinity. The facility rests on the Rocky Flats Alluvium which is 20-50 feet thick at the CSF site and consists primarily of clayey sands and gravels.

A geotechnical investigation will be performed as part of the Title II design to provide an accurate determination of the soil bearing capacity. The estimated loading of the CSF floor slab is 2200 psf. The building column footings will be sized based on the final bearing capacity, taking into account potential settlement and swelling.

3.7 SETTLEMENT/THERMAL EXPANSION

Settlement of the CSF is expected to be minimal. The maximum consolidation of the soil at 4000 psf was two percent. The settlement of the CSF should not exceed 2 to 3 inches. Differential settlement should not be a problem, due to the fairly uniform surficial soils and the 20 foot minimum alluvium thickness. If the geotechnical investigation determines the site is susceptible to unacceptable settlement, the building can be constructed using a pier foundation. Most likely potential swelling will have more impact on the design than unacceptable settlement.

4.0 PRECONCEPTUAL DESIGN

4.1 DESIGN PARAMETERS

The preliminary design parameters for CSF were incorporated as integral part of the preconceptual design process. At the request of the CDPHE, a table of design parameters has been provided as Attachment II to this narrative.

4.2 SITE WORK

4.2.1 Utilities Preparation

Figure A-1 in Appendix A-1 shows the location of the four CSF buildings. Only minimal site preparation will be required as most of the site is open or parking lot. The T124A trailers will require removal. First street which runs between Building 131 and the CSF will require closure or relocation. Primary electric power will be derived from the existing 13.8 kilovolt-amperes aerial lines for lighting and power in the buildings. The existing storm drains will be modified to properly handle the runoff from the footprint of the metal building.

4.2.2 Utilities

The only utilities required for the CSF are electric power and telephone. Both are easily accessible. Raw water is available at Building 124 if needed. Building 124 has an emergency shower. Emergency eye washes with self contained water tanks will be provided inside the CSF buildings. The CSF will not be heated as the waste will not contain free liquids. Ventilation will be provided as required by the Uniform Building Code (UBC) and Uniform Mechanical Code. Since all the waste is containerized, no special ventilation or filtration is required due to the storage of low level mixed waste. Some utilities that service the 130 Building Complex may require relocation. Utilities no longer in use will be abandoned-in-place by capping or grouting.

4.2.3 Earthwork

The grading design will provide existing and new contours, and spot elevations shown at grade changes and structure elevations. Cross sections will be provided where practical. The Title II Design will specify appropriate compaction requirements for approved material, moisture requirements, and general placement methods.

4.2.4 Site Access and Security

Existing RFETS roads will be used to access the CSF. Asphalt pavement will be placed between and adjacent to the building doors to provide vehicle access. A security fence will be constructed around the CSF to control access. The CSF is located within the RFETS Industrial Area and access to the site is already controlled. No additional requirements are necessary or warranted.

4.2.5 Landscaping

Seeding with a proper mixture of grasses or other plant material will be required for disturbed and bare areas, to provide erosion control and water conservation in accordance with the Soil Conservation Service requirements. Plant material will be selected as proven to be hardy in semi-arid climate adaptable to the RFETS area.

4.2.6 Site Drainage

A Drainage and Erosion Control Plan, and a Reclamation Performance Standard will be prepared during Title II design for construction, operation, and closure of the facility. A site drainage study will be prepared using the appropriate methods presented in the Denver Urban Storm Drainage Criteria Manual, Jefferson County Storm Drainage and Technical Criteria manual, and RFETS Standard SC-109, "Storm Sewer Design Criteria." Site drainage will be designed to accommodate the storm water as determined in the drainage calculations. Drainage must be designed to not allow flooding of the CSF from the 100-year, 24-hour event. All drainage analyses will use data from previous studies conducted for the RFETS where possible and appropriate (EG&G, 1992b and ASI, 1991). These studies will be verified for adequacy for the intended use.

Erosion control on steep slopes (defined as a 3:1 slope or steeper) will be provided with erosion fabric seeded with native grasses, rip rap surface, gravel surfaces, hard surface paving, or other approved methods to prevent erosion. Erosion control of other areas will be provided by use of silt fences and hay bales per Colorado Department of Transportation (CDOT) design criteria.

4.3 METAL BUILDING

4.3.1 Metal Building Description

The conceptual site plan and building layout are shown on Figures A-1 and A-2 of Appendix A-1. The metal buildings are 270 feet long by 130 feet wide with a 24 foot eave height. The CSF would consist of four metal buildings with a total footprint of approximately 6.8 acres. Each building would have a thirty foot wide central corridor for a large forklift to access in storing the containers. The floor plan and building elevations are shown in Figures A-2 and A- 3 of Appendix A-1. Each building will have a sliding door at each end to provide access for the containers. Doors will be provided at the ends and sides to provide personnel access and egress. The buildings will not have any interior columns which could restrict access and movement of containers. Inspection aisles will be provided to allow visual inspection of at least one side of every container. Wider aisles will be provided at the side doors for personnel egress.

The preconceptual design was based on Intermodal containers that are specially designed to accept bulk materials of higher densities such as soil. These containers 20 cubic yard capacity, measure 52" high by 82" wide by 227" long. Each full container will weigh approximately 35 tons. The containers have a variety of lids which provide a leak tight system. The selection of these containers was only for design purposes since the facility would be capable of accepting waste in other containers as long as the WAC were satisfied. As part of the design, it was assumed that the containers could be stacked four high in each metal building ultimately allowing the storage of up to 5000 containers. Reference Attachment V for more specific details on the containers.

4.3.2 Liquid Collection System

The metal buildings will have a continuous perimeter concrete curb six inches high for containment purposes. Ramps will be provided at all doorways to maintain the containment. All concrete slab joints and wall/slab joints will be constructed with bulb waterstops. The concrete slab and perimeter curb will be coated with a chemically resistant coating to provide an impermeable surface. For leak collection, the floor slab will slope to the corners of the building which will have containment sumps to facilitate liquid removal. This leak collection system will be designed to minimize clogging. The liquids will be transferred by a tanker to Building 891 or 374 for treatment. The liquid containment system is provided as a best management practice. The WAC does not allow storage of waste with free liquids, and the metal building will prevent precipitation from entering the CSF.

4.3.3 Treatment of Collected Liquids

RFETS currently has two facilities for the treatment of low-level mixed waste waters from the CSF; the Building 374 Liquid Waste Treatment Facility and the Building 891 Sitewide Treatment Facility. Building 891 has the capability of treating the anticipated liquid leakage, which could contain organics, heavy metals and radionuclides. The maximum treatment capacity is 30 gallons per minute. Building 891 is equipped with a tanker truck unloading station and 30,000 gallons of influent storage capacity.

Building 374 can treat water with metals and radionuclides; however, the Building 374 processes do not treat organic contaminants. Since soils with high concentrations of organic contaminants will be treated by thermal desorption prior to storage, the recovered liquids should contain only small concentrations of volatile organic compounds.

4.3.4 Product Compatibility

All coatings, water stops and other materials will be evaluated for compatibility with the wastes. Compatibility will be evaluated during Title II design.

4.4 SUPPORT FACILITIES

The CSF will operate as required by the demand of the individual projects generating waste. The metal buildings will provide the storage for containers, however, other activities associated with waste management will be supported by other facilities.

4.4.1 Personnel Facilities

The CSF will only be occupied during container movement and inspections. Adjacent existing buildings or trailers will be used for locker facilities, personnel protective equipment dress-out area, shower facilities and office/break space. If necessary a trailer will be installed to provide personnel facilities.

4.4.2 Equipment Decontamination

Equipment decontamination (e.g. large forklift) will be provided by the existing 903 Decontamination Pad.

4.5 STRUCTURAL DESIGN CRITERIA

The CSF is "Performance Category 1" in accordance with DOE-STD-1021, "Natural Phenomena Hazards Performance Categorization Criteria for Structures, Systems, and Components." The structural design will meet the requirements of the UBC and DOE-STD-1020, "Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities." The loads used in the structural design of buildings and other structures will comply with of ASCE 7, "Minimum Design Loads for Buildings and Other Structures." Dead loads will include the weights of all permanent materials and equipment supported in or on the structure including the structure's own weight and other permanent static loads. Live loads will include floor and roof area loads, moving vehicles, and impact loads.

Snow Loads: Minimum snow load will be 43 psf at ground level applied in accordance with ASCE 7.

Wind Loads: Wind load design will be in accordance with ASCE 7 with a basic wind speed of 109 mph. Exposure "C" will be used for all construction and the importance factor is 1.0.

Seismic Loads: Structures, equipment and tanks will be designed in accordance with the UBC and RFETS Standard SC-106, "Equipment Seismic Qualification."

4.6 SITE ELECTRICAL

4.6.1 General

Drawings generated during the Title II design phase will identify underground services and provide plan view dimensioning of service runs with locations of manholes, splice boxes and other pertinent features associated with them.

4.6.2 Power Supply

The Title II Drawings will detail the tapping of the existing 13.8 kV aerial line for providing a feeder to the pad mounted 13.8 kV-480Y/277 V, three phase, four wire transformer.

4.6.3 Illumination

Illumination levels will be determined from applicable tables in the latest edition of the Illuminating Engineering Society (IES) Handbook for interior and exterior lighting. The energy conservation measures recommended in DOE Order 6430.1A and ASHRAE Standard 90 will be incorporated where cost effective.

4.6.4 Grounding

Appropriate grounding conductors will be routed within all power conduits. Conduits will not be relied upon for ground continuity. Lightning protection will be provided on the roof of buildings per NFPA 780 and NFPA 70.

4.7 ENERGY CONSERVATION

An Energy Conservation Analysis will be required per DOE Order 6430.1A for all new facilities/buildings. This analysis will be performed during Title II design.

4.8 OPERATIONAL EQUIPMENT

The CSF will only require a large industrial fork lift for handling the roll-off containers.

4.9 OPERATIONS

The CSF will accept remedial waste from environmental restoration and decontamination and decommissioning projects across the site. The following remediation waste streams will be accepted at the CSF:

- Investigation Derived Materials (IDM).
- Low-level mixed waste.
- Bulk remediation wastes such as soils and sludges.
- Demolition debris from remediation activities..

All waste will be prepared for storage and will meet the CSF Waste Acceptance Criteria (WAC) prior to transport to the CSF. No waste processing will be done at this facility. A waste staging area will be provided for unloading of containerized waste.

RFETS projects will transport the containers on flat-bed winch trucks to the CSF where the containers will be unloaded. Operations personnel will ensure that the containers comply with the WAC after which the containers will be moved into the facility with a large industrial forklift and stacked four high. The aisle spaces of the facility are laid out so that operations personnel can visually inspect and monitor each container.

The current assumption is each project will manage any pre-treatment of organics, if required, and the packaging of their waste in containers before acceptance at the CAMU. This assumption may change if a decision is made to repackage waste to comply with specific waste acceptance criteria for an offsite disposal facilities.

One attribute for the location of the CSF is the proximity of the facility to the existing RFETS railroad. A short railroad spur could extend to the CSF where a loading facility could be constructed. The containers could easily be loaded on to rail cars and shipped offsite to a disposal facility in the future. Earlier studies and evaluations have shown rail shipment of remediation waste to be more efficient in cost and time because of the larger volumes which can be shipped. If the waste acceptance criteria for the offsite disposal facility required repackaging, the CSF could modify their procedures to repackage waste in order to meet offsite WAC's.

4.10 QUALITY ASSURANCE

The System Category Levels for this project based on COEM-DES-223 is a Category 3. Category 3 is defined as follows:

Category 3 - Systems not meeting the criteria for Categories 1, or 2. This system is relied upon for worker protection from radiological or toxicological hazards.

5.0 APPLICABLE CODES, STANDARDS, GUIDELINES, AND SPECIFICATIONS

A preliminary list of applicable codes, standards and guidelines has been generated and has been attached to this Preconceptual Design Narrative as Attachment III. This list will be further modified as part of Title II design.

A list of specifications for key elements of the preconceptual design have been attached to this Preconceptual Design Narrative as Attachment IV. This is a preliminary list of specifications. Changes in plant specifications or as part of the design process will be incorporated into the Title II design documentation.

6.0 REFERENCES

ASI, 1991, Storm-Runoff Quantity for Various Design Events, Advanced Sciences Inc., January 1991.

DOE, 1996, Final Rocky Flats Cleanup Agreement, July 16.

EG&G, 1992a, Floodplain Delineation, Hydrologic Analysis, prepared by U.S. Army Corps of Engineers, September 1992,

EG&G, 1992b, Rocky Flats Plant Drainage and Flood Control Master Plan, prepared by Wright Water Engineers, April 1992.

EG&G, 1994, RFP Wetlands Mapping and Resource Study, prepared by U.S. Army Corps of Engineers, December 1994.

EG&G, 1995a, Geologic Characterization Report for the Rocky Flats Environmental Technology Site, Volume I of the Sitewide Geoscience Characterization Study, March 1995.

EG&G, 1995b, Hydrogeologic Characterization Report for the Rocky Flats Environmental Technology Site, Volume II of the Sitewide Geoscience Characterization Study, April 1995.

EG&G, 1995c, Groundwater Geochemistry Report for the Rocky Flats Environmental Technology Site, January 1995.

Kirkham, R.M. and W.P. Rogers, 1981, Earthquake Potential in Colorado: A Preliminary Evaluation, Colorado Geological Survey Bulletin 43, 171p.

Schroba, R.R and P.E. Cararra, 1994, Preliminary Surficial Geologic Map of the Rocky Flats Plant and Vicinity, Jefferson and Boulder counties, Colorado, U.S. Geological Survey Open File Report 94-162, U.S. Geological Survey, Denver, Colorado.

Van Horn, R., 1976, Geology of the Golden Quadrangle, U.S. Geological Survey Professional Paper 172.

Attachments to Preconceptual Design Narrative for the Corrective Action Management Unit for Bulk Storage of Remediation Waste

Attachment I -	**Preliminary Design Parameters for CAMU for Containerized Storage**
Attachment II -	**Geotechnical Data**
Attachment III -	**Preliminary List of Applicable Codes, Standards, and Guidelines**
Attachment IV -	**Key Material Specifications and Requirements**
Attachment V -	**Specifications for Roll-Off Containers Used as a Basis of Design**

Attachment I - Preliminary Design Parameters for CAMU for Containerized Storage

ATTACHMENT I - Preliminary Design Parameters for CAMU for Containerized Storage

Design Item	Component	Performance Standard[1]	Design Guidance[3]	Design Parameter Demonstration[3]	Resultant Design Criteria[4]
1. Layout of CSF CAMU Designation Area	CSF layout and size	Provide for flexible facility expansion within CAMU designation area. Provide compatible scheduling of facility capacity versus waste generation rates and offsite disposal capabilities.	CAMU Regulations	Technical feasibility and review of layout concepts by the parties, followed by detailed design analysis of the selected layout configuration.	To be determined following design analysis.
2. Foundations	Site Geology / Engineering Characterization			Geotechnical index parameters, geological profiles, representative construction drawings (plans and specifications).	
	Settlement (total and differential)/ consolidation	Prevent failure of containment system /foundation due to settlement and subsidence.		Engineering analysis.	Allowable settlement to be selected following analysis.
	Bearing Capacity	Prevent failure of containment system /foundation from failure due to loading.		Engineering analysis.	Allowable settlement to be selected following analysis.
	Potential for Excess Hydrostatic Pressure	Prevent failures due to hydrostatic pressure.	Evaluate hydrostatic pressure caused by groundwater or infiltration of surface water as applicable.	Engineering analysis.	To be selected following analysis.
	Seismic Considerations	Structures will withstand seismic stress.	ASCE 7, UBC, and DOE-STD-1021 are applicable design standards.	Engineering analysis.	To be selected following analysis.
	Slope Stability	Prevent structure failure.	Proven past practices and ASTM standards	Engineering analysis.	To be selected following analysis.
	Structural Strength	Foundation must of sufficient strength to support contents and to prevent failure due to physical conditions and the stresses of daily operations.	6 CCR 1007-3, ACI, AISC, and ASTM standards and requirements as well as past practices for concrete foundations	Engineering analysis.	To be selected following analysis.
	Concrete Barrier (Concrete Slab and Curbing)	Must have a barrier that is sufficiently durable to withstand the movement of personnel, wastes, and heavy equipment and provide leak protection.	ACI and ASTM codes and past concrete practices	Confirmation of material properties of foundation including chemical compatibility will be performed under Title II design.	Design criteria to be selected during Title II design.

ATTACHMENT I - Preliminary Design Parameters for CAMU for Containerized Storage

Design Item	Component	Performance Standard[1]	Design Guidance[3]	Design Parameter Demonstration[3]	Resultant Design Criteria[4]
	Compatibility	Concrete barrier must be appropriate for physical and chemical compatibility characteristics.		Engineering Analysis. Chemical compatibility evaluation and testing of the coating on the concrete slab and curbs to demonstrate long-term performance	Criteria to be selected during Title II design.
	Containment System	Facility must be design and operated to ensure containment and prevent tracking of materials from unit by personnel or equipment		Confirmation of containment ability to be evaluated during Title II design phase.	Criteria to be selected during Title II design.
3. Leak Collection System	General	Prevent failure of the leak collection system due to settlement, loading, chemical incompatibility and clogging throughout active life.	Design system to maintain a minimum one percent slope and control clogging. Approaches to mitigate clogging will be evaluated during Title II design.	Engineering Analysis. Chemical compatibility evaluation and testing of the leak collection system components to demonstrate long-term performance.	Criteria to be selected following analysis.
	Compatibility	Leak collection system must be appropriate for physical and chemical compatibility characteristics of waste.		Confirmation of compatibility to be determined during Title II design phase.	Criteria be selected during Title II Design.
	Leak Collection System Sump	Allow for removal and measurement of collected liquids.		Engineering analysis of liquid flow velocities, accessibility and constructability.	To be selected following analysis as part of Title II Design.
	Spill Control	The building structure/ containers will be capable of providing a barrier for spills/leaks.	Based on past practices and demonstrated technologies.	Floor coatings and containers are commercially available and have demonstrated industrial effectiveness. Confirmation of effectiveness will be evaluated during Title II design.	To be selected following analysis as part of Title II Design.
4. Metal Building Shell	General	Structure must be completely contained and self - supporting. Containment building must be completely enclosed with leak-proof floor, walls, and roof.	Metal buildings have been demonstrated through past practice.	Abilities of metal building will be analyzed during Title II design.	To be selected following analysis during Title II Design.
	Protectiveness	Facility must be designed in a manner that assures protection of human health and environment.		RFETS has several existing storage facilities such as the Centralized Waste Storage Facility. Protectiveness will be evaluated during Title II design.	Criteria be selected during Title II Design.

ATTACHMENT I - Preliminary Design Parameters for CAMU for Containerized Storage

Design Item	Component	Performance Standard[1]	Design Guidance[3]	Design Parameter Demonstration[3]	Resultant Design Criteria[4]
	Structural Strength	Structure must of sufficient strength to support contents and to prevent failure due to physical conditions and the stresses of daily operations.	Applicable standards such as the UBC and AISC standards will be applied	Structural strength will be evaluated during Title II design.	To be selected following analysis during Title II Design.
	Dust Control	Has controls sufficient to prevent fugitive dust emissions to meet the visible emission standard.		Potential for dust emission will be analyzed in the Title II design phase.	To be selected following analysis during Title II Design.
5. Run-On/Run-Off	General	Provide run-on control system capable of preventing flow into facility during peak discharge of 100-year event Provide a run-off management system to control at least the water volume resulting from a 24-hour, 100-year storm.		Engineering drawings, profiles and calculations to size system, erosion potential, management of water systems, separation of run-on and run-off, provisions for retention of run-off as applicable.	To be selected following analysis during Title II Design.

ACI - American Concrete Institute
AISC - American Institute of Steel Construction
ASCE - American Society Civil Engineering
ASTM - American Society of Testing Materials
CSF - Containerized Storage Facility
UBC - Uniform Building Code

1. Performance Standard: An objective for design that is based on a regulatory requirement, regulatory guidance, and/or standard practice.
2. Design Guidance: Standard engineering practice reference manuals and design elements that have been identified in regulatory guidance or have been demonstrated by past practice to meet the performance standards.
3. Design Parameter Demonstration: Analysis required to demonstrate that the design criteria will provide conformance with the design guidance and the performance standard.
4. Resultant Design Criteria: Specific elements of design that have shown by supporting analytical demonstration to meet related performance standard.

Attachment II - Geotechnical Data

ATTACHMENT II

SUMMARY OF EXISTING GEOTECHNICAL DATA

Boring Number	Depth (ft)	Soil Class. (USCS)	SPT Blow Count[1]	Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Unconfined Compressive (psf)	Dry Density (pcf)	California Bearing Ratio (%)
E1-1	5	SP-SM	33							
"	10	GC	60/6							
E1-2	5	GC	3							
"	10	GC	12							
E1-3	5	GC	50/7							
"	10	GC	50/9							
E1-4	5	SC	50/6							
"	10	SC	50/11							
E2-6	2.5	SM		12.7						
"	4	CL	34	13.8	55	30	21			
"	8.5	GW-SW	50/0							
E2-7	4	CL	34							
"	9	CL	32	8.9						
Boring Number	Depth (ft)	Soil Class. (USCS)	SPT Blow Count[1]	Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Unconfined Compressive (psf)	Dry Density (pcf)	California Bearing Ratio (%)

E2-8	4	CL/CH	32							
J2-1	4	GM-SM	21	7.1						
"	7	GM-SM	23/6	11.4						
"	14	GM-SM	36/6	6.3						
J2-2	4	GM-SM	30/6							
"	7	GM-SM	42/6							
"	14	GM-SM	32.2					6600	113	
J2-3	4	GM-SM						4480	112	
"	5	"	28							
"	7	"	60/9							
"	14	"	32/6							
J2-5	5	GM-SM	50/6							
"	10	"	33/6							
"	14	"	35/6	14.9	38.9	18.4	20.5	4890	113	
L1-10	9	GC	55/9	9					111	
"	19	CL-CH	40	19.9					105	
Boring Number	Depth (ft)	Soil Class. (USCS)	SPT Blow Count[1]	Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Unconfined Compressive (psf)	Dry Density (pcf)	California Bearing Ratio (%)
L1-P1	2	GC	38							22.5

"	5	"	50/4							
L1-P2	2	GC	51							
"	5	"	30/0							
L1-P3	2	GC	36							
"	4	"	50							
L1-P4	2	GC	24							
"	4	"	64							
L1-P5	2	GC	16							
"	4	"	22							
L1-P7	2	GC	56							
"	4	"	42							
L1-P8	2	GC	16							
"	4	"	54							
L1-P9	2	GC	16							
"	4	"	25							
Boring Number	Depth (ft)	Soil Class. (USCS)	SPT Blow Count[1]	Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Unconfined Compressive (psf)	Dry Density (pcf)	California Bearing Ratio (%)
L1-P10	2	GC	36	11.4						
"	4	"	23							

N-4	5	SC		13	37.9		24.4			
U1-2	4	GC	30	16.8	52	28	24		111.9	
"	9	GC	28	9.0						
"	14	GC	47	14.0						
U1-3	4	GC	26	17.0					114.3	
"	9	GC	31	8.9						
U1-4	3	GC								28.7
"										

1. Standard Penetration Test - Number of Blows/Inches of Displacement (12 if not listed)

SUMMARY OF EXISTING SWELL-CONSOLIDATION TEST DATA

Borehole No.	Depth (ft)	Confining Pressure (psf)	Swell (%)	Final Pressure (psf)	Consolidation (%)
J2-5	13.5	1000	0.5	8000	1.7
U1-2	4	100	6.0	3000	0.3
U1-3	4	100	0	6000	3.6
L1-10	19	500	0.2	10,000	3.7

RECOMMENDED BEARING CAPACITY

Geotechnical Investigation	Maximum Bearing Capacity (psf)
J2	4500
L1	4000
U1	5000

Sources:

E1. Aguirre Engineers, Inc., Subsurface Investigation and Engineering Analysis Report, Electrical Systems Upgrade, Phase I, July 26, 1988.

E2. Aguirre Engineers, Inc., Subsurface Investigation and Engineering Analysis Report, Electrical Systems Upgrade, Phase II, December 19, 1988.

J2. Empire Laboratories, Inc., Soils and Foundation Investigation, Backwash Storage Tanks, Building 124, January 1974.

L1. Chen and Associates, Soil and Foundation Investigation , Proposed New Consolidated Nonnuclear Manufacturing Building, November 17, 1982.

N. Woodward Clyde and Associates, Soil and Foundation Investigation for Proposed Parking Lot Construction and Changing Road Curvature at Intersection on Entrance Road, April 1, 1965.

U1. Foundation Engineering Company, Subsurface Investigation and Engineering Analysis Report, Proposed Building 131, July 23, 1986.

Attachment III -
Preliminary List of Applicable Codes, Standards, and Guidelines

ATTACHMENT III

PRELIMINARY LIST OF APPLICABLE CODES, STANDARDS, AND GUIDELINES

The most current revision or controlled copies of the following codes, standards and guidelines apply to the design of this project.

General

1. **Department of Energy (DOE) Order 6430.1A, United States Department of Energy, General Design Criteria.**

2. **DOE Order 5820.2A, Radioactive Waste Management, Chapter III, Management of Low Level Waste.**

3. **DOE Order 4700.1A, Department of Energy Project Management System.**

4. **RFETS Conduct of Engineering Manuals, Volumes 1, 2, 3, 4 and 5.**

5. **RFETS Configuration Change Control Program Manual.**

6. **RFETS Standards, Volumes I, II, III, IV, V and VI.**

7. **RFETS Health and Safety Practices Manual.**

8. **RFETS Radiological Control Manual**

9. **DOE Environmental Protection, Safety and Health Protection Standards, DOE Order 5480.4.**

10. **ASTM Standards as applicable**

Civil

1. **Manual on Foundation Investigations, American Association of State Highway and Transportation Officials.**

2. **Subsurface Investigation for Design and Construction of Foundations of Buildings, American Society of Civil Engineers.**

3. **American Society of Civil Engineers - Manual No. 37, "Design and Construction of Sanitary and Storm Sewers."**

4. **American Water Works Association - "Standards."**

5. American Association of State Highway and Transportation Officials - "Geometrics Design and Highway Standards."

6. Colorado State Highway Department - "Standard Specifications for Road and Bridge Construction."

7. Jefferson County, Storm Drainage Design and Technical Criteria.

8. Colorado Division of Water Resources, Revised and Amended Rules and Regulations for Water Well Construction and Pump Installation, 1988.

9. American Association of State Highway and Transportation Officials - "Policy on Design of Urban Highway and Arterial Streets."

10. Asphalt Institute - "Asphalt Paving Manual," "Thickness Design Manual," "Soils Manual for Design of Asphalt Pavement Structures."

11. RFETS Standard SC-0102 - Security Fencing

12. RFETS Standard SC-0109 - Storm Sewer Design Criteria

13. RFETS Standard SF-0100, Fire Protection

14. Denver Regional Council of Governments, Urban Storm Drainage Criteria Manual.

Environmental

1. Colorado Department of Public Health and Environment, Colorado Hazardous Waste Regulations, Code of Colorado Regulations, 6 CCR 1007-3

2. Colorado Department of Public Health and Environment - Air Pollution Control Division, Colorado Air Pollution Control Regulations, Code of Colorado Regulations, Title 5, Chapter 1001, Regulations #1, 2, 3, 8).

3. Colorado Department of Public Health and Environment - Air Pollution Control Division, Colorado Ambient Air Quality Standards and New Source Performance Standards (Colorado Code of Regulations, Volume 5, Parts 14, 8).

4. Colorado Department of Public Health and Environment - Water Quality Control Division, Colorado Water Quality Control Regulations and Discharge Permit System Regulations, (Code of Colorado Regulations, Title 5, Chapter 1002, Articles 2, 3, 6).

5. Colorado Department of Public Health and Environment - Water Quality Control Division, Colorado Water Quality Standards, Groundwater Standards (Code of Colorado Regulations, Title 5, Chapter 1002, Article 8).

6. U.S. Environmental Protection Agency/Colorado Department of Health - Water Quality Control Division, Stormwater Discharge Regulations (40 CFR 122.26).

7. U.S. Department of Energy, National Environmental Policy Act Compliance, National Environmental Policy Act, 40 CFR Parts 1500 - 1508 (CEQ regulations to implement NEPA); DOE 5440.1C; 10 CFR 1021 (incorporates requirements for compliance with Endangered Species Act, Fish and Wildlife Coordination Act, National Historic Preservation Act).

8. RFETS Standard FO.5 - Handling of Purge and Development Water.

9. RFETS Standard FO.7 - Handling of Decontamination Water and Wash Water.

10. RFETS Standard FO.8 - Handling of Drilling Fluids and Cuttings.

11. RFETS Standard FO.13 - Containerizing, Preserving, Handling, and Shipping of Soil and Water Samples.

12. RFETS Standard GW.1 - Water Level Measurements in Wells and Piezometers.

13. RFETS Standard GW.2 - Well Development.

14. RFETS Standard GW.5 - Field Measurement of Groundwater Field Parameters.

15. RFETS Standard GW.6 - Groundwater Sampling.

16. RFETS Standard GT.1 - Logging Alluvial and Bedrock Material.

17. RFETS Standard GT.2 - Drilling and Sampling Using Hollow Stem Auger Techniques.

18. RFETS Standard GT.6 - Monitoring Wells and Piezometer Installation.

Architectural

1. NFPA-101 Life Safety Code, and NFPA Life Safety Code Handbook.

2. RFETS Standard SC-0100, Hollow Metal Doors and Frame

3. RFETS Standard, Builders Hardware

4. RFETS Standard, SC-0104, Standard for Glass and Glazing

Structural

1. AISI Specification for the Design of Cold-Formed Steel Structural Members.

2. AISC Steel Construction Manual, American Institute of Steel Construction,

3. ASCE 7, Minimum Design Loads for Buildings and Other Structures.

4. AWS D1.1, Structural Welding Code-Steel, American Welding Society.

5. RFETS Standard SC-0106, Equipment Seismic Qualification

6. SEAC, "1984 Structural Survey of Colorado Building Department and 1971 Snow Load Design Data for Colorado." (1984 Reprint), Structural Engineers Association of Colorado, December 1984.

7. DOE-STD-1021, "Natural Phenomena Hazards Performance Categorization Criteria for Structures, Systems, and Components"

8. DOE-STD-1020, "Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities".

9. ACI 318, Building Code Requirements for Reinforced Concrete, American Concrete Institute

10. Uniform Building Code (UBC), International Conference of Building Officials (ICBO).

Mechanical/Process

1. Uniform Plumbing Code, published by the International Association of Plumbing and Mechanical Officials (IAPMO).

2. Uniform Mechanical Code, published by the International Association of Plumbing and Mechanical Officials (IAPMO) and the International Conference of Building Officials (ICBO).

3. Energy Conservation in New Buildings, ASHRAE Standard 90, administered by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

4. Ventilation for Acceptable Indoor Air Quality, ASHRAE Standard 62, administered by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

6. RFETS Standard SMU-0100, Safety Showers

7. RFETS Standard SMU-0101, Safety Eye/Face Washes

8. RFETS Standard SMU-0302, Ventilation Design

9. RFETS Standard SMU-0303, Heating, Ventilation and Air Conditioning Standard

10. RFETS Standard SMU-0304, Standard for Fans

Electrical

1. MIL-HDBK- 1004/4, Electric Utilization Systems
2. NFPA 780, Lightning Protection Code
3. NFPA 70, National Electric Code (NEC)
4. NFPA 101, Life Safety Code.
5. ANSI/IEEE 142, IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems.
6. ANSI/IEEE 241, IEEE Recommended Practice for Electric Power Systems in Commercial Buildings.
7. ANSI/IEEE 242, IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems.
8. ASHRAE 90A, Energy Conservation in New Building Design
9. RFETS Standard SAM-0103, Instrumentation & Alarms
10. RFETS Standard SAM-0104, Level Sensors
11. RFETS Standard SC-0107, Sealing Building Penetrations & Electrical Conduit
12. RFETS Standard SE-0103, Standard for Electrical Wiring
13. RFETS Standard SE-0105, Motor Control 3 Wire P/B Standards
14. RFETS Standard SE-0107, Quality Control of Molded Case Breakers
15. RFETS Standard SE-0112, Building Electrical Raceway Systems
16. RFETS Standard SE-0205, Emergency Exit Signs
17. RFETS Standard SE-0301, Emergency Lighting Equipment
18. RFETS Standard SE-0401, Audible Warning Devices for Life Safety/Disaster Warning System
19. RFETS Standard SE-0550, Telephone Conduit and Equipment Installation,

20. **RFETS Standard SE-0701, Alarm System Cables**

21. **RFETS Standard SX-0164, Plant System and Component Identification System and Labelling**

22. **UL 96, Lightning Protection Components.**

23. **UL 96A, Lightning Protection Installation Practices.**

Attachment IV - Key Material Specifications and Requirements

This list of standards and requirements are provided to give enough information to designate the CAMU. Modifications might be necessary to address issues as part of the more detailed Title II Design. These specifications are RFETS standards.

SPEC # SPEC TITLE

DIVISION 1 - GENERAL REQUIREMENTS

01100 Special Contract Requirements
01300 Submittals
01400 Quality Assurance/Quality Control
01500 Temporary Facilities, Controls and Special Project Requirements
01610 Material Handling and Waste Disposal
01700 Subcontractor Safety

DIVISION 2 - SITEWORK

02070 Installing, Plugging, and Abandoning Monitoring Wells
02110 Site Clearing
02200 Earthwork, Grading and Excavation
02220 Trenching, Back-filling & Compaction for Pipelines
02221 Excavation for Pavement
02231 Aggregate Base Course
02380 Caissons
02510 Asphaltic Concrete Paving
02520 Portland Cement Concrete Paving
02660 Water Mains
02687 Site Gas Lines
02720 Site Storm Sewer Systems
02781 Site Grounding
02800 Signage
02830 Chain-Link Fencing
02900 Topsoil and Revegetation
02930 Erosion Control Measures
02936 Rip Rap

DIVISION 3 - CONCRETE

03100 Concrete Formwork
03200 Concrete Reinforcement
03300 Cast-in-Place Concrete
03346 Concrete Floor Finishing
03370 Concrete Curing
03600 Grout

DIVISION 4 - MASONRY

Not Used

DIVISION 5 - METALS

05500 Metal Fabrications
05520 Handrails and Railings

DIVISION 6 - WOOD AND PLASTICS
06200 Finish Carpentry

DIVISION 7 - THERMAL AND MOISTURE PROTECTION
07190 Vapor Retarders
07212 Rigid Insulation
07900 Joint Sealers

DIVISION 8 - DOORS AND WINDOWS
08111 Standard Steel Doors
08112 Standard Steel Frames
08331 Overhead Coiling Doors
08360 Sectional Overhead Doors
08710 Door Hardware

DIVISION 9 - FINISHES
09705 Epoxy Seamless Liner and Floor Finish
09900 Painting

DIVISION 10 - SPECIALTIES
10440 Interior and Exterior Signage/Graphics
10522 Fire Extinguishers and Accessories

DIVISION 11 - EQUIPMENT
11140 Miscellaneous Equipment
11500 Emergency Eyewash Station

DIVISION 12 - FURNISHINGS
Not Used

DIVISION 13 - SPECIAL CONSTRUCTION
13121 Pre-Engineered Buildings

DIVISION 15 - MECHANICAL
15050 Basic Mechanical Materials and Methods
15100 Valves
15135 Meters and Gages
15145 Hangers and Supports
15170 Motors
15240 Vibration Isolation
15250 Mechanical Insulation

15410 Plumbing Piping
15430 Plumbing Specialties
15451 Diaphragm Pumps
15452 Vertical Sump Pumps
15453 Horizontal End Suction Pumps
15454 Regenerative Turbine Pumps
15488 Propane Gas Piping Systems
15575 Metal Vents
15620 Fuel Fired Heaters
15782 Packaged Air Terminal Units
15852 Axial Fans
15870 Power Ventilators
15891 Metal Ductwork
15910 Duct Accessories
15932 Air Outlets and Inlets
15971 Electric Control Systems
15990 Testing, Adjusting and Balancing

DIVISION 16 - ELECTRICAL

16010 Electrical Basic Requirements
16050 Basic Electrical Methods and Materials
16111 Conduit
16121 Medium Voltage Cable
16123 Building Wire and Cable
16130 Boxes
16140 Wiring Devices
16160 Cabinets and Enclosures
16170 Grounding and Bonding
16190 Supporting Devices
16195 Electrical Identification
16311 Unit Substation
16365 Medium Voltage Switch and Fuses
16370 Overhead Power Distribution
16426 Distribution Switchboards
16441 Enclosed Switches
16461 Dry-Type Transformers
16470 Panelboards
16481 Enclosed Motor Controllers
16482 Motor Control Center
16496 Enclosed Isolation Bypass, Automatic Transfer Switch
16510 Interior Luminaries
16530 Site Lighting

16641 Cathodic Protection
16670 Lightning Protection System

16741 Telephone System, Pathways and Wiring
16770 Life Safety and Disaster Warning System
16902 Electric Controls and Relays

Attachment V - Specifications for Roll-Off Containers Used as a Design Basis

McClain of OKLAHOMA
4000 S.W. 113th
Oklahoma City, OK 73173
(405) 691-6311 • Fax (405) 691-4441
McClain E-Z Pack EPCO

ADDITIONAL INTERMODAL INFORMATION

- General Standards and Approvals
  The containers shall meet the requirements of the Association of American Railroads M-930-88 and be fitted with an approval plate. In addition, the containers are Container Safety Convention (CSC) approved.

Welding Specifications . . .

- Bulkhead..Bulkhead area is welded 100% inside and out. Vertical tubes skip welded; Placard plate angles skip welded. Micro Seal applied to areas along vertical tubes and angles.

- Rear Door..Rear door pan is one piece, no welding required on interior or exterior. Corner gussets on exterior of door are welded 100%; Placard angles skip welded; Horizontal tubes skip welded; Vertical tubes' skip welded. Micro Seal applied to areas along vertical and horizontal tubing, and placard angles.

- Hinge..Top hinge assembly welded 100%

- Roof..(Roof Panels) Exterior welded 100%

- Walls..(Side Walls) Top rail insert welded 100%; Ratchet plates welded 100%; All vertical wall tubes are skip welded, micro seal applied.

- Floor..Two piece (Rectangular Style), 100% welded, interior.
  Floor..One piece (Bathtub Style)

- Skid..(Understructure) Vertical crossmembers skip welded to underside of floor pan.

- Fork Tubes..Fork tubes (formed 1/4" plate) skip welded to floor pan. Fully welded to outside perimeter of floor pan.

McClain of OKLAHOMA
4000 S.W. 113th
Oklahoma City, OK 73173
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McClain E-Z Pack EPCO

ADDITIONAL INTERMODAL INFORMATION
continued . . .

Surface Preparation and Painting . . .

After each container is manufactured, it is water tested, before any further steps are taken. Once the container passes this inspection it goes to cleanup. Before containers are primed and painted, each container is cleaned. Our shop uses air and electric sanders along with grinders on all rough areas such as weld slag, etc. Each container is wiped down with an environmentally safe neutralizing wash, before primer is applied. We use a red oxide primer for a base coat, with an industrial grade enamel for the finish coat. Note: Underside of containers are primed only.

Stenciling . . .

- McClain to stencil information required on all "CSC" containers. (If applicable)
- McClain to furnish M-930 American Association of Railroads plate.
- Unit price(s) quoted include stenciling, using spray paint. Additional charge if 2 mil vinyl graphics are required.

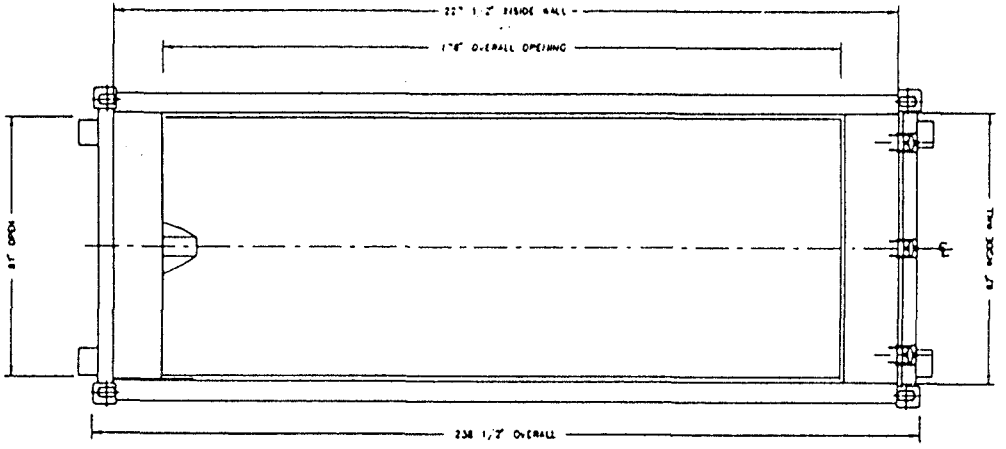
Warranty . . .

Structure...	1 year (Material and workmanship)
Paint System...	Under normal Exterior environment this coating system can be expected to last 3-5 years.
Markings...	(Optional) ... Hi-performance 2 mil vinyl graphic will last 5-7 years.

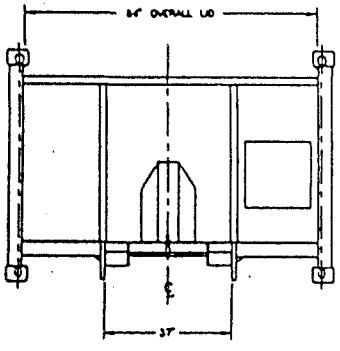
Additional Information . . .

All material purchased is prime hot roll material meeting A36 / C1018 chemistry. We buy our material in coil form directly from the mill and level as needed. This eliminates any sheet goods being stored outside, which allows rusting to occur.

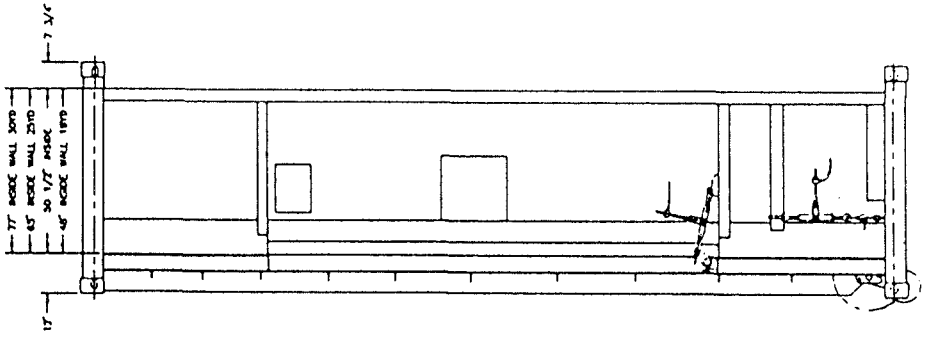
FILE COPY



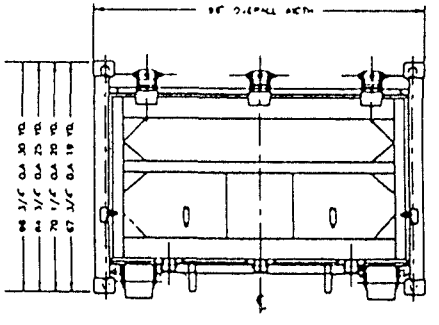
TOP VIEW



FRONT VIEW
BULKHEAD

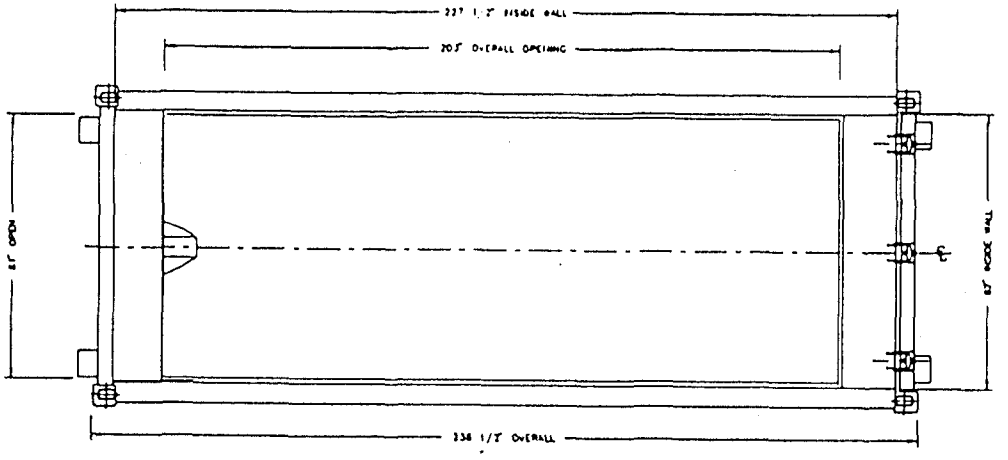


INTERMODAL CONTAINER
LEFT SIDE VIEW

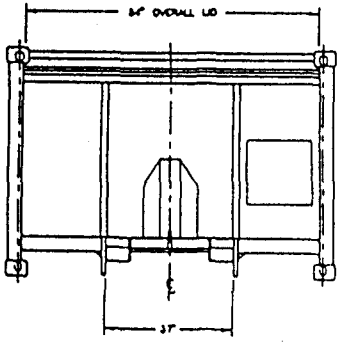


END VIEW
DOOR

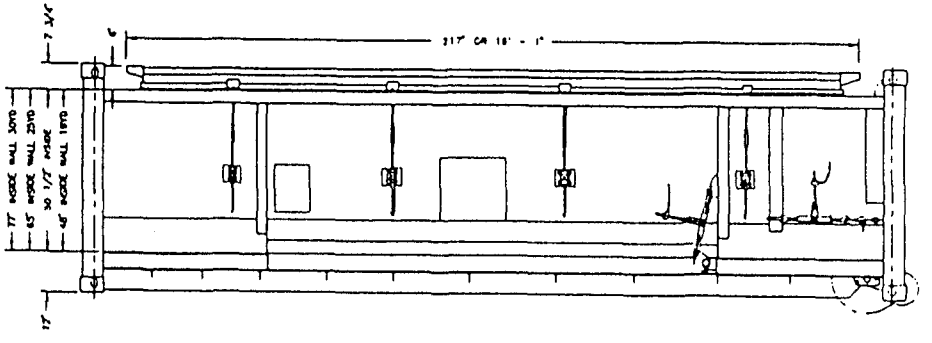
McCLAIN OF OKLAHOMA		
INTERMODAL		
[redacted] O.T.		
DRAWN:	SCALE: 1:16	DRAWING NO:
DATE:	TRACED:	SP16525
CHECKED:	APPROVED:	



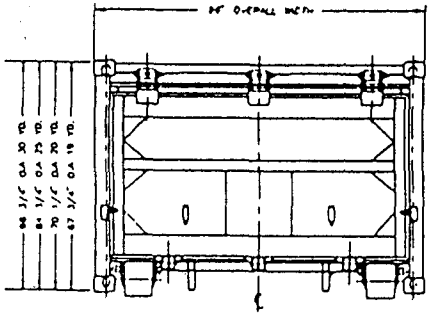
TOP VIEW



FRONT VIEW
BULKHEAD



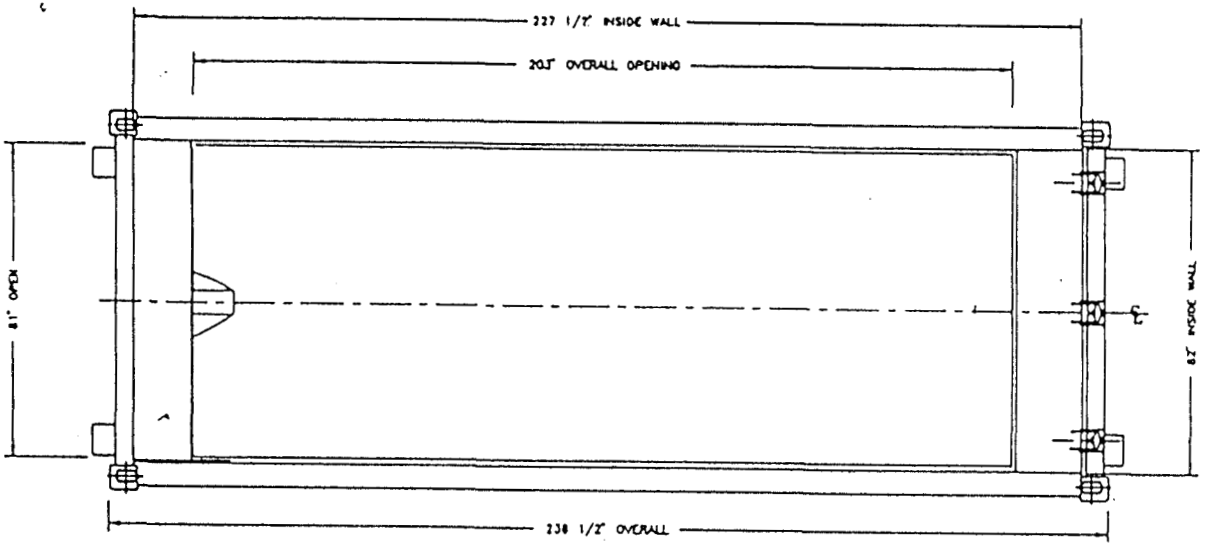
INTERMODAL CONTAINER
LEFT SIDE VIEW



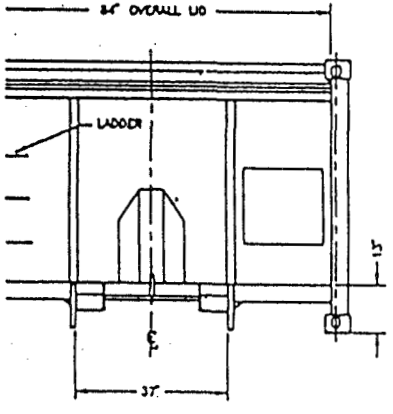
END VIEW
DOOR

McCLAIN OF OKLAHOMA		
INTERMODAL/ALUMINUM LID		
OPTIONS: ALUMINUM LID		
DRAWN: L. HANSKA	SCALE: 1:16	DRAWING NO: SF16525
DATE:	TRACED:	
CHECKED: H. FLOWERS	APPROVED:	

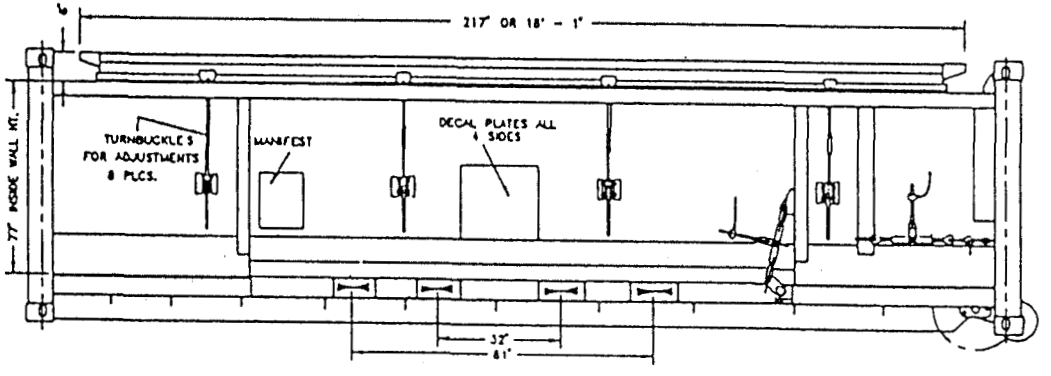
SALES



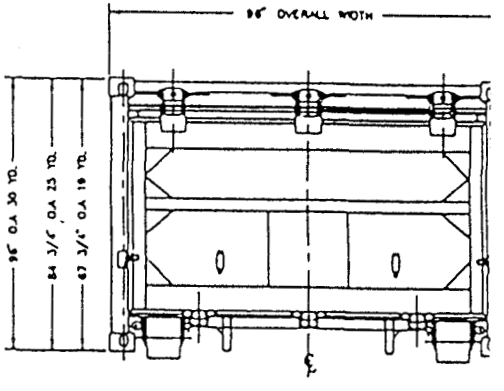
TOP VIEW



FRONT VIEW
BULKHEAD



INTERMODAL CONTAINER
LEFT SIDE VIEW



END VIEW
DOOR

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMALS ANGULAR
.XX ± .06 ± 1.5°
.XXX ± .010
DO NOT SCALE DRAWING

McCLAIN OF
OKLAHOMA CITY OKLAHOM

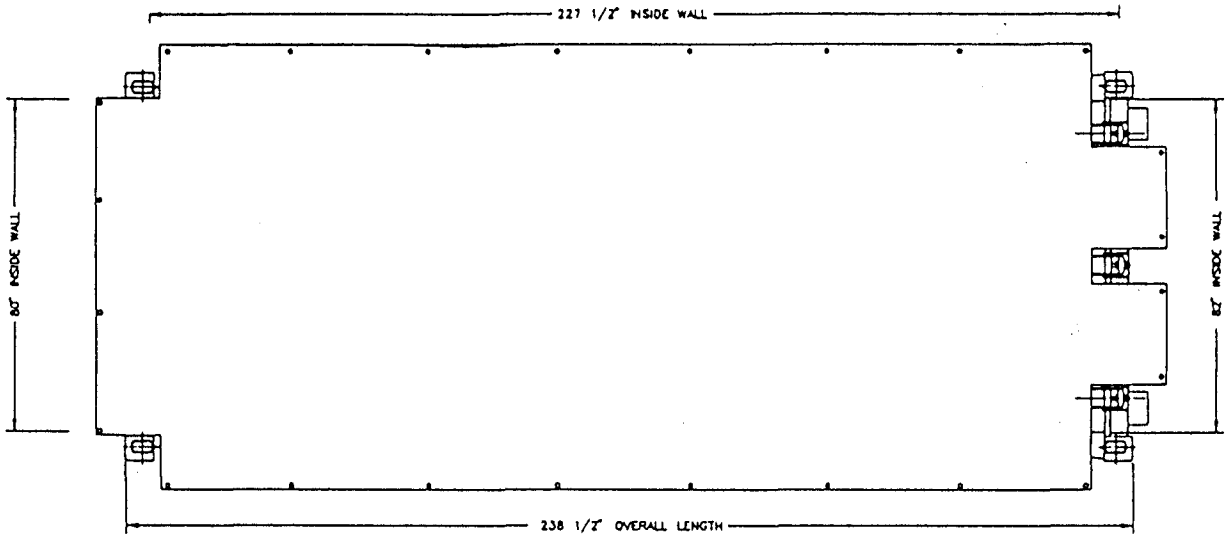
REVISIONS

NO.	DATE	DESCRIPTION	AUTH.

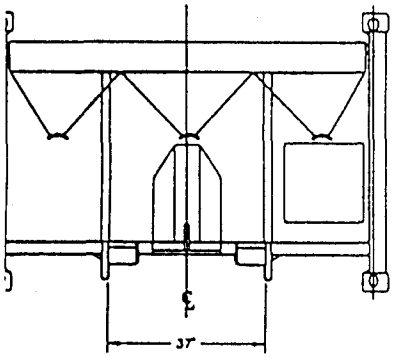
19,25,30 YD. IMDL\

DRAWN	L. HANSKA
CHECKED	N. FLOWERS
APPROVED	
DATE	10/83

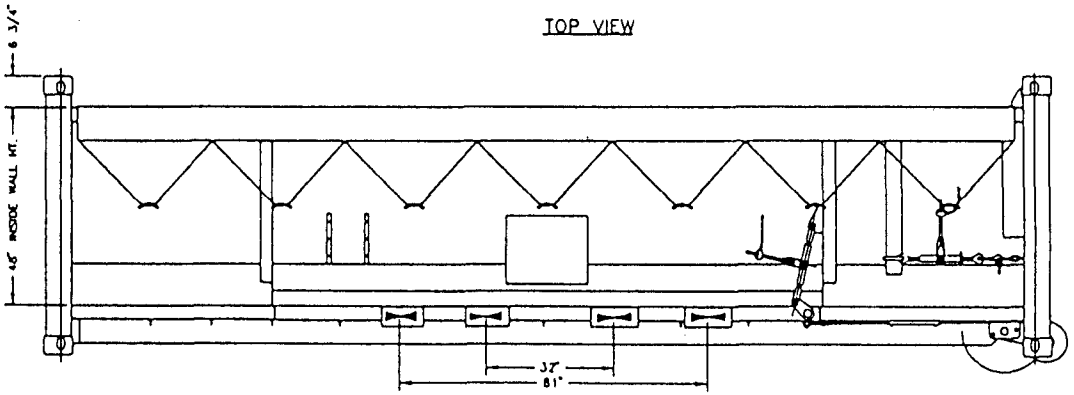
SHEET
DWG NO.
S/



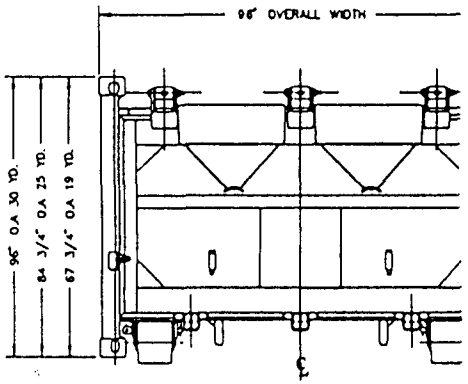
TOP VIEW



FRONT VIEW
BULKHEAD



INTERMODAL CONTAINER
LEFT SIDE VIEW



END VIEW
DOOR

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES DECIMALS .XX ± .06 .XXX ± .010 DO NOT SCALE DRAWING	ANGULAR ± 0.5°	McCLAIN OF OK	
		OKLAHOMA CITY	OKLAHOMA
REVISIONS		19,25,30 YD. IMDL\TARP'	
NO. DATE DESCRIPTION APPVD.		DRAWN L. HANSKA	SHEET OF
		CHECKED N. FLOWERS	DWG NO.
		APPROVED	SAL
		DATE 8/93	

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November 29, 1995

SPECIFICATION SHEET

"BATHTUB STYLE INTERMODAL ROLL-OFF SLUDGE CONTAINER"

INSIDE DIMENSIONS: **19 YARD**: 48" T x 82" W x 227" L **20 YARD**: 52" T x 82" W x 227" L
25 YARD: 65" T x 82" W x 227" L **30 YARD**: 77½" T x 82" W x 227" L
35 YARD: 89" T x 82" W x 227" L

SIDE WALLS:
- (1) piece - 10 Ga. SIDE WALL W/FORMED TOP RAIL
- WALL FORMS AN INTERIOR BAFFLE (FULL LENGTH)
- (2) VERTICAL SIDE WALL TUBES (PER SIDE)
- (2) RATCHET MOUNTS - 4 X 2 X 3/16 STRUCTURAL TUBE
- 10 Ga. ROOF PANELS (FRONT/REAR)
- ALUMINUM MANIFEST BOX (WATER TIGHT)

CORNER POST:
- 6 X 4 X 3/8 TUBE W/ISO CORNER CASTING W/CORNER STIFFENER

REAR DOOR:
- (1) piece - 10 Ga. FORMED DOOR PAN
- (1) HORIZONTAL (2) VERTICAL - 4 X 2 X 3/16 TUBE
- (2) HORIZONTAL - 4 X 4 X ¼ STRUCTURAL TUBE
- TOP HINGED REAR DOOR "8" POINT CLOSURE SYSTEM
- (3) ADJUSTABLE TOP HINGES W/ PIN-UP FEATURE
- (3) ADJUSTABLE GRAB HANDS (SAFETY RELEASE) / RATCHET LOCATED APPROX 5' FROM REAR CORNER POST
- (2) RATCHET ADJUSTMENT LATCHES
- RATCHETS ARE RATED @ 40,000# to 46,000# MINIMUM
- DOOR SEAL: 1 X 2 CLOSED CELL GASKET (SKINNED)
- GASKET LOCATED IN CONTAINER vs REAR DOOR

BULKHEAD:
- (1) piece 10 Ga. BULKHEAD / (2) 4 X 2 X 3/16 VERTICAL TUBES

FLOOR:
- (1) piece - 7 Ga. FORMED FLOOR PAN
- CROSSMEMBERS - 3" STRUCTURAL CHANNEL ON 16" CENTERS
- RAILS ARE (1) piece - 6 X 2 X ¼ TUBE
- SOLID BULL NOSE - 1¼" A36 PLT - SLID INTO RAILS (FULLY WELDED)
- ROLLERS ARE 4" dia X 6½" lg - W/GREASE ZERKS
- 1/4" GUSSETS ON EVERY CROSSMEMBER
- HOOK - 1¼" A570 PLT - INSERTED AND FULLY WELDED TO BASE

WHEELS:
- REAR PIN-UP WHEELS (FOR EASE IN LOADING & UNLOADING)
- 8" OD X 7¼" WIDE - AXLE - 1 7/8" CR ROUND
- WHEELS EQUIPPED W/ 1" dia., X 12" long PIN

INTERIOR:
- HYDRO TESTED FOR LEAKS

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November 29, 1995

SPECIFICATION SHEET

"BATHTUB STYLE INTERMODAL ROLL-OFF SLUDGE CONTAINER" WITH FORK TUBES

INSIDE DIMENSIONS: **19 YARD:** 48" T x 82" W x 227" L **20 YARD:** 52" T x 82" W x 227" L
25 YARD: 65" T x 82" W x 227" L **30 YARD:** 77½" T x 82" W x 227" L
35 YARD: 89" T x 82" W x 227" L

SIDE WALLS:
- (1) piece - 10 Ga. SIDE WALL W/FORMED TOP RAIL
- WALL FORMS AN INTERIOR BAFFLE (FULL LENGTH)
- (2) VERTICAL SIDE WALL TUBES (PER SIDE)
- (2) RATCHET MOUNTS - 4 X 2 X 3/16 STRUCTURAL TUBE
- 10 Ga. ROOF PANELS (FRONT/REAR)
- ALUMINUM MANIFEST BOX (WATER TIGHT)

CORNER POST:
- 6 X 4 X 3/8 TUBE W/ISO CORNER CASTING W/CORNER STIFFENER

REAR DOOR:
- (1) piece - 10 Ga. FORMED DOOR PAN
- (1) HORIZONTAL (2) VERTICAL - 4 X 2 X 3/16 TUBE
- (2) HORIZONTAL - 4 X 4 X ¼ STRUCTURAL TUBE
- TOP HINGED REAR DOOR "8" POINT CLOSURE SYSTEM
- (3) ADJUSTABLE TOP HINGES W/ PIN-UP FEATURE
- (3) ADJUSTABLE GRAB HANDS (SAFETY RELEASE) / RATCHET LOCATED APPROX 5' FROM REAR CORNER POST
- (2) RATCHET ADJUSTMENT LATCHES
- RATCHETS ARE RATED @ 40,000# to 46,000# MINIMUM
- DOOR SEAL: 1 X 2 CLOSED CELL GASKET (SKINNED)
- GASKET LOCATED IN CONTAINER vs REAR DOOR

BULKHEAD:
- (1) piece 10 Ga. BULKHEAD / (2) 4 X 2 X 3/16 VERTICAL TUBES

FLOOR:
- (1) piece - 7 Ga. FORMED FLOOR PAN
- CROSSMEMBERS - 5" STRUCTURAL CHANNEL ON 16" CENTERS
- FORK TUBES (4) 14" L X 5" T
- RAILS ARE (1) piece - 6 X 2 X ¼ TUBE
- SOLID BULL NOSE - 1¼" A36 PLT - SLID INTO RAILS (FULLY WELDED)
- ROLLERS ARE 4" dia X 6½" lg - W/GREASE ZERKS
- 1/4" GUSSETS ON EVERY CROSSMEMBER
- HOOK - 1¼" A570 PLT - INSERTED AND FULLY WELDED TO BASE

WHEELS:
- PIN-UP WHEELS (FOR EASE IN LOADING & UNLOADING)
- 8" OD X 7¼" WIDE - AXLE - 1 7/8" CR ROUND
- WHEELS EQUIPPED W/ 1" dia., X 12" long PIN

INTERIOR:
- HYDRO TESTED FOR LEAKS

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■ LID DESCRIPTIONS FOR INTERMODAL CONTAINERS ■

OVER-UNDER LID ASSEMBLY:

- (2) 7' X 7'7" Fill doors.
- 12 Ga., HR Sheet with 4 X 2 X 3/16 tube welded the full perimeter.
- (3) Ratchets per side - each rated @ 7,750# minimum.
- (6) 4" Rollers w/ grease zerk axles per "OVER LID" and (4) rollers per "UNDER LID".
- (10) Springs to assist in lifting action.
- Lids sealed with 1" X 1" gasket (skinned)
- Lids seal by means of compression.
- This cover is designed to allow lids to be located either at Rear Door End or Bulkhead End. Allowing a 7' X 7'7" fill area at both ends, therefore the container can be filled completely.

ROLL-TOP LID ASSEMBLY:

- (2) 4'5" X 7' Fill Doors.
- 12 Ga., HR Sheet with 4 X 2 X 3/16 tube welded the full perimeter.
- Each lid has (4) ratchets; (4) lid support roller assemblies; (4) interior rollers; (4) springs to assist in lifting action.
- Each lid is sealed with 1" X 2" closed cell (skinned) gasket.
- Lids seal by means of knife edge.
- This cover is designed so that one (1) lid rolls to bulkhead end and one (1) lid will roll to rear door end, therefore allowing access to the center of the container.

SPRING ASSISTED LID ASSEMBLY:

- (2) Fill doors (2) 5' X 7' doors.
- 10 Ga., W/4" Structural channel the full perimeter.
- (4) Lid assist springs per door.
- (2) Positive door latch assemblies per fill door.
- Sealed w/ 1" X 2" gasket (skinned). • Lids seal by means of knife edge.

"ALUMINUM" ROLL-OVER LID:

- (1) 7' X 18'1 1/2" Fill door.
- Lid panel fabricated from .032 Aluminum sheet. Aluminum extrusion welded the full perimeter; (8) Aluminum roof bows (extrusions) running across the width.
- Lid panel has (2) crossbraces running diagonally the full length for added strength, plus corner gussets.
- (2) Grab handles per side.
- (4) Quick release over-center lid latches per side.
- (4) 3" Rollers made of hard rubber w/an internal bearing; (4) 1 1/2" bearings to assist in rolling of lid.
- (4) Springs to assist in lifting action.
- Lids sealed with 1" X 2" gasket (skinned)
- This cover is designed to allow quick and easy operation. The "Roll-Over" lid can be rolled to the passenger or driver side, allowing access to an opening measuring 6'9" x 16'11".
- Approximate weight of "Aluminum" "Roll-Over" lid - 250#

Note:

- For further information on the fiberglass lids and tarps, please call.

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SPECIFICATION SHEET

EFFECTIVE
OCTOBER 1, 1994

"TARP ASSEMBLY"
Intermodal Container

SPECIFICATIONS:

TARP:
- 18 ounce - Coated Nylon [20-ounce available upon reqest]
- Weatherproof Nylon Based Fabric
- Bursting Strength: 20 lbs per square inch
- Temperature Ratings: -55 deg F / 180 - 190 deg F
- Approximate Weight - 35#
- Color: Customer To Determine - Overall Size: 118" W x 225" L
- (3) Cut-Outs On Door End
- Mounted (Bolted) On Bulkhead End W/2" Steel Strip x 85" long

[HARDWARE]

RATCHETS:
- Qty (3) / 2" Wide / Rated @ 12,000# Capacity
- Location: Rear Door

STRAPS:
- Qty (3) / 2" Nylon Webbing / (With Loop (1) End)
- Location: Rear Door

CROSSBOWS:
- Zinc Chromate Round Tube (1.09" O.D. x 14 Ga.,Wall)
- Formed with a 3" Rise
- Bow Ends . . . 3/4" Hot Roll Round Bar
- Crossbow Sleeves . . . 3/4" O.D. Round Tube

CRANK HANDLE:
- Qty (1) - Located Rear Door End
- Note: Crank Handle To Have Pocket For Storage When Not In Use

O-RINGS TO RUN LENGTH OF TARP / DRIVER & PASSENGER SIDES TO BE FASTENED BY (14) RUBBER STRAPS (BUNJI CORDS) - 12" long.

Note: The above tarp system is designed for heavy duty wear. These particular tarps are used quite extensively in Montana and N. Dakota, in the trucking industry.

- Description Of Intermodal Tarp Assembly Installed:
  - Rear Door End Has Three (3) Cut Outs for Straps & Hooks
  - Bulkhead End Is Permanently Mounted

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"SLUDGE GASKET"

GASKET SPECIFICATION: 1" x 2" and 1" x 1" CLOSED CELL EXTRUDED
COMPOUND NUMBER: #NS-10-P-S
TYPE: NEOPRENE SPONGE - SKINNED (4) SIDES
DUROMETER: 60 ± 10 / SHORE 00 - 50

PHYSICAL PROPERTIES

	Results
COMPRESSION/DEFLECTION	
Test Method: D1056	
3/4" Diameter Specimens Deflected 25% @ 0.5 Inch Per Minute.	
Load Required To Deflect Specimens 25% PSI	15.5
COMPRESSION SET	
Test Method: ASTM D 395, Method B	
Twenty-Two Hours @ 158°, 25% Deflection & 1/2 Hour Recovery.	
Compression Set Percentage:	43.5
HEAT AGED COMPRESSION DEFLECTION	
Test Method: ASTM D 865, D1056	
Specimens Deflected 25% @ 0.5 Inch Per Minute.	
Change In Load To Deflect Specimens 25% PSI:	+12.9
DIMENSIONAL STABILITY	
Test Method: ASTM D 865	
Specimen Aged 70 Hrs @ 212°F In A Forced Air Oven.	Width Change: 8.6% Length Change: 5.2%
OZONE RESISTANCE	
Test Method: ASTM D 1149	
Test Specimens Per ASTM D 518, Method A.	
Specimens Exposed For 72 Hours PPHM @ 104°F, 40% Elongation:	
Hours Of Exposure: 72	0
LOW TEMPERATURE BRITTLENESS	
Test Specimens: ASTM D 412, Die C.	
Specimens Aged Five House @ -40°F In Air	No Cracks
WATER ABSORPTION	
Eighteen Inch Specimens Immersed For A Period Of 24 Hours @ 73°F	
In Distilled Water. Weight Change Percentage As Follows:	+0.7
FLAME PROPAGATION	
One And One-Half Inch Flame Height. Five Minute Flame Application.	0.5
FLAME RESISTANCE	Pass
MIGRATION STAINING	
Test Method: ASTM D 925, Method B.	
Specimen Exposed For 48 Hours @ A 10" Distance From 275w,	
Type S Bulb. Test Surface: White Automotive	Non-Staining
FLUID AGING	
Test Method: ASTM D471	
70 Hours @ Room Temperature #3 Oil Immersion	
% Dimensional Change Length	± .102%
% Dimensional Change Width	± 1.47%

APPENDIX A-3

Designation Support Documentation

Appendix A-3:
Designation Support Documentation

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Section A-3.3	Proposed Groundwater Monitoring Plan Outline For The CSF	A-3.3.1
Section A-3.4	Comprehensive Construction Quality Assurance Plan Outline For The CSF	A-3.4.1
Section A-3.5	Health And Safety Plan Outline For The CSF	A-3.5.1
Section A-3.6	Security Plan Outline For The CSF	A-3.6.1
Section A-3.7	Proposed Surface Water Monitoring Plan Outline For The CSF	A-3.7.1
Section A-3.8	Contingency Plan Outline For The CSF	A-3.8.1
Section A-3.9	Inspection Plan Outline For The CSF	A-3.9.1
Section A-3.10	Operating Record System Plan Outline For The CSF	A-3.10.1
Section A-3.11	Personnel Training Plan Outline For The CSF	A-3.11.1
Section A-3.12	Chemical Compatability Testing Decision Process	A-3.12.1

SECTION A-3.1

CLOSURE AND POST CLOSURE PLAN OUTLINE FOR THE CONTAINERIZED STORAGE FACILITY

Revision 0

June, 1997

OUTLINE

1.0 INTRODUCTION

1.1 Purpose and Scope

2.0 FACILITY DESCRIPTION

2.1 General Description
- 2.1.1 Facility Description
- 2.2.2 Operations Summary

2.2 Physical Setting

2.3 Hydrogeologic Information
- 2.3.1 Geology
- 2.3.2 Hydrogeology

2.4 Current Groundwater Monitoring Program

2.5 Remediation Wastes Associated with the CAMU

2.6 Description of Areas and Facilities Undergoing Closure
- 2.6.1 Containerized Storage Facility
- 2.6.2 Waste Staging/Consolidation Areas
- 2.6.3 Decontamination Facilities

3.0 CLOSURE PROCEDURES

3.1 Closure Process

- 3.1.1 Decommissioning Phase
- 3.1.2 Certification Phase
- 3.1.3 Post-Closure Phase

3.2 Procedures for Removing Remediation Wastes
- 3.2.1 Disposal
- 3.2.2 Transportation

3.3 Decontamination of Facilities

3.4 Demolition of Facilities

3.5 Regrading and Revegetation

3.6 Certification

3.7 Spill Prevention and Response

3.8 Survey Plat

4.0 CLOSURE SCHEDULE

4.1 Expected Year of Closure and Total Time to Close

5.0 POST-CLOSURE CARE PLAN

5.1 Post-Closure Monitoring and Maintenance Plan
5.1.1 Monitoring Plan
5.1.2 Maintenance Plan

5.2 Certification of Post-Closure Care

5.3 Notation in the Deed

6.0 ACRONYMS

7.0 REFERENCES

INTRODUCTION

This Closure and Post-Closure Plan Outline has been prepared as an appendix to the Corrective Action Management Unit (CAMU) Decision Document (DD) for containerized waste storage in support of the designation of a CAMU to facilitate the final remedy of offsite disposal for cleanup of the Rocky Flats Environmental Technology Site (RFETS), located in Jefferson County, Colorado. This facility is anticipated to be clean closed by removal and offsite disposal of all remediation wastes and contaminated structural material. Although a closure plan outline is being submitted, this does not preclude the conversion of the facility to other uses as part of other RFETS closure activities, economic conversion, or privatization. Minimal post-closure care, if any, is anticipated.

PURPOSE AND SCOPE

This outline presents the Closure and Post-Closure Plan Outline for the CAMU at RFETS. This Closure and Post-Closure Plan was prepared in accordance with the Colorado Hazardous Waste Regulations found at 6 Code of Colorado Regulations (CCR) 1007-3, Section 264.552. Although not specifically required by 6 CCR 1007-3, Section 264.552, this Closure Plan uses as guidance many of the elements for closure and post-closure care specified in 6 CCR 1007-3, Part 265, Sub-part G (Closure and Post Closure).

This Closure Plan will include post-closure care activities, as necessary, for the CSF. The language in 6 CCR 1007-3 Section 264.552 requires that areas within the CAMU where remediation wastes remain in-place after closure of the CAMU be managed and contained to control, minimize, or eliminate future releases to the extent necessary to protect human health and the environment. The CSF will not have hazardous waste remain in place after closure. The facilities within the CAMU will not likely require post-closure care because waste and contaminated facility material will be removed from these facilities and the facilities will be decontaminated during closure.

Section 2.0 of this Closure Plan will present a general description of the CSF facility and the facilities within the CAMU undergoing closure. Section 3.0 will present a general discussion of the closure procedures and the associated waste management activities that will occur during closure. Section 4.0 will describe the anticipated schedule for closure activities, and Section 5.0 will provide a Post-Closure Plan if necessary. Section 6.0 will provide a list of acronyms, and Section 7.0 will provide the reader with a list of references used in the document.

This Closure and Post-Closure Plan Outline provides a framework for the final closure and post-closure of facilities within the CAMU. The final closure and post-closure plan will be developed in the future as closure is required. All future closure and post-closure plans will be submitted to CDPHE for approval.

CLOSURE PROCEDURES

It is the intent that closure activities will be performed to meet the closure standards specified in 6 CCR 1007-3, Section 264.552. The components of closure procedures presented in this section use as guidance many of the elements for closure specified in 6 CCR 1007-3, Part 265, Sub-part G. The closure of the CSF will be conducted in a manner that:

- Minimizes the need for further maintenance; and
- Control, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents,

contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere.

The components of closure described in this Closure Plan Outline and further developed during design will provide long-term protection of human health and the environment. Closure of the CAMU will include the following:

- Removal of wastes stored in the CSF
- Decontamination of the CSF
- Requirements for removal and decontamination of equipment, devices, and structures used in remediation waste management activities within the CAMU.

DRAFT

SECTION A-3.2

PRELIMINARY WASTE ACCEPTANCE CRITERIA FOR THE CONTAINERIZED STORAGE FACILITY

Revision 0
June, 1997

OUTLINE

1.0 PURPOSE

2.0 SCOPE

3.0 WASTE ACCEPTANCE CRITERIA

- 3.1 Waste Characterization Requirements
  - 3.1.1 Waste Characterization by Process Knowledge
  - 3.1.2 Waste Characterization by Sampling and Analysis
- 3.2 Physical Requirements
  - 3.2.1 General Requirements
  - 3.2.2 Containerization Requirements
- 3.3 Chemical Requirements
  - 3.3.1 General Requirements
  - 3.3.2 Asbestos Waste
  - 3.3.3 Polychlorinated Biphenyls (PCBs) Waste
- 3.4 Radiological Requirements
- 3.5 Packaging and Labeling Requirements
- 3.6 Waste Segregation Requirements

4.0 ADMINISTRATION

- 4.1 Waste Information
  - 4.1.1 Waste Characterization Data Report
  - 4.1.2 Analytical Results Form
  - 4.1.3 Sampling and Analysis Plan
  - 4.1.4 Packaging and Transportation Plan
  - 4.1.5 Documentation Acceptance
- 4.2 Waste Certification
- 4.3 Shipment
  - 4.3.1 Shipment Notification
  - 4.3.2 Waste Shipment

5.0 EXCEPTIONS TO THE WASTE ACCEPTANCE CRITERIA

6.0 ACRONYMS

7.0 REFERENCES

1.0 PURPOSE

This document specifies waste acceptance criteria (WAC) for wastes to be stored of at the Containerized Storage Facility (CSF) Corrective Action Management Unit (CAMU). These criteria were established by the Environmental Protection Agency (EPA), Colorado Department of Public Health and Environment (CDPHE), Department of Energy (DOE), and Department of Transportation (DOT). Compliance with the WAC ensures that storage of wastes meets all applicable requirements. Using the WAC ensures the following goals are achieved:

a. Hazardous and radioactive remediation wastes are effectively isolated from potential natural environmental pathways to protect the public health and environment,

b. Only specified wastes are accepted for storage,

c. Compliance by CSF operating personnel and generators to requirements,

d. Characteristics of the disposed wastes are known, certified, and available.

The central purpose for a CAMU designation is to allow safe and protective storage of hazardous and radioactive remediation wastes without treatment to meet Land Disposal Restrictions criteria. A CAMU is established to facilitate the implementation of reliable, effective, protective, and cost-effective remedies by providing an appropriate location for storage of hazardous and radioactive remediation wastes to facilitate offsite disposal. As such, certification of stored wastes will normally be via process knowledge from the specific remediation projects. A sampling and analysis plan can be used if process knowledge is not sufficient to certify the waste.

2.0 SCOPE

This document applies to all Rocky Flats Environmental Technology Site (RFETS) contractors, subcontractors, and Department of Energy, Rocky Flats Field Office (DOE,RFFO) remediation waste generators.

The CSF will only accept waste in containers meeting the definition of remediation wastes; typically wastes derived from environmental remediation (ER) cleanup and decontamination and decommissioning (D&D) activities at the RFETS.

Treatment of wastes, including size reduction, to meet storage criteria will be the responsibility of the waste generator and will not be done at the CSF.

DRAFT

SECTION A-3.3

PROPOSED GROUNDWATER MONITORING PLAN OUTLINE FOR THE CONTAINERIZED STORAGE FACILITY

Revision 0
June, 1997

OUTLINE

1.0 INTRODUCTION

1.1 Purpose of the Groundwater Monitoring Program

1.2 Site Description

1.3 Environmental History
- 1.3.1 Definition and Description of Contaminated Sites
- 1.3.2 Brief History of Groundwater Monitoring Activities
- 1.3.3 Current Status of The Groundwater Program

2.0 PHYSICAL AND HYDROLOGIC SETTING

2.1 Geology
- 2.1.1 Introduction
- 2.1.2 Stratigraphy
  - 2.1.2.1 Pediment Covering Alluviums
  - 2.1.2.2 Other Surficial Deposits
  - 2.1.2.3 Arapahoe Formation
  - 2.1.2.4 Laramie and Fox Hills Sandstone Formations
  - 2.1.2.5 Pierre Formation
- 2.1.3 Geologic Structure

2.2 Hydrogeology
- 2.2.1 Introduction
- 2.2.2 Definition of the Uppermost Aquifer for the Site
- 2.2.3 Groundwater Occurrence and Distribution
- 2.2.4 Groundwater Flow
- 2.2.5 Hydraulic Conductivities

2.3 Interaction with Surface Water

3.0 EVALUATION OF SITE IMPACTS TO GROUNDWATER

3.1 Impact of Individual Hazardous Substance Sites (IHSSs) on the Quality of Groundwater

3.2 Groundwater Contaminant Plumes
- 3.2.1 Old Landfill
- 3.2.2 Industrial Area Groundwater Contamination
  - 3.2.2.1 Carbon Tetrachloride Plume
  - 3.2.2.2 Industrial Area Plume

3.2.2.3 Other Industrial Area Plumes

4.0 DESCRIPTION OF THE CSF GROUNDWATER MONITORING PROGRAM

4.1 CSF Groundwater Program Objectives

4.2 CSF Monitoring Objectives
- 4.2.1 Identification of Potential Contaminants
- 4.2.2 Identification and Control of Contaminant Sources
  - 4.2.2.1 Hazardous Waste Management Areas
  - 4.2.2.2 Storage Tanks and Sumps
  - 4.2.2.3 Other Potential Contamination Sources
- 4.2.3 Identification of Potential Contaminant Pathways
- 4.2.4 Identification of Contaminant Concentrations
- 4.2.5 Monitoring of Remedial Actions
- 4.2.6 Protection From New Contaminant Sources

4.3 CSF Data Quality Objectives
- 4.3.1 Programmatic Data Quality Objectives
- 4.3.2 Individual Program DQO Elements
  - 4.3.2.1 Background Monitoring Wells
  - 4.3.2.2 Release Detection Wells
  - 4.3.2.3 Drainage Monitoring Wells
  - 4.3.2.4 Boundary Monitoring Wells
- 4.3.3 CSF Data Quality Objectives for Monitoring Groundwater Flow
  - 4.3.3.1 Sitewide Flow Monitoring
    - 4.3.3.1.1 Water Quality Flow Monitoring
    - 4.3.3.1.3 Industrial Area Flow Monitoring
    - 4.3.3.1.4 Background Groundwater Flow Monitoring
  - 4.3.3.2 Ecological Groundwater Flow Monitoring
- 4.3.4 CSF Data Quality Objective for Sampling Frequency

4.4 CSF Quality Control Objectives for Collection of Groundwater Samples
- 4.4.1 Field Data Collection
  - 4.4.1.1 Representative Samples
  - 4.4.1.2 Minimization of Contamination (Sampling)
  - 4.4.1.3 Standardization of Sampling Techniques
- 4.4.2 Accuracy of Water Level Measurements
- 4.4.3 Laboratory Analysis
- 4.4.4 Data Management
- 4.4.5 Groundwater Assessment/Reporting

4.5 Proposed CSF Groundwater Program
- 4.4.1 Program Components
  - 4.4.1.1 Sampling and Analysis
  - 4.4.1.2 Measurement of Groundwater Elevations
  - 4.4.1.3 Groundwater Reporting

4.2.1.4 Well Abandonment and Replacement

5.0 REFERENCES

1.0 INTRODUCTION

The outline for the CSF Groundwater Monitoring Plan is based on the current draft outline for the Rocky Flats Environmental Technology Site (RFETS) Integrated Monitoring Plan (IMP). It is intended that the CSF specific groundwater monitoring requirements would be incorporated into the IMP once the groundwater monitoring requirements for the CSF have been established during the design phase.

It is also intended that the current RFETS groundwater monitoring network be utilized to the greatest extent possible to satisfy background, upgradient, and downgradient monitoring requirements for the CSF. This would be established through development of CSF data quality objectives for groundwater monitoring during the design phase of the project.

The following attachments provide brief descriptions of the processes to be used to support development of a groundwater monitoring network for the CSF.

Attachment 1.
General Decision Criteria for
Groundwater Monitoring Network Efficiency Analysis

Analysis of efficiency of existing monitoring wells and the evaluation of the need for additional wells will generally be based upon the following process:

1. Down gradient well placement

   Step 1. Assess 50% Title II design
   Step 2. Identify groundwater flow paths relative to facility placement within the CAMU
   Step 3. Assess vertical component of groundwater flow.
   Step 4. Assess seasonal and temporal factors affecting groundwater flow.
   Step 5. Identify potential contaminant pathways.
   Step 6. Determine spatial relationship to existing groundwater monitoring network.
   Step 7. Select additional monitoring well sites as appropriate.

2. Up gradient well placement

   Step 1. Assess 50% Title II design
   Step 2. Identify groundwater flow paths up gradient relative to facility placement within the CAMU
   Step 3. Assess seasonal and temporal factors affecting groundwater flow.
   Step 4. Assess historical data for area surrounding the CAMU.
   Step 5. Determine spatial relationship to existing groundwater monitoring network.
   Step 6. Determine data adequacy of existing data and upgradient wells.
   Step 7. Select additional monitoring well sites as appropriate.

Attachment 2.
Release Reporting Assessment Criteria

Problem Statement:

The problem statement for RCRA Monitoring wells is: Have concentrations in downgradient monitoring wells exceeded mean concentrations in upgradient monitoring wells at RCRA units?

Problem Scope:

RCRA monitoring is conducted to detect potential excursions of contamination below the point of compliance established for RCRA units on Site. RCRA units are considered to be any units that are regulated under 6 CCR 1007-2 solid waste requirements, such as the CSF CAMU, Present Landfill, and the New Sanitary Landfill, and any future waste repositories.

Decision Statement:

IF	Mean concentrations in any downgradient wells exceed the mean concentration in upgradient wells,
AND	Concentrations at that well show an upward trend with time,
THEN	Report to appropriate agencies and initiate investigation into possible causes,
ELSE	Continue Monitoring.
Inputs:	Unit Specific Potential Contaminent Of Concerns (PCOCs) Field Parameters Water Levels
Boundaries:	Spatial - Decisions are based on pooled results of upgradient wells and on a well head basis in downgradient wells. Temporal - Data will be reviewed quarterly and decisions will be made on an annual basis.

SECTION A-3.4

COMPREHENSIVE CONSTRUCTION QUALITY ASSURANCE PLAN OUTLINE FOR THE CONTAINERIZED STORAGE FACILITY

Revision 0
June, 1997

OUTLINE

PART 1 - General Requirements

1.0 INTRODUCTION

1.1 Purpose of Plan
1.2 Plan Users
1.3 Codes, Standards, and Regulations

2.0 RESPONSIBILITY AND AUTHORITY

2.1 Definition of Parties
- 2.1.1 Definitions - General
- 2.1.2 Definitions - Contractor
- 2.1.3 Definitions - Design Engineer/Construction Quality Assurance Subsontractor
- 2.1.4 Definitions - Construction Subcontractor

2.2 Project Organization and Responsibilities
- 2.2.1 Owner
- 2.2.2 Contractor
- 2.2.3 Design Engineer/Construction Quality Assurance Subcontractor
- 2.2.4 Construction Subcontractor

3.0 PROJECT MEETINGS

3.1 Pre-Construction Meeting
3.2 Progress Meetings
3.3 Problem/Deficiency Meetings

4.0 DOCUMENT CONTROL

4.1 Scope
4.2 Responsibilities
4.3 Basic Requirements
4.4 Supplementary Requirements

5.0 CONTROL OF NONCONFORMANCE REPORTS

6.0 CONTROL OF PURCHASED ITEMS AND SERVICES

7.0 CONTROL OF MEASURING AND TEST EQUIPMENT

7.1 Scope
7.2 Responsibilities
7.3 Basic Requirements
7.4 Supplementary Requirements

8.0 SURVELLANCES

8.1 Scope
8.2 Responsibilities

8.3 Basic Requirements
8.4 Supplementary Requirements

9.0 RECORDS

9.1 Scope
9.2 Basic Responsibilities
9.3 Basic Requirements
9.4 Specific Responsibilities
9.5 Supplementary Requirements
9.6 Training Statement
9.7 Storage of Records

PART 2 - Construction Requirements

10.0 EARTHWORK

10.1 General
10.2 Common Fill
10.3 Soils Construction Evaluation
10.4 Topsoil and Revegetation

11.0 PIPING - PLASTIC

12.0 PIPING - METALLIC

13.0 GENERAL CIVIL - CONCRETE

14.0 STRUCTURAL

15.0 MECHANICAL

16.0 ELECTRICAL - WIRE CABLE

17.0 ELECTRICAL - RACEWAYS

18.0 ELECTRICAL - GROUNDING

19.0 INSTRUMENTATION

CONTROL OF COMPREHENSIVE CONSTRUCTION QUALITY ASSURANCE PLAN

The Comprehensive Construction Quality Assurance Plan (CCQAP) document is for the use of all quality assurance and quality control staff, project engineers, construction engineers, and all construction subcontractors site personnel involved with the construction of the Containerized Storage Facility (CSF) project at the Rocky Flats Environmental Technology Site. The corporate quality assurance manager will maintain a record of the recipients of the manual.

Controlled copies of this manual will be issued to appropriate project personnel involved in the supervision of work performed to the requirements of this manual.

From time to time, it may become necessary to prepare revisions to this manual. When a revision is prepared, the change shall be noted by a vertical line in the left-hand margin. If later a revision is made to the same sheet, the line indicating a previous change will be removed. Revisions shall be distributed with a new index showing the effective revision of the applicable section. When a complete re-write of the CCQAP is issued, no margin lines will be used. Revisions will receive a review and approval equivalent to the original.

When it becomes necessary to define project-specific activities and/or delete those activities which are not applicable to that project, an addendum to this manual, it is understood that reference to a specific individual will include the individual's designee, provided they are in the same department and are qualified to perform the designated function. In all cases, the quality requirements shall be verified and docmented by persons not directly performing the work, and responsibility for the work remains with the designated individual.

1.1 Purpose of Plan

This CCQAP establishes the construction quality assurance program, supervision, inspection and testing of all items of work, including those of suppliers and subcontractors, which will demonstrate compliance with subcontract documents, applicable standards, and permitting requirements related to the construction activities for the Rocky Flats CSF at the Department of Energy's Rocky Flats Environmental Technology Site (RFETS), Golden Colorado. Implementation of the CCQAP will help to provide quality work, cost and schedule control, and regulatory compliance.

The CCQAP has been developed as one documents. Within this document there are two main parts. The first part is the general section covering the project as a whole. Part 2 will focus on specifics of the CSF facility, such as earthwork, building construction, mechanical systems, and electrical and instrumentation systems.

In Part 2 of the CCQAP, the construction requirements of the facility quality assurance requirements are identified. In this Part, the sections of the CCQAP are focussed on the standard construction industry practices for the types of construction associated with the general site development, the building and mechanical systems, electrical power distribution and various other systems as shown on the Construction Drawings and Specifications for the complete CSF.

Construction quality assurance for the following components are contained in the Part 2 of the CCQAP portion of the project. This portion of the total project quality assurance for the project is designated to cover:

- Earthwork for general site grading and structural foundation
- Underground and overhead utilities (water, electrical, instrumentation, etc.)
- Building structural and mechanical systems
- Equipment decontamination facilities
- Personnel decontamination facilities
- Roadway and storm drainage components

The construction subcontractor, along with the contractor and contractor's representatives shall be knowledgable of all requirements for the Project QA procedures.

The elements contained within all parts of this CCQAP include:

(1) Defining responsibility and authority of all organizations and key personnel,

(2) Qualifications of construction quality assurance personnel,

(3) Summary of the activities used to document the installation,

(4) Presenting sampling requirements for key components, and

(5) Description of the documentation to be completed and archived.

1.2 Plan Users

The quality assurance and quality control staff, project engineers, construction engineers, and all Construction Subcontractor site engineers, managers, and foreman are required to become familiar with all parts of this document. All parties are required to review this document with particular attention to those sections applicable to their responsibilities.

SECTION A-3.5

HEALTH AND SAFETY PLAN OUTLINE FOR THE CONTAINERIZED STORAGE FACILITY

Revision 0
June, 1997

OUTLINE

The outline below has been prepared to describe the general content of the Health and Safety Plan for the Containerized Storage Facility (CSF). During or after design, the outline should be reviewed for applicability and revised as necessary.

1.0 INTRODUCTION

1.1 Purpose and Scope

1.2 Implementation and Modification of the Site Safety and Health Plan

1.3 Organization

2.0 SITE AND CSF FACILITY INFORMATION

2.1 General Site Description
- 2.1.1 Site Status
- 2.1.2 Site History
- 2.1.3 Climate
- 2.1.4 Locations of Resources Available to Onsite Personnel

2.2 Potential Chemicals Detected in Wastes Received at the Facility

2.3 Site Zones
- 2.3.1 Support Zones
- 2.3.2 Contamination Reduction Zones
- 2.3.3 Exclusion Zones

2.4 Site Control

3.0 PROJECT ORGANIZATION AND PERSONNEL REQUIREMENTS

3.1 Organization and Safety Responsibilities

3.2 Personnel Requirements

4.0 HEALTH AND SAFETY PROGRAMS

4.1 Required Personnel Training
- 4.1.1 CSF Personnel
- 4.1.2 RFETS Personnel
- 4.1.3 Occasional Site Personnel Potentially Exposed to Hazardous Substances Below Permissible Exposure Limits
- 4.1.4 Management and Supervisory Training
- 4.1.5 Refresher Training
- 4.1.6 Documentation
- 4.1.7 Exempt Personnel
- 4.1.8 Tailgate Safety Meetings
- 4.1.9 Safety Inspections and Audits

4.2 Medical Monitoring

4.3 Respiratory Protection Policy

4.4 Hazard Communication
4.4.1 Container Labeling
4.4.2 Material Safety Data Sheets

5.0 PROJECT HAZARD IDENTIFICATION AND MIGRATION

5.1 General Health and Safety Work Practices

5.2 Project Hazard Analyses

5.3 Hazard Mitigation

5.4 Required Personnel Protective Equipment and Related Safety Equipment
5.4.1 Levels of Personal Protective Equipment
5.4.2 Unknown Situations
5.4.3 Anticipated Personal Protective Equipment Levels by Site Activity

5.5 Air Monitoring for Project Operations
5.5.1 Gases and Vapors
5.5.2 Explosion Hazard
5.5.3 Oxygen Deficiency in Confined Spaces
5.5.4 Miscellaneous Equipment

5.6 Hazardous Pathways and Engineering Controls

6.0 DECONTAMINATION AND DISPOSAL PROCEDURES

6.1 Equipment Decontamination

6.2 Personnel Decontamination

6.3 Operations-Derived Material Disposal
6.3.1 Wastewater
6.3.2 Personal Protective Equipment
6.3.3 Solid Waste

7.0 EMERGENCY PROCEDURES

7.1 Emergency Information
7.1.1 Telephone Numbers
7.1.2 How to Report an Emergency
7.1.3 Emergency Routes
7.1.4 Emergency Signals

7.2 Contingency Plan

8.0 ACRONYMS

9.0 REFERENCES

ATTACHMENTS

Attachment 1 Hazardous Property Information

Attachment 2 Personnel Acknowledgements

Attachment 3 Accident Investigation

Attachment 4 Equipment Calibration and Maintenance

Attachment 5 First-Aid and Emergency Care

Attachment 6 Personnel Information

SECTION A-3.6

SECURITY PLAN OUTLINE FOR THE CONTAINERIZED STORAGE FACILITY

Revision 0
June,1997

OUTLINE

1.0 PURPOSE

1.1 Activity Overview

The plan will cover the operations of the Remediation Waste Storage Facility (RWSF). Operations include but are not limited to :

- The handling and placement of containers of remediation wastes within the facility,
- Associated maintenance activities,
- Required inspections,
- Waste staging and shipment,
- Health and safety monitoring and oversight,
- Additional required monitoring,
- Facility access control, and
- Leachate collection and treatment activities

1.2 Security Plan Objective

This plan prescribes security measures to protect human health and the environment from wastes stored within the facility and any classified matter received, used, and stored by employees.

2.0 SCOPE

2.1 Activity Description and Management Organization

This plan addresses any required security measures required while work is performed or the facility remains in operation.

- Construction Manager,
- Operations Manager,
- Contractor Technical Representative,
- Facility Security Officer (FSO), and
- Operations personnel.

2.2 Target Description

This plan describes the security measures implemented to ensure the protection of human health and the environment from any release or threat of release of remediation wastes from the RWSF. This program protects classified matter and unclassified but sensitive matter used to direct work that may be used or is applicable to personnel at the RWSF.

2.3 Threat Description

2.4 Limitations

3.0 RESPONSIBILITIES

3.1 All Employees

All employees have the responsibility to:

- Follow all operational, health and safety, and other applicable work control procedures.
- Identify issues of concern relating to violation of procedure or any other potential health and safety, operational, or security concern.
- Comply with all RFETS Safeguards and Security Program requirements including those stated in the RWSF Security Plan.

3.2 Operations Manager

3.3 Contractor Technical Representative, Kaiser-Hill

3.4 Facility Security Officer

3.5 Security Custodian

4.0 SAFEGUARDS AND SECURITY PROGRAM REQUIREMENTS

The target identified by this plan and all other items of Department of Energy, Rocky Flats Environmental Technology Site safeguards and security interest are protected by an integrated system of safeguards and security program activities applied with a graded approach.

4.1 Physical Protection Program

The physical protection program is directed by DOE-5632.1C, Protection and Control of Safeguards and Security Interests.

4.2 Protection Force Program

The program is directed by DOE-5632.7A, Protective Forces.

4.3 Nuclear Material Control Program

4.4 Personnel Security Program

The program is directed by DOE-5631.2C, Personnel Security Program.

4.5 Information Security Programs

4..5.1 Classified Matter Protection & Control (CMPC)

The CMPC program is directed by DOE-5639.1, information Security Program.

4.5.2 Classified Automated Information Systems (AIS) Security Program

The classified AIS program is directed by DOE-5639.6A, Classified Automated Information Security Program.

4.5.3 Operations Security (OPSEC) Program

The OPSEC program is directed by DOE-5639.7, Operations Security Program. Additional direction is provided by the DOE-OPSEC Master Plan, RFFO Instruction 5639.7, and the Kaiser-Hill Implementation Plan.

4.5.4 Counterintelligence (CI) Program

The CI program is directed by DOE-5670.3, Counterintelligence Program.

4.5.5 Technical Surveillance Countermeasures (TSCM) Program

The TSCM program is directed by DOE-5639.5, Technical Surveillance Countermeasures Program.

4.5.6 Violations of Law, Losses, and Incidents of Security Concerns (VOLLI) Program

The program is directed by DOE-5639.3, Violations of Law, Losses, and Incidents of Security Concerns.

4.6 Security Awareness Program

The program is directed by DOE-5631.1C, Safeguards and Security Awareness Program.

4.7 Physical Protection of DOE Property and Unclassified Facilities

Program direction is included in DOE-5632.1C, Protection and Control of Safeguards and Security Interests.

4.8 Safeguards and Security Evaluation Program

Employees, facilities, and procedures are subject to audit to evaluate compliance with the requirements stated in this security plan.

4.9 Security Plan Review Process

SECTION A-3.7

PROPOSED SURFACE WATER MONITORING PLAN OUTLINE FOR THE CONTAINERIZED STORAGE FACILITY

Revision 0

June, 1997

OUTLINE

1.0 INTRODUCTION

1.1 Purpose of the Surface Water Monitoring Program

1.2 Site Description

1.3 Environmental History
- 1.3.1 Definition and Description of Contaminated Sites
- 1.3.2 Brief History of Surface Water Monitoring Activities

2.0 PHYSICAL AND HYDROLOGIC SETTING

2.1 Local Hydrology
- 2.1.1 Woman Creek Drainage
  - 2.1.1.1 Woman Creek
  - 2.1.1.2 Standley Reservoir
- 2.1.2 Walnut Creek Drainage
  - 2.1.2.1 North Walnut Creek
  - 2.1.2.2 South Walnut Creek
  - 2.1.2.3 Great Western Reservoir

2.2 Interaction with Groundwater

2.3 Interaction with Site Ecology

3.0 DESCRIPTION OF THE RFETS SURFACE WATER MONITORING PROGRAM

3.1 Current Status of the Surface Water Program

3.2 Integrated Monitoring Plan

4.0 SURFACE WATER MONITORING

4.1 Monitoring Objectives
- 4.2.1 Identification of Potential Contaminants
- 4.2.2 Identification of Data Quality Objectives
- 4.2.3 Identification and Control of Contaminant Sources
- 4.2.4 Identification of Potential Contaminant Pathways
- 4.2.5 Identification of Monitoring Locations
- 4.2.6 Surface Water Control

4.2 Monitoring
- 4.2.1 Monitoring Locations
- 4.2.2 Field Data Collection
  - 4.2.2.1 Sampling and Analysis
  - 4.4.2.2 Quality Assurance
- 4.4.3 Data Management
- 4.4.4 Surface Water Assessment/Reporting
- 4.4.5 Non-Point Of Compliance Monitoring

4.3 Surface Water Control
4.3.1 Pond System
4.3.2 Drainage and Flow impacts
4.3.3 National Pollutant Discharge Elimination System Permit
4.3.4 Community Assurance

5.0 EVALUATION OF CSF IMPACTS ON SURFACE WATER

5.1 Impact on Site Surface Water Data Quality Objectives
5.2 Additional Monitoring Requirements
5.3 Impact to Surface Water Control Systems
5.4 Impact To Offsite Discharges

6.0 REFERENCES

1.0 INTRODUCTION

The outline for the CSF Surface Water Monitoring Plan (SWMP) is based on the draft Rocky Flats Environmental Technology Site (RFETS) Integrated Monitoring Plan (IMP) for surface water. It is expected that all surface water monitoring for the CSF and the area surrounding it would be conducted as part of the integrated site program described in the IMP and that additional site specific monitoring outside the IMP would not be necessary since the proposed location is in the Industrial area of RFETS and would fall under existing or planned monitoring and surface water control systems.

1.1 Purpose of the Surface Water Monitoring Program

The objective of the SWMP is to demonstrate that RFETS surface water monitoring program as described by the IMP provides reasonable assurance that surface water associated with the CSF is monitored and controlled and will not impact downstream receptors. It will achieve this objective by :

- Determining contaminant types and migration pathways that could impact surface water including interactions with other media
- Evaluating the impacts of CSF in meeting RFETS Data Quality Objectives (DQOs) for surface water
- Determining any additional monitoring requirements necessary to meet RFETS DQOs
- Evaluating changes in run-off and flow patterns on the existing drainage system
- Evaluating the impact on offsite discharges of surface water

SECTION A-3.8

CONTINGENCY PLAN OUTLINE FOR THE CONTAINERIZED STORAGE FACILITY

Revision 0
June, 1997

OUTLINE

The outline below has been prepared to describe the general content of the Containerized Waste Storage Facility Contingency Plan. During or after design, the outline should be reviewed for applicability and revised as necessary.

1.0 INTRODUCTION

1.1 Purpose and Scope

1.2 Organization

2.0 EMERGENCY COORDINATORS

3.0 IMPLEMENTATION OF THE CONTINGENCY PLAN

3.1 CSF Containers
- 3.1.1 Containment Failure or Failure Due to External Forces
- 3.1.2 Human Exposure
- 3.1.3 Reportable Quantities

3.2 Decontamination Areas
- 3.2.1 Containment Failure or Failure Due to External Forces
- 3.2.2 Human Exposure
- 3.2.3 Reportable Quantities

3.3 Waste Staging/Handling Areas
- 3.3.1 Containment Failure or Failure Due to External Forces
- 3.3.2 Human Exposure
- 3.3.3 Reportable Quantities

3.4 Floor Drainage Collection System
- 3.4.1 System Failure or Failure Due to External Forces
- 3.4.2 Human Exposure
- 3.4.3 Reportable Quantities

4.0 EMERGENCY RESPONSE PROCEDURES

4.1 Pre-Incident Phase (Preparedness)

4.2 Incident Phase
- 4.2.1 Notification
- 4.2.2 Identification and Compatibility of Hazardous Wastes
- 4.2.3 Wind Rose
- 4.2.4 Assessment
- 4.2.5 Control Procedures
  - 4.2.5.1 Fire and/or Explosion
  - 4.2.5.2 Spills or Material Releases

4.3 Post-Incident Phase
- 4.3.1 Recording Procedures
- 4.3.2 Field Investigation
- 4.3.3 Clean-up and/or Reconstruction/Modification
- 4.3.4 Resumption of Normal Operations

5.0 RESPONSIBILITIES OF INCIDENT RESPONSE PERSONNEL
5.1 Emergency Coordinator
5.2 Field Incident Commander
5.3 Incident Safety Officer
5.4 Response Teams
6.0 EMERGENCY EQUIPMENT
6.1 Fire Fighting Equipment
6.2 Spill Control Equipment
7.0 EVACUATION PLANS
8.0 ADMINISTRATION CONTINGENCY PLAN
9.0 ACRONYMS
10.0 REFERENCES
Attachment 1 - Emergency Contacts

SECTION A-3.9

INSPECTION PLAN OUTLINE FOR THE CONTAINERIZED STORAGE FACILITY

Revision 0
June, 1997

OUTLINE

The outline below has been prepared to describe the general content of the Inspection Plan for the Containerized Storage Facility. During or after design, the outline should be reviewed for applicability and revised as necessary.

1.0 INTRODUCTION

1.1 Purpose and Scope

1.2 Organization

2.0 INSPECTION REQUIREMENTS

2.1 CSF Containers

2.2 Floor Drainage Collection System

2.3 Decontamination Areas

2.4 Waste Staging/Handling Areas

2.5 Emergency Response Systems

2.6 Other Areas

3.0 INSPECTION SCHEDULE

3.1 Daily Inspections

3.2 Weekly Inspections

3.3 Monthly Inspections

3.4 Quarterly Inspections

3.5 Annual Inspections

4.0 DEFICIENCY CORRECTION REQUIREMENTS

5.0 RECORD KEEPING REQUIREMENTS

5.1 Inspection Logs

5.2 Deficiency Correction Logs

6.0 ACRONYMS

7.0 REFERENCES

SECTION A-3.10

OPERATING RECORD SYSTEM PLAN OUTLINE FOR THE CONTAINERIZED STORAGE FACILITY

Revision 0
June,1997

OUTLINE

The outline below has been prepared to describe the general content of the Operating Record System Plan. During or after design, the outline should be reviewed for applicability and revised as necessary.

1.0 INTRODUCTION

- 1.1 Purpose and Scope
- 1.2 Organization

2.0 WASTE DESCRIPTION, QUANTITIES, AND DISPOSITION

3.0 WASTE ANALYSES

4.0 CONTINGENCY PLAN IMPLEMENTATIONS

5.0 INSPECTION RECORDS

6.0 MONITORING, TESTING, AND ANALYTICAL DATA

7.0 RECORDS OF CORRECTIVE ACTION

8.0 ANNUAL CERTIFICATION OF WASTE MINIMIZATION

9.0 RECORD RETENTION, AVAILABILITY, AND DISPOSITION

10.0 BIENNIAL REPORTING REQUIREMENTS

11.0 ADDITIONAL REPORTING REQUIREMENTS

12.0 ACRONYMS

13.0 REFERENCES

SECTION A-3.11

PERSONNEL TRAINING PLAN OUTLINE FOR THE CONTAINERIZED STORAGE FACILITY

Revision 0
June, 1997

OUTLINE

The outline below has been prepared to describe the general content of the Personnel Training Plan for the Containerized Storage Facility. During or after design, the outline should be reviewed for applicability and revised as necessary.

1.0 INTRODUCTION

- 1.1 Purpose and Scope
- 1.2 Organization

2.0 GENERAL

- 2.1 Instructor Qualifications
- 2.2 Training Schedule
  - 2.2.1 On-the-Job Training
  - 2.2.2 Classroom Training

3.0 CURRICULUM

- 3.1 Emergency Response
  - 3.1.1 Spill Response
  - 3.1.2 Fires and Explosions
  - 3.1.3 Natural Forces
  - 3.1.4 Other Emergencies
  - 3.1.5 Emergency Shutdown Procedures
- 3.2 Emergency Equipment
- 3.3 Alarm and Communication Systems
- 3.4 Waste Management

4.0 RECORD KEEPING

- 4.1 Job Descriptions
- 4.2 Training Descriptions
- 4.3 Training Records

5.0 ACRONYMS

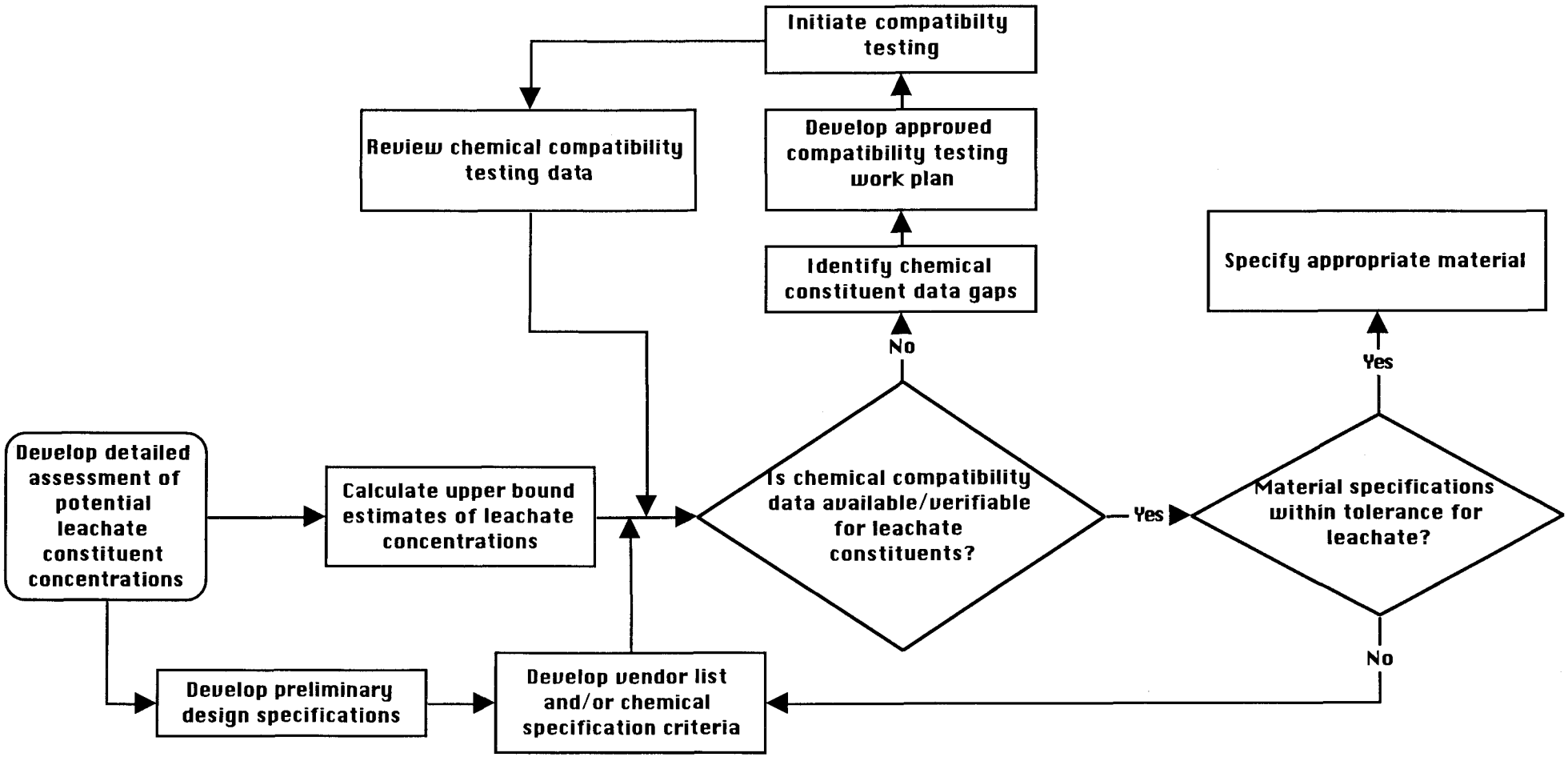
6.0 REFERENCES

SECTION A-3.12

CHEMICAL COMPATABILITY TESTING DECISION PROCESS

Revision 0
June, 1997

Chemical Compatibility
Testing Decision Process



APPENDIX A-4

Siting Study Figures

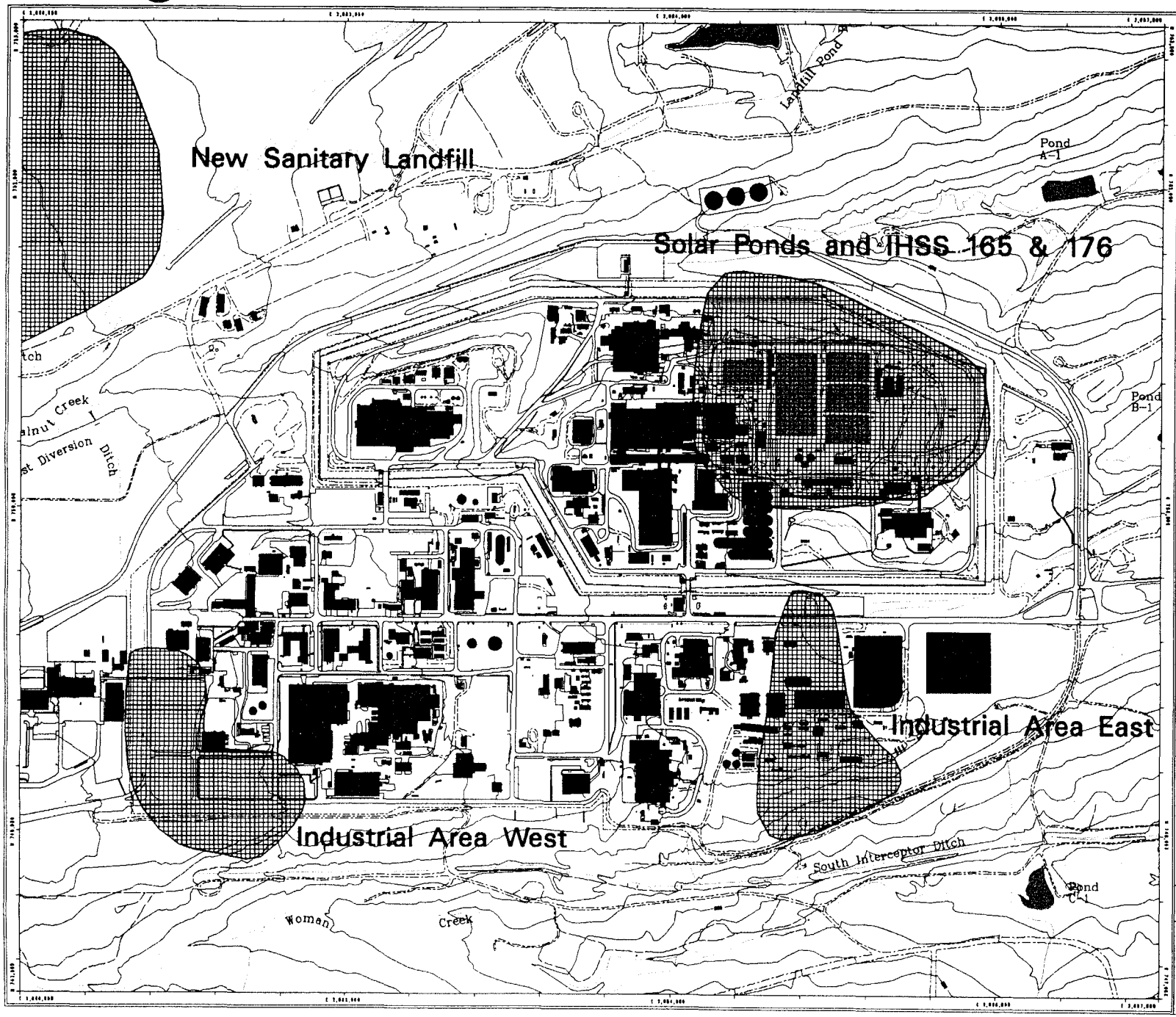


Figure 1
Location Map

EXPLANATION

Potential RWSF Sites

Standard Map Features

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' intervals)
- Rocky Flats boundary
- Paved roads
- Dirt Roads
- Trails

DATA SOURCE:
Buildings, roads, and fences provided by Facilities Engr, EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by USGS - (date unknown)

Scale = 1 : 10360
1 inch represents approximately 863 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
RMRS Rocky Mountain Remediation Services, L.L.C.
Geographic Information Systems Group
Rocky Flats Environmental Technology Site
P.O. Box 464
Golden, CO 80402-0464

MAP ID: 97-0014

February 28, 1997

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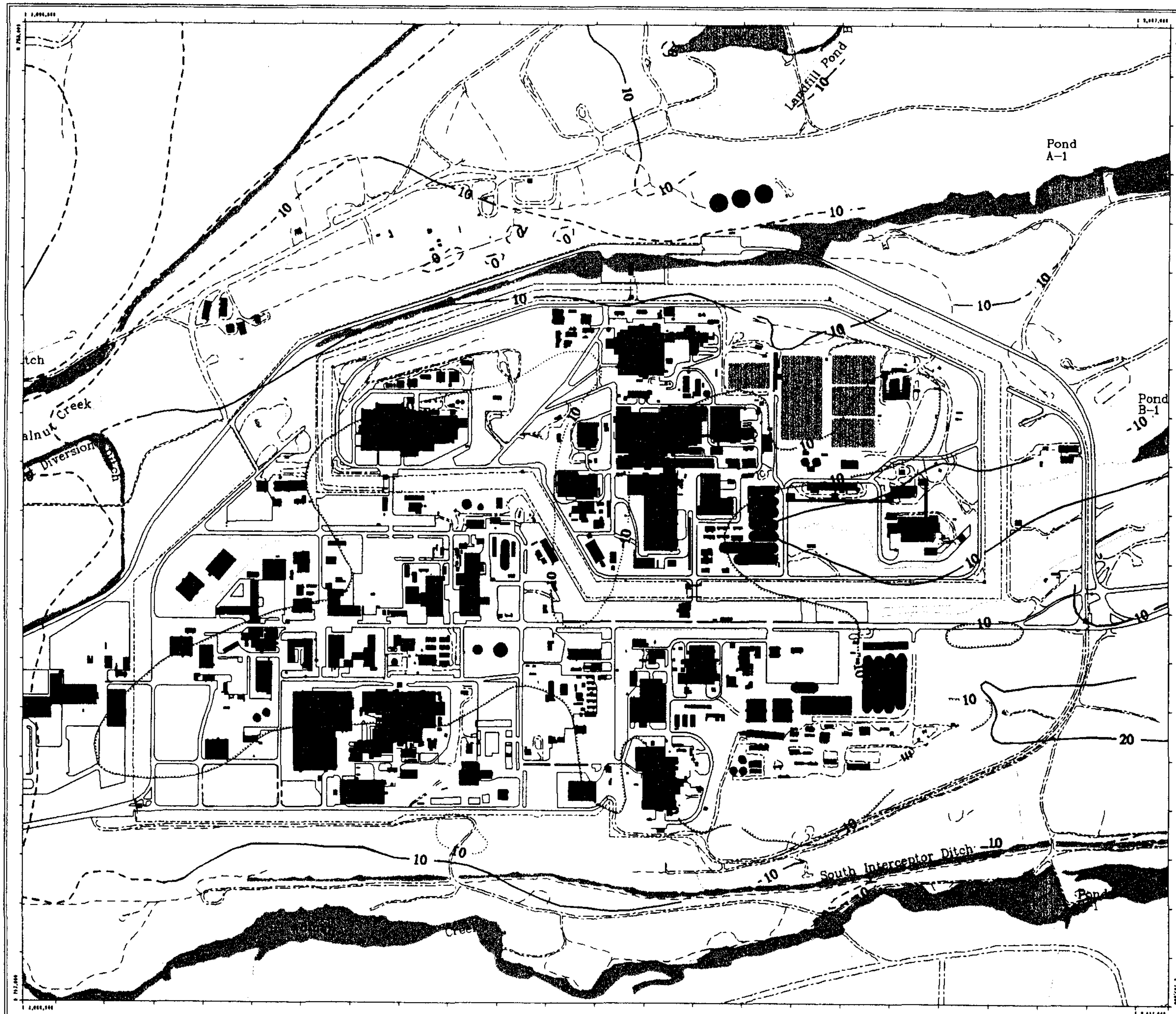
Figure 2
Hydrogeological Conditions



EXPLANATION

- Line of Equal Depth to Water (in feet)
- (dashed where inferred)
- Decreasing Line of Equal Depth to Water (in feet)
- (dashed where inferred)

Standard Map Features

- Buildings or other structures
- 100 year floodplain
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt Roads
- Trails

DATA SOURCE:
Buildings, roads, and fences provided by Facilities Engr.
EG&G Rocky Flats, Inc. - 1991
Hydrology provided by USGS - (date unknown)

Scale = 1 : 10770
1 inch represents approximately 898 feet

250 0 500 1000ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
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Golden, CO 80402-0464

MAP ID: Draft

February 24, 1997

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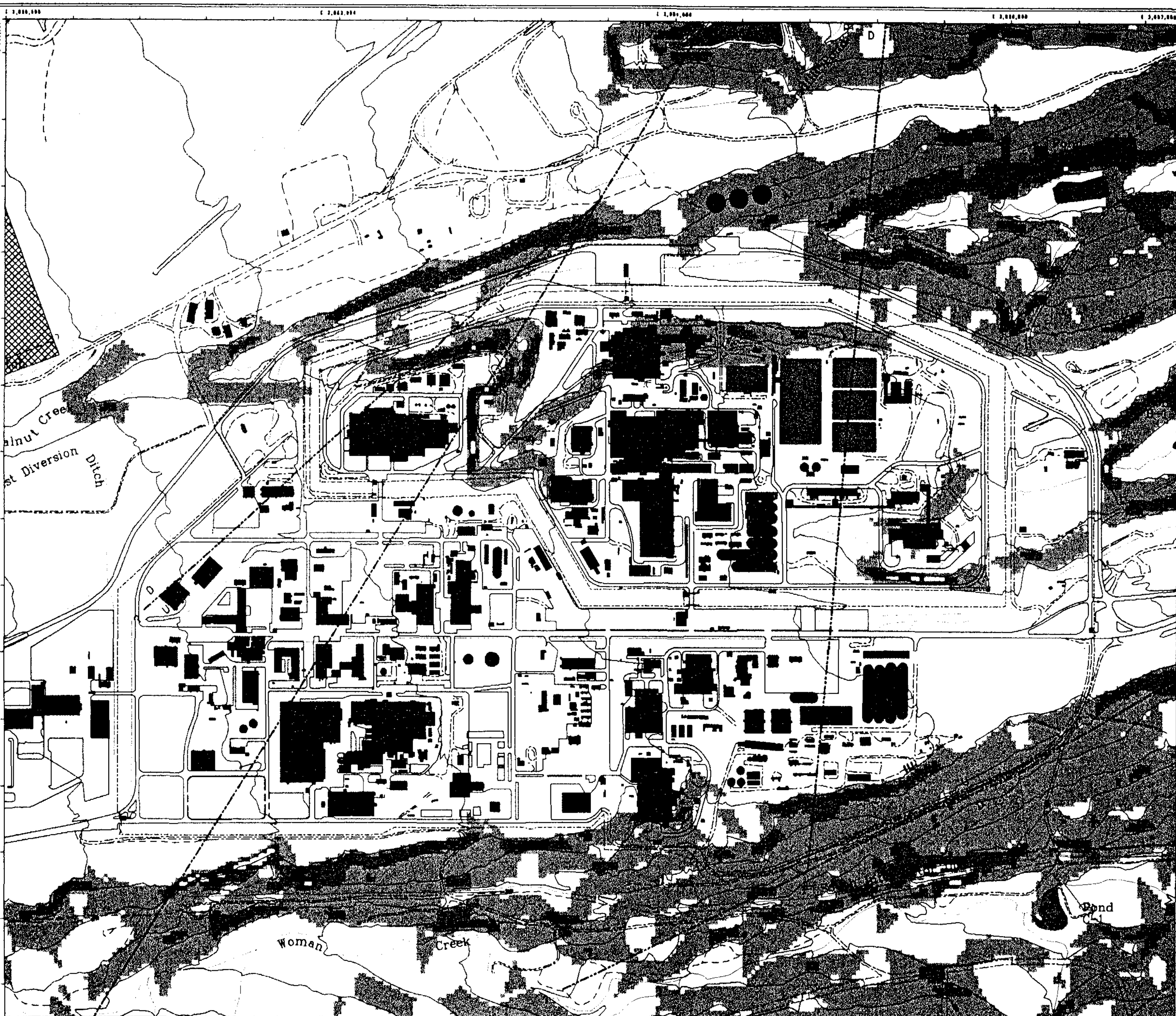

Figure 3
Geological and Geotechnical Conditions

EXPLANATION

Fault line - dashed where inferred

Slope Categories

- Slope = 15% - 20%
- Slope = 20% - 30%
- Slope > 30%

Standard Map Features

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Contours (20' intervals)
- Rocky Flats boundary
- Paved roads
- Dirt Roads
- Trails

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.
EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by
USGS - (date unknown)

Scale = 1 : 10380
1 inch represents approximately 863 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
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Prepared by:

RMRS Rocky Mountain Remediation Services, L.L.C.
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P.O. Box 464
Golden, CO 80402-0464

MAP ID: Draft

February 25, 1997

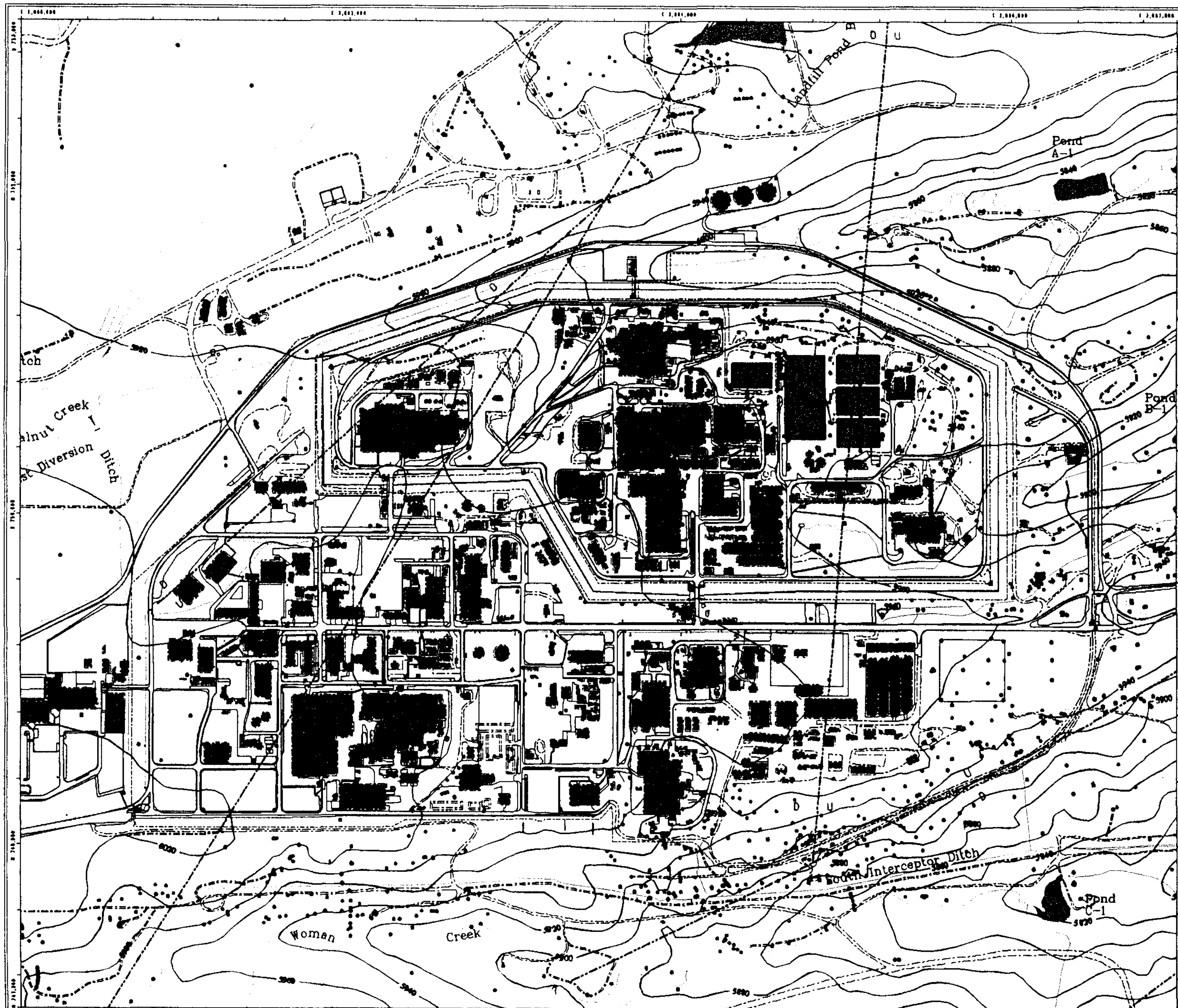

Figure 4
Structure Base of Alluvium

EXPLANATION

- Structure base of alluvium (top of bedrock elevation)
- Fault line - dashed where inferred
- Groundwater wells
- Boreholes

Standard Map Features

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt roads
- Dirt Roads
- Trails

DATA SOURCE:
Buildings, roads, and fences provided by Facilities Engr., EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by USGS - (date unknown)

Scale = 1 : 10380
1 inch represents approximately 863 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
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Golden, CO 80402-0464

MAP ID: Draft

February 28, 1997

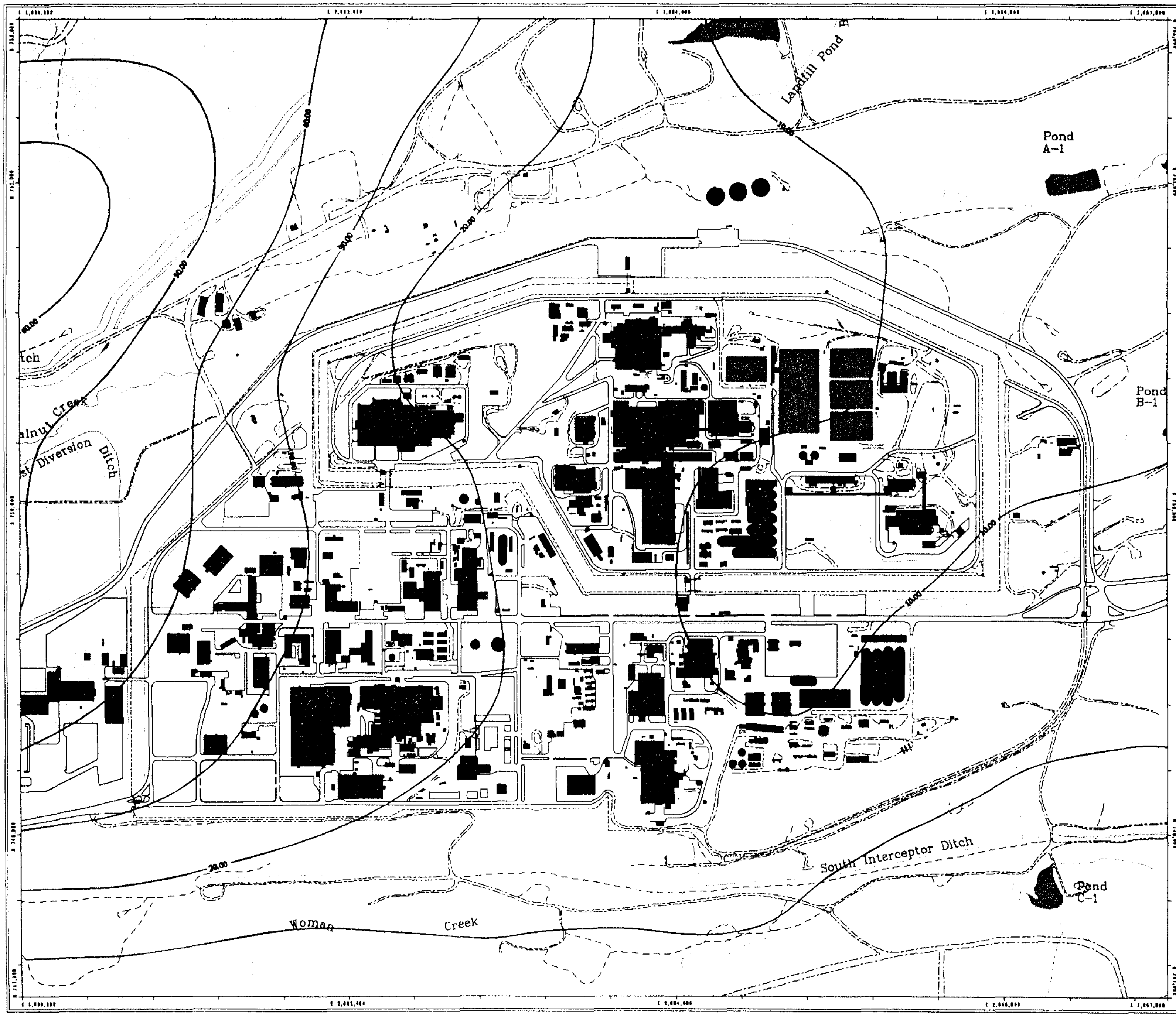

Figure 5
Thickness of Alluvium

EXPLANATION

Thickness of alluvium

Alluvium thickness greater than or equal to 40 Ft.

NOTE:
Potential economic thickness is 40 feet plus

Standard Map Features

Buildings or other structures

Lakes and ponds

Streams, ditches, or other drainage features

Fences

Rocky Flats boundary

Paved roads

Dirt Roads

Trails

DATA SOURCE:
Buildings, roads, and fences provided by Facilities Engr., EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by USGS - (date unknown)

N

Scale = 1 : 10360
1 inch represents approximately 863 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:

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P.O. Box 464
Golden, CO 80402-0464

MAP ID: Draft

February 25, 1997

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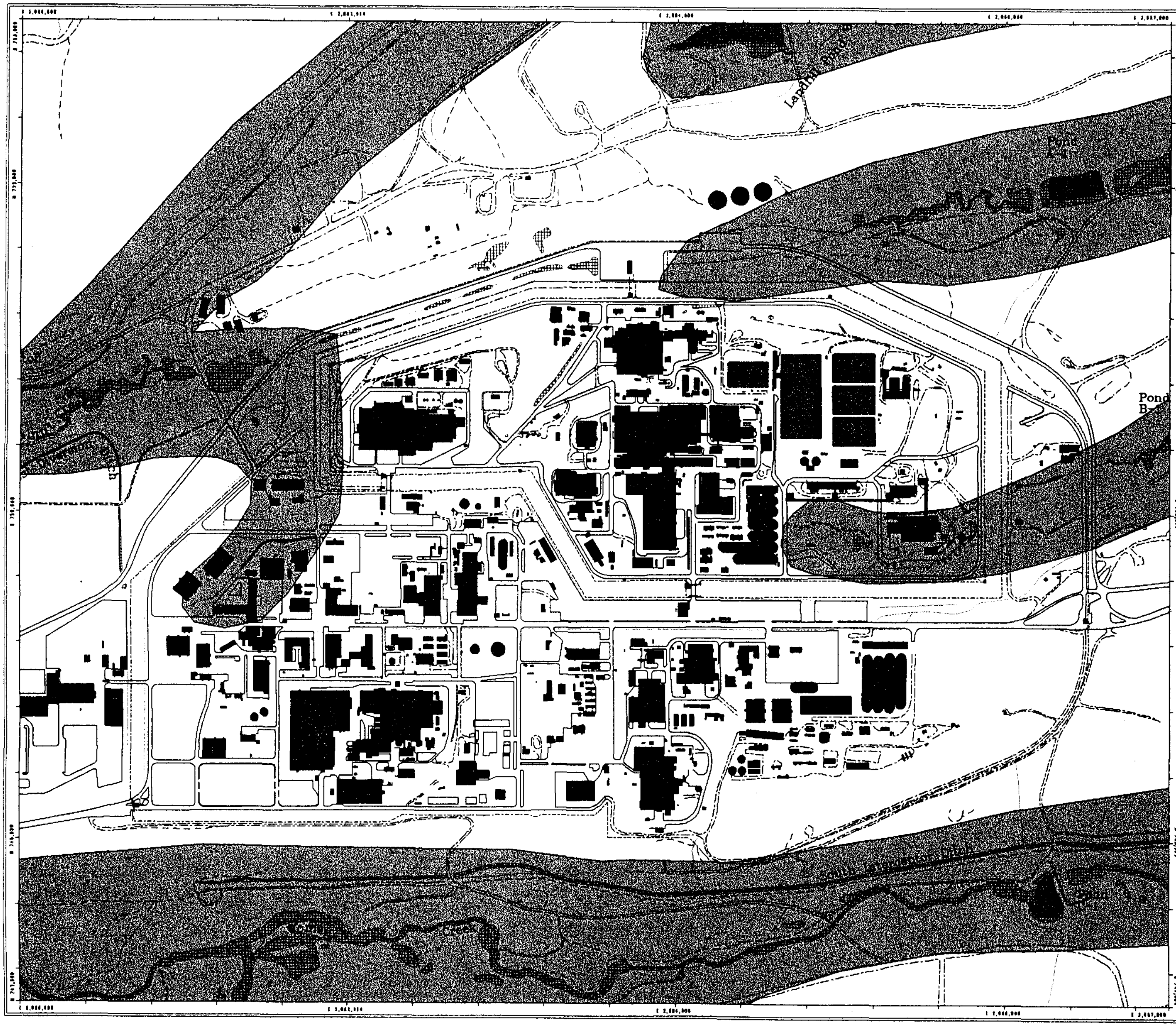

Figure 6

Ecology and NEPA Map

EXPLANATION

Wetland Features

- Wetlands
- Point Wetlands (< 10ft Diameter)
- Linear Wetlands (< 10ft wide)

Preble's Meadow Jumping Mouse

- Probable Range

Standard Map Features

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt Roads
- Trails

DATA SOURCE:
Buildings, roads, and fences provided by
Facilities Engr.
EG&G Rocky Flats, Inc. - 1992
Hydrology provided by
USGS - (date unknown)

Scale = 1 : 10380
1 inch represents approximately 863 feet

200 0 400 800

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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Rocky Flats Environmental Technology Site

Prepared by:

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MAP ID: Draft

February 25, 1997

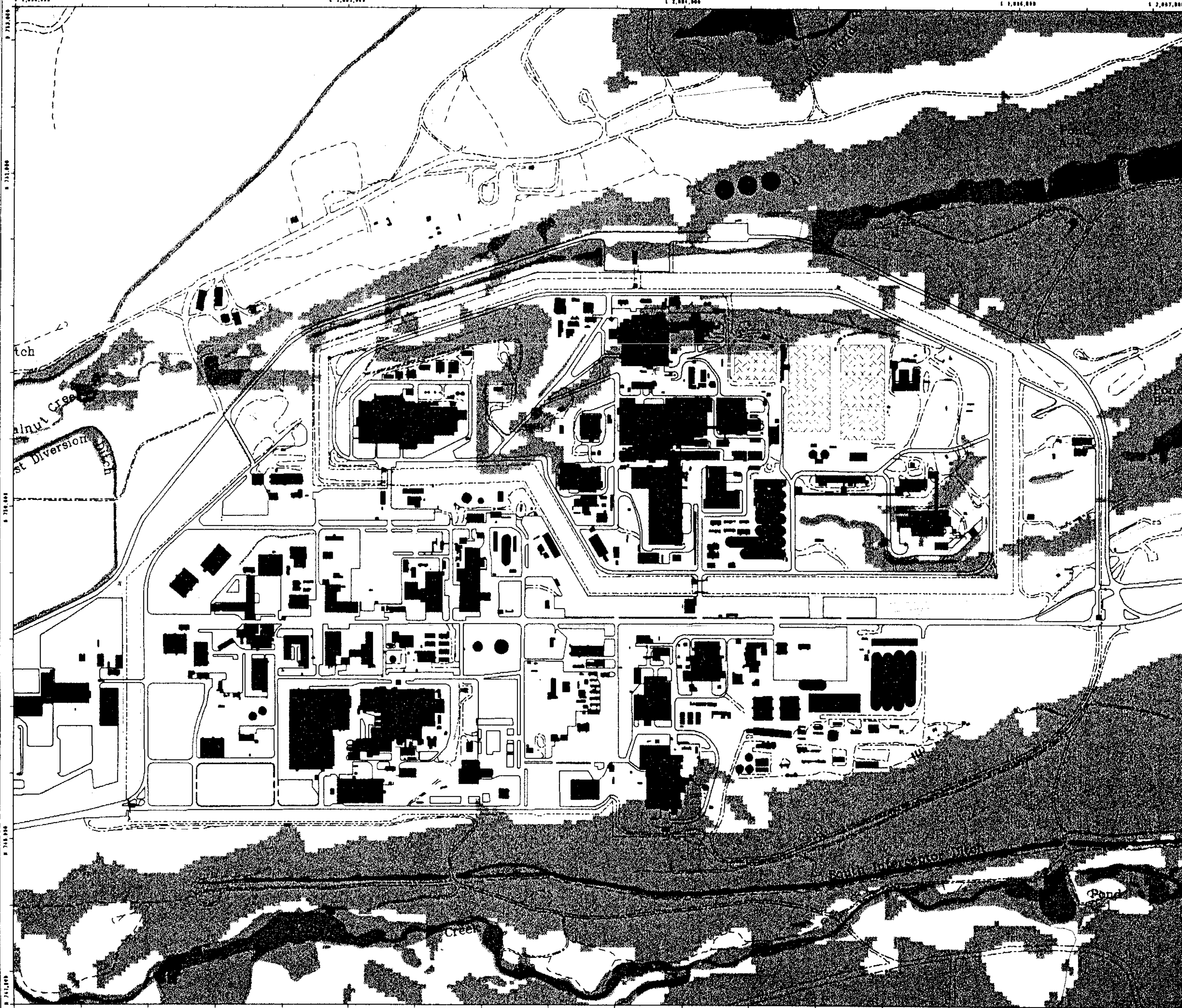


Figure 7
Adverse (for RWSF siting) Conditions Map

EXPLANATION

NOTE:
This map was created using the analytical capabilities of ARC/INFO. Three data layers (coverage's) were combined, representing physical restraining criteria, each given an equal weighting factor: wetlands, 100-year floodplain, and slopes greater than 15%. The surface was color coded based on the number of criteria present.
Point and line wetland features have a 60 foot buffer around them for better visibility.

- Lands best suited for the placement of a Waste Management Facility, based on criteria stated above
- One criterion present
- Two criteria present
- Three criteria present (least suitable location)

Standard Map Features

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt Roads
- Trails

Scale = 1 : 10380
1 inch represents approximately 863 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

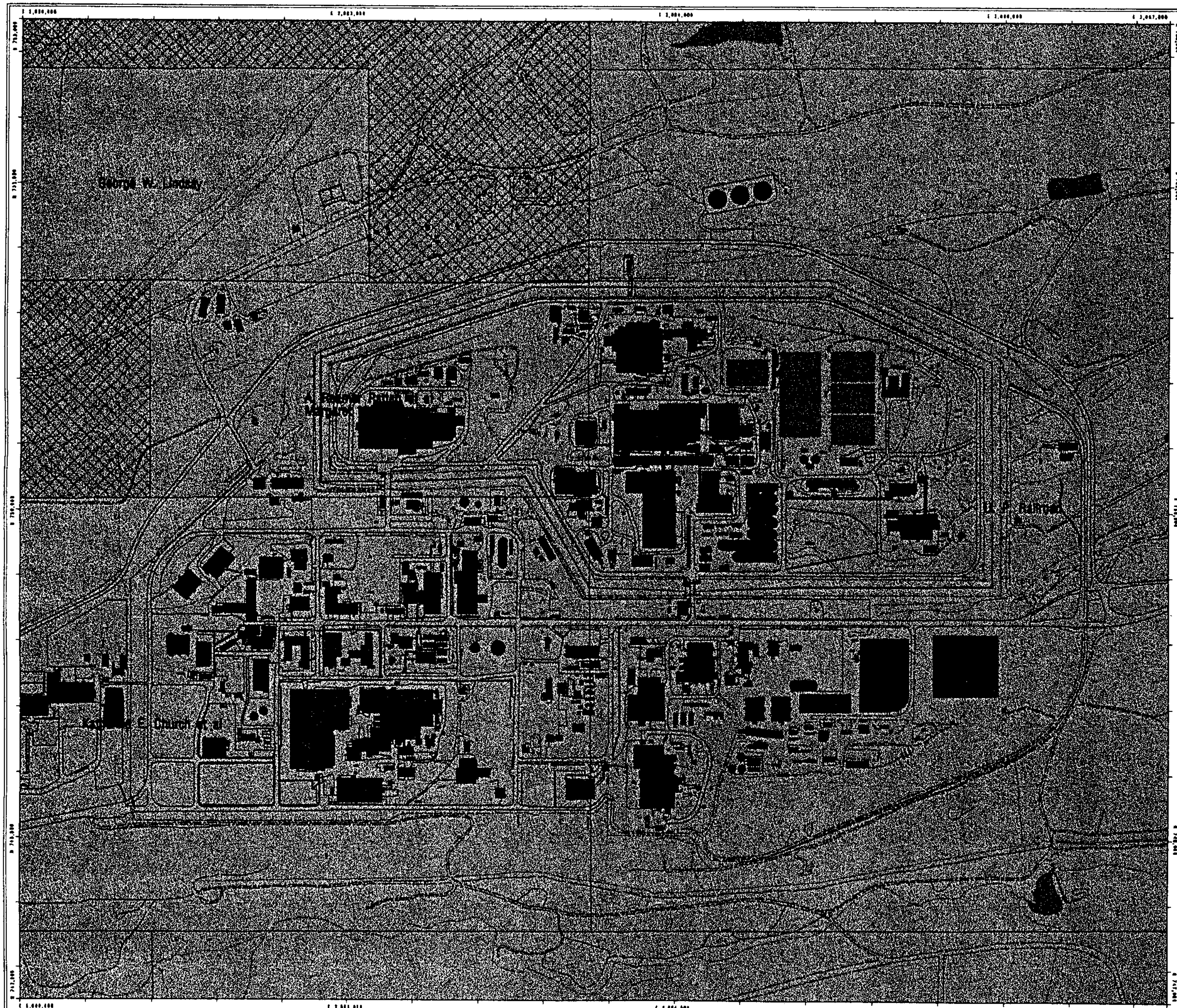
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
RMRS Rocky Mountain Remediation Services, L.L.C.

MAP ID: x7707

February 25, 1997

Figure 8
Mineral Ownership Map



EXPLANATION

- Private
- Government
- Both Government and Private

Standard Map Features

- Buildings or other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences
- Rocky Flats boundary
- Paved roads
- Dirt Roads
- Trails

DATA SOURCE:
Buildings, roads, and fences provided by Facilities Engr. EG&G Rocky Flats, Inc. - 1991.
Hydrology provided by USGS - (date unknown)

Scale ~ 1 : 10360
1 inch represents approximately 863 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
RMRS Rocky Mountain Remediation Services, L.L.C.

MAP ID: Draft

February 25, 1997