Proposed Plan and Draft Modification of the Rocky Flats Environmental Technology Site Resource Conservation and Recovery Act Permit for Operable Unit 3 — Offsite Areas

United States Department of Energy (DOE) | Jefferson County, Colorado | December, 1995

DOE Announces Preferred Alternative for OU 3, Offsite Areas

This ***Proposed Plan***[1] presents DOE's preferred alternative for remedial action at the Rocky Flats Environmental Technology Site (RFETS) ***Operable Unit 3*** (OU 3) – Offsite Areas RFETS is located in Jefferson County, Golden, Colorado (see Figure 1) The OU 3 – Offsite Areas occupies approximately 38 square-miles of land located outside the RFETS boundary as shown on Figure 2

The Proposed Plan serves as the basis for the OU 3 ***Corrective Action Decision/Record of Decision (CAD/ROD)*** and applies only to OU 3 All interested parties are encouraged to review and comment on the Proposed Plan and to submit their comments to the locations identified below This Proposed Plan has been prepared by DOE in cooperation with the U S Environmental Protection Agency (EPA) and the Colorado Department of Public Health and Environment (CDPHE), pursuant to the ***Resource Conservation and Recovery Act (RCRA)***, the ***Colorado Hazardous Waste Act (CHWA)***, and the ***Comprehensive Environmental Response Compensation and Liability Act (CERCLA)***

This Proposed Plan meets the requirements of CERCLA section 117(a), RCRA, and the ***Rocky Flats Interagency Agreement (IAG)***, between DOE, EPA, and CDPHE dated January, 1991

The Draft Modification of the Rocky Flats RCRA Permit is used to incorporate remedial action decisions at the Site into the Site's RCRA Permit CDPHE issues the Final Hazardous Waste Permit Modification when the remedial decision process is completed

The preferred remedial alternative proposed in this plan for OU 3 is No Action (no remedial action taken) In accordance with the IAG and EPA guidance, a No Action decision is appropriate at sites where a previous removal action or natural environmental processes mitigate the likelihood of an adverse effect on the health of a human or ecological population as a result of exposure to chemical and/or radiological constituents Results of the ***RCRA Facility Investigation/Remedial Investigation (RFI/RI)*** performed at OU 3 show that OU 3 meets risk standards promulgated by EPA and CDPHE as being protective of human health and the environment both now and in the future

Opportunities for Public Involvement
Mark Your Calendar

Public Comment Period

Public Hearing
Time
Location

[1]Bold, italic words or acronyms are defined in the glossary located at the end of this Proposed Plan

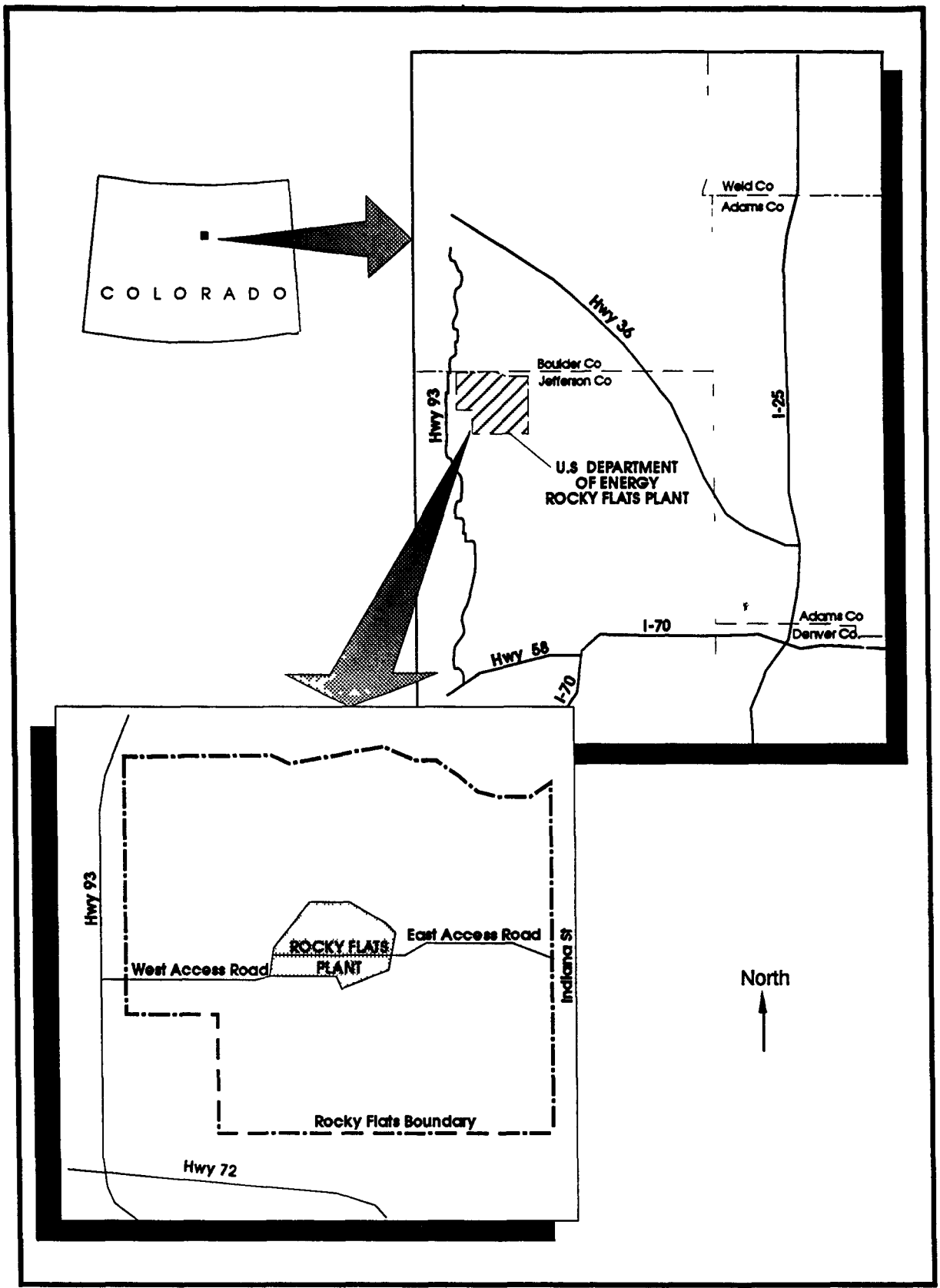

Figure 1 Location of Rocky Flats Environmental Technology Site

Send Comments to
DOE External Affairs Office
P O Box 928
Golden, Colorado 80402-0928

or
Colorado Department of Public Health & Environment
of HMWMD-HWC-B2
Denver, Colorado 80222-1530
Phone (303) 692-3358

Information Repositories
Rocky Flats Public Reading Room
Front Range Community College, Level B
3645 W 112th Avenue
Westminster, Colorado 80030

Colorado Department of Public Health & Environment
Hazardous Materials & Waste Mgmt Division
4300 Cherry Creek Drive South
Denver, Colorado 80222-1530

U S Environmental Protection Agency
Superfund Records Center
999 18th Street, 5th Floor
Denver, Colorado 80202-2401

Rocky Flats Citizens Advisory Board
9035 Wadsworth Parkway
Suite 2250
Westminster, Colorado 80021

Standley Lake Library
8485 Kipling
Arvada, Colorado 80005

Public Involvement Process

Community acceptance is one of the criteria that DOE and the regulatory agencies must evaluate during the RCRA/CERCLA process of selecting a final site remedy Evaluation of community acceptance is accomplished through a formal public involvement program. The DOE program consists of (1) promoting dialogue with citizens on issues of concern, which began with the development of the RFI/RI Work Plan, and will

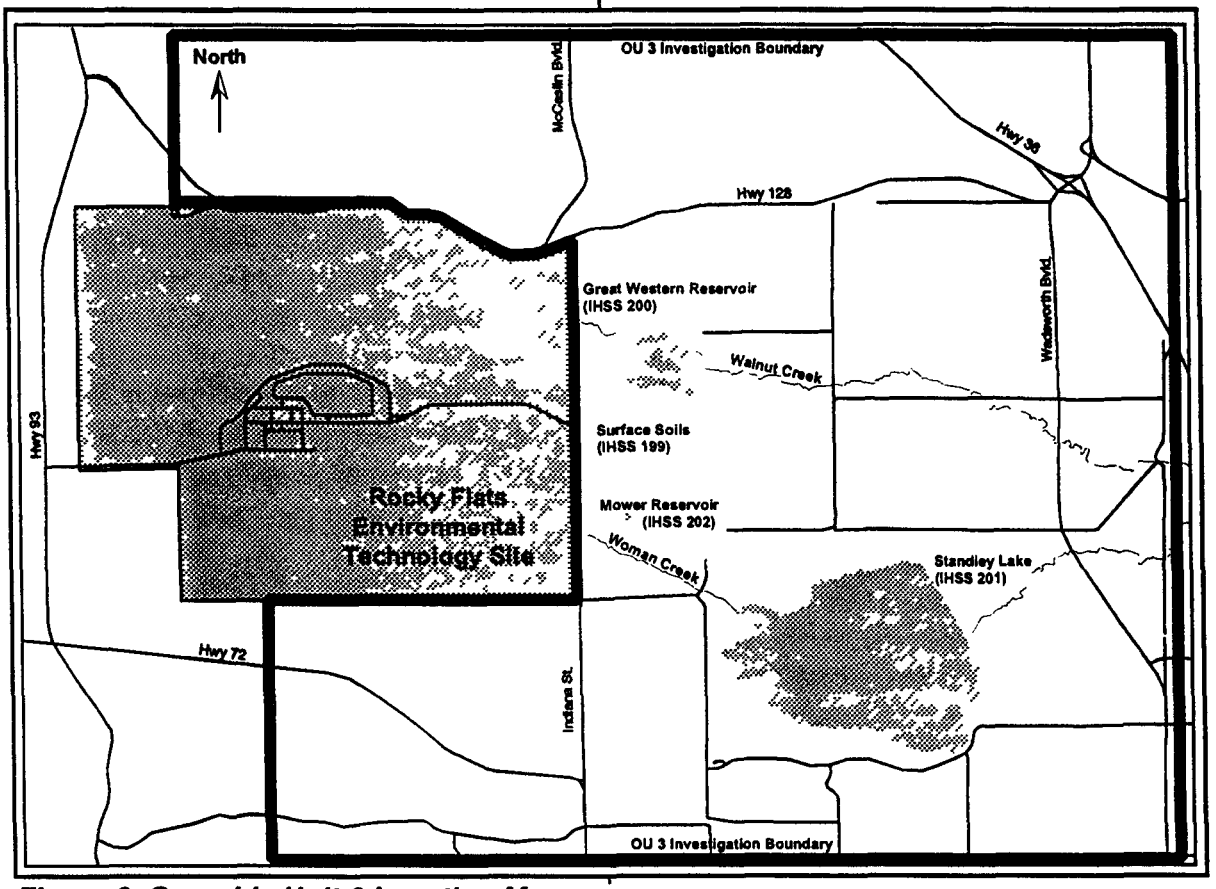

Figure 2 Operable Unit 3 Location Map

continue by presenting the results of the RFI/RI, and (2) seeking citizen participation in the selection of a final remedy method at the subject site This Proposed Plan is being issued for public review and comment in response to the second program component.

A public comment period will be held for the OU 3 Proposed Plan from _____ to _____ A public hearing will be held on _____ In addition to the Proposed Plan, the public is encouraged to review and comment on the Final OU 3 RFI/RI Report, which presents results of the investigation conducted at OU 3 (RFI/RI copies are available for review at each of the Information Repositories) Comments on the Proposed Plan and the RFI/RI Report may be submitted orally or in writing at the public hearing, or mailed directly to either of the two comment mailing addresses listed in the Opportunities for Public Involvement section beginning on Page 1 Written comments must be postmarked no later than _____

Upon timely request, the public comment period may be extended Such a request must be submitted in writing to DOE and postmarked no later than _____ **FAILURE TO RAISE AN ISSUE OR PROVIDE INFORMATION DURING THE PUBLIC COMMENT PERIOD MAY PREVENT THE PUBLIC FROM RAISING THAT ISSUE OR SUBMITTING SUCH INFORMATION IN AN APPEAL OF THE REGULATORY AGENCIES' FINAL DECISION.**

DOE, EPA, and CDPHE will make the final remedy action selection after review and consideration of comments received from the Public A summary of responses to all Public and regulatory agency comments will be presented in the ***Responsiveness Summary*** section of the OU 3 *CAD/ROD* document

Site Background

RFETS is located in northern Jefferson County, Colorado (see Figure 1) RFETS occupies approximately 6,550 acres of Federal land and is a government-owned and contractor-operated facility that is part of the nationwide nuclear weapons production complex DOE's former mission at RFETS was to produce components for nuclear weapons Its current mission is to manage wastes and materials and to cleanup and convert the Site in a manner that is safe, environmentally and socially responsible, physically secure, and cost-effective

Most plant structures are located within the Rocky Flats Industrial Area, which occupies approximately 400 acres This area is surrounded by a buffer zone of approximately 6,150 acres Until 1992, RFETS was used to fabricate nuclear weapon components from plutonium, uranium, beryllium, and stainless steel Support activities included chemical recovery, purification of recyclable transuranic radionuclides, and research and development in metallurgy, machining, nondestructive testing, coatings, remote engineering, chemistry, and physics

The production processes at Rocky Flats resulted in the generation of radioactive and non-radioactive wastes Onsite storage and disposal of these wastes has contributed to hazardous and radioactive contamination in onsite soils, surface water, and groundwater Due to the complex nature of RFETS, ***Individual Hazardous Substance Sites (IHSSs)*** within the Site were defined and grouped into sixteen OUs based upon one or more common features This included the type of contaminant, the environmental media, or the previous use of the contaminated areas

OU 3 is defined as offsite areas While this definition is inclusive of areas north, east, south, and west of the RFETS boundary, a working definition (study area) of OU 3 was developed to include suspected contaminated areas and to focus the RFI/RI on areas where the evaluation of previous data has indicated the presence of measurable contamination Therefore, OU 3 consists of four areas identified as IHSSs (see Figure 2)

IHSS 199 — Contamination of Land Surface: IHSS 199 is composed of surface soils located outside the RFETS boundary that are contaminated by historical releases from the Site, including 350 acres of land located east of Indiana Street known as the Remedy Lands This remedy acreage was prescribed as a result of a 1975 lawsuit filed against DOE by the Church (McKay) plaintiffs and Great Western Venture Partnership Additional information on the Remedy Lands can be referenced in the Final Past Remedy Report, Operable Unit No 3 – IHSS 199 (1991, DOE) – available at each of the Information Repositories

IHSS 200 — Great Western Reservoir: IHSS 200 consists of Great Western Reservoir, the associated drainages east of Indiana Street flowing into the reservoir, and their respective sediments Great Western Reservoir is located approximately 1-1/2 miles east of the Site

IHSS 201 — Standley Lake: IHSS 201 includes Standley Lake, the associated drainages east of Indiana Street flowing into the reservoir, and their associated sediments Standley Lake is located approximately 2 miles southeast of the Site

IHSS 202 — Mower Reservoir: IHSS 202 consists of Mower Reservoir, the associated drainages flowing into and out of the reservoir, and their respective sediments Mower Reservoir is located approximately 1-1/2 miles southeast of the Site and approximately 1,500 feet east of the eastern RFETS buffer zone boundary

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Other Activities Affecting OU 3

The Standley Lake Protection Project (SLPP), the first major component of the Option B process, is in the final stages of implementation. The SLPP will use the Woman Creek detention reservoir and other surface water management features that will physically isolate Standley Lake from stream runoff originating on RFETS Construction of the Woman Creek Reservoir was completed in the Fall 1995 to detain and divert Woman Creek flows and protect Standley Lake in the event of a 100-year flood The Woman Creek Reservoir was constructed upstream of Standley Lake to store Woman Creek stream flows for testing, and treatment if necessary, before release, up to the 100-year storm event.

Summary of Site Risks

The risks to human health and the environment associated with OU 3 are characterized within the OU 3 RFI/RI The RFI/RI was completed in accordance with requirements presented in the IAG and specifically identified in the OU 3 RFI/RI Work Plan and addenda The objectives of the RFI/RI are as follows

- Define physical features and ecological characteristics of OU 3
- Define sources of contamination
- Characterize the nature and extent of contamination in each media of each IHSS (i e , soil, sediment, surface water, groundwater, and air)

- Describe contaminant fate and transport mechanisms
- Collect data to support the quantitative Baseline Risk Assessment which includes the Human Health Risk Assessment and the Ecological Risk Assessment.

These objectives have been met by reviewing historical information, completing sampling and laboratory analyses of surface soils, subsurface soils, sediments, groundwater, surface water, and air to support the Human Health Risk Assessment, and completing sampling and laboratory analyses of terrestrial and aquatic biota to support the Ecological Risk Assessment The results of an evaluation of human health and ecological ***risks*** at OU 3 are presented in the RFI/RI report Risks were evaluated and quantified for each media of each IHSS by applying the specific risk characterization guidance agreed upon by EPA, CDPHE, and DOE The results of the risk assessment process are compared with regulatory agency guidelines that are developed for the purpose of protecting human health.

The Baseline Risk Assessment evaluated health risks from surface water and sediments in Great Western Reservoir (IHSS 200), Standley Lake (IHSS 201), and Mower Reservoir (IHSS 202) as well as from the soils surrounding these bodies of water (IHSS 199) For the reservoir sediments, the only ***chemical of concern (COC)*** identified during the RFI/RI investigation was plutonium-239/240 in the surface sediments of Great Western Reservoir There were no other COCs found in the sediments, and no COCs identified in the surface water For surficial soils, the COCs identified were plutonium-239/240 and americium-241

A residential exposure scenario and a recreational exposure scenario were used to assess the potential exposure risks in OU 3. The exposure assessment develops scenarios under which exposure to COCs may take place and takes into consideration the exposure routes, potential receptors, durations of exposure, transport media, and exposure source areas The residential exposure scenario is the most conservative exposure scenario and the recreational exposure scenario is the least conservative scenario considered in the OU 3 HHRA

For residential exposure to the surficial soils (IHSS 199), direct contact to plutonium and americium is assumed to occur as a result of ingestion and inhalation Indirect contact is assumed to occur through limited vegetable, beef, and milk consumption, and through external radiation exposure Exposure to sensitive populations were considered in the residential scenario (i e , children) Using these exposure parameters, and the highest level of plutonium identified in the soils east of Indiana Street (6 47 picocuries per gram [pCi/g]), the health risk calculated for the soils is 3 in 1,000,000 Specifically, the risk posed by this maximum level of plutonium in the soil may result in, at most, three additional incidences of cancer in a lifetime per one million people

For recreational exposure to surficial soils, the risk values are even lower because the exposure area is larger, the exposure duration is shorter, and the exposure is limited to soil ingestion, inhalation, and external radiation The estimated excess lifetime cancer risk is 0 05 in 1,000,000 for exposure to soils during a lifetime of recreational use

Recreational exposure to surface soils in IHSS 199 is the most realistic present and future exposure scenario This open-space area located south of Great Western Reservoir and immediately east of Indiana Street is projected to remain

as open space, with less restricted access to the area for recreational/open-space purposes This land is controlled through zoning limitations and perpetual land-use restrictions included in the existing City of Broomfield and City of Westminster deeds of ownership

While not currently plausible, residential exposure to sediments in Great Western Reservoir (IHSS 200) was evaluated by assuming that a resident will occupy a drained Great Western Reservoir, and be exposed to surface sediments

In this scenario, residential houses would be built within the natural drainage area directly on top of the exposed sediments (no foundation backfill material would be used before constructing the house), and no flood-control construction.

A residential scenario was evaluated because of the uncertain future use of Great Western Reservoir In this scenario, the exposure parameters for the sediments of this reservoir are the same as for the surficial soils of IHSS 199, and include sediment ingestion, inhalation, external radiation exposure, and ingestion of vegetables, beef, and milk The estimated excess cancer risk associated with these exposures is 0 9 in 1,000,000 By using conservative assumptions and evaluating residential exposure, the maximum risk is calculated for Great Western Reservoir should the reservoir be drained and developed

For recreational conditions in which exposure is intermittent and of short duration, risk from exposure to the sediments in Great Western Reservoir is 0 01 in 1,000,000

A comparison of the Human Health Risk Assessment results with regulatory agency guidelines indicates that all of the risk values for residential and recreational exposure scenarios are within or below the EPA guidelines for a risk range that is considered to be protective of human health (100 in 1,000,000 to 1 in 1,000,000) These values illustrate that under the most conservative residential exposure assumptions the risk in OU 3 from Site contaminants is very low, and is below the levels that warrant additional investigation or clean-up

The Ecological Risk Assessment did not identify any significant ecological effects on terrestrial or aquatic ecosystems

Summary of Radionuclide Analytical Results for Surface Water

No COCs were identified in surface water samples collected from Standley Lake, Great Western Reservoir, and Mower Reservoir For informational purposes, Table 1 summarizes the maximum and mean concentrations of plutonium and americium detected in surface water from these reservoirs Table 1 includes CDPHE standards, the National Drinking Water Standards, and the Rocky Flats Site Specific Standards for plutonium-239, -240 and americium-241 in surface water

Summary of Radionuclide Analytical Results for Soil

Plutonium-239, -240 and americium-241 were identified as COCs in surficial soils of IHSS 199 For informational purposes, Table 2 provides a summary of the analytical results for plutonium and americium in soils sampled for the OU3 RFI/RI and background data for plutonium and americium concentrations in surface soils in the Rock Creek area (Background Geochemical Characterization Report, September 1993)

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Summary of Remedial Alternative

Based on results of the Human Health Risk Assessment and the Ecological Risk Assessment, the remedial alternative proposed in this Proposed Plan for OU 3 is No Action The results of the Human Health Risk Assessment show that OU 3 risks do not exceed human health-based standards set by the EPA and the CDPHE The results of the Ecological Risk Assessment show no ecological risks or effects to terrestrial and aquatic ecosystems within OU 3 Further investigation or remedial action in OU 3 is not warranted to be protective of human health and the environment.

Table 1 Summary of Plutonium and Americium in OU 3 Surface Water

Surface Water	Maximum	Mean	Statewide ← ~~CDPHE~~ Standard	National Drinking Water Standard	Site Specific Standard
Plutonium-239, -240 (pCi/L)					
Great Western Reservoir (IHSS 200)	0 005	0 002	15	a	0 03
Standley Lake (IHSS 201)	0 009	0 002	15	a	0 03
Mower Reservoir (IHSS 202)	0 030	0 005	15	a	0 05
Americium-241 (pCi/L)					
Great Western Reservoir (IHSS 200)	0 017 OK	0 005	b	a	0 03
Standley Lake (IHSS 201)	0 026	0 006	b	a	0 03
Mower Reservoir (IHSS 202)	0 017	0 006	b	a	0 05

Legend

pCi/L = picocuries per liter
a = No National Drinking Water Standard Has Been Established for This Constituent
b = No CDPHE Standard Has Been Established for Americium-241 in Surface Water

Table 2 Summary of Plutonium and Americium in OU 3 Soils

Soil	Minimum	Maximum	Mean	Background Minimum	Background Maximum	Background Mean
Plutonium-239, -240 (pCi/g)						
Contamination of Land Surface (IHSS 199)	-0 00574	6 468	0 158 0.356	0 026	0 1	0 055
Americium-241 (pCi/g)						
Contamination of Land Surface (IHSS 199)	-0 002	0 52	0 035 0.093	0 0095	0 036	0 02

Legend

pCi/g = picocuries per gram

Glossary

Chemicals of Concern (COCs): Chemicals identified in a particular medium which originated from RFETS that, based on concentration and toxicity, contribute significantly to risks calculated for exposure scenarios involving that medium

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or Superfund): A law passed in 1980 that established a program to identify abandoned hazardous waste sites, ensured that they were cleaned up, and evaluated damages to natural resources

Corrective Action Document/Record of Decision (CAD/ROD): A public document that describes the cleanup alternative(s) selected for a RCRA/CERCLA site The CAD/ROD is prepared based on information acquired through the RFI/RI, the Corrective Measures Study/Feasibility Study (CMS/FS) (if performed), and community participation.

Individual Hazardous Substance Site (IHSS) An area that may be contaminated as a result of previous operations and disposal practices

Operable Unit (OU): A term defined by CERCLA used to describe a certain portion of a CERCLA site An OU may be established based on a particular type of contamination, contaminated media (e g , soils and water), source of contamination, and/or geographical location.

Preferred Alternative The preliminary recommendation that is judged to provide the best balance of tradeoffs with respect to long- and short-term effectiveness, implementability, cost and the reduction of contaminant toxicity, mobility, or volume through treatment

Proposed Plan: The public document that first introduces the preferred alternative for site remediation. The Proposed Plan is produced through the cooperation of the regulatory agencies and is reviewed by the public

RCRA Facility Investigation/Remedial Investigation (RFI/RI): An investigation to collect and analyze information to determine the nature and extent of contamination that may be present at a site The objectives of the OU 3 RFI/RI included characterizing the physical features and ecological characteristics of the site, defining sources of contamination, describing contaminant fate and transport, and collecting data to support a quantitative baseline risk assessment

Record of Decision (ROD): A public record that documents and explains the cleanup decisions for a CERCLA site The ROD is based on information from the Remedial Investigation and Feasibility Study (if performed), public comments, and community concerns

Resource Conservation and Recovery Act (RCRA) A law passed in 1976 by the U S Congress to require the "cradle-to-grave" management of hazardous wastes CDPHE, through the Hazardous Materials and Waste Management Division, implements RCRA in Colorado

Responsiveness Summary: The section of the CAD/ROD that summarizes public and regulatory agency comments and provides responses to those comments

Risk: The likelihood of an adverse effect on the health of a human or ecological population as a result of exposure to chemical and/or radiological constituents