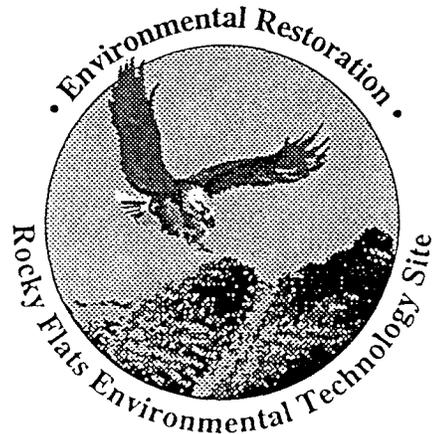




Modification to the Proposed Action Memorandum for the Remediation of Individual Hazardous Substance Site 109, Ryan's Pit

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**MODIFICATION TO THE
PROPOSED ACTION MEMORANDUM
FOR THE REMEDIATION OF
INDIVIDUAL HAZARDOUS SUBSTANCE SITE 109,
RYAN'S PIT**

Rocky Mountain Remediation Services, L.L.C.

**February 21, 1996
Rev. 3**

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ACRONYMS

Am	Americium
Be	Beryllium
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
DOE/RFFO	Department of Energy/Rocky Flats Field Office
EPA	Environmental Protection Agency
IAG	Interagency Agreement
IHSS	Individual Hazardous Substance Site
OU	Operable Unit
PAM	Proposed Action Memorandum
PPRG	Programmatic Preliminary Remediation Goal
Pu	Plutonium
RFETS	Rocky Flats Environmental Technology Site
TCLP	Toxicity characteristic leaching procedure
U	Uranium
UCL	Upper confidence level
UTL	Upper tolerance limit

1.0 INTRODUCTION

1.1 SITE NAME AND LOCATION

This Modification pertains to the Proposed Action Memorandum (PAM) finalized for the Individual Hazardous Substance Site (IHSS) 109 of Operable Unit (OU) 2, known as Ryan's Pit, at the Rocky Flats Environmental Technology Site (RFETS). Ryan's Pit was selected for remediation due to the contaminants and volatile organic compounds residing in the trench that were degrading the groundwater in its vicinity. Organic chemicals were disposed in the trench for a period of approximately five years before the trench was backfilled and its use discontinued. Under the authority of the approved PAM, the contaminated soils were removed from the trench in the fall of 1995 and are currently being remediated using thermal desorption.

1.2 IDENTIFICATION OF LEAD AND SUPPORT AGENCIES

The United States Department of Energy/Rocky Flats Field Office (DOE/RFFO), in conjunction with the United States Environmental Protection Agency (EPA) and the Colorado Department of Public Health and Environment (CDPHE), is managing the remediation of this project site under the Rocky Flats Interagency Agreement (IAG), January 22, 1991.

1.3 COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT (CERCLA)

In line with the provisions of CERCLA (42 USC 9617, Section 117) for public involvement, if any significant changes are made to the scope, performance, or cost of the remedy identified in the approved PAM, an explanation of the significant differences and the reasons such changes were made shall be published.

DOE/RFFO recognizes that due to the radiological content of the soil being returned to the ground, this interim removal action of Ryan's Pit soils may not be the final action for this material. The 903 Pad Interim Measure/Interim Remedial Action Decision Document being developed to address the remediation of the larger area encompassing Ryan's Pit and the Buffer Zone Record of Decision will re-examine the need for further action.

1.4 SUMMARY OF CIRCUMSTANCES FOR MODIFICATION

Although the remedial investigation data shows the presence of low levels of radionuclide contaminants in Ryan's Pit, the predominant contaminants disposed in the trench were volatile organic compounds that were migrating into the groundwater. However, based on analytical data from the excavated soils, two radionuclide elements and one metallic element exceed the Site risk-based remediation goals. The approved PAM cites that "if radiologically contaminated soils are encountered in the trench above the risk-based programmatic preliminary remediation goals for subsurface soils, the soils will be appropriately disposed of."

Although the average concentration of the three elements slightly exceed the risk-based remediation goal, the average concentration value in the excavated soils is still within the EPA's acceptable range of lifetime cancer risk to an individual ranging from 10^{-4} to 10^{-6} . Therefore, this action proposes to return all of the treated Ryan's Pit soils to the former trench site since the concentrations existing in the soils are still protective of human health.

1.5 ADMINISTRATIVE RECORD FILE

In accordance with CERCLA, this Modification will become part of the Administrative Record file. This modification will be available for review by the public in the Administrative File at the following locations: Rocky Flats Public Reading Room, Front Range Community College, Westminster, Colorado; CDPHE Hazardous Materials and Waste Management Division, Denver, Colorado; Citizens Advisory Board Westminster, Colorado; Standley Lake Library, Arvada, Colorado; and the EPA Superfunds Records Center, Denver, Colorado.

The analytical results received by the on-site laboratories in November of 1995 showed elevated concentrations of two of the radionuclide elements, Pu-239/240 (plutonium) and U-238 (uranium), in some of the soil samples, as seen in Table 1. Additionally, the laboratory provided total metal concentrations on the samples collected which showed an elevated concentration of beryllium (Be) in some of the soil samples. The concentrations of these elements are considered elevated because they exceed their respective concentrations accepted by the Site as the Programmatic Preliminary Remediation Goals (PPRGs) for subsurface soils as depicted in Table 2. The PPRGs are point value action levels corresponding to a risk of 10^{-6} .

2.0 SITE HISTORY AND REMEDY SUMMARY

2.1 SITE HISTORY SUMMARY

Between 1966 and 1970, Ryan's Pit was used to dispose of principally non-radioactive liquid chemicals. The organic chemicals, disposed in small quantities, included trichloroethane, tetrachloroethylene, trichloroethylene, and diesel fuel. Other items may have included paint thinner and small quantities of construction-related materials.

From characterization data collected as part of the remedial investigation of OU 2, and subsequent subsurface investigations of the disposal trench, Ryan's Pit contained elevated concentrations of volatile organic compounds as identified above. Evaluation of the monitoring well data in the vicinity of the trench indicated that Ryan's Pit was the primary contaminant source of volatile organic compounds which were degrading the downgradient groundwater.

A Proposed Action Memorandum was developed in accordance with the requirements of the IAG to perform a contaminant source removal action for Ryan's Pit. The Proposed Action Memorandum, *Final Proposed Action Memorandum for the Remediation of Individual Hazardous Substance Site 109, Ryan's Pit*, was finalized on August 24, 1995.

2.2 SELECTED REMEDY SUMMARY

The proposed action for Ryan's Pit entailed the excavation of approximately 180 cubic yards of contaminated soils from the trench, containerizing those soils in roll-off containers, and subsequent on-site treatment of the soils using low temperature thermal desorption. Following the treatment of the soils to remove the volatile organic compounds, the soils are planned to be returned to the former trench site. The original topsoil, segregated in a separate container, will be used to cover the treated soils and reclaim the site. The area will then be regraded to blend with the topography in the area and reseeded with the appropriate grasses.

3.0 DESCRIPTION OF THE MODIFICATION

3.1 SUMMARY OF THE BASIS FOR THE MODIFICATION

The original proposed action for Ryan's Pit was to return the soils to the former trench site after they were treated to remove the volatile organic compounds that were contaminating the areal groundwater. Based on the remedial investigation data collected from Ryan's Pit, low level concentrations of radiological contaminants were expected to be encountered in the soils removed from the trench. Real-time radiological monitoring was performed during the excavation and during the containerization of the soil. This monitoring showed no detectable removable or fixed contamination at any time during the excavation activity. Sodium iodide detectors were also used to monitor the soil, and they showed no significant increase in radioactivity above naturally occurring background levels.

After the excavation of the soils from Ryan's Pit, the contaminated soils were sampled and analyzed in accordance with the *Sampling and Analysis Plan*, August 28, 1995. One of the data quality objectives was to collect a composite grab sample from each roll-off container prior to treatment and analyze for toxicity characteristic leaching procedure (TCLP) metals, plutonium (Pu-239-240), americium (Am-241), and uranium (U-235-238).

3.2 DESCRIPTION OF THE SIGNIFICANT DIFFERENCE

The primary difference between the remedy presented in the PAM in August, 1995 and the new direction presented in this Modification is the return of treated soils to the former Ryan's Pit site that have radiological and metal concentrations exceeding the PPRGs for subsurface soils. However, the exceedances are still within the EPA's acceptable risk range as described by the risk assessment that was performed.

A human health risk assessment was performed to assess the risks due to replacing the soils back into the former trench site that contain Pu-239/240, U-238, and Be above background levels. In determining whether the levels of Pu-239/250, U-238, and Be in the soils were above background, a background comparison was performed. The upper tolerance limit characterized with a 99% confidence that 99% of the data were below that point (UTL_{99/99}) was used for this comparison. The UTL_{99/99} concentrations from the *Background Geochemical Characterization Report* (DOE, 1993) in geologic materials for the upper hydrostratigraphic unit were used. For this comparison, data from one composite sample taken from each of the nine roll-off containers was used. If any of the nine samples exceeded the UTL_{99/99} for a given analyte, the analyte was considered to be above background. If the concentration of an analyte was below the UTL_{99/99} for all samples, the analyte was dropped from further consideration.

The UTL_{99/99} for Pu-239/240, U-238, and Be are 0.02/pCi/gm, 1.73 pCi/gm, and 15.75 mg/kg, respectively. By examining the sample results from each roll-off container in Table 1, it can be seen that the sample results for Pu-239/240 and U-238 were above background. Therefore, the risks from Pu-239/240, U-238, and Be were calculated in the risk assessment.

Human health risks were calculated for analytes considered to be above background. The 95% upper confidence level (95% UCL) was calculated for the data set for each analyte. The *Supplemental Guidance to RAGS, Calculating the Concentration Term* (EPA publication 9285.7-081) was followed to calculate the 95% UCL concentration. All analyte distributions were considered to be normal for the 95% UCL calculation.

Human health risks were derived using approved PPRGs. The PPRGs used were taken from the *Programmatic Risk-Based Preliminary Remediation Goals* (DOE, August, 1995). This document calculates the risk-based PPRGs based on a number of exposure scenarios and has been approved for use at RFETS by EPA and CDPHE. This site-specific document is based on the risk assessment methodologies outlined in *Risk Assessment Guidance for Superfund, Volume I, Human Superfund, Volume I, Human Health Evaluation Manual, Part B, Development of Risk-Based Preliminary Remediation Goals* (OERR publication 9285.7-01B).

The human health risks were calculated by dividing the 95% UCL concentration for each analyte by the construction worker PPRG for that analyte. The PPRG is set at 1×10^{-6} for each scenario. This quotient was then multiplied by 10^{-6} . The resulting number is the risk that would exist if a construction worker was exposed to the analytes through the ingestion, inhalation, and external irradiation pathways. The Future Site Use Working Group has designated the Buffer Zone for future use as open space; therefore, this is the most conservative hypothetical future exposure scenario that will be seen at RFETS for exposure to subsurface soils. Table 2 shows the construction worker PPRG along with the risk from Pu-239/240, U-238, and Be. The sum of the risk from each of the three analytes is 9.6×10^{-6} .

Since the human health risks calculated for the Ryan's Pit subsurface soils are within the individual lifetime cancer risk range from 10^{-4} to 10^{-6} , the treated soils could be placed back into the former trench site while still being protective of human health. This action is consistent with the approved PAM, and no additional costs will result from the implementation of this Modification.

4.0 STATUTORY DETERMINATION

Considering the new information that has been developed and the changes that have been made to the selected remedy, EPA and CDPHE believe that the remedy remains protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to this proposed action, and is cost-effective.

5.0 PUBLIC PARTICIPATION ACTIVITIES

DOE/RFFO will be soliciting comments from the public on this revised proposed action between February 21, 1996 and March 22, 1996. This Modification will be presented to the public during the public comment period at a prearranged meeting such as the monthly Citizens Advisory Board.

**TABLE 1
DATA AND SUMMARY STATISTICS**

SOIL DATA

Radionuclide/Metal	Roll-Off 1	Roll-Off 2	Roll-Off 3	Roll-Off 4	Roll-Off 5	Roll-Off 6	Roll-Off 7	Roll-Off 8	Roll-Off 9
Uranium-238 (pCi/gram)	14.3	16.2	41.1	48.6	28.1	205	588	641	101
Plutonium-239/240 (pCi/gram)	3.2	40	56	258	35	111	1380	305	40
Beryllium (mg/kg)	2.1	34.1	34.2	26.9	36.2	65.6	44.7	33.9	26.5

SUMMARY STATISTICS

Radionuclide/Metal	Minimum	Maximum	Mean	Standard Deviation	Number of Samples	t Statistic	95% UCL
Uranium-238 (pCi/gram)	14.3	641.0	187.0	249.8	9	1.86	341.9
Plutonium-239/240 (pCi/gram)	3.2	1380.0	247.6	437.6	9	1.86	518.9
Beryllium (mg/kg)	2.1	65.6	33.8	16.7	9	1.86	44.2

**TABLE 2
RISK FROM SUBSURFACE SOILS AT RYAN'S PIT**

Radionuclide/Metal	Construction Worker PPRG (Risk = 10 ⁻⁶)	95% UCL Concentration	Calculated Risk for Ryan's Pit Soils
Uranium-238	60.1 pCi/gm	341.9 pCi/gm	5.7E-06
Plutonium-239/240	219 pCi/gm	518.9 pCi/gm	2.4E-06
Beryllium	28.9 mg/kg	44.2 mg/kg	1.5E-06