

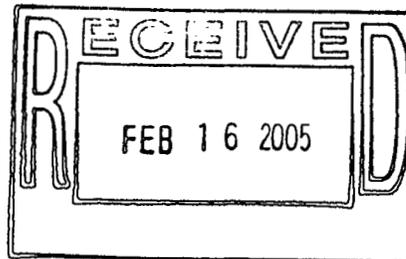
**Environmental Restoration
RFCA Standard Operating Protocol
for Routine Soil Remediation
FY04 Notification #04-11
IHSS Group NE-1 (Ponds B-1, B-2, and B-3)**

Approval received from the U.S. Environmental Protection Agency

December 8, 2004.

Approval letter contained in the Administrative Record.

November 2004



ADMIN RECORD
OU06-A-000598

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TABLE OF CONTENTS

1.0 INTRODUCTION 1
 2.0 IHSS GROUP NE-1..... 1
 2.1 PCOCs..... 4
 2.2 Project Conditions..... 4
 2.3 RFCA Subsurface Soil Risk Screen Evaluation 4
 2.4 Remediation Plan 7
 2.5 Stewardship Evaluation 10
 2.5.1 Proximity to Other Contaminant Sources 10
 2.5.2 Surface Water Protection 11
 2.5.3 Monitoring 12
 2.5.4 Stewardship Actions and Recommendations..... 12
 2.6 Accelerated Action Remediation Goals..... 13
 2.7 Treatment 13
 2.8 Project-Specific Monitoring..... 13
 2.9 Resource Conservation and Recovery Act (RCRA) Units and Intended Waste
 Disposition 13
 2.10 Future Plans 13
 2.11 Administrative Record Documents..... 14
 2.12 Projected Schedule..... 14
 3.0 PUBLIC PARTICIPATION 14
 4.0 REFERENCES 14

LIST OF FIGURES

Figure 1 IHSS Group NE-1, A-, B-, and C-Series Ponds Location Map 2
 Figure 2 IHSS Group NE-1 (Ponds B-1, B-2, and B-3) Potential Remediation Areas 3
 Figure 3 IHSS Group NE-1, Ponds B-1, B-2, and B-3 Existing Sediment Sampling
 Results Greater Than MDLs/RLs or Background Means Plus Two Standard
 Deviations..... 5
 Figure 4 IHSS Group NE-1, B-Series Ponds Existing Surface Soil Sampling Results
 Greater Than MDLs/RLs or Background Means Plus Two Standard Deviations 6
 Figure 5 IHSS Group NE-1, Ponds B-1, B-2, and B-3 Proposed Confirmation Sampling
 Locations 9

LIST OF TABLES

Table 1 Potential Remediation Areas for IHSS Group NE-1 1

LIST OF ATTACHMENTS

Attachment 1 B-Ponds Remediation Activities, Biological Evaluation Rev. 4,
 Classification Exemption CEX-105-01
 Appendix A – Programmatic Biological Opinion

ACRONYMS

AAESE	Accelerated Action Ecological Screening Evaluation
AL	action level
Am	americium
BMP	best management practice
BO	Biological Opinion
BZ	Buffer Zone
COC	contaminant of concern
CRA	Comprehensive Risk Assessment
CWA	Clean Water Act
cy	cubic yard
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
EDDIE	Environmental Data Dynamic Information Exchange
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ER RSOP	Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation
FY	Fiscal Year
IA	Industrial Area
IHSS	Individual Hazardous Substance Site
IM/IRA	Interim Measure/Interim Remedial Action
IMP	Integrated Monitoring Plan
K-H	Kaiser-Hill Company, L.L.C.
MCL	maximum contaminant level
MDL	method detection limit
nCi/g	nanocuries per gram
NFAA	No Further Accelerated Action
OU	Operable Unit
OPWL	Original Process Waste Line
PAC	Potential Area of Concern
PCB	polychlorinated biphenyl
pCi/g	picocuries per gram
pCi/L	picocuries per liter
PCOC	potential contaminant of concern
PDF	Portable Document Format
POC	Point of Compliance
POE	Point of Evaluation
Pu	plutonium
RAO	remedial action objective
RCRA	Resource Conservation and Reclamation Act
RFCA	Rocky Flats Cleanup Agreement
RFETS or Site	Rocky Flats Environmental Technology Site
RL	reporting limit

RSOP	RFCA Standard Operating Protocol
SSRS	Subsurface Soil Risk Screen
SVOC	semivolatile organic compound
UBC	Under Building Contamination
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound
WRW	wildlife refuge worker

1.0 INTRODUCTION

This Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) (DOE 2003a) Notification includes the notification to remediate Individual Hazardous Substance Sites (IHSSs), at the Rocky Flats Environmental Technology Site (RFETS or Site) Buffer Zone (BZ) during Fiscal Year (FY) 2004 (04). The purpose of this Notification is to invoke the ER RSOP for Ponds B-1, B-2, and B-3 in IHSS Group NE-1. Activities specified in the ER RSOP are not reiterated here; however, deviations from the ER RSOP are included where appropriate.

Sediment and soil with contaminant concentrations greater than RFCA wildlife refuge worker (WRW) action levels (ALs), or as indicated by the Subsurface Soil Risk Screen (SSRS), and associated debris will be removed in accordance with RFCA (DOE et al. 2003) and the ER RSOP (DOE 2003a). Ecological effects will be evaluated in the Accelerated Action Ecological Screening Evaluation (AAESE) and the ecological risk assessment portion of the sitewide Comprehensive Risk Assessment (CRA). The AAESE and the CRA will employ analytical results of confirmation sampling from the Ponds B-1, B-2, and B-3 remediation to determine if additional remediation is warranted.

IHSS Group NE-1 consists of the Walnut Creek and Woman Creek A-, B-, and C-Series retention ponds, as shown on Figure 1. The proposed remediation sites covered under ER RSOP Notification #04-11 are listed in Table 1.

**Table 1
Potential Remediation Areas for IHSS Group NE-1**

IHSS Group	IHSS	PCOCs	Media	Estimated Remediation Volume (in place)
NE-1	Pond B-1 (IHSS 142.5) Pond B-2 (IHSS 142.6) Pond B-3 (IHSS 142.7)	Metals PCBs Radionuclides SVOCs VOCs	Soil and Sediment	As identified.

2.0 IHSS GROUP NE-1

IHSS Group NE-1 (Figure 1) contains the A-, B-, and C-Series ponds. This ER RSOP Notification addresses only Ponds B-1, B-2, and B-3, as shown on Figure 2. The remaining ponds not addressed in this Notification, Ponds A-1 through A-4, B-4 and B-5, and C-2, are currently being evaluated by the DOE to determine the path-forward for these areas. Pond C-1 received a No Further Accelerated Action (NFAA) on June 17, 2004.

**IHSS Group NE-1
A, B, and C-Series Ponds
Location Map**

Figure 1

KEY

Proposed remediation area
(Ponds B-1, B-2, and B-3)



IHSS location (Pond)



Building/structure



Demolished structure



Paved area



Dirt road



Stream, ditch, or other
drainage feature



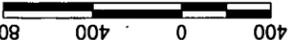
Surface water
Point of Evaluation (POE) station



Surface water
Point of Compliance (POC) station



Scale = 1:10,000



State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Prepared by:

RADMS

Prepared for:

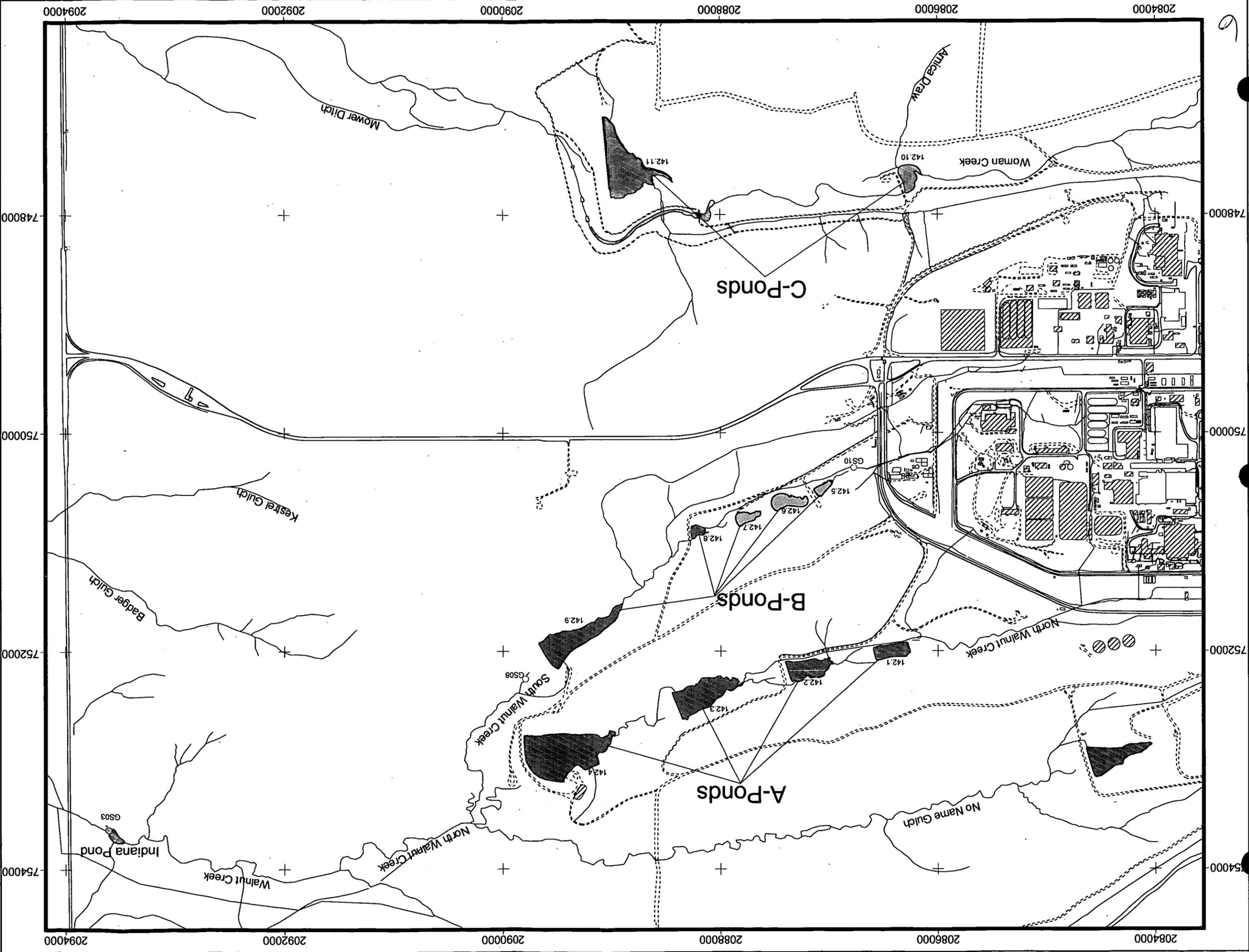
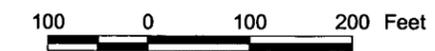
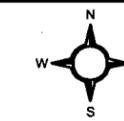


Figure 2

**IHSS Group NE-1
(Ponds B-1, B-2, and B-3)
Potential Remediation Areas**

KEY

-  Proposed remediation area (Ponds B-1, B-2, and B-3)
-  IHSS location (Pond)
-  IHSS location
-  Building/structure
-  Paved area
-  Topography (5-ft contour interval)
-  Dirt road
-  Stream, ditch, or other drainage feature
-  OPWL location (removed)
-  OPWL location
-  OPWL location (planned to be removed)
-  Approximate location of air sampler



Scale = 1:2,200

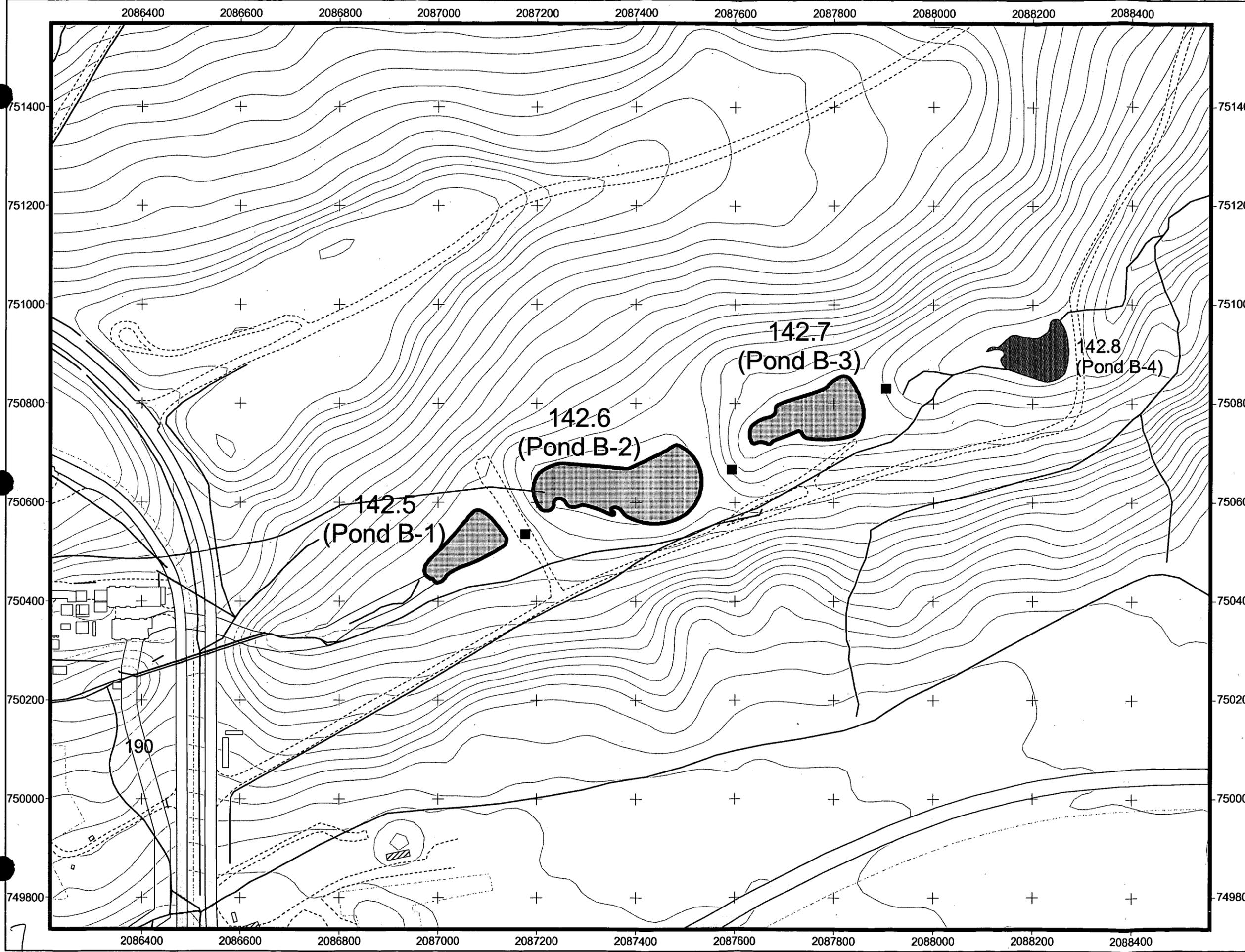
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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2.1 PCOCs

Potential contaminants of concern (PCOCs) at IHSS Group NE-1 (Ponds B-1, B-2, and B-3) are listed in Table 1. The PCOCs were determined based on process knowledge and data collected during previous studies (DOE 1992, 1996, 1997).

2.2 Project Conditions

The following conditions are present within the IHSS Group NE-1, Ponds B-1, B-2, and B-3 area:

- The general types of materials that have been routinely released to the B-Series drainage during the history of RFETS include the following: treated sanitary effluent, treated and untreated process waste, treated and untreated decontamination laundry wastewater, cooling tower blowdown, footing drain flows, and stormwater runoff.
- Ponds B-1 and B-2 are "offline," i.e., isolated from the South Walnut Creek drainage, except during emergency events when water can be diverted to these ponds. Pond B-3 receives discharges of treated water from the Site's Wastewater Treatment Plant.
- Sediment samples collected from Ponds B-1, B-2, and B-3 and nearby areas indicate the presence of americium-241 and plutonium-239/240 at activities greater than the WRW ALs (Figure 3).
- Soil samples collected from the B-Series ponds and nearby areas indicate one location (CW46-001) contains americium-241 and plutonium-239/240 at activities greater than the WRW ALs (Figure 4).
- None of the remaining PCOCs (metals, polychlorinated biphenyls [PCBs], semivolatile organic compounds [SVOCs], and volatile organic compounds [VOCs]) were detected in sediments or soil at levels above the WRW ALs. However, these contaminants were detected above background means plus two standard deviations and will be included in the analysis of confirmation soil and sediment samples.
- Sediment measurements in the B-Series ponds indicate thicknesses of 2- to 8-feet. Thicker sediments may exist.
- The "Pond B-1 Dam Hot Spot" is located on the east side of the dam near the Original Process Waste Line (OPWL) discharge point. The OPWL has been removed from this area.
- Groundwater elevations may have risen in recent months due to precipitation events.
- Groundwater below the ponds contains VOC contamination.

2.3 RFCA Subsurface Soil Risk Screen Evaluation

An SSRS is performed when nonradionuclides and uranium are present in soil 6 inches below the ground surface, or when americium-241 and plutonium-239/240 are present below 3 feet from the ground surface. Because all sediment will be removed from the ponds, the SSRS will be conducted using confirmation sampling data during remedial activities and will be documented in the closeout report.

THIS TARGET SHEET REPRESENTS AN
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: 04-RF-01304; KLW-061-04)

**Environmental Restoration RFCA Standard
Operating Protocol for Routine Soil Remediation
FY04 Notification #04-11 IHSS Group NE-1 (Pond
B-1, Pond B-2, and Pond B-3)**

November 2004

Figure 3:

**IHSS Group NE-1 A, B, and C-
Series Ponds Sediment Sampling
Results Greater Than MDLs/RLs or
Background Means Plus Two
Standard Deviations**

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November 2004

CERCLA Administrative Record Document, OU06-A-000598

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

GOLDEN, COLORADO

9

Figure 4

IHSS Group NE-1
B-Ponds Existing Surface
and Subsurface Soil Results
Greater than MDLs/RLs
OR
Background Means
Plus Two Standard Deviations

Key

- Detected Above WRW Action Level
- Detected Below Action Level
- Below Background or MDL/RL
-  Demolished Structure
-  Structure
-  Asphalt
-  Dirt Road
-  Lake
-  Stream



200 0 200 400 Feet

Scale = 1:5,500

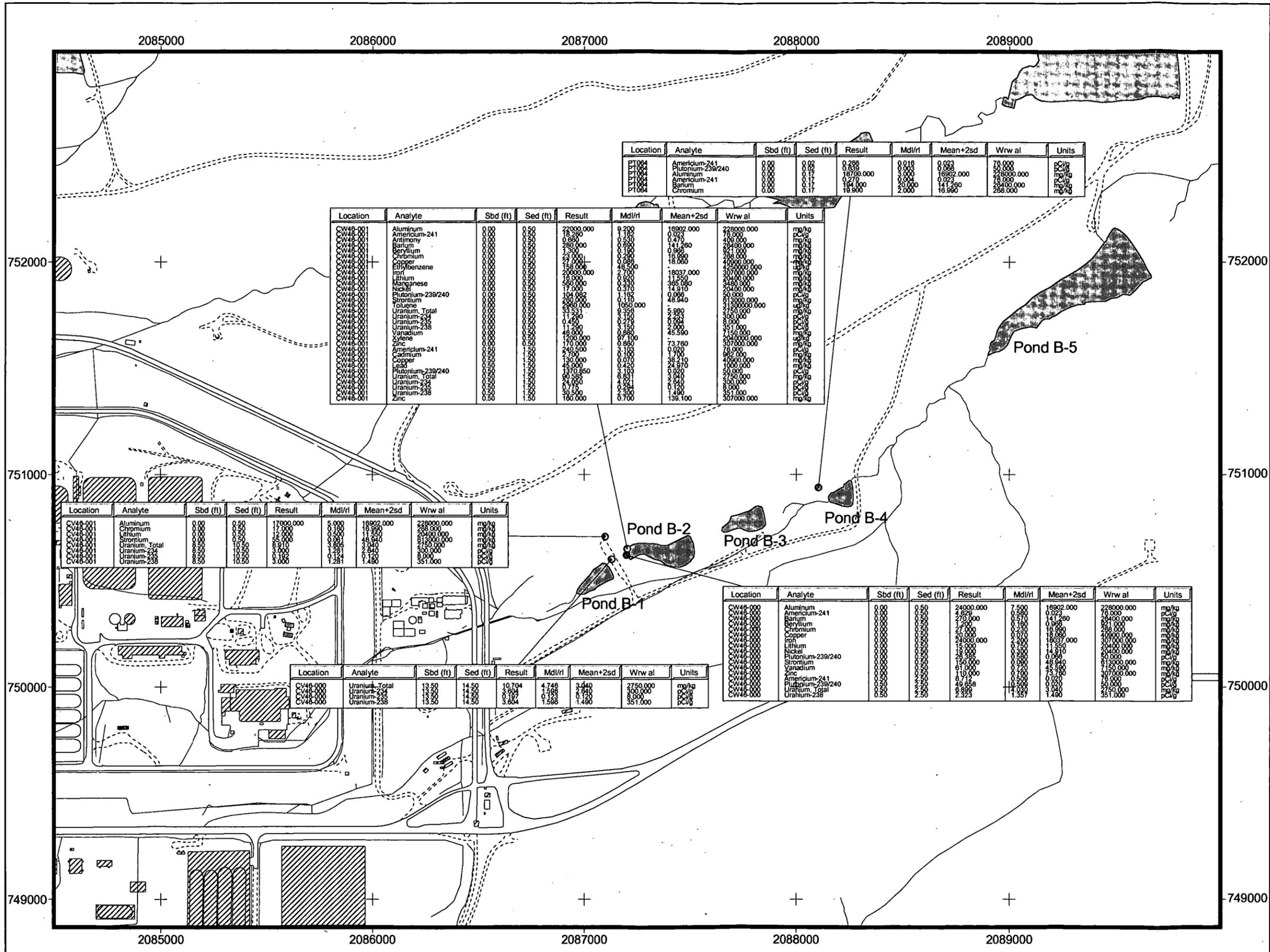
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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Rocky Flats Environmental Technology Site

Prepared by:  Date: November 2004

Prepared for:


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b123ponds032904gpp.apr



Location	Analyte	Sbd (ft)	Sed (ft)	Result	Mdl/rl	Mean+2sd	Wrw al	Units
PT084	Americium-241	0.00	0.02	0.288	0.018	0.023	78.000	pCi/g
PT084	Plutonium-239/240	0.00	0.02	18700.000	3.000	18902.000	228000.000	mg/kg
PT084	Aluminum	0.00	0.17	184.000	30.000	0.073	78.000	pCi/g
PT084	Selenium	0.00	0.17	19.900	2.000	14.280	288.000	mg/kg

Location	Analyte	Sbd (ft)	Sed (ft)	Result	Mdl/rl	Mean+2sd	Wrw al	Units
CW48-001	Aluminum	0.00	0.50	22000.000	9.200	18902.000	228000.000	mg/kg
CW48-001	Americium-241	0.00	0.50	18.280	1.180	0.023	78.000	pCi/g
CW48-001	Antimony	0.00	0.50	0.860	0.330	0.476	409.000	mg/kg
CW48-001	Barium	0.00	0.50	280.000	0.000	14.280	18400.000	mg/kg
CW48-001	Beryllium	0.00	0.50	130.000	0.180	0.585	88.000	mg/kg
CW48-001	Chromium	0.00	0.50	23.000	0.000	18.080	288.000	mg/kg
CW48-001	Copper	0.00	0.50	23.000	0.000	18.080	288.000	mg/kg
CW48-001	Ethylbenzene	0.00	0.50	158.000	48.500	425000.000	425000.000	mg/kg
CW48-001	Iron	0.00	0.50	20800.000	2.000	19037.000	208000.000	mg/kg
CW48-001	Lithium	0.00	0.50	11.500	0.000	11.500	20400.000	mg/kg
CW48-001	Manganese	0.00	0.50	590.000	0.330	395.080	32400.000	mg/kg
CW48-001	Nickel	0.00	0.50	17.000	0.330	14.910	30400.000	mg/kg
CW48-001	Plutonium-239/240	0.00	0.50	104.082	1.180	0.068	50.000	pCi/g
CW48-001	Strontium	0.00	0.50	2800.000	0.110	48.940	613000.000	mg/kg
CW48-001	Toluene	0.00	0.50	33.531	9.950	27000.000	27000.000	mg/kg
CW48-001	Uranium, Total	0.00	0.50	0.420	0.000	5.980	307000.000	pCi/g
CW48-001	Uranium-234	0.00	0.50	0.120	0.000	0.624	300.000	pCi/g
CW48-001	Uranium-235	0.00	0.50	0.120	0.000	0.624	300.000	pCi/g
CW48-001	Uranium-238	0.00	0.50	0.180	0.000	3.150	351.000	pCi/g
CW48-001	Vanadium	0.00	0.50	48.000	0.880	45.590	71500.000	mg/kg
CW48-001	Xylene	0.00	0.50	170.000	0.880	73.780	307000.000	mg/kg
CW48-001	Zinc	0.00	0.50	240.000	0.100	1.700	78.000	pCi/g
CW48-001	Americium-241	0.00	0.50	2.000	0.100	0.100	78.000	pCi/g
CW48-001	Cesium	0.00	0.50	130.000	0.070	39.210	49900.000	mg/kg
CW48-001	Copper	0.00	0.50	130.000	0.070	39.210	49900.000	mg/kg
CW48-001	Ssd	0.00	0.50	1370.850	3.100	0.020	50.000	mg/kg
CW48-001	Plutonium-239/240	0.00	0.50	90.885	6.831	3.040	2750.000	pCi/g
CW48-001	Uranium, Total	0.00	0.50	0.715	0.281	0.120	80.000	pCi/g
CW48-001	Uranium-234	0.00	0.50	0.175	0.281	0.120	80.000	pCi/g
CW48-001	Uranium-235	0.00	0.50	0.175	0.281	0.120	80.000	pCi/g
CW48-001	Uranium-238	0.00	0.50	30.500	3.300	1.490	351.000	pCi/g
CW48-001	Zinc	0.00	0.50	180.000	0.700	139.100	307000.000	mg/kg

Location	Analyte	Sbd (ft)	Sed (ft)	Result	Mdl/rl	Mean+2sd	Wrw al	Units
CV48-001	Aluminum	0.00	0.50	17000.000	5.000	18902.000	228000.000	mg/kg
CV48-001	Chromium	0.00	0.50	17.000	0.180	18.280	288.000	mg/kg
CV48-001	Lithium	0.00	0.50	10.500	0.000	11.500	20400.000	mg/kg
CV48-001	Strontium	0.00	0.50	25.000	0.000	48.940	613000.000	mg/kg
CV48-001	Uranium, Total	0.00	0.50	0.910	0.000	3.040	307000.000	pCi/g
CV48-001	Uranium-234	0.00	0.50	0.260	0.000	0.624	300.000	pCi/g
CV48-001	Uranium-235	0.00	0.50	0.260	0.000	0.624	300.000	pCi/g
CV48-001	Uranium-238	0.00	0.50	3.080	0.281	1.480	351.000	pCi/g

Location	Analyte	Sbd (ft)	Sed (ft)	Result	Mdl/rl	Mean+2sd	Wrw al	Units
CV48-000	Uranium, Total	13.50	14.50	10.704	4.748	3.440	2750.000	mg/kg
CV48-000	Uranium-234	13.50	14.50	3.604	1.598	2.940	300.000	pCi/g
CV48-000	Uranium-235	13.50	14.50	3.604	1.598	2.940	300.000	pCi/g
CV48-000	Uranium-238	13.50	14.50	3.604	1.598	2.940	351.000	pCi/g

Location	Analyte	Sbd (ft)	Sed (ft)	Result	Mdl/rl	Mean+2sd	Wrw al	Units
CW48-000	Aluminum	0.00	0.50	24000.000	7.500	18902.000	228000.000	mg/kg
CW48-000	Americium-241	0.00	0.50	8.920	0.590	0.023	78.000	pCi/g
CW48-000	Barium	0.00	0.50	270.000	0.100	14.280	28400.000	mg/kg
CW48-000	Beryllium	0.00	0.50	27.000	0.360	0.585	88.000	mg/kg
CW48-000	Chromium	0.00	0.50	27.000	0.000	18.080	288.000	mg/kg
CW48-000	Copper	0.00	0.50	27.000	0.000	18.080	288.000	mg/kg
CW48-000	Iron	0.00	0.50	24000.000	2.000	19037.000	208000.000	mg/kg
CW48-000	Lithium	0.00	0.50	15.000	0.000	11.500	20400.000	mg/kg
CW48-000	Nickel	0.00	0.50	15.000	0.000	14.910	30400.000	mg/kg
CW48-000	Plutonium-239/240	0.00	0.50	25.380	0.590	0.068	80.000	pCi/g
CW48-000	Strontium	0.00	0.50	150.000	0.000	48.940	613000.000	mg/kg
CW48-000	Vanadium	0.00	0.50	61.000	0.120	45.590	71500.000	mg/kg
CW48-000	Zinc	0.00	0.50	8.110	0.700	73.780	307000.000	mg/kg
CW48-000	Americium-241	0.00	0.50	8.110	0.509	0.020	78.000	pCi/g
CW48-000	Plutonium-239/240	0.00	0.50	49.658	0.509	0.020	50.000	pCi/g
CW48-000	Uranium, Total	0.00	0.50	9.899	1.437	3.040	2750.000	pCi/g
CW48-000	Uranium-238	0.00	0.50	2.323	1.337	1.490	351.000	pCi/g

2.4 Remediation Plan

In accordance with RFCA, Paragraph 16, remedial actions are exempt from the administrative requirement to obtain federal or state permits, in this case a Clean Water Act (CWA) Section 404 permit; however, the substantive requirements of such permits must be met. Sediment removal activities, as described in this Notification, will include proper maintenance, control of soil erosion, protection of water quality, and minimization of impacts to wildlife species. The proposed actions will result in temporary impacts to the wetlands in this area. Approximately 2.6 acres of open water and emergent wetlands have been identified (based on high water areas) near the ponds. Following remediation activities, the ponds and wetlands will be restored. Therefore, the change in inventory resulting from this action should be minimal.

The RSOP Notification remediation plan for IHSS Group NE-1, Ponds B-1, B-2, and B-3 includes the following objectives:

- Conduct work according to the following general sequence of events:
 - Build water diversion ditches around each pond to minimize run-on.
 - Dewater the ponds.
 - a) Pond B-1 will be pumped into Pond B-2.
 - b) Pond B-2 will be pumped into Pond A-2.
 - c) Pond B-3 will be pumped into Pond A-2 after Building 995 is closed.
 - Mix Pond B-1 sediment with portland cement to remove free water.
 - Excavate the de-watered sediment in Pond B-1 and place directly into waste containers for off-site disposal.
 - Perform confirmation sampling.
 - Repeat mixing of portland cement, excavation, direct loading into containers for offsite disposal, and confirmation sampling for Ponds B-2 and B-3.
 - Recontour ponds to a safe configuration.
 - Revegetate the area by using native plant species and by integrating applicable phytoremediation methods described in the Ground Water Interim Measure/Interim Remedial Action (IM/IRA) report.
- Remove free water in the sediments before excavation using a product of finely ground portland cement clinker mixed with a small amount of gypsum (calcium sulfate dihydrate). The portland cement clinker is made by heating to a high temperature a mixture of substances such as limestone, sand, clay and shale. Portland cement is essentially hydraulic calcium silicates contained in a crystalline mass, not separable into individual components. Major compounds in portland cement consist of the following:
 - tricalcium silicate ($3\text{CaO}\cdot\text{SiO}_2$) CAS #12168-85-3;
 - dicalcium silicate ($2\text{CaO}\cdot\text{SiO}_2$) CAS #10034-77-2;
 - tricalcium aluminate ($3\text{CaO}\cdot\text{Al}_2\text{O}_3$) CAS #12042-78-3;

- tetracalcium aluminoferrite ($4\text{CaO}\cdot\text{Al}_2\text{O}_3\cdot\text{Fe}_2\text{O}_3$) CAS #12068-35-8; and
 - calcium sulfate dihydrate (gypsum) ($\text{CaSO}_4\cdot 2\text{H}_2\text{O}$) CAS #7778-18-9.
- Sediment will be removed laterally to the average water mark or until confirmation sampling indicates no further sediment or soil removal is necessary in accordance with RFCA. Proposed statistical and biased sampling locations are shown on Figure 5. The proposed statistical sampling locations are based on a 36-foot grid spacing over the area of the pond. Additional biased sampling locations are located beyond the perimeter of the pond and dam areas.
 - Remove sediment and soil with plutonium-239/240 or americium-241 activities greater than the RFCA WRW ALs. If confirmation samples indicate radionuclide activities are greater than WRW ALs below the excavation surface, conduct an SSRS. Sediment in Ponds B-1, B-2, and B-3 is approximately 2- to 8-feet thick, although areas of thicker sediment may exist. All sediment will be removed from Ponds B-1, B-2, and B-3 and confirmation samples will be collected and analyzed for all PCOCs (metals, radionuclides, PCBs, SVOCs, and VOCs) from soil below the sediment. Confirmation samples will be collected from the first 6-inch interval below the excavation surface.
 - Remove soil from the "Pond B-1 Dam Hot Spot," located between Pond B-1 and Pond B-2 on the far eastern side of the Pond B-1 dam, as shown on Figure 4 (sample CW46-001). Collection of confirmation samples near the dam and riprap areas will be coordinated in consultation with the State Engineers Office.

Although this Notification addresses only soil and sediment removal from Ponds B-1, B-2, and B-3, additional considerations, including the following, will be taken into account:

- Pond A-2 will be used to contain water from Ponds B-1, B-2, and B-3. This process is part of the approved B-Pond operation plan. Water is typically only pumped down to a level that prohibits any sediment contamination of the water. Pond A-2 has historically shown no contamination from this water management operation.
- A Biological Evaluation (Attachment 1) was prepared that describes impacts to endangered species and wetlands associated with the B-Series ponds. The Biological Evaluation is being discussed with the U.S. Environmental Protection Agency (EPA).
- A Programmatic Biological Assessment was written to address threatened and endangered species issues (with particular regard to the Preble's mouse) for closure projects at RFETS. The B-Series ponds remediation activities were included in this document. A Biological Opinion (BO) has been received from the U.S. Fish and Wildlife Service (USFWS) giving approval for the project along with specific requirements that must be employed during the project activities (i.e., BMPs, activity specific measures, terms and conditions; see Appendix A of Attachment 1 for the BO).
- Build water diversion ditches around each pond to minimize run-on. These diversion ditches will be constructed within the allowed footprint of the project and are described in greater detail in the BE in Attachment 1.

13

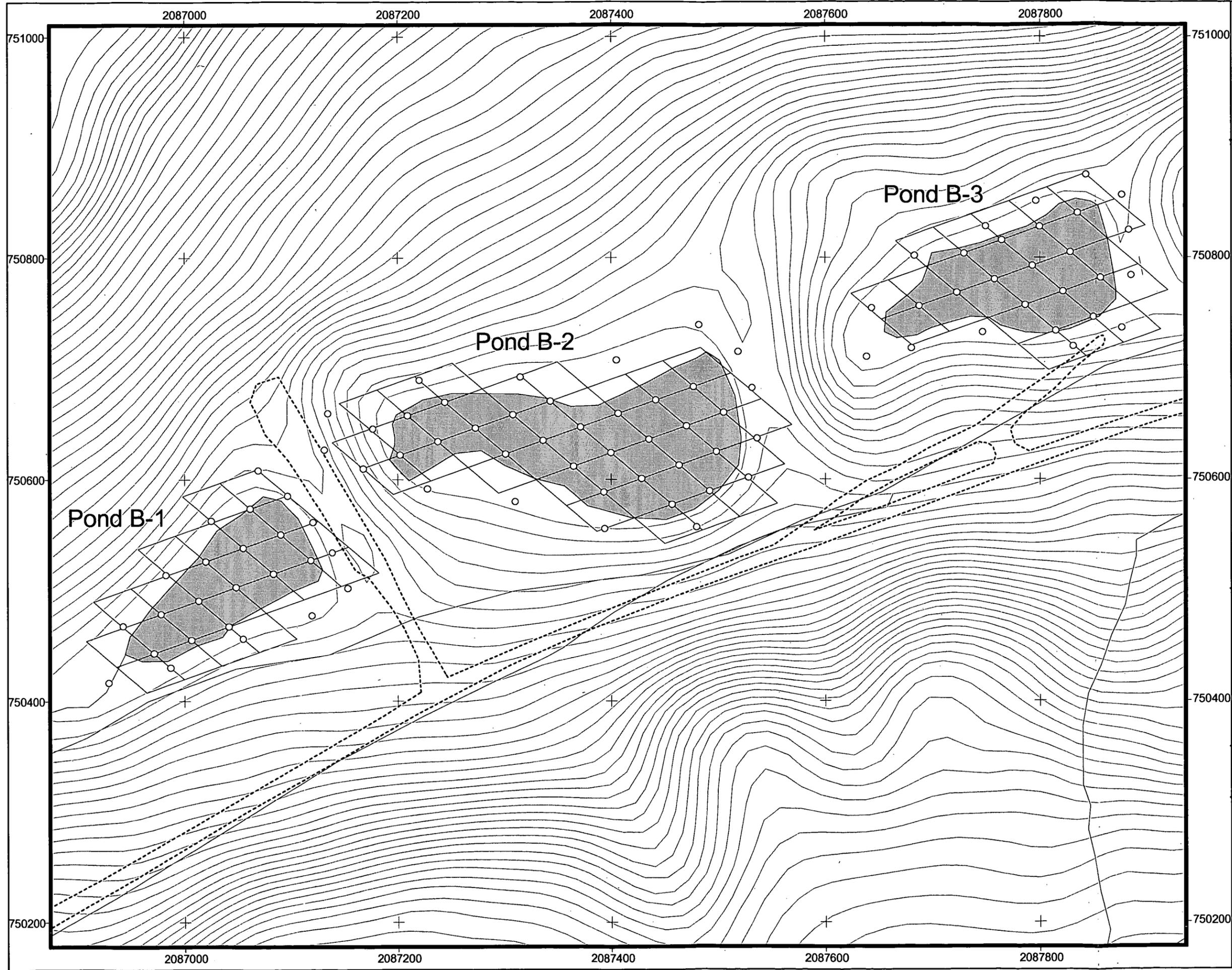
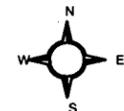


Figure 5

IHSS Group NE-1
Ponds B-1, B-2, and B-3
Proposed Confirmation
Sampling Locations

Key

- Potential Statistical Confirmation Sampling Location
- Potential Biased Confirmation Sampling Location
- ▨ Statistical Sampling Grid
- ▨ Demolished Structure
- ▭ Structure
- ▭ Asphalt
- ⋯ Dirt Road
- ▨ Lake
- ~ Stream
- ~ Topography (2-ft interval)



50 0 50 Feet

Scale = 1 : 1,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Prepared by: **RADMS** Date: November 2004



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b123ponds032904gpp.apr

- Fill material will only be placed in the ponds after remediation to leave the project area in a safe condition. This may include filling isolated excavation potholes, and surface water control ditches, and providing slope stability.
- Effluent discharge from Building 995 will be directed to Pond B-3 until the building is decommissioned in October 2004 and all the remaining effluent is discharged. Sediment removal will commence in Pond B-3 after effluent discharge has ceased.

It is anticipated that after remediation there may be areas with concentrations of metals, radionuclides, and organics greater than background means plus two standard deviations or reporting limits (RLs), but below RFCA ALs.

2.5 Stewardship Evaluation

Based on the PCOCs (Table 1) and the ER RSOP (DOE 2003a), it is anticipated that all contamination above RFCA ALs will be remediated. Figure 2 shows the potential remediation areas.

An additional stewardship evaluation will be conducted during remediation using the consultative process and documented in a Closeout Report for IHSS Group NE-1 (Ponds B-1, B-2, and B-3). A new map of residual contamination will be generated after remediation. The following sections present the stewardship evaluation.

2.5.1 Proximity to Other Contaminant Sources

IHSS Group NE-1 (Ponds B-1, B-2, and B-3) is in the RFETS northeastern BZ and receives flow from the central IA. A number of IHSS Groups are located within the area draining to the B-Series ponds. These IHSS Groups still require closure activities by ER or Decontamination and Decommissioning (D&D) and include the following:

- IHSS Group 000-2;
- IHSS Group 000-4;
- IHSS Group 100-1;
- IHSS Group 100-2;
- IHSS Group 400-7 (accelerated action underway; will be complete before B-Series ponds remediation begins);
- IHSS Group 500-3;
- IHSS Group 700-2;
- IHSS Group 700-3;
- IHSS Group 700-8;
- IHSS Group 800-3; and
- Seeps along Walnut Creek may also be a possible continuing source of VOC contaminants to the B-Ponds.

Demolition and any accelerated action activities at these IHSS Groups could be a potential source of contamination to the B-Series ponds. Most significantly, demolition and remediation activities at Buildings 776 and 777 (IHSS Group 700-3) pose a potential for radioactive contaminants to be transported to the B-Series ponds via water runoff from dust suppression operations during demolition. To minimize this potential, dust suppression water associated with the demolition activity will be collected in tanks and recycled. Erosion controls will be established and maintained at the boundaries of the building footprints through berms, wattles, or straw bales. Additionally, storm drains in the vicinity will be covered during the demolition activities. Management of the water is addressed in the Building 776/777 Closure Project Decommissioning Operations Plan (DOE 1999).

2.5.2 Surface Water Protection

Surface water protection includes the following considerations:

Is there a pathway to surface water from potential erosion to streams or drainages?

Yes. Sediment and soil contaminants from IHSS Group NE-1 (Ponds B-1, B-2, and B-3) could migrate to surface water. However, during remediation activities, all existing drainage from each pond will be blocked, thereby making any potential impact to surface water from sediment unlikely.

Do characterization data indicate there are contaminants in surface soil?

Yes. Existing sediment and soil data for IHSS Group NE-1 (Ponds B-1, B-2, and B-3) indicate activities of americium-241 and plutonium-239/240 exist that exceed RFCA WRW ALs.

Do monitoring results from POEs or Points of Compliance (POCs) indicate there are surface water impacts from the area under consideration?

Yes. The nearest RFCA POEs are GS10 (upstream of Pond B-1) and GS08 (downstream of Pond B-5) (Figure 1). GS08 receives flow from all of the B-Series ponds (although Ponds B-1 and B-2 are frequently pumped to North Walnut Creek) and treated effluent from the Eastern Collection Trench. Sample results for plutonium-239/240 and americium-241 have been measured above 0.15 picocuries per liter (pCi/L) at both of these monitoring stations. However, IHSS Group NE-1 (Ponds B-1, B-2, and B-3) receives water from a large part of the IA, and surface water quality at the monitoring stations cannot be attributable to any single IHSS Group.

Radionuclide activities in B-Pond sediments exceed background levels and could potentially affect surface water quality. However, the B-Ponds sediment will be remediated and verified by confirmation sampling, thereby eliminating the potential affect on surface water. All PCOCs listed on Table 1 will be analyzed during confirmation sampling of the B-Series ponds.

15

Is the IHSS Group in an area with high erosion potential, based on the 100-Year Average Erosion Map?

Yes. IHSS Group NE-1 (Ponds B-1, B-2, and B-3) is located in an area subject to erosion in accordance with Figure 1 of RFCA (DOE et al. 2003).

2.5.3 Monitoring

Monitoring includes the following considerations:

Do monitoring results from POEs or POCs indicate there are groundwater impacts from the area under consideration?

No. All contaminated RFETS groundwater discharges into the drainages and ponds. The Site plume location map (DOE 2002) indicates there is VOC contamination in groundwater southwest of the B-Series ponds, which is defined as the East Trenches Plume. Numerous wells are used to monitor groundwater both upgradient and downgradient of the East Trenches Plume Collection System. Groundwater quality data obtained from monitoring wells located downgradient of the collection trench and immediately upgradient of the B-Series ponds indicate concentrations of some VOCs are greater than Tier I ALs. However, upgradient of the trench, prior to capture and treatment, VOC contaminant concentrations have been reported at greater than 40 times the Tier I ALs.

The plume is attributable to multiple upgradient sources, i.e., the 903 Pad and East Trenches. The B-Series ponds are not a source of the East Trenches Plume. Further groundwater evaluation will be conducted as part of the groundwater plume remedial decision and future Sitewide evaluation.

Can the impact be traced to a specific IHSS Group?

No. Impacts to groundwater cannot be traced to IHSS Group NE-1 (Ponds B-1, B-2, and B-3). All sources are upgradient of the ponds.

Are additional monitoring stations needed?

Not applicable at this time. The need for and placement of monitoring stations will be re-evaluated in the Long-Term Stewardship Plan.

Can existing monitoring locations be deleted if additional remediation is conducted?

Not applicable at this time. Existing wells monitor contamination from areas outside IHSS Group NE-1 (Ponds B-1, B-2, and B-3).

2.5.4 Stewardship Actions and Recommendations

The current stewardship actions and recommendations for IHSS Group NE-1 (Ponds B-1, B-2, and B-3) are as follows:

- Use best management practices (BMPs) to reduce erosion into surface water.
- Implement requirements of the BO for protection of the Preble's mouse habitat in the project area. See Appendix A of Attachment 1 for specific requirements.

- Implement near-term institutional controls until final closure and stewardship decisions are implemented, including the following:
 - Restrict access; and
 - Control soil excavations through the Site Soil Disturbance Permit process.

- Implement long-term stewardship actions, including the following:
 - Prohibitions on construction of buildings in the area; and
 - Restrictions on excavations or other soil disturbances.

- Temporary surface water performance monitoring is recommended to be discussed as part of the Integrated Monitoring Plan (IMP) process

These recommendations may change based on in-process remediation activities and other future RFETS remediation decisions.

2.6 Accelerated Action Remediation Goals

ER RSOP remedial action objectives (RAOs) include the following:

- Provide a remedy consistent with the RFETS goal of protection of human health and the environment.
- Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls.
- Minimize the spread of contaminants during implementation of accelerated actions.
- Minimize disturbances to habitat in the area due to remediation activities. Specific environmental controls will be included in Work Control Documents.

2.7 Treatment

Not applicable at this time.

2.8 Project-Specific Monitoring

Air samplers may be used at the remediation area consistent with work controls to determine airborne radioactivity concentrations. Approximate locations of air samplers are shown on Figure 2; however, the number and actual locations will be determined in the field, based upon site wind conditions.

2.9 Resource Conservation and Recovery Act (RCRA) Units and Intended Waste Disposition

Not applicable.

2.10 Future Plans

Reconfiguration plans of the B-Series ponds, such as dam notching and placing of fill material in the excavated areas, will be conducted in consultation with the EPA and U.S. Army Corps of Engineers under a separate project. These efforts will be implemented to ensure that the substantive requirements of Section 404 of the Clean Water Act are met.

2.11 Administrative Record Documents

DOE, 1992-2003, Historical Release Reports for the Rocky Flats Plant, Golden, Colorado.

DOE, 1996, Final Phase I RFI/RI Report, Walnut Creek Priority Drainage, Operable Unit 6, Rocky Flats Plant, Golden, Colorado, February.

DOE, 1999, Building 776/777 Closure Project, Decommissioning Operations Plan, Revision 0, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002, Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2003, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Modification 1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003, RFCA Standard Operating Protocol for Recycling Concrete, Revision 1, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

2.12 Projected Schedule

Remediation of IHSS Group NE-1 (Ponds B-1, B-2, and B-3) is expected to begin in the first quarter FY05.

3.0 PUBLIC PARTICIPATION

ER RSOP Notification #04-11 activities were discussed with stakeholders and agencies on an October 19, 2004 status meeting. A Portable Document Format (PDF) version of this Notification was provided to the local governments. This Notification is available at the Rocky Flats Reading Rooms and on the Environmental Data Dynamic Information Exchange (EDDIE) Website at www.rfets.gov.

4.0 REFERENCES

DOE, 1992, Historical Release Report for the Rocky Flats Plant, Golden, Colorado, June.

DOE, 1996, Final Phase I RFI/RI Report, Walnut Creek Priority Drainage, Operable Unit 6, Rocky Flats Plant, Golden, Colorado, February.

DOE, 1997, Annual Historical Release Report for the Rocky Flats Plant, Golden, Colorado, September.

DOE, 1999, Building 776/777 Closure Project, Decommissioning Operations Plan, Revision 0, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002, Second Quarter RFCA Groundwater Monitoring Report, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2003a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Modification 1, Rocky Flats Environmental Technology Site, Golden, Colorado, September.

DOE, 2003b, Automated Surface-Water Monitoring Report, Water Year 2002, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, CDPHE, and EPA, 2003, Modifications to the Rocky Flats Cleanup Agreement Attachment, U.S. Department of Energy, Colorado Department of Public Health and Environment, and U.S. Environmental Protection Agency, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

Attachment 1

**B-Ponds Remediation Activities, Biological Evaluation Rev. 4,
Classification Exemption CEX-105-01**

Appendix A

**Programmatic Biological Opinion
April 2004**

21

B-Ponds Remediation Activities
Biological Evaluation Rev. 4
Classification Exemption CEX-105-01

The B-Series Ponds are located in South Walnut Creek at the Rocky Flats Environmental Technology Site. The ponds have served as detention ponds for the past several decades. As part of the Site cleanup and closure activities, the sediments in Ponds B-1, B-2, and B-3, all three of which have elevated contaminant levels will be remediated. It is estimated that approximately 2 to 3 feet of the upper layer of sediment and soil will be removed from each pond. Contaminated material will be placed into waste containers, moved to a temporary staging area pending characterization, and shipped for offsite disposal. The project is being conducted as a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) action and therefore wetland issues fall under the jurisdiction of the U.S. Environmental Protection Agency (EPA) per the requirements of the Memorandum of Agreement (DOE 1996). Current plans are to begin the work in late September/early October 2004.

The general description and sequence of the work activities necessary to complete the remediation of the B-Ponds (B-1, B-2, and B-3) is as follows:

- Build diversion ditches around ponds to prevent surface flow from entering ponds during project activities. A diversion ditch will be cut into the hillside north of the B-ponds along the length of the B-1, B-2, and B-3 ponds to prevent runoff from the hillside from reaching the ponds. The diversion ditch will have erosion controls installed to prevent runoff from the ditch itself and to slow water movement in the ditch. An additional ditch will be cut along the south edge of the road that runs parallel to the B-ponds. Erosion controls will be installed to slow water movement in the ditch.
- Pump surface water in B-1 into B-2.
- Pump combined B-1 and B-2 water from B-2 into A-2.
- Pump B-3 surface water to A-2 after B995 is closed.
- B-1 sediments mixed with portland cement to remove free water.
- Excavate de-watered soil in B-1 and place directly into waste containers for off-site disposal.
- B-2 sediments mixed with portland cement to remove free water.
- Excavate de-watered soil in B-2 and place directly into waste containers for off-site disposal.
- Mix sediments in B-3 with portland cement to de-water, excavate and place into waste containers.
- No fill material will be placed on the pond bottoms after remediation activities are completed, unless potholes exist in the pond bottom that must be filled to match the contour of the pond bottom. If surrounding material from the pond bottom is not sufficient to fill the potholes, additional fill material may be used. If used, it will consist primarily of silts and sands.
- Once final contouring is completed, revegetation using native plant species will be performed.

The sediment removal will take place to the high water mark or to where confirmation sampling indicates no further contaminants (i.e. below action levels). Sediment will be removed from the ponds using a sludge pump, excavator or similar equipment. Soil directly below the sediment will be excavated using an excavator or similar equipment. Sediments will be de-watered with reagent (portland cement) to remove free water prior to placing in waste containers. Debris will be removed if necessary and packaged in appropriate containers. Straw waddles, silt fence and/or straw bales will be used for erosion control. Temporary access roads may be constructed if necessary to access the pond bottom with construction equipment.

The wetlands in the area of the B-Ponds were delineated by the U.S. Army Corps of Engineers in 1994 as part of a wetland study at the Site (Figure 1; COE 1994). Table 1 below lists the wetland types present at each of the three ponds. Some additional seepage on the south side of the B-1 pond has created conditions where enough moisture has been present at or near the ground surface to support the growth of vegetation characteristic of wetter areas. These areas are dominated by arctic rush (*Juncus balticus*) and Canada thistle (*Cirsium arvense*).

Table 1. Temporary Wetland Impacts

Wetland Type	Acres
Pond B-1	
Palustrine Scrub-Shrub, Seasonally Flooded	0.02
Palustrine Emergent, Temporarily Flooded	0.07
Palustrine Unconsolidated Bottom, Semipermanently Flooded	0.50
Palustrine Emergent, Saturated	0.21
Palustrine Unconsolidated Bottom, Permanently Flooded	0.00
Total	0.80
Pond B-2	
Palustrine Emergent, Temporarily Flooded	0.20
Palustrine Emergent, Seasonally Flooded	0.19
Lacustrine Limnetic, Unconsolidated Bottom, Permanently Flooded	0.72
Total	1.11
Pond B-3	
Palustrine Scrub-Shrub, Seasonally Flooded	0.02
Palustrine Unconsolidated Bottom, Permanently Flooded	0.50
Palustrine Emergent, Temporarily Flooded	0.17
Palustrine Emergent, Seasonally Flooded	0.08
Total	0.70
Grand Total	2.61

The B-Series Ponds are located in the habitat of the federally listed threatened Preble's meadow jumping mouse (Preble's mouse; *Zapus hudsonius preblei*). The Preble's mouse and other threatened or endangered species issues have been addressed in Section 7 consultation with the USFWS in a Programmatic Biological Assessment (PBA; Parts I and II) written for Site closure activities (DOE 2004a, 2004b). The USFWS has issued a Biological Opinion (BO) covering the project activities outlined in this document (USFWS 2004; Appendix A).

Wetland impacts should be temporary because after project completion the ponds will be allowed to refill and the wetland vegetation will be re-established. Wetland re-establishment will not be conducted until another project, that will notch each of the dams at ponds B-1, B-2, and B-3, has been completed. Revegetation will occur after the notching since portions of the project footprints overlap. Then the areas will be revegetated using native plant species, either by seeding, staking, or using container plants, following the guidance and success criteria outlined in Part II of the PBA for Preble's mouse mitigation (DOE 2004b). Revegetation plans may be

23

integrated with the possible use of phytoremediation that may be used to slow further migration of the VOC plume in the valley fill alluvium on the south side of the B-Ponds (Groundwater IM/IRA).

The U.S. Department of Energy is notifying the EPA that wetlands at ponds B-1, B-2, and B-3, will be impacted as part of this project. The B-Pond remediation work is being conducted under the *Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY04 Notification #04-011 IHSS Group NE-1 (Ponds B-1, B-2, and B-3)*.

DOE. 1996. Memorandum of Agreement for the Administration of a Wetland Bank at Rocky Flats. . U.S. Department of Energy, Rocky Flats Field Office, Golden, CO. March 1996.

DOE. 2004a. Programmatic Biological Assessment for Department of Energy Activities at the Rocky Flats Environmental Technology Site. Part I. U.S. Department of Energy, Rocky Flats Field Office, Golden, CO. January 2004.

DOE. 2004b. Programmatic Biological Assessment for Department of Energy Activities at the Rocky Flats Environmental Technology Site. Part II. U.S. Department of Energy, Rocky Flats Field Office, Golden, CO. April 2004.

USACE, 1994. Rocky Flats Plant Wetland Mapping and Resource Study. (Prepared for U. S. Department of Energy), United States Army Corps of Engineers, Omaha District. December. 1994.

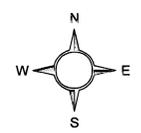
USFWS. 2004. Biological Opinion for Part II of the Programmatic Biological Assessment for Department of Energy Activities at the Rocky Flats Environmental Technology Site. U.S. Fish and Wildlife Service, Lakewood Office, Lakewood, CO. April 5, 2004.

Figure 3

IHSS Group NE-1
A, B, and C-Series Ponds
Sediment Sampling Results
Greater Than MDLs/RLs
or
Background Means
Plus Two Standard Deviations

KEY

- Detected Above WRW Action Level
 - Detected Below Action Levels
- Building
- Demolished
 - Standing
- Paved Roads
- Asphalt
 - Dirt Roads
- Lakes
- Lakes
- Streams
- Streams



500 0 500 1000 Feet

Scale 1 : 5,750

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Prepared by: Date: November 2004

Prepared for:

KAISER-HILL
COMPANY

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