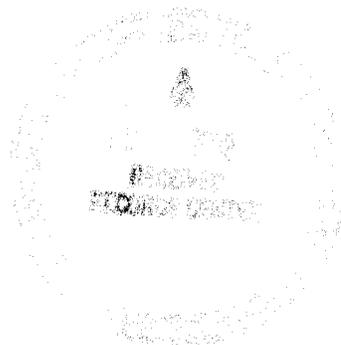


NOTICE

All drawings located at the end of the document.

**DRAFT CLOSEOUT REPORT
FOR IHSS GROUP 800-6**

**DOCUMENT CLASSIFICATION
REVIEW WAIVER PER
CLASSIFICATION OFFICE**



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ENCLOSURE

Compact Disc – Analytical Data

3

ACRONYMS

ACM	asbestos containing material
AL	action level
AOC	Area of Concern
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CHWA	Colorado Hazardous Waste Act
COC	contaminant of concern
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
DQA	Data Quality Assessment
DQO	Data Quality Objective
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ER RSOP	Environmental Restoration RFCA Standard Operating Procedure
ft	feet
HDPE	high-density polyethylene
HEPA	high efficiency particulate absorption
IA	Industrial Area
IDC	Item Description Code
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
K-H	Kaiser-Hill Company L.L.C.
LLW	low-level waste
mg/kg	milligrams per kilogram
NLR	No Longer Representative
NPWL	New Process Waste Lines
OPWL	Original Process Waste Lines
PAC	Potential Area of Concern
PARCCS	precision, accuracy, representativeness, completeness, comparability and sensitivity
pCi/g	picocuries per gram
PCB	Polychlorinated Biphenyls
PCOC	potential contaminant of concern
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RL	reporting limit
RSOP	RFCA Standard Operating Procedure
SAP	Sampling and Analysis Plan
Site	Rocky Flats Environmental Technology Site
SOR	sum of ratio
SVOC	semivolatile organic compound
UBC	Under Building Contamination
ug/kg	micrograms per kilogram
VOC	volatile organic compound
V&V	verification and validation

1.0 INTRODUCTION

This closeout report summarizes characterization and accelerated action activities conducted at Individual Hazardous Substance Site (IHSS) Group 800-6 at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado. IHSS Group 800-6 consists of the following IHSSs and Under Building Contamination (UBC) site:

- UBC 889, Decontamination and Waste Reduction Facility;
- Original Process Waste Line (OPWL) Tanks 28 and 40; and
- IHSS 800-164.3, Radioactive Site 800 Area Site #2 Building 889 Storage Pad

The location of IHSS Group 800-6 is shown on Figure 1, and the UBC site, OPWL tanks and the IHSS are shown on Figure 2.

Accelerated action activities were planned and executed in accordance with the Industrial Area (IA) Sampling and Analysis Plan (SAP) (DOE 2001a), IASAP Addendum #IA-02-01 (DOE 2001b), and the Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) (DOE 2002a). Notification of the planned activities was provided in ER RSOP Notification #02-02 (DOE 2002b), which was approved by the Colorado Department of Public Health and Environment (CDPHE) on March 13, 2002 (CDPHE 2002).

This report contains the information necessary to demonstrate attainment of cleanup objectives and final closure of IHSS Group 800-6. This information includes:

- Site Characterization Information
 - Description of site characterization activities, and
 - Site characterization data, including data tables and maps;
- Site Accelerated Action Information
 - Description of the accelerated action, including the rationale for the action and map of the target remediation area,
 - Map of the actual remediation area, including bounds of the excavation, and dates and durations of specific remedial activities,
 - Photographs documenting site characterization, remediation, and reclamation activities;
- Confirmation sampling data, including data tables and location maps, as well as a comparison of the confirmation data to applicable cleanup goals;
- Description of Resource Conservation and Recovery Act (RCRA) unit closure activities,

- Description of deviations from the ER RSOP,
- Description of near-term stewardship actions and long-term stewardship recommendations;
- Description of site condition after remediation that includes a map of residual contamination above background plus two standard deviations, reporting limits (RLs), and Tier II Action Levels (ALs);
- Disposition of wastes;
- Site reclamation;
- Table of No Longer Representative locations and sample numbers that have been remediated. These data will be used to mark database records so they are not used in the Comprehensive Risk Assessment or other Site analyses; and
- Data quality assessment (DQA), including comparison of confirmation data with project data quality objectives (DQOs).

2.0 SITE CHARACTERIZATION

IHSS Group 800-6 characterization information consists of historical knowledge and analytical data. Historical information for the UBC site, OPWL tanks, and IHSS is presented below in Sections 2.1 through 2.3. Analytical data for IHSS Group 800-6 (pre-accelerated action and accelerated action data) are summarized in Sections 2.4 through 2.6. A complete data set, including both pre-accelerated action and accelerated action data, is enclosed in a compact disk.

Accelerated action analytical data were collected in accordance with IASAP Addendum #IA-02-01 (DOE 2001b). Sampling specifications, including potential contaminants of concern and media to be sampled, are presented in Table 1. Deviations from the IASAP Addendum are presented and explained in Table 2.

2.1 UBC 889, Decontamination and Waste Reduction Facility

Building 889 was placed into service in 1969 and housed decontamination and waste reduction operations for wastes originating outside the Site's Protected Area. Wastes entering Building 889 included surplus equipment that was decontaminated by steam cleaning for reuse on site or sale offsite. HEPA filters, combustible wastes, and non-reusable equipment were compacted, placed in crates, and shipped offsite for disposal. Tank 28 was constructed into the Building 889 slab.

2.2 OPWL Tank 40

Tank T-40 is located in the 800 Area west of Building 889. T-40 was reportedly installed in the mid-1950s and was abandoned in 1981 or 1982. The tank consists of two 400-

gallon underground concrete tanks located in a concrete vault. The top of vault is approximately 7 feet below grade.

2.3 IHSS 800-164.3, Radioactive Site 800 Area Site #2 Building 889 Storage Pad

Building 889 is a decontamination facility that was first occupied in 1969. A storage pad north of the building was used to store uranium-contaminated equipment and contaminated drums prior to decontamination. An area to the west was used for the same purpose. A radioactive survey supports the fact that there was contamination at this western location.

Two incidents occurred at Building 889 that involve contaminated drums. On June 16, 1982, a waste drum spontaneously ignited, and on July 20, 1984, a chip fire started in an improperly packed drum. Another incident occurred in September 1983, when nine machine tools were stored outside waiting for decontamination. The plastic sheeting that was covering the equipment had blown off, possibly allowing contamination to spread.

Building 884 was constructed in 1958 as a storage facility for Building 883. It was used as a mixed waste storage building. In September 1966, drums were reported to be leaking in the drum storage area outside of this building. Approximately 700 square feet (ft²) of soil and rocks were contaminated. It is thought that this information refers to a storage area east of Building 884 that was used prior to the construction of Building 889.

Some drums that contained hazardous or non-hazardous environmentally safe waste were sent to Building 889 for decontamination and reuse. The drum incidents in 1982 and 1984 involved uranium chip fires. No contamination was reported released when the drum caught fire in 1982. No documentation was found that detailed responses related to the incidents in 1983 or 1984.

Table 1
IHSS Group 800-6 Characterization Sampling Specifications

IHSS Group	IHSS/PAC/UBC Site	Location	Easting	Northing	Media	Begin Depth (ft)	End Depth (ft)	Analyte	Method
800-6	UBC 889	CF38-005	2083878	749150.1	Surface Soil	0	0.5	Metals	6010
		CF38-005	2083878	749150.1	Subsurface Soil	0.5	2.5	SVOC	8270
		CF38-005	2083878	749150.1	Subsurface Soil	0.5	2.5	Radionuclides	HPGe
		CF38-005	2083878	749150.1	Subsurface Soil	0.5	2.5	Metals	6010
		CF38-005	2083878	749150.1	Subsurface Soil	0.5	2.5	VOC	8260
		CF38-006	2083914	749150.1	Subsurface Soil	0.5	2.5	Radionuclides	HPGe
		CF38-006	2083914	749150.1	Subsurface Soil	0.5	2.5	SVOC	8270
		CF38-006	2083914	749150.1	Surface Soil	0	0.5	Metals	6010
		CF38-006	2083914	749150.1	Subsurface Soil	0.5	2.5	Metals	6010
		CF38-006	2083914	749150.1	Subsurface Soil	0.5	2.5	VOC	8260
		CF38-007	2083896	749119.1	Subsurface Soil	0.5	2.5	Radionuclides	HPGe
		CF38-007	2083896	749119.1	Subsurface Soil	0.5	2.5	SVOC	8270
		CF38-007	2083896	749119.1	Surface Soil	0	0.5	Metals	6010
		CF38-007	2083896	749119.1	Subsurface Soil	0.5	2.5	Metals	6010
		CF38-007	2083896	749119.1	Subsurface Soil	0.5	2.5	VOC	8260
		CF38-008	2083842	749087.8	Subsurface Soil	0.5	2.5	Radionuclides	HPGe
		CF38-008	2083842	749087.8	Subsurface Soil	0.5	2.5	SVOC	8270
		CF38-008	2083842	749087.8	Surface Soil	0	0.5	Metals	6010
		CF38-008	2083842	749087.8	Subsurface Soil	0.5	2.5	Metals	6010
		CF38-008	2083842	749087.8	Subsurface Soil	0.5	2.5	VOC	8260
CF38-011	2083848	749145.2	Subsurface Soil	7.33	7.33	Radionuclides	HPGe		
CF38-011	2083848	749145.2	Subsurface Soil	7.33	7.33	SVOC	8270		
CF38-011	2083848	749145.2	Subsurface Soil	7.33	7.33	Metals	6010		
CF38-011	2083848	749145.2	Subsurface Soil	7.33	7.33	VOC	8260		
CF38-014	2083854	749121	Subsurface Soil	7.17	7.17	Radionuclides	HPGe		
CF38-014	2083854	749121	Subsurface Soil	7.17	7.17	SVOC	8270		

Table 1
IHSS Group 800-6 Characterization Sampling Specifications

IHSS Group	IHSS/PAC/UBC Site	Location	Easting	Northing	Media	Begin Depth (ft)	End Depth (ft)	Analyte	Method
IHSS 164.3		CF38-014	2083854	749121	Subsurface Soil	7.17	7.17	Metals	6010
		CF38-014	2083854	749121	Subsurface Soil	7.17	7.17	VOC	8260
		CF38-015	2083916	749137.5	Subsurface Soil	3	5	Radionuclides	HPGe
		CF38-015	2083916	749137.5	Subsurface Soil	3	5	SVOC	8270
		CF38-015	2083916	749137.5	Subsurface Soil	3	5	Metals	6010
		CF38-015	2083916	749137.5	Subsurface Soil	3	5	VOC	8260
		CE38-001	2083698	749150.4	Subsurface Soil	0.5	0.67	Radionuclides	HPGe
		CE38-001	2083698	749150.4	Subsurface Soil	0.5	0.67	SVOC	8270
		CE38-001	2083698	749150.4	Surface Soil	0	0.5	Metals	6010
		CE38-001	2083698	749150.4	Subsurface Soil	0.5	0.67	Metals	6010
		CE38-001	2083698	749150.4	Subsurface Soil	0.5	0.67	VOC	8260
		CE38-002	2083734	749150.2	Subsurface Soil	0.5	2.5	Radionuclides	HPGe
		CE38-002	2083734	749150.2	Subsurface Soil	0.5	2.5	SVOC	8270
		CE38-002	2083734	749150.2	Surface Soil	0	0.5	Metals	6010
		CE38-002	2083734	749150.2	Subsurface Soil	0.5	2.5	Metals	6010
		CE38-002	2083734	749150.2	Subsurface Soil	0.5	2.5	VOC	8260
		CE39-001	2083698	749212.4	Subsurface Soil	0.5	2.5	Radionuclides	HPGe
		CE39-001	2083698	749212.4	Subsurface Soil	0.5	2.5	SVOC	8270
		CE39-001	2083698	749212.4	Surface Soil	0	0.5	Metals	6010
		CE39-001	2083698	749212.4	Subsurface Soil	0.5	2.5	Metals	6010
	CE39-001	2083698	749212.4	Subsurface Soil	0.5	2.5	VOC	8260	
	CE39-002	2083716	749253.5	Subsurface Soil	0.5	2.5	Radionuclides	HPGe	
	CE39-002	2083716	749253.5	Subsurface Soil	0.5	2.5	SVOC	8270	
	CE39-002	2083716	749253.5	Surface Soil	0	0.5	Metals	6010	
	CE39-002	2083716	749253.5	Subsurface Soil	0.5	2.5	Metals	6010	
	CE39-002	2083716	749253.5	Subsurface Soil	0.5	2.5	VOC	8260	
	CE39-002	2083716	749253.5	Subsurface Soil	0.5	2.5	Radionuclides	HPGe	
	CE39-002	2083716	749253.5	Subsurface Soil	0.5	2.5	SVOC	8270	
	CE39-002	2083716	749253.5	Surface Soil	0	0.5	Metals	6010	
	CE39-002	2083716	749253.5	Subsurface Soil	0.5	2.5	Metals	6010	
	CE39-002	2083716	749253.5	Subsurface Soil	0.5	2.5	VOC	8260	
	CE39-002	2083716	749253.5	Subsurface Soil	0.5	2.5	Radionuclides	HPGe	
	CE39-002	2083716	749253.5	Subsurface Soil	0.5	2.5	SVOC	8270	

Table 1
IHSS Group 800-6 Characterization Sampling Specifications

IHSS Group	IHSS/PAC/UBC Site	Location	Eastings	Northing	Media	Begin Depth (ft)	End Depth (ft)	Analyte	Method
		CE39-003	2083716	749181.3	Subsurface Soil	0.5	2.5	Radionuclides	HPGe
		CE39-003	2083716	749181.3	Subsurface Soil	0.5	2.5	SVOC	8270
		CE39-003	2083716	749181.3	Surface Soil	0	0.5	Metals	6010
		CE39-003	2083716	749181.3	Subsurface Soil	0.5	2.5	Metals	6010
		CE39-003	2083716	749181.3	Subsurface Soil	0.5	2.5	VOC	8260
		CF38-001	2083770	749150.1	Subsurface Soil	0.5	2.5	Radionuclides	HPGe
		CF38-001	2083770	749150.1	Subsurface Soil	0.5	2.5	SVOC	8270
		CF38-001	2083770	749150.1	Surface Soil	0	0.5	Metals	6010
		CF38-001	2083770	749150.1	Subsurface Soil	0.5	2.5	Metals	6010
		CF38-001	2083770	749150.1	Subsurface Soil	0.5	2.5	VOC	8260
		CF38-002	2083806	749150.2	Subsurface Soil	0.5	2.5	Radionuclides	HPGe
		CF38-002	2083806	749150.2	Subsurface Soil	0.5	2.5	SVOC	8270
		CF38-002	2083806	749150.2	Surface Soil	0	0.5	Metals	6010
		CF38-002	2083806	749150.2	Subsurface Soil	0.5	2.5	Metals	6010
		CF38-002	2083806	749150.2	Surface Soil	0	0.5	VOC	8260
		CF38-003	2083842	749150.1	Subsurface Soil	0.5	2.5	Radionuclides	HPGe
		CF38-003	2083842	749150.1	Subsurface Soil	0.5	2.5	SVOC	8270
		CF38-003	2083842	749150.1	Surface Soil	0	0.5	Metals	6010
		CF38-003	2083842	749150.1	Subsurface Soil	0.5	2.5	Metals	6010
		CF38-003	2083842	749150.1	Subsurface Soil	0.5	2.5	VOC	8260
		CF39-001	2083752	749243.4	Subsurface Soil	0.5	2.5	Radionuclides	HPGe
		CF39-001	2083752	749243.4	Subsurface Soil	0.5	2.5	SVOC	8270
		CF39-001	2083752	749243.4	Surface Soil	0	0.5	Metals	6010
		CF39-001	2083752	749243.4	Subsurface Soil	0.5	2.5	Metals	6010
		CF39-001	2083752	749243.4	Subsurface Soil	0.5	2.5	VOC	8260
		CF39-003	2083788	749243.6	Subsurface Soil	0.5	2.5	Radionuclides	HPGe

Table 1
IHSS Group 800-6 Characterization Sampling Specifications

IHSS Group	IHSS/PAC/UBC Site	Location	Easting	Northing	Media	Begin Depth (ft)	End Depth (ft)	Analyte	Method
		CF39-003	2083788	749243.6	Subsurface Soil	0.5	2.5	SVOC	8270
		CF39-003	2083788	749243.6	Surface Soil	0	0.5	Metals	6010
		CF39-003	2083788	749243.6	Subsurface Soil	0.5	2.5	Metals	6010
		CF39-003	2083788	749243.6	Subsurface Soil	0.5	2.5	VOC	8260
		CF39-004	2083788	749181.4	Subsurface Soil	0.5	2.5	Radionuclides	HPGe
		CF39-004	2083788	749181.4	Subsurface Soil	0.5	2.5	SVOC	8270
		CF39-004	2083788	749181.4	Surface Soil	0	0.5	Metals	6010
		CF39-004	2083788	749181.4	Subsurface Soil	0.5	2.5	Metals	6010
		CF39-004	2083788	749181.4	Subsurface Soil	0.5	2.5	VOC	8260
		CF39-006	2083824	749243.7	Surface Soil	0	0.5	Radionuclides	HPGe
		CF39-006	2083824	749243.7	Subsurface Soil	0.5	2.5	SVOC	8270
		CF39-006	2083824	749243.7	Surface Soil	0	0.5	Metals	6010
		CF39-006	2083824	749243.7	Subsurface Soil	0.5	2.5	Metals	6010
		CF39-006	2083824	749243.7	Subsurface Soil	0.5	2.5	VOC	8260
		CF39-007	2083824	749181.3	Subsurface Soil	0.5	2.5	Radionuclides	HPGe
		CF39-007	2083824	749181.3	Subsurface Soil	0.5	2.5	SVOC	8270
		CF39-007	2083824	749181.4	Surface Soil	0	0.5	Metals	6010
		CF39-007	2083824	749181.3	Subsurface Soil	0.5	2.5	Metals	6010
		CF39-007	2083824	749181.3	Subsurface Soil	0.5	2.5	VOC	8260
		CF39-008	2083860	749243.8	Surface Soil	0	0.5	Radionuclides	HPGe
		CF39-008	2083860	749243.8	Subsurface Soil	0.5	2.5	SVOC	8270
		CF39-008	2083860	749243.8	Surface Soil	0	0.5	Metals	6010
		CF39-008	2083860	749243.8	Subsurface Soil	0.5	2.5	Metals	6010
		CF39-008	2083860	749243.8	Subsurface Soil	0.5	2.5	VOC	8260
		CF39-009	2083860	749181.2	Subsurface Soil	0.5	2.5	Radionuclides	HPGe
		CF39-009	2083860	749181.2	Subsurface Soil	0.5	2.5	SVOC	8270

Table 1
IHSS Group 800-6 Characterization Sampling Specifications

IHSS Group	IHSS/PAC/UBC Site	Location	Easting	Northing	Media	Begin Depth (ft)	End Depth (ft)	Analyte	Method
		CF39-009	2083860	749181.2	Surface Soil	0	0.5	Metals	6010
		CF39-009	2083860	749181.2	Subsurface Soil	0.5	2.5	Metals	6010
		CF39-009	2083860	749181.2	Subsurface Soil	0.5	2.5	Metals	6010
		CF39-011	2083896	749243.6	Surface Soil	0	0.5	Radionuclides	HPGe
		CF39-011	2083896	749243.6	Subsurface Soil	0.5	2.5	SVOC	8270
		CF39-011	2083896	749243.6	Surface Soil	0	0.5	Metals	6010
		CF39-011	2083896	749243.6	Subsurface Soil	0.5	2.5	Metals	6010
		CF39-011	2083896	749243.6	Subsurface Soil	0.5	2.5	VOC	8260
		CF39-012	2083896	749181.3	Subsurface Soil	0.5	2.5	Radionuclides	HPGe
		CF39-012	2083896	749181.3	Subsurface Soil	0.5	2.5	SVOC	8270
		CF39-012	2083896	749181.3	Surface Soil	0	0.5	Metals	6010
		CF39-012	2083896	749181.3	Subsurface Soil	0.5	2.5	Metals	6010
		CF39-012	2083896	749181.3	Subsurface Soil	0.5	2.5	VOC	8260
		CF39-013	2083914	749212.4	Surface Soil	0	0.5	Radionuclides	HPGe
		CF39-013	2083914	749212.4	Subsurface Soil	0.5	2.5	SVOC	8270
		CF39-013	2083914	749212.4	Surface Soil	0	0.5	Metals	6010
		CF39-013	2083914	749212.4	Subsurface Soil	0.5	2.5	Metals	6010
		CF39-013	2083914	749212.4	Subsurface Soil	0.5	2.5	VOC	8260
	PAC 000-504, New Process Waste Line	CF38-025	2083885	749096.7	Subsurface Soil	5	5	Radionuclides	HPGe
		CF38-025	2083885	749096.7	Subsurface Soil	5	5	Metals	6010
		CF38-025	2083885	749096.7	Subsurface Soil	5	5	VOC	8260
	IHSS 121, Original Process Waste Lines Tank T-40	CF38-017	2083788	749124.4	Subsurface Soil	15	15	Radionuclides	HPGe
		CF38-018	2083788	749112.6	Subsurface Soil	15	15	Radionuclides	HPGe
		CF38-023	2083821	749131.1	Subsurface Soil	3	5	Radionuclides	HPGe
		CF38-023	2083821	749131.1	Subsurface Soil	3	5	SVOC	8270
		CF38-023	2083821	749131.1	Subsurface Soil	3	5	Metals	6010

Table 1
IHSS Group 800-6 Characterization Sampling Specifications

IHSS Group	IHSS/PAC/UBC Site	Location	Easting	Northing	Media	Begin Depth (ft)	End Depth (ft)	Analyte	Method
IHSS 121, Original Process Waste Lines Tank T-28		CF38-023	2083821	749131.1	Subsurface Soil	3	5	VOC	8260
		CF38-024	2083777	749119.8	Subsurface Soil	10.5	12.5	SVOC	8270
		CF38-024	2083777	749119.8	Subsurface Soil	10.5	12.5	VOC	8260
		CF38-019	2083844	749144.9	Subsurface Soil	6.7	6.7	Radionuclides	HPGe
		CF38-019	2083844	749144.9	Subsurface Soil	6.7	6.7	SVOC	8270
		CF38-019	2083844	749144.9	Subsurface Soil	6.7	6.7	Metals	6010
		CF38-019	2083844	749144.9	Subsurface Soil	6.7	6.7	VOC	8260
		CF38-020	2083852	749121.3	Subsurface Soil	6.7	6.7	Radionuclides	HPGe
		CF38-020	2083852	749121.3	Subsurface Soil	6.7	6.7	SVOC	8270
		CF38-020	2083852	749121.3	Subsurface Soil	6.7	6.7	Metals	6010
		CF38-020	2083852	749121.3	Subsurface Soil	6.7	6.7	VOC	8260
		CF38-021	2083849	749142	Subsurface Soil	6.7	6.7	Radionuclides	HPGe
		CF38-021	2083849	749142	Subsurface Soil	6.7	6.7	SVOC	8270
		CF38-021	2083849	749142	Subsurface Soil	6.7	6.7	Metals	6010
		CF38-021	2083849	749142	Subsurface Soil	6.7	6.7	VOC	8260
		CF38-010	2083812	749115	Subsurface Soil	5	5	Radionuclides	HPGe
		CF38-010	2083812	749115	Subsurface Soil	5	5	SVOC	8270
		CF38-010	2083812	749115	Subsurface Soil	5	5	Metals	6010
		CF38-010	2083812	749115	Subsurface Soil	5	5	VOC	8260
		CF38-027	2083785	749132.2	Subsurface Soil	4.5	5	Radionuclides	HPGe
		CF38-027	2083785	749132.2	Subsurface Soil	4.5	5	SVOC	8270
		CF38-027	2083785	749132.2	Subsurface Soil	4.5	5	Metals	6010
		CF38-027	2083785	749132.2	Subsurface Soil	4.5	5	VOC	8260

Table 2
Deviations from the IASAP Addendum

IHSS/PAC/ UBC Site	Location	Media	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Begin Depth (ft)	End Depth (ft)	Analyte	Comment
UBC 889	CF38-005	Surface Soil	2083878	749150.08	2083878	749150.1	0	0.5	Metals	No change
	CF38-005	Subsurface Soil	2083878	749150.08	2083878	749150.1	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF38-006	Surface Soil	2083914	749150.08	2083914	749150.1	0	0.5	Metals	No change
	CF38-006	Subsurface Soil	2083914	749150.08	2083914	749150.1	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF38-007	Surface Soil	2083896	749118.94	2083896	749119.1	0	0.5	Metals	No change
	CF38-007	Subsurface Soil	2083896	749118.94	2083896	749119.1	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF38-008	Surface Soil	2083842	749087.71	2083842	749087.8	0	0.5	Metals	No change
	CF38-008	Subsurface Soil	2083842	749087.71	2083842	749087.8	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF38-011	Subsurface Soil	2083837	749114.68	2083848	749145.2	7.33	7.33	Radionuclides Metals VOCs SVOC	Sample depth was estimated because the excavation could not be safely approached for a measurement. Soil sample was collected manually from the bucket of a backhoe.
	CF38-014	Subsurface Soil	2083847	749113.82	2083854	749121	7.17	7.17	Radionuclides Metals VOCs SVOC	Sample depth was estimated because the excavation could not be safely approached for a measurement. Soil sample was collected manually from the bucket of a backhoe.
	CF38-015	Subsurface Soil	2083920	749136.17	2083916	749137.5	3	5	Radionuclides	No change

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IHSS/PAC/ UBC Site	Location	Media	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Begin Depth (ft)	End Depth (ft)	Analyte	Comment
IHSS 164.3	CF38-016	Subsurface Soil	2083822	749130.81			2.5	4.5	Radionuclides Metals VOCs SVOC	This location is covered by location CF38-023. CF38-016 became the designation for a waste sample (sediment from south transit duct).
	CE38-001	Surface Soil	2083698	749150.08	2083698	749150.4	0	0.5	Metals	No change
	CE38-001	Subsurface Soil	2083698	749150.08	2083698	749150.4	0.5	0.67	Radionuclides Metals VOCs SVOC	
	CE38-002	Surface Soil	2083734	749150.08	2083734	749150.2	0	0.5	Metals	No change
	CE38-002	Subsurface Soil	2083734	749150.08	2083734	749150.2	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CE39-001	Surface Soil	2083698	749212.43	2083698	749212.4	0	0.5	Metals	Sample was relocated due to the presence of a utility or other impediment to sampling. The sample was collected within the deeper depth interval, but refusal of hand sampling equipment occurred at a depth short of the maximum planned depth.
	CE39-001	Subsurface Soil	2083698	749212.43	2083698	749212.4	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CE39-002	Surface Soil	2083716	749243.16	2083716	749253.5	0	0.5	Metals	Sample was relocated due to the presence of a utility or other impediment to sampling.
	CE39-002	Subsurface Soil	2083716	749243.16	2083716	749253.5	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CE39-003	Surface Soil	2083716	749181.26	2083716	749181.3	0	0.5	Metals	No change
	CE39-003	Subsurface Soil	2083716	749181.26	2083716	749181.3	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF38-001	Surface Soil	2083770	749150.08	2083770	749150.1	0	0.5	Metals	No change

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IHSS/PAC/ UBC Site	Location	Media	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Begin Depth (ft)	End Depth (ft)	Analyte	Comment
	CF38-001	Subsurface Soil	2083770	749150.08	2083770	749150.1	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF38-002	Surface Soil	2083806	749150.08	2083806	749150.2	0	0.5	Metals	No change
	CF38-002	Subsurface Soil	2083806	749150.08	2083806	749150.2	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF38-003	Surface Soil	2083842	749150.08	2083842	749150.1	0	0.5	Metals	No change
	CF38-003	Subsurface Soil	2083842	749150.08	2083842	749150.1	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF38-004	Surface Soil	2083860	749118.90			0	0.5	Radionuclides Metals SVOC	This location is covered by location CF38-014
	CF38-004	Subsurface Soil	2083860	749118.90			0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF38-012	Surface Soil	2083864	749147.40			0	0.5	Radionuclides Metals SVOC	This location is covered by location CF38-011
	CF38-012	Subsurface Soil	2083864	749147.40			0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF39-001	Surface Soil	2083752	749243.61	2083752	749243.4	0	0.5	Metals	Sample was relocated due to the presence of a utility or other impediment to sampling.
	CF39-001	Subsurface Soil	2083752	749243.61	2083752	749243.4	0.5	2.5	Radionuclides Metals VOCs SVOC	

Table 2
Deviations from the IASAP Addendum

IHSS/PAC/ UBC Site	Location	Media	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Begin Depth (ft)	End Depth (ft)	Analyte	Comment
	CF39-003	Surface Soil	2083788	749243.61	2083788	749243.6	0	0.5	Metals	Sample was relocated due to the presence of a utility or other impediment to sampling. The sample was collected within the deeper depth interval, but refusal of hand sampling equipment occurred at a depth short of the maximum planned depth.
	CF39-003	Subsurface Soil	2083788	749243.61	2083788	749243.6	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF39-004	Surface Soil	2083788	749181.26	2083788	749181.4	0	0.5	Metals	Sample was relocated due to the presence of a utility or other impediment to sampling.
	CF39-004	Subsurface Soil	2083788	749181.26	2083788	749181.4	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF39-006	Surface Soil	2083824	749243.61	2083824	749243.7	0	0.5	Metals	Sample was relocated due to the presence of a utility or other impediment to sampling.
	CF39-006	Subsurface Soil	2083824	749243.61	2083824	749243.7	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF39-007	Surface Soil	2083824	749181.26	2083824	749181.3	0	0.5	Metals	Sample was relocated due to the presence of a utility or other impediment to sampling.
	CF39-007	Subsurface Soil	2083824	749181.26	2083824	749181.3	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF39-008	Surface Soil	2083860	749243.61	2083860	749243.8	0	0.5	Metals	Sample was relocated due to the presence of a utility or other impediment to sampling.
	CF39-008	Subsurface Soil	2083860	749243.61	2083860	749243.8	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF39-009	Surface Soil	2083860	749181.26	2083860	749181.2	0	0.5	Metals	Sample was relocated due to the presence of a utility or other impediment to sampling.
	CF39-009	Subsurface Soil	2083860	749181.26	2083860	749181.2	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF39-011	Surface Soil	2083896	749243.61	2083896	749243.6	0	0.5	Metals	Sample was relocated due to the presence of a utility or other impediment to sampling.

Table 2
Deviations from the IASAP Addendum

IHSS/PAC/ UBC Site	Location	Media	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Begin Depth (ft)	End Depth (ft)	Analyte	Comment
	CF39-011	Subsurface Soil	2083896	749243.61	2083896	749243.6	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF39-012	Surface Soil	2083896	749181.26	2083896	749181.3	0	0.5	Metals	Sample was relocated due to the presence of a utility or other impediment to sampling.
	CF39-012	Subsurface Soil	2083896	749181.26	2083896	749181.3	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF39-013	Surface Soil	2083914	749212.43	2083914	749212.4	0	0.5	Metals	Sample was relocated due to the presence of a utility or other impediment to sampling.
	CF39-013	Subsurface Soil	2083914	749212.43	2083914	749212.4	0.5	2.5	Radionuclides Metals VOCs SVOC	
	CE39-004	Surface Soil	2083734	749212.43			0	0.5	Metals	Not sampled; located under Building 884.
	CE39-004	Subsurface Soil	2083734	749212.43			0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF39-002	Surface Soil	2083770	749212.43			0	0.5	Metals	Not sampled; located under Building 884.
	CF39-002	Subsurface Soil	2083770	749212.43			0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF39-005	Surface Soil	2083806	749212.43			0	0.5	Metals	Not sampled; located under Building 884.
	CF39-005	Subsurface Soil	2083806	749212.43			0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF39-010	Surface Soil	2083878	749212.43			0	0.5	Metals	Not sampled; located under cargo container.

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Table 2
Deviations from the IASAP Addendum

IHSS/PAC/ UBC Site	Location	Media	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Begin Depth (ft)	End Depth (ft)	Analyte	Comment
PAC 000-504, New Process Waste Line	CF39-010	Subsurface Soil	2083878	749212.43			0.5	2.5	Radionuclides Metals VOCs SVOC	
	CF38-025	Subsurface Soil			2083885	749096.7	5	5	Radionuclides Metals VOCs	Location added. Soil collected beneath New Process Waste Line.
	CE39-005	Subsurface Soil	2083699	749167.92			8.5	10.5	Radionuclides Metals VOCs SVOC	Not sampled; biased sample located under a process line that was not removed.
	CE38-003	Subsurface Soil	2083704	749160.01			8.5	10.5	Radionuclides Metals VOCs SVOC	Not sampled; biased sample located under a process line that was not removed.
	CF39-016	Subsurface Soil	2083790	749164.77			8.5	10.5	Radionuclides Metals VOCs SVOC	Not sampled; biased sample located under a process line that was not removed.
	CF39-017	Subsurface Soil	2083801	749164.43			8.5	10.5	Radionuclides Metals VOCs SVOC	Not sampled; biased sample located under a process line that was not removed.
	CF39-018	Subsurface Soil	2083811	749165.31			8.5	10.5	Radionuclides Metals VOCs SVOC	Not sampled; biased sample located under a process line that was not removed.
	CF39-019	Subsurface Soil	2083852	749166.84			8.5	10.5	Radionuclides Metals VOCs SVOC	Not sampled; biased sample located under a process line that was not removed.

Table 2
Deviations from the IASAP Addendum

IHSS/PAC/ UBC Site	Location	Media	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Begin Depth (ft)	End Depth (ft)	Analyte	Comment
IHSS 121, Original Process Waste Lines Tank T-40	CE38-009	Subsurface Soil	2083796	749155.51			8.5	10.5	Radionuclides Metals VOCs SVOC	Not sampled; biased sample located under a process line that was not removed.
	CF38-017	Subsurface Soil			2083788	749124.4	15	15	Radionuclides	Location added. Soil collected beneath northeastern corner of Tank 40.
	CF38-018	Subsurface Soil			2083788	749112.6	15	15	Radionuclides	Location added. Soil collected beneath southeastern corner of Tank 40.
	CF38-023	Subsurface Soil			2083821	749131.1	3	5	Radionuclides Metals VOCs SVOC	Location added. Location had been backfilled before sample was taken. Geologist determined where base of fill existed (3'), then sampled a two-foot interval below the base.
	CF38-024	Subsurface Soil			2083777	749119.8	10.5	12.5	VOC & SVOC	Location added. Soil collected beneath Tank 40.
	CF38-013	Subsurface Soil	2083784	749123.77			6.5	8.5	Radionuclides Metals VOCs SVOC	This location is covered by locations CF38-017 and CF38-024. CF38-013 became the designation for a waste sample (Tank 40 sludge).
IHSS 121, Original Process Waste Lines Tank T-28	CF38-019	Subsurface Soil			2083844	749144.9	6.7	6.7	Radionuclides Metals VOCs	Location added. Soil collected beneath the Tank 28 West Process Waste Line.
	CF38-020	Subsurface Soil			2083852	749121.3	6.7	6.7	Radionuclides Metals VOCs SVOC	Location added. Soil collected beneath the South Tank 28 leak.
	CF38-021	Subsurface Soil			2083849	749142	6.7	6.7	Radionuclides Metals VOCs SVOC	Location added. Soil collected around the outside of the south transit duct where it entered the sump.

Table 2
Deviations from the IASAP Addendum

IHSS/PAC/ UBC Site	Location	Media	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Begin Depth (ft)	End Depth (ft)	Analyte	Comment
IHSS 121, Original Process Waste Lines	CF38-010	Subsurface Soil	2083878	749212.43	2083812	749115	5	5	Radionuclides Metals VOCs SVOC	Sample depth was estimated because the excavation could not be safely approached for a measurement. Soil sample was collected manually from the bucket of a backhoe.
	CF38-027	Subsurface Soil			2083785	749132.2	4.5	5	Radionuclides Metals VOCs SVOC	Location added. Soil collected beneath the north-south OPWL.

2.4 Analytical Data for UBC 889

The UBC was characterized during the accelerated action. No historical samples had been collected. Accelerated action sample locations and analytical results associated with UBC 889 are presented in Figure 3 and in Table 3. Only results greater than background mean plus two standard deviations or reporting limits are shown. The data indicate no contamination. All contaminant concentrations were below RFCA Tier II ALs.

2.5 Analytical Data for OPWL Tank 40

OPWL Tank 40 was characterized prior to and during the accelerated action. Pre-accelerated action sample locations and analytical results for Group 800-6 are presented in Figure 4. Only results greater than background mean plus two standard deviations or reporting limits are shown. The data indicate no contamination (i.e., concentrations were below RFCA Tier II ALs), with one exception. The surface sample at Location 04995 had a beryllium concentration of 2.1 mg/kg. The background concentration is 0.966 mg/kg, the Tier II AL is 1.04 mg/kg, and the Tier I AL is 104 mg/kg. In addition, pre-accelerated action data indicated that SVOCs and chlorinated solvents were PCOCs at Tank 40. These compounds were not found at concentrations greater than RFCA Tier II ALs during the accelerated action sampling (see next paragraph). Furthermore, sampling locations around the tank have been impacted by the excavation activities and are no longer representative (refer to Section 11.0). After the tank was removed, the excavation was backfilled, and the area was graded, covered with clean fill, and seeded.

Accelerated action sample locations and results for Group 800-6 are presented in Figure 3 and in Table 3. Only results greater than background mean plus two standard deviations or reporting limits are shown. Data indicate no contamination. All contaminant concentrations were below RFCA Tier II ALs, including those associated with Tank 40.

2.6 Analytical Data for IHSS 800-164.3

IHSS 800-164.3 was characterized prior to and during the accelerated action. Pre-accelerated action sample locations and analytical results for Group 800-6 are presented in Figure 4. Only results greater than background mean plus two standard deviations or reporting limits are shown. The data indicate no contamination. All contaminant concentrations were below RFCA Tier II ALs.

Accelerated action sample locations and analytical results for Group 800-6 are presented in Figure 3 and in Table 3. Only results greater than background mean plus two standard deviations or reporting limits are shown. The data indicate no contamination. All contaminant concentrations were below RFCA Tier II ALs.

However, not all samples could be collected and analyzed (i.e., from Locations CE39-004, CF39-002, CF39-005 and CF30-010). Sampling will be completed after Building 884 and the cargo containers are removed. Results will be reported in a separate closeout report. However, the number of samples collected (i.e., sampling power) was sufficient to indicate that concentrations in the area are below Tier II action levels (refer to Section 12.6).

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Table 3
IHSS Group 800-6 Accelerated Action Characterization Data

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte Name	Result	Reporting Limit	Background Plus Two Standard Deviations	Tier II Action Level	Tier I Action Level	Unit
800-6	IHSS 121 – Original Process Waste Lines	CF38-027	METHYLENE CHLORIDE	1.4	0.92	N/A	6	578	ug/kg
		CF38-010	ACETONE	16	4.7	N/A	272000	27200000	ug/kg
800-6	IHSS 121 – Original Process Waste Lines Tank T-28	CF38-019	1,2-DICHLOROPROPANE	2.2	1.7	N/A	11	1130	ug/kg
		CF38-019	ACETONE	820	6.4	N/A	272000	27200000	ug/kg
		CF38-019	BIS(2-ETHYLHEXYL)PHTHALATE	120	99	N/A	3110000	311000000	ug/kg
		CF38-019	CARBON DISULFIDE	3.4	1.3	N/A	9880	988000	ug/kg
		CF38-019	TETRACHLOROETHENE	2.1	1.4	N/A	32	3150	ug/kg
		CF38-021	1,2,4-TRICHLOROBENZENE	6.6	0.8	N/A	19200000	19200000	ug/kg
		CF38-021	ACETONE	13	5.2	N/A	192000000	192000000	ug/kg
		CF38-021	BIS(2-ETHYLHEXYL)PHTHALATE	160	77	N/A	320000	32000000	ug/kg
		CF38-021	NAPHTHALENE	5.3	0.97	N/A	76800000	76800000	ug/kg
		CF38-021	TETRACHLOROETHENE	1.1	1.1	N/A	86200	8620000	ug/kg
		CF38-020	XYLENES (TOTAL)	82	36	N/A	97400	9740000	ug/kg
		CF38-020	NAPHTHALENE	530	59	N/A	101000	10100000	ug/kg
800-6	IHSS 121 – Original Process Waste Lines Tank T-40	CF38-020	PHENOL	160	90	N/A	37500	3750000	ug/kg
		CF38-024	BENZO(A)ANTHRACENE	50	50	N/A	1600	160000	ug/kg
		CF38-024	BIS(2-ETHYLHEXYL)PHTHALATE	1900	88	N/A	3110000	311000000	ug/kg
		CF38-024	CARBON DISULFIDE	780	450	N/A	9880	988000	ug/kg
		CF38-024	ETHYLBENZENE	1200	930	N/A	9320	932000	ug/kg
		CF38-024	NAPHTHALENE	12000	360	N/A	101000	10100000	ug/kg
		CF38-024	NAPHTHALENE	6300	3400	N/A	101000	10100000	ug/kg
		CF38-024	PYRENE	57	51	N/A	3970000	397000000	ug/kg
		CF38-024	XYLENES (TOTAL)	7900	1600	N/A	97400	9740000	ug/kg

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Table 3
IHSS Group 800-6 Accelerated Action Characterization Data

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte Name	Result	Reporting Limit	Background Plus Two Standard Deviations	Tier II Action Level	Tier I Action Level	Unit
800-6	IHSS 164.3 - Radioactive Site 800 Area Site #2, Building 886 Spills	CE38-001	STRONTIUM	55.1	0.0061	48.94	1000000	1000000	mg/kg
CE38-002		METHYLENE CHLORIDE	1.4	0.8	N/A	6	578	ug/kg	
CE38-002		TETRACHLOROETHENE	1	0.99	N/A	32	3150	ug/kg	
CE39-001		ALUMINUM	17500	1.4	16902	1000000	1000000	mg/kg	
CE39-001		CHROMIUM	21	0.06	16.99	4410	44300	mg/kg	
CE39-001		LITHIUM	12.4	0.2	11.55	38400	38400	mg/kg	
CE39-001		METHYLENE CHLORIDE	0.9	0.82	N/A	6	578	ug/kg	
CE39-001		SELENIUM	1.4	0.5	1.22	9610	9610	mg/kg	
CE39-001		STRONTIUM	90	0.0067	48.94	1000000	1000000	mg/kg	
CE39-001		STRONTIUM	89	0.0069	48.94	1000000	1000000	mg/kg	
CE39-002		ACETONE	5.2	5	N/A	272000	27200000	ug/kg	
CE39-002		ALUMINUM	22100	1.4	16902	1000000	1000000	mg/kg	
CE39-002		BARIUM	208	0.043	141.26	133000	133000	mg/kg	
CE39-002		CHROMIUM	36.4	0.059	16.99	4410	44300	mg/kg	
CE39-002		LITHIUM	15	0.19	11.55	38400	38400	mg/kg	
CE39-002		NICKEL	21.3	0.72	14.91	38400	38400	mg/kg	
CE39-002		STRONTIUM	84.4	0.0068	48.94	1000000	1000000	mg/kg	
CE39-002		VANADIUM	49.4	0.27	45.59	13400	13400	mg/kg	
CE39-003		STRONTIUM	95.4	0.0065	48.94	1000000	1000000	mg/kg	
CF38-001		LITHIUM	11.7	0.25	11.55	38400	38400	mg/kg	
CF38-001	METHYLENE CHLORIDE	1.2	0.8	N/A	6	578	ug/kg		
CF38-002	STRONTIUM	71.8	0.0063	48.94	1000000	1000000	mg/kg		
CF38-003	BIS(2-ETHYLHEXYL)PHTHALATE	1100	74	N/A	3110000	311000000	ug/kg		
CF38-003	PYRENE	74	43	N/A	3970000	397000000	ug/kg		

Table 3
IHSS Group 800-6 Accelerated Action Characterization Data

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte Name	Result	Reporting Limit	Background Plus Two Standard Deviations	Tier II Action Level	Tier I Action Level	Unit
		CF38-003	STRONTIUM	75.2	0.0065	48.94	1000000	1000000	mg/kg
		CF38-003	TOLUENE	0.94	0.83	N/A	7070	707000	ug/kg
		CF39-001	BARIUM	166	0.043	141.26	133000	133000	mg/kg
		CF39-001	BARIUM	800	0.042	289.38	133000	133000	mg/kg
		CF39-001	CHROMIUM	17.4	0.059	16.99	4410	44300	mg/kg
		CF39-001	STRONTIUM	94.6	0.0068	48.94	1000000	1000000	mg/kg
		CF39-003	BARIUM	147	0.043	141.26	133000	133000	mg/kg
		CF39-003	CHROMIUM	91.8	0.059	68.27	4410	44300	mg/kg
		CF39-003	STRONTIUM	78	0.0068	48.94	1000000	1000000	mg/kg
		CF39-004	ACETONE	9.3	4.6	N/A	272000	27200000	ug/kg
		CF39-004	METHYLENE CHLORIDE	0.91	0.8	N/A	6	578	ug/kg
		CF39-006	METHYLENE CHLORIDE	1.3	0.9	N/A	6	578	ug/kg
		CF39-006	PYRENE	64	43	N/A	3970000	397000000	ug/kg
		CF39-006	STRONTIUM	64.8	0.0068	48.94	1000000	1000000	mg/kg
		CF39-006	STRONTIUM	65.2	0.0068	48.94	1000000	1000000	mg/kg
		CF39-006	VANADIUM	53.8	0.27	45.59	13400	13400	mg/kg
		CF39-007	ACETONE	5.5	4.6	N/A	272000	27200000	ug/kg
		CF39-007	METHYLENE CHLORIDE	1.1	0.8	N/A	6	578	ug/kg
		CF39-007	STRONTIUM	66.9	0.006	48.94	1000000	1000000	mg/kg
		CF39-008	CHROMIUM	19.4	0.058	16.99	4410	44300	mg/kg
		CF39-008	METHYLENE CHLORIDE	1.5	0.94	N/A	6	578	ug/kg
		CF39-008	ZINC	91.4	0.22	73.76	576000	576000	mg/kg
		CF39-009	STRONTIUM	86.6	0.006	48.94	1000000	1000000	mg/kg
		CF39-011	METHYLENE CHLORIDE	1.5	0.9	N/A	6	578	ug/kg
		CF39-011	PYRENE	92	46	N/A	3970000	397000000	ug/kg

Table 3
IHSS Group 800-6 Accelerated Action Characterization Data

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte Name	Result	Reporting Limit	Background Plus Two Standard Deviations	Tier II Action Level	Tier I Action Level	Unit
800-6		CF39-011	STRONTIUM	60.8	0.0066	48.94	1000000	1000000	mg/kg
		CF39-012	METHYLENE CHLORIDE	0.96	0.8	N/A	6	578	ug/kg
		CF39-012	STRONTIUM	52.2	0.006	48.94	1000000	1000000	mg/kg
		CF39-013	CHROMIUM	20.4	0.059	16.99	4410	44300	mg/kg
		CF39-013	CHRYSENE	98	62	N/A	160000	160000000	ug/kg
		CF39-013	FLUORANTHENE	200	99	N/A	5370000	537000000	ug/kg
		CF39-013	METHYLENE CHLORIDE	2.1	1	N/A	5.78	578	ug/kg
		CF39-013	PYRENE	230	47	N/A	3970000	397000000	ug/kg
		CF39-013	STRONTIUM	214	0.0069	211.38	1000000	1000000	mg/kg
		CF39-013	STRONTIUM	79.3	0.0069	48.94	1000000	1000000	mg/kg
		CF38-025	METHYLENE CHLORIDE	5.7	0.88	N/A	6	578	ug/kg
		CF38-005	BENZO(A)ANTHRACENE	63	41	N/A	1600	160000	ug/kg
		CF38-005	CHROMIUM	17	0.059	16.99	4410	44300	mg/kg
		CF38-005	CHRYSENE	67	56	N/A	160000	160000000	ug/kg
		CF38-005	COPPER	52.3	0.17	18.06	71100	71100	mg/kg
		CF38-005	COPPER	56.6	0.16	38.21	71100	71100	mg/kg
		CF38-005	FLUORANTHENE	160	88	N/A	5370000	537000000	ug/kg
CF38-005	IRON	23400	1.6	18037	576000	576000	mg/kg		
CF38-005	MANGANESE	489	0.037	365.08	83600	83600	mg/kg		
CF38-005	NICKEL	18.1	0.72	14.91	38400	38400	mg/kg		
CF38-005	PYRENE	150	42	N/A	3970000	397000000	ug/kg		
CF38-005	STRONTIUM	115	0.0068	48.94	1000000	1000000	mg/kg		
CF38-005	TETRACHLOROETHENE	1.2	1.1	N/A	32	3150	ug/kg		
CF38-005	VANADIUM	66.8	0.27	45.59	13400	13400	mg/kg		
CF38-006	CHROMIUM	20.1	0.055	16.99	4410	44300	mg/kg		
	PAC 000-504, New Process Waste Line								
	UBC 889								

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Table 3
IHSS Group 800-6 Accelerated Action Characterization Data

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte Name	Result	Reporting Limit	Background Plus Two Standard Deviations	Tier II Action Level	Tier I Action Level	Unit
		CF38-006	COBALT	11.4	0.082	10.91	115000	115000	mg/kg
		CF38-006	COPPER	73	0.16	18.06	71100	71100	mg/kg
		CF38-006	COPPER	65.8	0.16	38.21	71100	71100	mg/kg
		CF38-006	COPPER	75.4	0.16	38.21	71100	71100	mg/kg
		CF38-006	IRON	31300	1.5	18037	576000	576000	mg/kg
		CF38-006	MANGANESE	556	0.034	365.08	83600	83600	mg/kg
		CF38-006	METHYLENE CHLORIDE	1.1	0.87	N/A	6	578	ug/kg
		CF38-006	METHYLENE CHLORIDE	1.5	0.93	N/A	6	578	ug/kg
		CF38-006	NICKEL	24.6	0.67	14.91	38400	38400	mg/kg
		CF38-006	STRONTIUM	131	0.0064	48.94	1000000	1000000	mg/kg
		CF38-006	VANADIUM	76.9	0.26	45.59	13400	13400	mg/kg
		CF38-007	ACETONE	5.5	4.9	N/A	272000	2720000	ug/kg
		CF38-007	CHROMIUM	18.4	0.057	16.99	4410	44300	mg/kg
		CF38-007	COPPER	39.6	0.16	18.06	71100	71100	mg/kg
		CF38-007	COPPER	69.2	0.16	38.21	71100	71100	mg/kg
		CF38-007	IRON	22800	1.5	18037	576000	576000	mg/kg
		CF38-007	MANGANESE	418	0.035	365.08	83600	83600	mg/kg
		CF38-007	NICKEL	18.6	0.69	14.91	38400	38400	mg/kg
		CF38-007	STRONTIUM	106	0.0066	48.94	1000000	1000000	mg/kg
		CF38-007	TETRACHLOROETHENE	2.6	1.1	N/A	32	3150	ug/kg
		CF38-007	VANADIUM	60.7	0.26	45.59	13400	13400	mg/kg
		CF38-007	VANADIUM	90.8	0.25	88.49	13400	13400	mg/kg
		CF38-008	ACETONE	110	5.5	N/A	272000	2720000	ug/kg
		CF38-008	BARIUM	194	0.041	141.26	133000	133000	mg/kg
		CF38-008	BENZO(A)ANTHRACENE	77	44	N/A	1600	160000	ug/kg

Table 3
IHSS Group 800-6 Accelerated Action Characterization Data

IHSS Group	IHSS/PAC/UBC Site	Location Code	Analyte Name	Result	Reporting Limit	Background Plus Two Standard Deviations	Tier II Action Level	Tier I Action Level	Unit
		CF38-008	CHROMIUM	88.1	0.059	68.27	4410	44300	mg/kg
		CF38-008	CHRYSENE	93	60	N/A	160000	1600000	ug/kg
		CF38-008	FLUORANTHENE	160	95	N/A	5370000	53700000	ug/kg
		CF38-008	MANGANESE	803	0.035	365.08	83600	83600	mg/kg
		CF38-008	MERCURY	4.9	0.014	1.52	576	576	mg/kg
		CF38-008	NICKEL	23.8	0.68	14.91	38400	38400	mg/kg
		CF38-008	PYRENE	160	45	N/A	3970000	39700000	ug/kg
		CF38-008	STRONTIUM	75.2	0.0065	48.94	1000000	1000000	mg/kg
		CF38-008	ZINC	391	0.22	73.76	576000	576000	mg/kg
		CF38-011	ACETONE	30	5.6	N/A	272000	27200000	ug/kg
		CF38-011	STRONTIUM	224	0.0073	211.38	1000000	1000000	mg/kg
		CF38-011	TETRACHLOROETHENE	2.7	1.2	N/A	32	3150	ug/kg
		CF38-014	ACETONE	5.7	5.5	N/A	272000	27200000	ug/kg
		CF38-014	ACETONE	6.4	5.6	N/A	272000	27200000	ug/kg
		CF38-014	STRONTIUM	268	0.0074	211.38	1000000	1000000	mg/kg
		CF38-014	STRONTIUM	291	0.0074	211.38	1000000	1000000	mg/kg
		CF38-015	1,2,4-TRICHLOROBENZENE	6.5	0.76	N/A	4330	433000	ug/kg
		CF38-015	ACETONE	5.2	4.9	N/A	272000	27200000	ug/kg
		CF38-015	BIS(2-ETHYLHEXYL)PHTHALATE	96	75	N/A	3110000	311000000	ug/kg
		CF38-015	COPPER	48.4	0.16	38.21	71100	71100	mg/kg
		CF38-015	NAPHTHALENE	5.5	0.93	N/A	101000	10100000	ug/kg

2.7 Sum of Ratios and Area of Concern

RFCA Tier II and Tier I sum of ratios (SORs) were calculated for the IHSS Group 800-6 locations. SOR calculations were based on accelerated action analytical data and the following list of contaminants of concern (COCs):

- Radionuclides (americium-241, plutonium-239/240, uranium-234, uranium-235, and uranium-238);
- Metals (arsenic, copper, mercury, lead, etc.); and
- Organics [volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs)].

The COCs are based on data that exceed background mean plus two standard deviations or RLs. Metals and organics were grouped together for nonradionuclide SOR calculations. Plutonium, americium, and uranium were grouped together for radionuclide SOR calculations. Table 4 presents the SORs for surface soil, and Table 5 presents the SORs for subsurface soils. SORs were calculated for all locations with analytical results greater than background mean plus two standard deviations or reporting limits. All SORs were less than 1. SORs based on pre-accelerated action and accelerated action analytical data are presented in Section 8.0, Post-Remediation Condition.

The Area of Concern (AOC), shown on Figure 5, was determined based on analytical results presented in Section 2.0 (i.e., pre-accelerated action and accelerated action data). The AOC is defined as the area with any contaminant concentration greater than background mean plus two standard deviations or RLs. Data from sample locations that are no longer representative were excluded.

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Table 4
RFCA Tier II Sum of Ratios for IHSS Group 800-6 Surface Soil

Location	Tier II SOR Radionuclides	Tier II SOR Non-Radionuclides
CE38-001	N/A	0.000
CE39-001	N/A	0.018
CE39-002	N/A	0.028
CE39-003	N/A	0.000
CF38-001	N/A	0.000
CF38-002	N/A	0.000
CF38-003	N/A	0.000
CF38-005	N/A	0.053
CF38-006	N/A	0.069
CF38-007	N/A	0.050
CF38-008	N/A	0.012
CF39-001	N/A	0.001
CF39-003	N/A	0.001
CF39-006	N/A	0.004
CF39-007	N/A	0.000
CF39-008	N/A	0.000
CF39-009	N/A	0.000
CF39-011	N/A	0.000
CF39-012	N/A	0.000
CF39-013	N/A	0.000

N/A – Not applicable. Contaminants may be present but at concentrations below background plus two standard deviations or RL.

Table 5
RFC A Tier II Sum of Ratios for IHSS Group 800-6 Subsurface Soil

Location	Tier II SOR Radionuclides	Tier II SOR Non-Radionuclides	Interval	Begin Depth (feet)	End Depth (feet)
CE38-002	N/A	0.27	0.5'-2.5'	0.5	2.5
CE39-001	N/A	0.16	0.5'-2.5'	0.5	2.5
CE39-002	N/A	0.00	0.5'-2.5'	0.5	2.5
CE39-003	N/A	0.00	0.5'-2.5'	0.5	2.5
CF38-001	N/A	0.21	0.5'-2.5'	0.5	2.5
CF38-003	N/A	0.00	0.5'-2.5'	0.5	2.5
CF38-005	N/A	0.08	0.5'-2.5'	0.5	2.5
CF38-006	N/A	0.19	0.5'-2.5'	0.5	2.5
CF38-007	N/A	0.09	0.5'-2.5'	0.5	2.5
CF38-008	N/A	0.06	0.5'-2.5'	0.5	2.5
CF39-001	N/A	0.01	0.5'-2.5'	0.5	2.5
CF39-004	N/A	0.16	0.5'-2.5'	0.5	2.5
CF39-006	N/A	0.23	0.5'-2.5'	0.5	2.5
CF39-007	N/A	0.19	0.5'-2.5'	0.5	2.5
CF39-008	N/A	0.26	0.5'-2.5'	0.5	2.5
CF39-009	N/A	0.14	0.5'-2.5'	0.5	2.5
CF39-011	N/A	0.26	0.5'-2.5'	0.5	2.5
CF39-012	N/A	0.17	0.5'-2.5'	0.5	2.5
CF39-013	N/A	0.41	0.5'-2.5'	0.5	2.5
CF38-010	N/A	0.00	4.5'-6.5'	5	5
CF38-015	N/A	0.00	4.5'-6.5'	3	5
CF38-025	N/A	0.99	4.5'-6.5'	5	5
CF38-027	N/A	0.24	4.5'-6.5'	4.5	5
CF38-019	N/A	0.27	6.5'-8.5'	6.7	6.7
CF38-020	N/A	0.01	6.5'-8.5'	6.7	6.7
CF38-021	N/A	0.04	2.5'-4.5'	3	5
CF38-014	N/A	0.00	6.5'-8.5'	7.17	7.17
CF38-011	N/A	0.09	6.5'-8.5'	7.33	7.33
CF38-024	N/A	0.50	6.5'-8.5'	10.5	12.5

N/A – Not applicable. Contaminants may be present but at concentrations below background plus two standard deviations or RL.

3.0 ACCELERATED ACTION

Accelerated action objectives were developed and described in ER RSOP Notification #02-02 (DOE 2002b). ER RSOP remedial action objectives include the following:

1. Provide a remedy consistent with the RFETS goal of protection of human health and the environment;
2. Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls; and
3. Minimize the spread of contaminants during implementation of accelerated actions.

The accelerated action remediation goals for IHSS Group 800-6 include the following:

1. Remove the UBC 889 floor slab, which will be dispositioned in accordance with the RSOP for Recycling Concrete (DOE 1999a);
2. Remove two concrete sumps (Tank 28);
3. Remove RCRA Interim Status Tank 40 (emptied, rinsed, and foamed in July 1996);
4. Remove the tank/sump beneath the eastern portion of the B889 slab if contaminated above RFCA Tier I ALs or if within 3 feet of the surface;
5. Remove portions of OPWL P10 that are beneath the slab and within IHSS 800-164.3;
6. Potentially remove portions of New Process Waste Line (NPWL) and Valve Vault 4 within IHSS 800-164.3 to as close to Valve Vaults 3, 5, and 6 as possible; and
7. Remediate surface and subsurface soil contamination to below RFCA Tier I ALs.

Accelerated action activities were conducted between April 19 and July 18, 2002. Start and end dates of significant activities are listed in Table 6. Key components associated with the acceleration action are shown in Figure 6. Photographs of site activities are provided in Appendix A.

Table 6
Dates of Accelerated Action Activities

Activity	Start Date	End Date	Duration
Characterization Sampling	May 8, 2002	July 9, 2002	37 Day
Removal Activities	June 7, 2002	June 27, 2002	14 Days
Backfill Excavations	May 22, 2002	July 3, 2002	31 Days
Reseed	July 18, 2002	July 18, 2002	1 Day

3.1 Removal Activities

All accelerated action objectives were achieved, except those associated with IHSS 800-164.3. Four samples were not collected because Building 884 and a cargo container to the east were still present and covered part of the IHSS. The covered area will be sampled and remediated as necessary after the building and cargo containers are removed. Related work and any sampling results will be documented in another report at a later date. Portions of the NPWL and Valve Vault 4 within IHSS 164.3 also were not removed as part of this action. The NPWL and valve vaults will be addressed based on site-wide decisions regarding the NPWL and valve vaults. Any related work and sampling results will also be documented in another closeout report at a later date. Removal activities are described below.

Soil within excavations was sampled and found to be uncontaminated (refer to Sections 2.4 – 2.6). Therefore, no soil that was sampled was removed. Excavations were then backfilled, and the area was graded and seeded (refer to Section 10.0). Documentation regarding approval to backfill is provided in ER Regulatory Contact Records dated May 14, 2002, May 21, 2002, and September 11, 2002 (refer to Appendix B). Approximately 70 cubic yards of fill was brought to the project site. Approximately 330 cubic yards of topsoil was brought to the project site.

Building 889 Slab, Sumps, Air Ducts, and Underground Utilities

The Building 889 slab was removed, as well as the footer walls, footers, and portions of the concrete pillars (i.e., the top 5 ft). These items were surveyed and disposed of at an off-site sanitary landfill. Because the slab surface contained paint, it was classified as Polychlorinated Biphenyl (PCB) Bulk Product Waste. The two Tank 28 sumps (exhaust pits) were sprayed with Instacote™ and disposed of as low level radioactive waste. The four smaller sumps and the trough connecting all the sumps were disposed of as low level radioactive waste. Underground utilities encountered (e.g., utility alarm, communication, and electric lines) were surveyed, and based on results, disposed of as sanitary waste.

Two large, transite air ducts (24-inch outer diameter) were also removed (approximately 40 ft). Prior to removal, holes were made into the ducts, and a large amount of water was found in each (a total of approximately 900 gallons). This water was pumped to a poly tank and sampled. Low levels of radioactivity and VOCs were detected, and based on results, the water was taken to the Building 891 wastewater treatment plant. A black tarry sediment also was found in the ducts. This material was sampled and found to also contain low levels of radioactivity and VOCs. The material was not removed from the ducts. Based on process knowledge and analytical results, the ducts were classified as asbestos containing material (ACM) and non-hazardous, low level radioactive waste. They were filled with foam and disassembled, and the ends were wrapped in plastic sheeting.

Waste Lines

A portion of line P-10, which is part of the OPWL and made of stainless steel, was tapped and drained, filled with epoxy, and removed. The portion removed included the

portion under the Building 889 slab, the portion going to Tank 40, and the portion going to an area southwest of Valve Vault 4 (refer to Figure 8). The end of the portion remaining was filled with grout (2 ft into the line). The removed section was cut up and placed in a low-level radioactive waste container. The container was then filled with foam.

An 8-foot section of metal housing around the NPWL (RCRA Unit 40) adjacent to Building 889 was removed. The housing was disposed of as low level radioactive site. The remaining line consists of a high-density polyethylene (HDPE) line in which the actual waste line resides. The waste line is polyvinyl chloride (PVC) pipe. The waste line was capped, and the space between the waste line and the HDPE line was filled with grout. The disposition of the waste line will be determined as part of the Building 865 D&D Project.

Tank/Sump Beneath the Eastern Portion of the Building 889 Slab and Tank 40

The tank/sump located beneath the eastern portion of Building 889 was removed. No pipes were attached. It had been previously filled with concrete. After the tank had been removed, it was broken up and surveyed. Based on survey results, the debris was disposed of at an off-site sanitary landfill.

Tank 40 was sprayed with Instacote™ and removed. The two tanks within the structure had been previously emptied and rinsed, and the entire structure foamed in 1996. The upper portion of the structure had been previously surveyed and classified as sanitary waste. The debris from the upper portion was disposed of at an off-site sanitary landfill. The remainder of the vault contained two tanks and was disposed of as low level radioactive waste based on previous survey data.

Following the excavation of Tank 40, groundwater, with an oily layer on top, was observed at the bottom of the excavation. A sample was collected and analyzed, and results indicated the presence of various polyaromatic hydrocarbons. Based on the results, the material may be diesel fuel. Using the consultative process, CDPHE approved backfilling the excavation (refer to Appendix B).

4.0 CONFIRMATION SAMPLING

Because all results from characterization sampling indicate no contamination above RFCA Tier II Als, no soils that were sampled were removed. Therefore, there was no need to conduct confirmation sampling to ensure that residual contaminant concentrations were below ALs.

5.0 RCRA UNIT CLOSURE

Two tanks, which were part of the OPWL system and regulated under the Colorado Hazardous Waste Act (CHWA), and a portion of the NPWL, also regulated under the CHWA, were removed (refer to Figure 6).

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- Tank 28, which consisted of two concrete sumps (exhaust pits) within the slab, was sprayed with “Instacote™” and disposed of as low level radioactive waste. Process knowledge was used to determine that the debris was not radioactive mixed waste.
- Tank 40 had been previously emptied, rinsed and foamed in 1996. The upper vault also had been previously surveyed and classified as sanitary waste. The vault debris was sent to an off-site sanitary landfill. The two tanks were disposed of as low level radioactive waste.
- An 8-foot section of metal housing around the NPWL (RCRA Unit 40) adjacent to Building 889 was removed. The remaining line consists of a HDPE line in which the actual waste line resides. The waste line is PVC pipe. The waste line was capped, and the space between the waste line and the HDPE line was filled with grout. The disposition of the waste line will be determined as part of the Building 865 Decontamination and Decommissioning (D&D) Project.

6.0 STEWARDSHIP ANALYSIS

The IHSS Group 800-6 stewardship evaluation was conducted through ongoing consultation with the regulatory agencies. The regulatory agencies were informed through frequent project updates, e-mails, telephone contact, and personal contact throughout the project duration. Copies of ER Regulatory Contact Records are provided in Appendix B.

As discussed in Section 3.1, accelerated actions at IHSS Group 800-6 consisted of excavation of the Building 889 slab, footers, footer walls, upper portions of concrete pillars, sumps and tanks, a small portion of the NPWL, and a large portion of the OPWL in the area (refer to Figure 6). No contamination was found under the items removed (refer to Figure 3 and Table 3) and in areas sampled prior to the accelerated action (refer to Figure 4). The only exception was the elevated beryllium concentration in the surface soil sample near Tank 40, however, that sample location is no longer representative (refer to Section 2.5).

6.1 Accelerated Action Stewardship

Stewardship actions that were implemented during the accelerated action included posting signs and barriers, including yellow chain and jersey barriers.

6.2 Stewardship Recommendations

Near- and long-term stewardship recommendations are based on remaining process waste lines, samples not yet collected, and the stewardship evaluation presented in ER RSOP Notification #02-02 (DOE 2002b). Portions of the NPWL and Valve Vault 4 within IHSS 164.3 were not removed as part of this action. The NPWL, OPWL and valve vaults will be addressed based on site-wide decisions regarding these items. Any related work and sampling results will be documented in another closeout report at a later date. Sampling at IHSS 164.3 also was not completed, because four sample locations were covered by Building 884 and a cargo container. The covered area will be sampled and

remediated as necessary after the building and cargo containers are removed. Sampling results and any remediation will be documented in another report at a later date.

- Recommendations for near-term institutional controls until final closure and stewardship decisions are implemented include the following:
 - Maintain signs and barriers; and
 - Control soil excavation through the Site Soil Disturbance Permit process.
- Recommendations for long-term stewardship actions include the following:
 - Continuing Federal ownership and control over the Site.

These recommendations may change based on any additional remediation activities (i.e., related to IHSS 800-164.3) and other future Site remedial activities.

7.0 DEVIATIONS FROM THE ER RSOP

All accelerated action objectives were achieved, except those associated with IHSS 800-164.3. Sampling at the IHSS was not completed, because Building 884 and cargo containers to the east were still present and covered part of the IHSS. However, most samples were collected and analyzed (refer to Section 2.6). The covered area will be sampled and remediated as necessary after the building and cargo containers are removed. Sampling results and any remediation will be documented in another report at a later date. In addition, portions of the NPWL and Valve Vault 4 within IHSS 164.3 were not removed as part of this action. The NPWL and valve vaults will be addressed based on site-wide decisions regarding the NPWL and valve vaults. Any related work and sampling results will be documented in another closeout report at a later date.

8.0 POST-REMEDICATION CONDITIONS

Post remediation conditions at UBC 889, Tanks 28 and 40, and IHSS 800-164.3 are described below.

8.1 UBC 889

The Building 889 slab, footing walls, and footers were removed, as well as the top five feet of the concrete pillars. The lower portions of the pillars, therefore, remain. Sumps, waste lines, transite ducts, and underground utilities also were removed, including the tank/sump beneath the eastern portion of the Building 889 slab. Most of the NPWL located east of the Building 889 site remains, including Valve Vault 4, as well as the portion traversing IHSS 164.3 (refer to Figure 6). The remaining line consists of a HDPE line in which the actual waste line resides. The waste line is PVC pipe. The waste line was capped, and the space between the waste line and the HDPE line was filled with grout. The disposition of the waste line will be determined as part of the Building 865 D&D Project. Portions of the OPWL also remain. Sampling results from the soil

beneath the items removed (e.g., slab, footing walls, footers, sumps, and waste lines) indicate that all contaminant concentrations are less than RFCA Tier II ALs.

8.2 OPWL Tanks 28 and 40

Tanks 28 and 40 were removed, as well as a portion of OPWL P-10. This line was removed to an area southwest of Valve Vault 4 (refer to Figure 6). The end of the portion remaining was filled with grout (2 ft into the line). Sampling results from the soil beneath the items removed (i.e., tanks, sumps and waste lines) indicate no contaminant concentrations above RFCA Tier II ALs. There was one elevated surface beryllium concentration found prior to the accelerated action, but it did not exceed the Tier II AL by much (2.1 mg/kg vs 1.04 mg/kg) and was considerably less than the Tier I AL (104 mg/kg) (refer to Section 2.5). In addition, the sample location where the elevated concentration was found is not longer representative.

8.3 IHSS 800-164.3

Sampling results in the IHSS indicate that all contaminant concentrations are less than RFCA Tier II ALs. However, sampling was not completed. Four sample locations were covered by Building 884 and the cargo containers to the east. The covered area will be sampled and remediated as necessary after the building and cargo containers are removed. Sampling results and any remediation will be documented in another closeout report at a later date. However, the number of samples collected (i.e., sampling power) was sufficient to indicate that contaminant concentrations in the area are below Tier II action levels (refer to Section 12.6).

In addition, portions of the NPWL and Valve Vault 4 within IHSS 164.3 were not removed as part of this action. The NPWL and valve vaults will be addressed based on site-wide decisions regarding the NPWL and valve vaults. Any related work and sampling results will also be documented in another closeout report at a later date.

8.4 Residual Contamination

Residual contamination was determined based on pre-accelerated action and accelerated action characterization. Pre-accelerated action characterization indicate no contaminant concentrations in surface and subsurface soils greater than RFCA Tier II ALs, except for beryllium in the surface soil adjacent to Tank 40. However, as stated in Section 8.2, the sample is no longer representative. Accelerated action characterization indicate no contaminant concentrations in surface and subsurface soils greater than RFCA Tier II ALs. Concentrations greater than background plus two standard deviations or RLs at IHSS Group 800-6 are presented in Table 7 and shown on Figures 7 and 8. Pipelines that were not removed during the accelerated action are shown on Figure 6. As discussed in Section 3.1, pipeline ends were grouted.

SORs for Tier I and Tier II action levels, based on pre-accelerated action and accelerated action data, are listed in Tables 8 and 9 for surface and subsurface soils, respectively. Data from sample locations that are no longer representative were excluded. As shown, SORs are less than 1. SORs for non-radionuclides are presented in Figure 9. SORs for

radionuclides are not presented, because results were less than background plus two standard deviations or reporting limits.

9.0 WASTE MANAGEMENT

Waste from the IHSS Group 800-6 accelerated action consisted of concrete, asphalt, soil, and pipeline. Asphalt, underground utilities, and uncontaminated concrete were disposed of as sanitary waste. Because the slab surface contained paint and caulk, it was classified and disposed of as PCB Bulk Product Waste. Contaminated concrete was loaded into metal waste boxes for disposal as low-level waste. The two Tank 28 sumps and the two Tank 40 tanks were first sprayed with Instacote™. Pipeline was placed in metal waste containers for disposal as low-level waste (LLW). These containers were then filled with foam. The transite air ducts were filled with foam, cut up, and disposed of as non-hazardous low-level radioactive waste. Water found in the ducts was pumped into poly tanks and trucked to the Building 891 wastewater treatment plant. Waste types, volumes, and disposition are presented in Table 10. Waste characterization data are summarized in Table 11.

10.0 SITE RECLAMATION

All excavated areas within IHSS Group 800-6 were backfilled. Excavated soil was used as backfill in the excavation from which it was removed. An additional 70 cubic yards (approximate) of fill was brought to the project site for use. In addition, approximately 330 cubic yards of topsoil was brought to the project site to bring excavated areas up to grade. The area was rough graded before the topsoil was distributed over the site. The topsoil was graded, then scarified, and a seed mix consisting of Canada bluegrass was spread over the site using broadcast seeding methods. Hydromulch was applied to conserve moisture and prevent erosion.

11.0 NO LONGER REPRESENTATIVE SAMPLING LOCATIONS

Sampling locations that are no longer representative include the four historical locations next to Tank 40 (i.e., 04795, 04895, 04995 and 05095). These locations were impacted when Tank 40 was excavated. No longer representative sampling locations are shown on Figure 10.

Table 7
Residual Contamination at IHSS Group 800-6

Location	Analyte	Media	Concentration	Units	Background + 2 SD	Detection Limit	Tier I AL	Tier II AL
42992	Plutonium-239/240	Surface Soil	0.025	pci/g	0.02	0.01	1088	252
42992	Copper	Surface Soil	20.7	mg/kg	18.06	5	71100	71100
42992	Strontium	Surface Soil	135	mg/kg	48.94	400	1000000	1000000
42992	Toluene	Subsurface Soil	210	ug/kg	NA	5	707000	7070
42992	Toluene	Subsurface Soil	83	ug/kg	NA	5	707000	7070
42992	Toluene	Subsurface Soil	140	ug/kg	NA	5	707000	7070
CE38-001	Strontium	Surface Soil	55.1	mg/kg	48.94	400	1000000	1000000
CE38-002	Methylene Chloride	Subsurface Soil	1.4	ug/kg	NA	0.8	578	5.78
CE38-002	Tetrachloroethene	Subsurface Soil	1	ug/kg	NA	0.99	3150	31.5
CE39-001	Selenium	Surface Soil	1.4	mg/kg	1.224	0.5	9610	9610
CE39-001	Lithium	Surface Soil	12.4	mg/kg	11.55	0.2	38400	38400
CE39-001	Strontium	Surface Soil	89	mg/kg	48.94	400	1000000	1000000
CE39-001	Strontium	Surface Soil	90	mg/kg	48.94	400	1000000	1000000
CE39-001	Aluminum	Surface Soil	17500	mg/kg	16902	1.4	1000000	1000000
CE39-001	Methylene Chloride	Subsurface Soil	0.9	ug/kg	NA	0.82	578	5.78
CE39-002	Lithium	Surface Soil	15	mg/kg	11.55	0.19	38400	38400
CE39-002	Vanadium	Surface Soil	49.4	mg/kg	45.59	0.27	13400	13400
CE39-002	Strontium	Surface Soil	84.4	mg/kg	48.94	400	1000000	1000000
CE39-002	Nickel	Surface Soil	21.3	mg/kg	14.91	0.72	38400	38400
CE39-002	Barium	Surface Soil	208	mg/kg	141.26	0.043	133000	133000
CE39-002	Aluminum	Surface Soil	22100	mg/kg	16902	1.4	1000000	1000000
CE39-002	Acetone	Subsurface Soil	5.2	ug/kg	NA	5	27200000	2720000
CE39-003	Strontium	Surface Soil	95.4	mg/kg	48.94	400	1000000	1000000
CF38-001	Methylene Chloride	Subsurface Soil	1.2	ug/kg	NA	0.8	578	5.78
CF38-002	Strontium	Surface Soil	71.8	mg/kg	48.94	400	1000000	1000000
CF38-003	Pyrene	Subsurface Soil	74	ug/kg	NA	43	397000000	39700000
CF38-003	Strontium	Surface Soil	75.2	mg/kg	48.94	400	1000000	1000000
CF38-003	Toluene	Subsurface Soil	0.94	ug/kg	NA	0.83	707000	7070

Table 7
Residual Contamination at IHSS Group 800-6

Location	Analyte	Media	Concentration	Units	Background + 2 SD	Detection Limit	Tier I AL	Tier II AL
CF38-003	Bis(2-ethylhexyl)phthalate	Subsurface Soil	1100	ug/kg	NA	74	31100000	3110000
CF38-005	Vanadium	Surface Soil	66.8	mg/kg	45.59	0.27	13400	13400
CF38-005	Nickel	Surface Soil	18.1	mg/kg	14.91	0.72	38400	38400
CF38-005	Copper	Surface Soil	52.3	mg/kg	18.06	0.17	71100	71100
CF38-005	Manganese	Surface Soil	489	mg/kg	365.08	0.037	83600	83600
CF38-005	Iron	Surface Soil	23400	mg/kg	18037	1.6	576000	576000
CF38-005	Tetrachloroethene	Subsurface Soil	1.2	ug/kg	NA	1.1	3150	31.5
CF38-005	Benzo(a)anthracene	Subsurface Soil	63	ug/kg	NA	41	160000	1600
CF38-005	Chrysene	Subsurface Soil	67	ug/kg	NA	56	1600000	160000
CF38-005	Pyrene	Subsurface Soil	150	ug/kg	NA	42	397000000	3970000
CF38-005	Strontium	Surface Soil	115	mg/kg	48.94	400	1000000	1000000
CF38-005	Fluoranthene	Subsurface Soil	160	ug/kg	NA	88	537000000	5370000
CF38-005	Copper	Subsurface Soil	56.6	mg/kg	38.21	0.16	71100	71100
CF38-006	Vanadium	Surface Soil	76.9	mg/kg	45.59	0.26	13400	13400
CF38-006	Strontium	Surface Soil	131	mg/kg	48.94	400	1000000	1000000
CF38-006	Nickel	Surface Soil	24.6	mg/kg	14.91	0.67	38400	38400
CF38-006	Copper	Surface Soil	73	mg/kg	18.06	0.16	71100	71100
CF38-006	Manganese	Surface Soil	556	mg/kg	365.08	0.034	83600	83600
CF38-006	Cobalt	Surface Soil	11.4	mg/kg	10.91	0.082	115000	115000
CF38-006	Iron	Surface Soil	31300	mg/kg	18037	1.5	576000	576000
CF38-006	Methylene Chloride	Subsurface Soil	1.1	ug/kg	NA	0.87	578	5.78
CF38-006	Copper	Subsurface Soil	65.8	mg/kg	38.21	0.16	71100	71100
CF38-007	Vanadium	Surface Soil	60.7	mg/kg	45.59	0.26	13400	13400
CF38-007	Strontium	Surface Soil	106	mg/kg	48.94	400	1000000	1000000
CF38-007	Nickel	Surface Soil	18.6	mg/kg	14.91	0.69	38400	38400
CF38-007	Copper	Surface Soil	39.6	mg/kg	18.06	0.16	71100	71100
CF38-007	Manganese	Surface Soil	418	mg/kg	365.08	0.035	83600	83600
CF38-007	Iron	Surface Soil	22800	mg/kg	18037	1.5	576000	576000

Table 7
Residual Contamination at IHSS Group 800-6

Location	Analyte	Media	Concentration	Units	Background + 2 SD	Detection Limit	Tier I AL	Tier II AL
CF38-007	Tetrachloroethene	Subsurface Soil	2.6	ug/kg	NA	1.1	3150	31.5
CF38-007	Acetone	Subsurface Soil	5.5	ug/kg	NA	4.9	27200000	272000
CF38-007	Vanadium	Subsurface Soil	90.8	mg/kg	88.49	0.25	13400	13400
CF38-007	Copper	Subsurface Soil	69.2	mg/kg	38.21	0.16	71100	71100
CF38-008	Nickel	Surface Soil	23.8	mg/kg	14.91	0.68	38400	38400
CF38-008	Manganese	Surface Soil	803	mg/kg	365.08	0.035	83600	83600
CF38-008	Barium	Surface Soil	194	mg/kg	141.26	0.041	133000	133000
CF38-008	Zinc	Surface Soil	391	mg/kg	73.76	0.22	576000	576000
CF38-008	Benzo(a)anthracene	Subsurface Soil	77	ug/kg	NA	44	160000	1600
CF38-008	Chrysene	Subsurface Soil	93	ug/kg	NA	60	16000000	160000
CF38-008	Pyrene	Subsurface Soil	160	ug/kg	NA	45	397000000	3970000
CF38-008	Fluoranthene	Subsurface Soil	160	ug/kg	NA	95	537000000	5370000
CF38-008	Strontium	Surface Soil	75.2	mg/kg	48.94	400	1000000	1000000
CF38-008	Mercury	Subsurface Soil	4.9	mg/kg	1.52	0.014	576	576
CF38-008	Chromium	Subsurface Soil	88.1	mg/kg	68.27	0.059	44300	4410
CF38-008	Acetone	Subsurface Soil	110	ug/kg	NA	5.5	272000000	272000
CF38-010	Acetone	Subsurface Soil	16	ug/kg	NA	4.7	272000000	272000
CF38-011	Tetrachloroethene	Subsurface Soil	2.7	ug/kg	NA	1.2	3150	31.5
CF38-011	Acetone	Subsurface Soil	30	ug/kg	NA	5.6	272000000	272000
CF38-011	Strontium	Subsurface Soil	224	mg/kg	48.94	400	1000000	1000000
CF38-014	Acetone	Subsurface Soil	5.7	ug/kg	NA	5.5	272000000	272000
CF38-014	Strontium	Subsurface Soil	268	mg/kg	48.94	400	1000000	1000000
CF38-015	1,2,4-Trichlorobenzene	Subsurface Soil	6.5	ug/kg	NA	0.76	433000	4330
CF38-015	Naphthalene	Subsurface Soil	5.5	ug/kg	NA	0.93	101000000	101000
CF38-015	Acetone	Subsurface Soil	5.2	ug/kg	NA	4.9	272000000	272000
CF38-015	Bis(2-ethylhexyl)phthalate	Subsurface Soil	96	ug/kg	NA	75	311000000	3110000
CF38-015	Copper	Subsurface Soil	48.4	mg/kg	38.21	0.16	71100	71100
CF38-019	1,2-Dichloropropane	Subsurface Soil	2.2	ug/kg	NA	1.7	1130	11.3

Table 7
Residual Contamination at IHSS Group 800-6

Location	Analyte	Media	Concentration	Units	Background + 2 SD	Detection Limit	Tier I AL	Tier II AL
CF38-019	Tetrachloroethene	Subsurface Soil	2.1	ug/kg	NA	1.4	3150	31.5
CF38-019	Carbon Disulfide	Subsurface Soil	3.4	ug/kg	NA	1.3	988000	9880
CF38-019	Bis(2-Ethylhexyl)Phthalate	Subsurface Soil	120	ug/kg	NA	99	311000000	3110000
CF38-019	Acetone	Subsurface Soil	820	ug/kg	NA	6.4	272000000	272000
CF38-020	Phenol	Subsurface Soil	160	ug/kg	NA	90	3750000	37500
CF38-020	Total Xylenes	Subsurface Soil	82	ug/kg	NA	36	9740000	97400
CF38-020	Naphthalene	Subsurface Soil	530	ug/kg	NA	59	101000000	101000
CF38-021	1,2,4-Trichlorobenzene	Subsurface Soil	6.6	ug/kg	NA	0.8	433000	4330
CF38-021	Tetrachloroethene	Subsurface Soil	1.1	ug/kg	NA	1.1	3150	31.5
CF38-021	Acetone	Subsurface Soil	13	ug/kg	NA	5.2	272000000	272000
CF38-021	Bis(2-ethylhexyl)phthalate	Subsurface Soil	160	ug/kg	NA	77	311000000	3110000
CF38-021	Naphthalene	Subsurface Soil	5.3	ug/kg	NA	0.97	101000000	101000
CF38-024	Benzo(a)anthracene	Subsurface Soil	50	ug/kg	NA	46	160000	1600
CF38-024	Bis(2-ethylhexyl)phthalate	Subsurface Soil	1900	ug/kg	NA	77	311000000	3110000
CF38-024	Carbon Disulfide	Subsurface Soil	780	ug/kg	NA	1.3	988000	9880
CF38-024	Ethylbenzene	Subsurface Soil	1200	ug/kg	NA	930	932000	9320
CF38-024	Naphthalene	Subsurface Soil	6300	ug/kg	NA	59	101000000	101000
CF38-024	Naphthalene	Subsurface Soil	12000	ug/kg	NA	59	101000000	101000
CF38-024	Pyrene	Subsurface Soil	57	ug/kg	NA	45	397000000	3970000
CF38-024	Total Xylenes	Subsurface Soil	7900	ug/kg	NA	36	9740000	97400
CF38-025	Methylene Chloride	Subsurface Soil	5.7	ug/kg	NA	0.88	578	5.78
CF38-027	Methylene Chloride	Subsurface Soil	1.4	ug/kg	NA	0.92	578	5.78
CF39-001	Strontium	Surface Soil	94.6	mg/kg	48.94	400	1000000	1000000
CF39-001	Barium	Surface Soil	166	mg/kg	141.26	0.043	133000	133000
CF39-001	Barium	Subsurface Soil	800	mg/kg	289.38	0.042	133000	133000
CF39-003	Barium	Surface Soil	147	mg/kg	141.26	0.043	133000	133000
CF39-003	Strontium	Surface Soil	78	mg/kg	48.94	400	1000000	1000000
CF39-003	Chromium	Subsurface Soil	91.8	mg/kg	68.27	0.059	44300	4410

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Table 7
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Location	Analyte	Media	Concentration	Units	Background + 2 SD	Detection Limit	Tier I AL	Tier II AL
CF39-004	Methylene Chloride	Subsurface Soil	0.91	ug/kg	NA	0.8	578	5.78
CF39-004	Acetone	Subsurface Soil	9.3	ug/kg	NA	4.6	27200000	272000
CF39-006	Vanadium	Surface Soil	53.8	mg/kg	45.59	0.27	13400	13400
CF39-006	Strontium	Surface Soil	64.8	mg/kg	48.94	400	1000000	1000000
CF39-006	Pyrene	Subsurface Soil	64	ug/kg	NA	43	397000000	3970000
CF39-006	Methylene Chloride	Subsurface Soil	1.3	ug/kg	NA	0.9	578	5.78
CF39-007	Methylene Chloride	Subsurface Soil	1.1	ug/kg	NA	0.8	578	5.78
CF39-007	Acetone	Subsurface Soil	5.5	ug/kg	NA	4.6	27200000	272000
CF39-007	Strontium	Surface Soil	66.9	mg/kg	48.94	400	1000000	1000000
CF39-008	Zinc	Surface Soil	91.4	mg/kg	73.76	0.22	576000	576000
CF39-008	Methylene Chloride	Subsurface Soil	1.5	ug/kg	NA	0.94	578	5.78
CF39-009	Methylene Chloride	Subsurface Soil	0.82	ug/kg	NA	0.8	578	5.78
CF39-009	Strontium	Surface Soil	86.6	mg/kg	48.94	400	1000000	1000000
CF39-011	Pyrene	Subsurface Soil	92	ug/kg	NA	46	397000000	3970000
CF39-011	Methylene Chloride	Subsurface Soil	1.5	ug/kg	NA	0.9	578	5.78
CF39-012	Methylene Chloride	Subsurface Soil	0.96	ug/kg	NA	0.8	578	5.78
CF39-013	Benzo(a)anthracene	Subsurface Soil	72	ug/kg	NA	46	160000	1600
CF39-013	Chrysene	Subsurface Soil	98	ug/kg	NA	62	16000000	160000
CF39-013	Strontium	Surface Soil	79.3	mg/kg	48.94	400	1000000	1000000
CF39-013	Pyrene	Subsurface Soil	230	ug/kg	NA	47	397000000	3970000
CF39-013	Fluoranthene	Subsurface Soil	200	ug/kg	NA	99	537000000	5370000
CF39-013	Methylene Chloride	Subsurface Soil	2.1	ug/kg	NA	1	578	5.78
CF39-013	Strontium	Subsurface Soil	214	mg/kg	48.94	400	1000000	1000000
SED01695	Benzo(a)pyrene	Surface Soil	34	ug/kg	NA	350	61400	614
SED40196	Americium-241	Surface Soil	1.269	pci/g	0.0227	0.023	215	38
SED40196	Plutonium-239/240	Surface Soil	6.602	pci/g	0.066	0.005	1429	252
SED40296	Americium-241	Surface Soil	1.833	pci/g	0.0227	0.01	215	38
SED40296	Plutonium-239/240	Surface Soil	5.717	pci/g	0.066	0.014	1429	252

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Table 7
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Location	Analyte	Media	Concentration	Units	Background + 2 SD	Detection Limit	Tier I AL	Tier II AL
SED40396	Americium-241	Surface Soil	1.453	pci/g	0.0227	0.01	215	38
SED40396	Americium-241	Surface Soil	1.85	pci/g	0.0227	0.013	215	38
SED40396	Plutonium-239/240	Surface Soil	5.523	pci/g	0.066	0.019	1429	252
SED40396	Plutonium-239/240	Surface Soil	5.672	pci/g	0.066	0.005	1429	252
SS462094	Plutonium-239/240	Surface Soil	0.1	pci/g	0.066	0.006	1429	252
SS462294	Americium-241	Surface Soil	0.024	pci/g	0.0227	0.01	215	38
SS462294	Plutonium-239/240	Surface Soil	0.082	pci/g	0.066	0.003	1429	252
SS462394	Americium-241	Surface Soil	0.038	pci/g	0.0227	0.009	215	38
SS462394	Plutonium-239/240	Surface Soil	0.12	pci/g	0.066	0.005	1429	252
SS462494	Americium-241	Surface Soil	0.045	pci/g	0.0227	0.02	215	38
SS462494	Plutonium-239/240	Surface Soil	0.11	pci/g	0.066	0.003	1429	252
SS462594	Americium-241	Surface Soil	0.048	pci/g	0.0227	0.02	215	38
SS462594	Plutonium-239/240	Surface Soil	0.13	pci/g	0.066	0.003	1429	252
SS462694	Americium-241	Surface Soil	0.042	pci/g	0.0227	0.01	215	38
SS462694	Plutonium-239/240	Surface Soil	0.069	pci/g	0.066	0.005	1429	252
SS462794	Americium-241	Surface Soil	0.024	pci/g	0.0227	0.007	215	38
SS462794	Plutonium-239/240	Surface Soil	0.12	pci/g	0.066	0.003	1429	252
SS462894	Americium-241	Surface Soil	0.058	pci/g	0.0227	0.02	215	38
SS462894	Plutonium-239/240	Surface Soil	0.12	pci/g	0.066	0.006	1429	252
SS463094	Plutonium-239/240	Surface Soil	0.098	pci/g	0.066	0.007	1429	252
SS463194	Plutonium-239/240	Surface Soil	0.1	pci/g	0.066	0.01	1429	252
SS463294	Americium-241	Surface Soil	0.024	pci/g	0.0227	0.007	215	38
SS463394	Uranium-235	Surface Soil	0.18	pci/g	0.0939	0.07	135	24
SS463394	Uranium-238	Surface Soil	4.7	pci/g	2	0.07	586	103
SS463494	Uranium-235	Surface Soil	0.14	pci/g	0.0939	0.07	135	24
SS463494	Uranium-238	Surface Soil	5.1	pci/g	2	0.07	586	103
SS463694	Americium-241	Surface Soil	0.047	pci/g	0.0227	0.01	215	38
SS463694	Plutonium-239/240	Surface Soil	0.17	pci/g	0.066	0.005	1429	252

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Table 7
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Location	Analyte	Media	Concentration	Units	Background + 2 SD	Detection Limit	Tier I AL	Tier II AL
SS463794	Uranium-235	Surface Soil	0.21	pci/g	0.0939	0.07	135	24
SS463794	Americium-241	Surface Soil	0.09	pci/g	0.0227	0.01	215	38
SS463794	Uranium-238	Surface Soil	11	pci/g	2	0.08	586	103
SS463794	Plutonium-239/240	Surface Soil	0.4	pci/g	0.066	0.004	1429	252
SS463894	Uranium-235	Surface Soil	0.4	pci/g	0.0939	0.03	135	24
SS463894	Americium-241	Surface Soil	0.11	pci/g	0.0227	0.002	215	38
SS463894	Uranium-238	Surface Soil	14	pci/g	2	0.06	586	103
SS463894	Plutonium-239/240	Surface Soil	0.32	pci/g	0.066	0.007	1429	252
SS464194	Americium-241	Surface Soil	0.082	pci/g	0.0227	0.007	215	38
SS464194	Plutonium-239/240	Surface Soil	0.31	pci/g	0.066	0.005	1429	252
SS464294	Uranium-235	Surface Soil	0.18	pci/g	0.0939	0.07	135	24
SS464294	Americium-241	Surface Soil	0.29	pci/g	0.0227	0.005	215	38
SS464294	Uranium-238	Surface Soil	3.6	pci/g	2	0.07	586	103
SS464294	Plutonium-239/240	Surface Soil	1.1	pci/g	0.066	0.005	1429	252
SS464594	Uranium-235	Surface Soil	0.12	pci/g	0.0939	0.03	135	24
SS464594	Uranium-238	Surface Soil	0.16	pci/g	0.0939	0.03	135	24
SS464594	Americium-241	Surface Soil	0.052	pci/g	0.0227	0.01	215	38
SS464594	Americium-241	Surface Soil	0.081	pci/g	0.0227	0.006	215	38
SS464594	Uranium-238	Surface Soil	3.2	pci/g	2	0.04	586	103
SS464594	Plutonium-239/240	Surface Soil	0.22	pci/g	0.066	0.009	1429	252
SS464694	Americium-241	Surface Soil	0.027	pci/g	0.0227	0.008	215	38
SS464694	Americium-241	Surface Soil	0.046	pci/g	0.0227	0.01	215	38
SS464694	Plutonium-239/240	Surface Soil	0.12	pci/g	0.066	0.006	1429	252
SS464894	Plutonium-239/240	Surface Soil	0.067	pci/g	0.066	0.01	1429	252
SS465194	Plutonium-239/240	Surface Soil	0.089	pci/g	0.066	0.004	1429	252
SS465194	Plutonium-239/240	Surface Soil	0.089	pci/g	0.066	0.01	1429	252
SS465294	Americium-241	Surface Soil	0.16	pci/g	0.0227	0.01	215	38
SS465294	Plutonium-239/240	Surface Soil	0.75	pci/g	0.066	0.006	1429	252

Table 7
Residual Contamination at IHSS Group 800-6

Location	Analyte	Media	Concentration	Units	Background + 2 SD	Detection Limit	Tier I AL	Tier II AL
SS465394	Americium-241	Surface Soil	0.084	pci/g	0.0227	0.01	215	38
SS465394	Plutonium-239/240	Surface Soil	0.4	pci/g	0.066	0.004	1429	252
SS465794	Americium-241	Surface Soil	0.04	pci/g	0.0227	0.007	215	38
SS465794	Plutonium-239/240	Surface Soil	0.17	pci/g	0.066	0.01	1429	252
SS465994	Americium-241	Surface Soil	0.24	pci/g	0.0227	0.01	215	38
SS465994	Plutonium-239/240	Surface Soil	1.4	pci/g	0.066	0.004	1429	252
SS466094	Americium-241	Surface Soil	0.36	pci/g	0.0227	0.009	215	38
SS466094	Plutonium-239/240	Surface Soil	2.2	pci/g	0.066	0.006	1429	252
SS466294	Americium-241	Surface Soil	0.034	pci/g	0.0227	0.02	215	38
SS466294	Plutonium-239/240	Surface Soil	0.13	pci/g	0.066	0.009	1429	252
SS466594	Plutonium-239/240	Surface Soil	0.13	pci/g	0.066	0.005	1429	252

Table 8
Sum of Ratios for Surface Soils Based on Pre-Accelerated Action and Accelerated Action Analytical Results

Location	Tier II SOR Radionuclides	Tier II SOR Non-Radionuclides
CE38-001	N/A	0.000
CE39-001	N/A	0.018
CE39-002	N/A	0.028
CE39-003	N/A	0.000
CF38-001	N/A	0.000
CF38-002	N/A	0.000
CF38-003	N/A	0.000
CF38-005	N/A	0.053
CF38-006	N/A	0.069
CF38-007	N/A	0.050
CF38-008	N/A	0.012
CF39-001	N/A	0.001
CF39-003	N/A	0.001
CF39-006	N/A	0.004
CF39-007	N/A	0.000
CF39-008	N/A	0.000
CF39-009	N/A	0.000
CF39-011	N/A	0.000
CF39-012	N/A	0.000
CF39-013	N/A	0.000
42992	N/A	0.000
SED01695	N/A	0.065
SED40196	0.060	N/A
SED40296	0.071	N/A
SED40396	0.131	N/A
SS462094	0.000	N/A
SS462294	0.001	N/A
SS462394	0.001	N/A
SS462494	0.002	N/A
SS462594	0.002	N/A
SS462694	0.001	N/A
SS462794	0.001	N/A
SS462894	0.002	N/A
SS463094	0.000	N/A
SS463194	0.000	N/A
SS463294	0.001	N/A
SS463394	0.053	N/A
SS463494	0.055	N/A
SS463694	0.002	N/A
SS463794	0.120	N/A

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Table 8
Sum of Ratios for Surface Soils Based on Pre-Accelerated Action and Accelerated Action Analytical Results

Location	Tier II SOR Radionuclides	Tier II SOR Non-Radionuclides
SS463894	0.157	N/A
SS464194	0.003	N/A
SS464294	0.054	N/A
SS464594	0.047	N/A
SS464694	0.002	N/A
SS464894	0.000	N/A
SS465194	0.001	N/A
SS465294	0.007	N/A
SS465394	0.004	N/A
SS465794	0.002	N/A
SS465994	0.012	N/A
SS466094	0.018	N/A
SS466294	0.001	N/A
SS466594	0.001	N/A

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Table 9
Sum of Ratios for Subsurface Soils Based on
Pre-Accelerated Action and Accelerated Action Analytical Results

Location	Begin Depth	End Depth	Tier II SOR Radionuclides	Tier II SOR Non-Radionuclides
CE38-002	0.5	2.5	N/A	0.274
CE39-001	0.5	2.5	N/A	0.156
CE39-002	0.5	2.5	N/A	0.000
CE39-003	0.5	2.5	N/A	0.000
CF38-001	0.5	2.5	N/A	0.208
CF38-003	0.5	2.5	N/A	0.001
CF38-005	0.5	2.5	N/A	0.079
CF38-006	0.5	2.5	N/A	0.191
CF38-007	0.5	2.5	N/A	0.090
CF38-008	0.5	2.5	N/A	0.058
CF38-010	5	5	N/A	0.000
CF38-011	7.33	7.33	N/A	0.086
CF38-014	7.17	7.17	N/A	0.000
CF38-015	3	5	N/A	0.002
CF38-019	6.7	6.7	N/A	0.265
CF38-020	6.7	6.7	N/A	0.010
CF38-021	3	5	N/A	0.037
CF38-024	10.5	12.5	N/A	0.502
CF38-025	5	5	N/A	0.986
CF38-027	4.5	5	N/A	0.242
CF39-001	0.5	2.5	N/A	0.006
CF39-004	0.5	2.5	N/A	0.157
CF39-006	0.5	2.5	N/A	0.225
CF39-007	0.5	2.5	N/A	0.190
CF39-008	0.5	2.5	N/A	0.260
CF39-009	0.5	2.5	N/A	0.142
CF39-011	0.5	2.5	N/A	0.260
CF39-012	0.5	2.5	N/A	0.166
CF39-013	0.5	2.5	N/A	0.409
42992	0	4.8	0.000	N/A
42992	0.75	1	N/A	0.075
42992	4.55	4.8	N/A	0.012
42992	9.45	9.7	N/A	0.615

**Table 10
Waste Summary**

Waste Package No.	Container Type	Final Volume (ft3)	Waste Type	Notes	IDC	Media Type
N/A	Bulk	1080.6	NON	Also contains rebar.	N/A	Concrete
N/A	Bulk	953.5	NON	Also contains rebar.	N/A	Concrete
not given	Bulk	540.3	NON	Waste volume is based on one 20 cubic yard truckload. Media consists of debris, including concrete, wire metal and wood.	N/A	Other - see note
0041787	Bulk	540.3	NON	Waste Package Number is bill of lading number. Waste volume is based on one 20 cubic yard truckload. Media consists of debris, including concrete, wire metal and wood.	N/A	Other - see note
00041789	Bulk	540.3	NON	Waste Package Number is bill of lading number. Waste volume is based on one 20 cubic yard truckload. Media consists of debris including, concrete, wire metal and wood.	N/A	Other - see note
00041788	Bulk	540.3	NON	Waste Package Number is bill of lading number. Waste volume is based on one 20 cubic yard truckload. Media consists of debris, including concrete, asphalt, and metal.	N/A	Other - see note
00041790	Bulk	406.1	NON	Waste Package Number is bill of lading number. Waste volume is based on one 15 cubic yard truckload. Media consists of debris, including concrete, asphalt, and metal.	N/A	Other - see note
0004181	Bulk	540.3	NON	Waste Package Number is bill of lading number. Waste volume is based on one 20 cubic yard truckload. Media consists of debris, including concrete, rebar and metal pipe.	N/A	Other - see note
00041805	Bulk	540.3	NON	Waste Package Number is bill of lading number. Waste volume is based on one 20 cubic yard truckload. Media consists of debris, including concrete, rebar and metal pipe.	N/A	Other - see note
N/A	Bulk	1080.6	NON	Waste volume is based on two 20 cubic yard truckloads. Media consists of debris, including concrete, rebar and foam.	N/A	Other - see note

Table 10
Waste Summary

Waste Package No.	Container Type	Final Volume (ft3)	Waste Type	Notes	IDC	Media Type
N/A	Bulk	946.4	NON	Waste volume is based on one 15 cubic yard truckload and one 20 cubic yard truckload. Media consists of debris, including concrete, rebar and pipe.	N/A	Other - see note
N/A	Bulk	1620.9	NON	Waste volume is based on three 20 cubic yard truckloads. Media consists of debris, including concrete, rebar and metal pipe.	N/A	Other - see note
N/A	Bulk	1539.7	NON	Waste volume is based on two 20 cubic yard truckloads and one 17 cubic yard truckload. Media consists of debris, including concrete and asphalt.	N/A	Other - see note
N/A	Bulk	540.3	NON	Waste volume is based on one 20 cubic yard truckload.	N/A	Concrete
N/A	Bulk	406.1	NON	Waste volume is based on one 15 cubic yard truckload.	N/A	Concrete
N/A	Bulk	1080.6	NON	Waste volume is based on two 20 cubic yard truckloads.	N/A	Concrete
N/A	Bulk	1080.6	NON	Waste volume is based on two 20 cubic yard truckloads. Media consists of debris, including concrete, pipe and re-bar.	N/A	Other - see note
N/A	Bulk	540.3	NON	Waste volume is based on one 20 cubic yard truckload.	N/A	Concrete
00041811	Bulk	0.0	NON	Waste Package Number is bill of lading number. Waste volume is based on one 20 cubic yard truckload.	N/A	Concrete
00041831	Bulk	399.1	NON	Waste Package Number is bill of lading number. Waste volume is based on one 15 cubic yard truckload.	N/A	Concrete
00041871	Bulk	540.3	NON	Waste Package Number is bill of lading number. Waste volume is based on one 20 cubic yard truckload. Media consists of debris, including concrete, pipe and re-bar.	N/A	Other - see note
050178	Bulk	540.3	NON	Waste Package Number is bill of lading number. Waste volume is based on one 20 cubic yard truckload. Media consists of debris, including concrete, pipe and re-bar.	N/A	Other - see note
X29666	CAR	1189.0	LLW	This is concrete and process waste pipe.	5001	Other - see note
X29668	CAR	1189.0	LLW	Transite Duct, asbestos contaminated low-level waste.	5001	Other - see note
X29669	CAR	1200.7	LLW		5001	Other - see note

NON - non-radioactive/non-hazardous
LLW - low level radioactive waste

Table 11
Waste Characterization Data Summary – Detected Analytes

Matrix Type	Analyte	Maximum	Number of Samples	Detection Frequency (%)	Units
Sediment from Transit Ducts*	Aluminum	6120	1	100	mg/kg
	Antimony	10.8	1	100	mg/kg
	Arsenic	4.7	1	100	mg/kg
	Barium	451	1	100	mg/kg
	Beryllium	393	1	100	mg/kg
	Cadmium	32.8	1	100	mg/kg
	Chromium	984	1	100	mg/kg
	Cobalt	32.3	1	100	mg/kg
	Copper	196	1	100	mg/kg
	Iron	46700	1	100	mg/kg
	Lead	422	1	100	mg/kg
	Lithium	9.6	1	100	mg/kg
	Manganese	784	1	100	mg/kg
	Mercury	0.6	1	100	mg/kg
	Molybdenum	53	1	100	mg/kg
	Nickel	1820	1	100	mg/kg
	Selenium	9	1	100	mg/kg
	Silver	416	1	100	mg/kg
	Strontium	428	1	100	mg/kg
	Tin	21.3	1	100	mg/kg
	Vanadium	31.7	1	100	mg/kg
	Zinc	1700	1	100	mg/kg
	Am 241	16	1	100	mg/kg
	Plutonium 239/240	19.5	1	100	mg/kg
Uranium 233/234	1400	1	100	mg/kg	
Uranium 235	244	1	100	mg/kg	
Uranium 238	8520	1	100	mg/kg	
Concrete	Aluminum	6860	2	100	mg/kg
	Antimony	0.42	2	100	mg/kg
	Arsenic	4.6	2	100	mg/kg
	Barium	114	2	100	mg/kg
	Beryllium	0.26	2	100	mg/kg
	Cadmium	0.28	2	100	mg/kg
	Chromium	12.6	2	100	mg/kg
	Cobalt	2.8	2	100	mg/kg
	Copper	10.7	2	100	mg/kg
	Iron	8190	2	100	mg/kg
	Lead	4.4	2	100	mg/kg
	Lithium	10.4	2	100	mg/kg
	Manganese	145	2	100	mg/kg
	Molybdenum	2.7	2	100	mg/kg

Table 11
Waste Characterization Data Summary – Detected Analytes

Matrix Type	Analyte	Maximum	Number of Samples	Detection Frequency (%)	Units
	Nickel	11.1	2	100	mg/kg
	Strontium	287	2	100	mg/kg
	Tin	2.6	2	100	mg/kg
	Vanadium	69.7	2	100	mg/kg
	Zinc	34.4	2	100	mg/kg
	Uranium-235	0.217	2	100	pCi/g
	Uranium-238	1.8	2	100	pCi/g
Original Process Waste Line Water	Antimony	40	1	100	ug/l
	Barium	88	1	100	ug/l
	Beryllium	4.5	1	100	ug/l
	Cadmium	0.46	1	100	ug/l
	Chromium	19.5	1	100	ug/l
	Cobalt	7.9	1	100	ug/l
	Copper	31	1	100	ug/l
	Iron	1350	1	100	ug/l
	Lead	5.6	1	100	ug/l
	Lithium	7600	1	100	ug/l
	Manganese	50.5	1	100	ug/l
	Mercury	0.13	1	100	ug/l
	Molybdenum	17500	1	100	ug/l
	Nickel	288	1	100	ug/l
	Selenium	47.5	1	100	ug/l
	Strontium	48.7	1	100	ug/l
	Tin	11.7	1	100	ug/l
	Vanadium	16.4	1	100	ug/l
	Zinc	117	1	100	ug/l
Water From Transite Duct	Aluminum	1080	2	100	ug/l
	Antimony	46.8	2	100	ug/l
	Barium	111	2	100	ug/l
	Beryllium	21.9	2	100	ug/l
	Cadmium	1.7	1	50	ug/l
	Chromium	40	2	100	ug/l
	Cobalt	18.5	2	100	ug/l
	Cobalt	2.7	2	100	ug/l
	Copper	64.1	2	100	ug/l
	Iron	6660	2	100	ug/l
	Lead	34.3	2	100	ug/l
	Lithium	7880	2	100	ug/l
	Manganese	126	2	100	ug/l
	Mercury	0.16	2	100	ug/l
	Molybdenum	18500	2	100	ug/l

Table 11
Waste Characterization Data Summary – Detected Analytes

Matrix Type	Analyte	Maximum	Number of Samples	Detection Frequency (%)	Units
	Nickel	279	2	100	ug/l
	Selenium	37.8	2	100	ug/l
	Silver	3.2	1	50	ug/l
	Strontium	177	2	100	ug/l
	Tin	13.7	2	100	ug/l
	Vanadium	21.5	2	100	ug/l
	Zinc	1690	2	100	ug/l

*Even though results from the total metal analysis suggest that the sediment could be RCRA characteristic, metal concentrations in sludge from process tanks were less than the RCRA characteristic limits (based on historical analysis using the toxicity characteristic leaching procedure).

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12.0 DATA QUALITY ASSESSMENT

The DQA is based on various criteria derived from EPA Guidance, particularly the DQO process and DOE quality requirements. References are listed in Sections 12.9 and 13.

12.1 DQO Decisions

Consistent with the original DQO decision rules of the project, SOR calculations were performed on sample results, by sample and across the AOC (refer to Tables 8 and 9). All SORs were below 1 relative to RFCA Tier I and Tier II ALs, hence no remediation within IA Group 800-6 is required. Several organics (mostly SVOCs) were detected at “significant” levels (>10 times the reportable limit), but SORs were not calculated, because associated ALs are not published in RFCA. Quality control evaluations performed on the IHSS Group 800-6 data are documented within the databases “PlanvsActuals2.mdb” and “IHSS-specificSets.mdb”.

12.2 Verification and Validation of Results

Verification ensures that data produced and used by the project are documented and traceable per quality requirements. Validation consists of a technical review of data that directly support the project decisions, such that any limitations of the data relative to project goals are stated. Verification and validation (V&V) criteria include:

- Chain-of-Custody;
- Preservation and hold-times;
- Instrument Calibrations;
- Preparation Blanks;
- Interference Check Samples (metals);
- Matrix Spikes/Matrix Spike Duplicates;
- Laboratory Control Samples;
- Field Duplicate measurements;
- Chemical yield (radiochemistry);
- Required Quantitation Limits/Minimum Detectable Activities (sensitivity of chemical and radiochemical measurements, respectively); and,
- Sample Analysis and Preparation methods.

Evaluation of V&V criteria ensures that precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) parameters are satisfactory (i.e.,

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- Chain-of-Custody;
- Preservation and hold-times;
- Instrument Calibrations;
- Preparation Blanks;
- Interference Check Samples (metals);
- Matrix Spikes/Matrix Spike Duplicates;
- Laboratory Control Samples;
- Field Duplicate measurements;
- Chemical yield (radiochemistry);
- Required Quantitation Limits/Minimum Detectable Activities (sensitivity of chemical and radiochemical measurements, respectively); and,
- Sample Analysis and Preparation methods.

Evaluation of V&V criteria ensures that precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS) parameters are satisfactory (i.e.,

within specified tolerances documented in the laboratory-specific contract scope of work). Satisfactory V&V of laboratory quality controls are indicated by a 10% (or greater) validation frequency of all results by method and matrix-type, and <10% rejection of those records validated.

Validation results are summarized in Table 12. All data are useable except for R and R1 data, which indicate rejection of data. All other data are useable with qualification except for V data, which are useable without qualification.

Hardcopy records of the V&V results and individual (analytical) data packages are filed by RIN and are maintained by Kaiser-Hill Analytical Services Division (ASD); hardcopies will ultimately reside in the Federal Center (Lakewood, CO). Hardcopy records may also be viewed as Adobe® Acrobat (*.pdf) files on the RFETS intranet under the ASD link.

12.3 Precision

Precision of field sampling was adequate based on the repeatability of all (18) real/duplicate sample results to within concentrations below all respective RFCA Tier II ALs. Laboratory precision is addressed in Section 12.2 and Table 12.

12.4 Accuracy (and Bias)

Maps

Distance measurements recorded on maps are within ± 1 ft, based on the global positioning system technology in use (Trimble 4800 Series).

Methylene chloride results in real samples should be concluded as nondetects and should not be used in SOR calculations, as the real results do not exceed 10 times their associated lab blank concentrations [use of the “10-times” rule per Environmental Protection Agency (EPA) data validation guidance; EPA, 1996a].

Laboratory accuracy is addressed in Section 12.2 and Table 12.

12.5 Representativeness

Samples acquired for the project are representative based on the types, number and location of samples acquired relative to the site-specific history. Other criteria that corroborate representativeness include:

- Implementation of industry-standard Chain-of-Custody protocols;
- Compliance with sample preservation and hold times; and
- Compliance with documented and Site-approved sampling plans (IASAP) and procedures, including SW-846 analytical methods (graphical comparisons can be made between the planning maps within the IASAP and SAP-Addenda vs. actual maps published within this report).

Table 12
Group 800-6, Summary of Validated Records in the RFETS Soil-Water Database

Validation Qualifier Code	Total Of CAS No.	Radionuclides Alpha Spec	Metals SW-846 6010/6010B	VOC SW-846 8260	SVOC SW-846 8270B	Metals SW-846 Total	Sulfides SW9030A, CHAPTER 7	pH SW9040B CHAPTER 7	Anions SW9056 or E300_0
J	219		205	14					
J1	533		500	22	10		1		
U1	5			5					
V	1902		330	841	731				
V1	7029		1179	3207	2637	2	2	2	2
JB	7			7					
JB1	1			1					
UJ	237		53	180	4				
UJ1	671		113	474	84				
R	1		1						
R1	2		2						
Null	741	5	182	481	63	8			
1	732		247	191	290			2	2
Total	12080	5	2812	5423	3819	8	3	4	4
% Validated	88%	0%	85%	88%	91%	0%	100%	50%	50%
% Rejected of the Validated Set	0.0%	NA	0.1%	0.0%	0.0%	NA	0.0%	0.0%	0.0%

12.6 Completeness

Sampling completeness is evaluated through the number and types of samples acquired relative to the project DQOs. Specifically, were enough samples collected, and valid results produced, to make project decisions?

A summary of the V&V for all Electronic Data Deliverable records indicates that the minimum required percentages of validation, >10%, were achieved for all sample types and methods, with the exception of five alpha spectroscopy results and the on-site gamma spectroscopy. Validation of gamma-spectroscopy results is in progress. Of the percentages validated, greater than 90% were acceptable for use (i.e., well less than 10% of the records were rejected).

Relative to the EPA's DQO (G-4) process, enough samples were acquired to conclude with 90% confidence that the mean concentration, for each analyte, is less than its associated Tier II action level. In addition, the minimum numbers of samples required, by sample type, were calculated using Gilbert 1987, and compared with the actual numbers of samples taken. Results indicate that sufficient numbers of samples were taken to characterize Group 800-6, including IHSS 164.3 (refer to Table 13).

Table 13
Numbers of Samples Taken Compared with Number of Samples Required

Sample Type	Actual No. of Samples	Number of Samples Required (Gilbert 1987)
Surface Soil Rad (0-6" depth)	31	30
Surface Soil NonRad (0-6" depth)	18	18
Subsurface Soil Rad (>6" depth)	22	21
Subsurface Soil NonRad (>6 depth)	23	23

12.7 Comparability

All results presented are comparable with nation-wide Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) data and DOE complex-wide environmental data. This comparability is based on:

- Use of standardized engineering units in the reporting of measurement results;
- Consistent sensitivities of measurements (generally $\leq \frac{1}{2}$ corresponding action levels);
- Use of site-approved procedures (e.g., Contractual Statements of Work for laboratory analyses);
- Systematic quality controls; and
- Thorough documentation of the planning, sampling/analysis process, and data reduction into formats designed for making decisions (traceable to the project's original data quality objectives).

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12.8 Sensitivity

Adequate sensitivities, in units of ug/kg for organics, mg/kg for metals, and pCi/g for radionuclides were attained for all analytes, with exceptions noted below. Some records (but not necessarily all records) with the analytes listed below have RLs above their associated RFCA Tier II Als (Table 14). "Adequate" sensitivity is defined as an RL less than the analyte's associated action level (typically <1/2 the action level).

Table 14
Analytes with Reporting Limits Greater than RFCA Tier II ALs

CAS No.	Analyte Name
51-28-5	2,4-DINITROPHENOL
121-14-2	2,4-DINITROTOLUENE
606-20-2	2,6-DINITROTOLUENE
91-94-1	3,3'-DICHLOROBENZIDINE
111-44-4	BIS(2-CHLOROETHYL) ETHER
10061-01-5	CIS-1,3-DICHLOROPROPENE
621-64-7	N-NITROSO-DI-N-PROPYLAMINE
98-95-3	NITROBENZENE
87-86-5	PENTACHLOROPHENOL
10061-02-6	TRANS-1,3-DICHLOROPROPENE

The following four analytes also had reporting limits greater than RFCA Tier I Als (Table 15).

Table 15
Analytes with Reporting Limits Greater than RFCA Tier I ALs

CAS No.	Analyte Name
121-14-2	2,4-DINITROTOLUENE
606-20-2	2,6-DINITROTOLUENE
111-44-4	BIS(2-CHLOROETHYL) ETHER
621-64-7	N-NITROSO-DI-N-PROPYLAMINE

12.9 K-H V&V Guidelines

General Guidelines for Data Verification and Validation, DA-GR01-v1, December 3, 1997.

V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v1, 2/13/98.

V&V Guidelines for Volatile Organics, DA-SS01-v1, 12/3/97.

V&V Guidelines for Semivolatile Organics, DA-SS02-v1, 12/3/97.

68

EPA 540/R-94/013 (1996b), *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*.

EPA 540/R-94/012 (1996a), *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*.

Lockheed-Martin, 1997, *Evaluation of Radiochemical Data Usability*, ES/ER/MS-5.

12.10 SUMMARY

DQOs were attained relative to sampling power (number and types of samples), confidence in decisions (>90%), and the various V&V criteria (especially the PARCCS parameters). Validation of laboratory quality control criteria remains in progress for the gamma spectroscopy results.

13.0 REFERENCES

CDPHE, 2002, Environmental Restoration RFCA Standard Operating Protocol FY02 Notification #02-02 Approval Letter, March.

DOE, 1999a, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Golden, CO.

DOE 1999b, DOE Order 414.1A Order 414.1A, Quality Assurance.

DOE, 2000. *Rocky Flats Cleanup Agreement (RFCA)*, Attachment 5, Rocky Flats Environmental Technology Site, Golden, CO, March.

DOE, 2001a, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, CO, June.

DOE 2001b, Industrial Area Sampling and Analysis Plan Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, CO, November.

DOE, 2001c, First Quarter RFCA Groundwater Monitoring Report for Calendar Year 2001, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2001d, Fourth Quarter RFCA Groundwater Monitoring Report for Calendar Year 2000, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE 2002a, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, CO. January.

DOE 2002b, Environmental Restoration RFCA Standard Operating Protocol Notification #02-02, Rocky Flats Environmental Technology Site, Golden, CO, February.

69

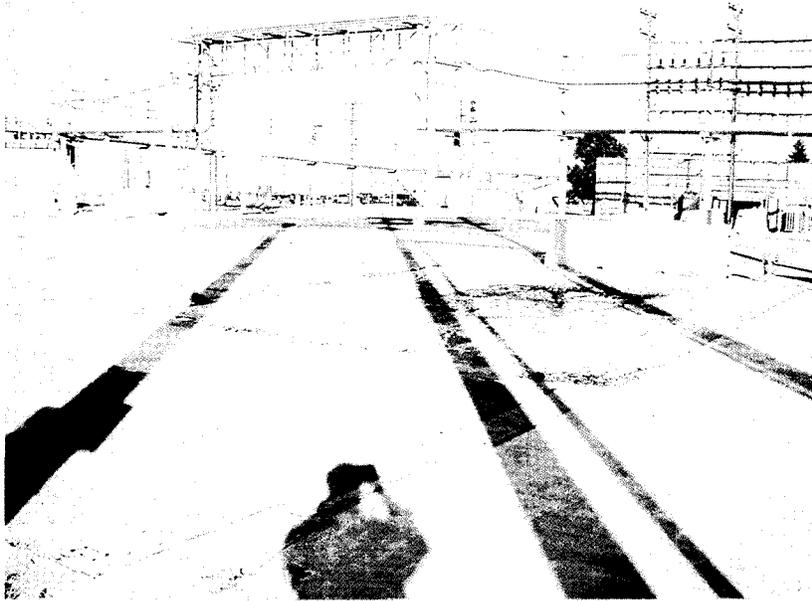
EPA, 1994a, QA/G-4, Guidance for the Data Quality Objective Process.

EPA, 1998, QA/G-9, Guidance for the Data Quality Assessment Process; Practical Methods for Data Analysis U.S. EPA 540/R-94/013, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review.

Gilbert, 1987, Statistical Methods for Environmental Pollution Monitoring, published by Van Nostrand Reinhold, New York, New York, 1987.

**Appendix A
Project Photographs**

Best Available Copy



Building 889 Slab Prior to Removal



Tank 40 Prior to Removal



Bottom Half Segment of Tank 40 During Removal



Tank 40 Removed



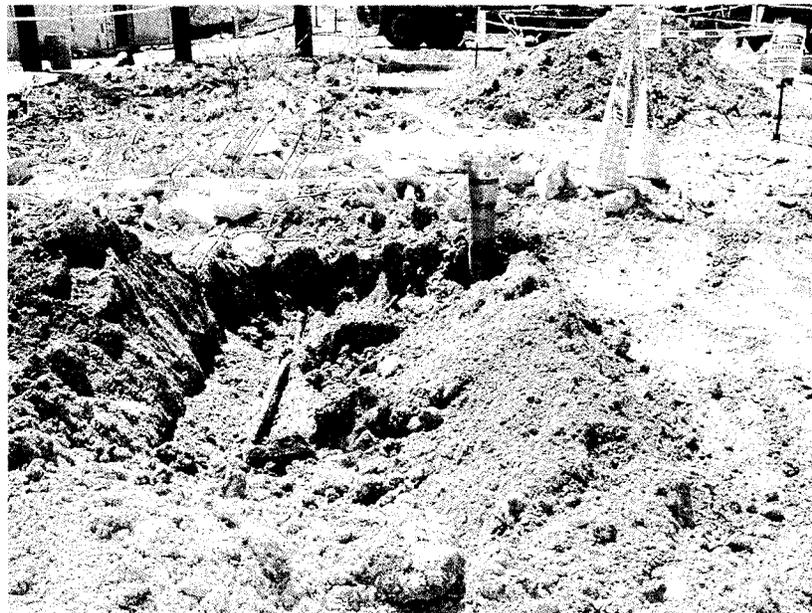
Transite Duct Foaming



Building 889 East Tank Removed and NPWL Exposed



Close up of Removed East Tank



Close up of NPWL Exposed Segment



NPWL Segment Excavated



Building 889 Janitor's Sink Removed



Overview of OPWL and Tank 28 Area



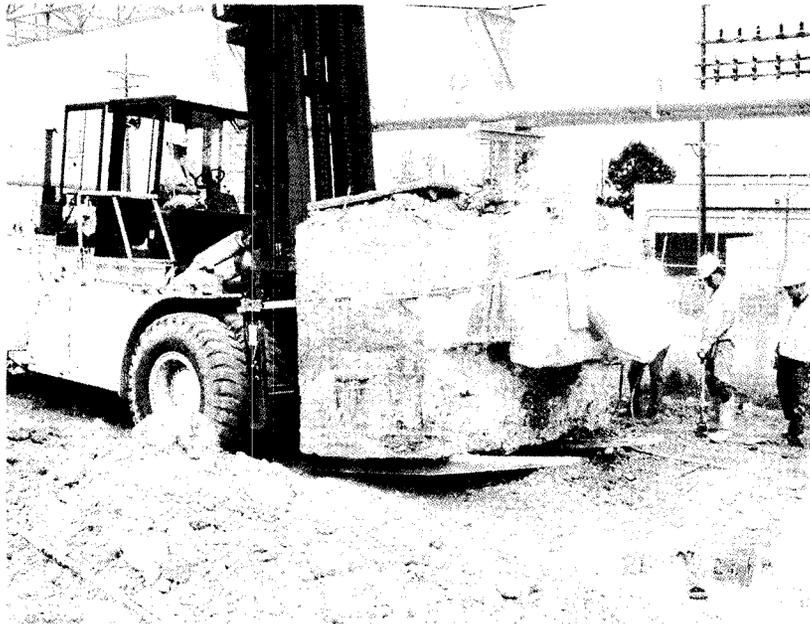
North and South Tank 28 Exposed



OPWL Exposed Near Tank 28



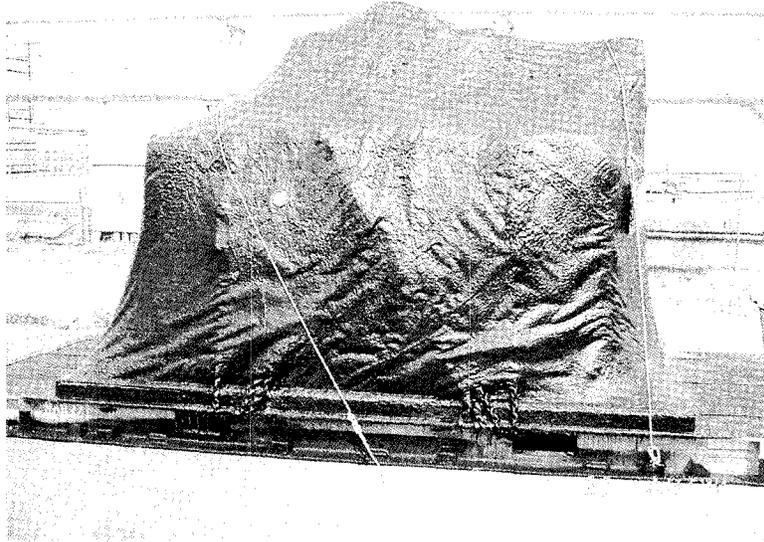
OPWL Exposed



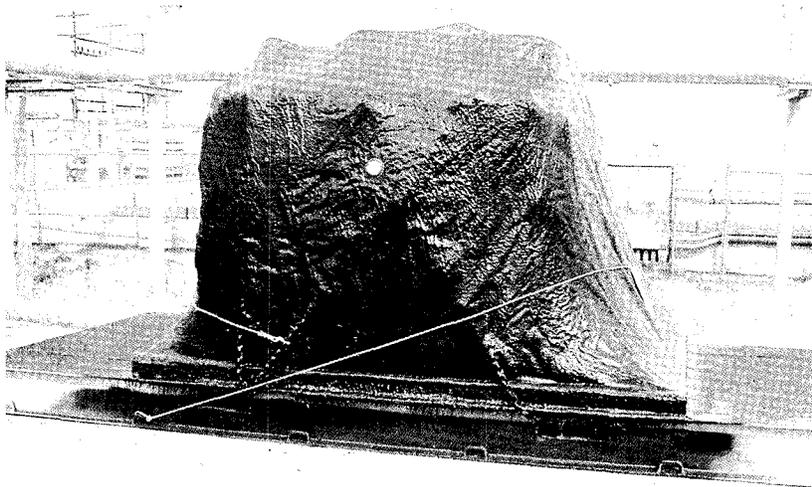
South Tank 28 Removed



North Tank 28 Ready for Removal

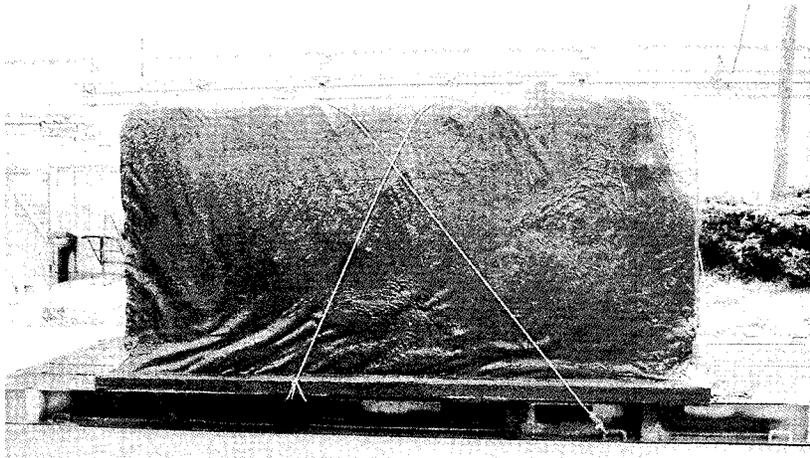


South Tank 28 with Instacote



23 408PM

North Tank 28 with Instacote



Tank 40 with Instacote

Appendix B Correspondence

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE REGULATORY CONTACT RECORD

Date/Time: February 21, 2002

Site Contact(s): Mike Bemski, Susan Serreze, Craig Cowdery
Phone: 303-966-4090, 303-966-2677, 303-966-2506

Regulatory Contact: Elizabeth Pottorff, Carl Spreng, and Dave Kruchek
Phone: 303-692-3429, 303-692-3358, 303-692-3328

Agency: CDPHE

Purpose of Contact: Walk down of Building 889 and Notification #02-02 Discussion

Discussion

A meeting was held with Elizabeth Pottorff, Carl Spreng, and Dave Kruchek (CDPHE) to discuss the potential remediation at B889. Several issues were discussed including the following:

- Characterization sampling intervals would include 0.0 to 2.5 feet and if contamination was found additional intervals would be sampled.
- The potential location of a tank/sump at the eastern portion of the building.
- The location of exhaust sumps.

CDPHE agreed to the sampling strategy. K-H agreed to further evaluate the potential sump location at the eastern portion of the building and add a biased sampling location in this area. The IASAP Addendum #IA-02-01, which had already been approved, was not modified, however, these changes were made in the RADMS sampling plan.

Required Distribution:

C. Spreng, CDPHE
D. Kruchek, CDPHE
E. Pottorff, CDPHE
G. Kleeman, EPA
N. Castaneda, RFFO
L. Brooks, K-H
M. Broussard, K-H
L. Butler, K-H
A. Primrose, K-H

Contact Record 4/24/02
Rev. 0

L. Norland, K-H
S. Nesta, K-H
D. Foss, CH2MH
S. Serreze, Arcadia
C. Cowdery, Washington Group
M. Bemski, SSOC
D. Reeder, Summit
ER Meeting Minutes Book
Administrative Record

24

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE REGULATORY CONTACT RECORD

Date/Time: April 5, 2002/ 1:00 pm
Site Contact(s): Lane Butler/Annette Primrose
Phone: 5245/4385

Regulatory Contact: Mark Sattelberg
Phone: 5413
Agency: US Fish and Wildlife

Purpose of Contact: Discussion of Topsoil requirements for ER and D&D Projects

Discussion

Mark Sattelberg and Lane Butler walked the B111 and B123 site. Mark Sattelberg then discussed the topsoil requirements in effect at the Site with his restoration person at the Rocky Mountain Arsenal. Based on that discussion, he recommends that the topsoil requirements for building demolition and environmental remediation projects consist of five to six inches of topsoil and mixing it into the underlying backfill with the ripper on a dozer or similar equipment. For larger projects, such as the final site regrade and revegetation, the carbon/nitrogen content of the soils needs to be evaluated.

Based on this and following discussions, the Site will use a nominal 5 inches of topsoil mixed with the underlying fill dirt to an approximate depth of 4 inches for the interim actions. For the final Site revegetation, DOE/KH should develop a revegetation plan that spells out how soils will be amended and what seed mixtures will be planted. The plan should take into account local topography, soil types, vegetation types, and moisture levels. It should be planned out well in advance so that everyone knows what will happen once the response action is done.

Contact Record Prepared By: Annette Primrose

Required Distribution:

R. DiSalvo, RFFO
S. MacLeod, RFFO
J. Legare, RFFO
N. Newell, CDPHE
S. Gunderson, CDPHE
T. Rehder, USEPA
P. Arnold, K-H 371
J. Berardini, K-H MS
C. Deck, K-H
C. Gilbreath, K-H 771
T. Hopkins, K-H 776
S. Nesta, K-H RISS

G. Scott, K-H
D. Shelton, K-H
K. North, K-H ESS
A. Rosenman, K-H ESS
J. Mead, K-H ESS
J. Dischinger, RFCSS
D. Johnson, K-H ESS

Additional Distribution:

L. Brooks
M. Broussard
L. Butler
N. Castaneda
D. Foss
F. Gibbs
R. Nininger
L. Norland
M. Sattelberg
S. Surovchak
Administrative Record
ER Contact Record Book

Contact Record 4/10/00
Rev. 7/13/00

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**ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
REGULATORY CONTACT RECORD**

Date/Time: May 14, 2002

Site Contact(s): Mike Bemski
Phone: 303-966-4090

Regulatory Contact: Elizabeth Pottorff, Carl Spreng
Phone: 303-692-3429 303-692-3358

Agency: CDPHE

Purpose of Contact: Approval to backfill of excavations where foundation footers were removed at the 889 Project

Discussion

Foundation footers at the 889 Project extended into the soil to an approximate depth of four feet. These footers are being removed entirely and following surveying by Radiological Operations and approval from Radiological Engineering, the footers are being shipped to the Front Range Landfill as sanitary waste. Additionally, a visual inspection is made of both the concrete and the soil for indications of contamination.

Approval was sought from CDPHE to backfill the excavations associated with the removal of the foundation. Elizabeth Pottorff did a walkdown of the 889 Project and agreed to allow for return of the excavated soil as backfill if the soil passed the evaluation listed above. After the 889 site is sufficiently cleared of equipment and concrete rubble, Geoprobe subsurface sampling will take place, and should any contamination be found, equipment will be onsite to remediate those soils.

Additionally, this approval to use the excavated soil as backfill applies only to the areas at the 889 Project where contamination is unlikely. A separate evaluation will be done on the portion of the subsurface where the sumps, ducts, and pipes are present.

Contact Record Prepared by: Michael Bemski

Required Distribution:

E. Pottorff, CDPHE

C. Spreng, CDPHE

G. Kleeman, EPA

N. Castaneda, RFFO

L. Brooks, K-H

L. Butler, K-H

A. Primrose, K-H

S. Serreze, Arcadia

C. Madore, RMC

L. Norland, K-H

ER Regulatory Contacts Book

Administrative Record

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE REGULATORY CONTACT RECORD

Date/Time: May 21, 2002

Site Contact(s): Mike Bemski
Phone: 303-966-4090

Regulatory Contact: Elizabeth Pottorff, Carl Spreng
Phone: 303-692-3429 303-692-3358

Agency: CDPHE

Purpose of Contact: Approval to backfill at the excavation site of Tank 40 at the 889 Project

Discussion

Tank 40 was a large concrete tank used to store process waste from B-889. The storage compartments at the base of Tank 40 were removed intact and there was no evidence of leakage from the tank. When the tank was removed from the ground, a thin black film floating on the groundwater was noted. Nearly all of the film was collected for sample and analysis showed the fluid to be diesel-like and diesel degradation products. No radiological contamination was found. Following the taking of the sample, no new black film was evident.

A walkdown was held with Elizabeth Pottorff to discuss the occurrence of the black film and the potential backfill of the excavation site of Tank 40.

The issues were discussed including the following:

- What environmental impact did the occurrence of the black film present;
- What options merited consideration for further action, if any.

From the discussion, the following was noted:

Very little of the diesel-like material was present.

Diesel would continue to naturally attenuate.

There were no chlorinated hydrocarbons such as solvents.

No health hazard was present due to whatever diesel remained.

With the above information, the decision was made to proceed with the backfill of the Tank 40 excavation with the same soil that had been removed and that no further remediation would be attempted on the diesel.

Contact Record Prepared by: Michael Bemski

Required Distribution:

E. Pottorff, CDPHE
C. Spreng, CDPHE
G. Kleeman, EPA
N. Castaneda, RFFO
L. Brooks, K-H
L. Butler, K-H
A. Primrose, K-H
S. Serreze, Arcadia
C. Madore, RMC
L. Norland, K-H
ER Regulatory Contacts Book
Administrative Record

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**ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
REGULATORY CONTACT RECORD**

Date/Time: May 22, 2002

Site Contact(s): Michael Bemski
Phone: 303-966-4090

Regulatory Contact: Elizabeth Pottorff
Phone: 303-692-3429

Agency: CDPHE

Purpose of Contact: Discussion of uT

Discussion

Figure 15 of the ER RSOP is a flow diagram that illustrates the work planning process for implementing RSOP field activities. As with all flow diagrams in the ER RSOP, Figure 15 is color coded to indicate activities where regulatory agency consultation is expected. An error was made in color coding that resulted in an indication that the agencies would be involved in the Management Readiness Assessment. The activity that should have been highlighted for agency participation is the Pre-Evolution Briefing.

This error was discussed by telephone with Carl Spreng and Gary Kleemen and both agreed that it should be corrected. They also agreed that since there were no text changes, the document could be modified simply by letter from DOE with a copy of the corrected flow diagram. I agreed that we would prepare the corrected diagram for transmittal by DOE.

Contact Record Prepared By: R. Lee Norland

Required Distribution:

L. Butler
N. Castaneda
S. Nesta
L. Norland
S. Surovchak
ER Contact Record Book

Contact Record 4/10/00
Rev. 7/13/00

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE ER REGULATORY CONTACT RECORD

Date/Time: September 11, 2002/ 1345

Site Contact(s): Mike Bemski
Phone: 303-966-4090

Regulatory Contact: Elizabeth Pottorff
Phone: 303-692-3429

Agency: CDPHE

Purpose of Contact: Permission to backfill excavations at the 889 Project

Discussion

On June 27, all excavation of the underground utilities had been completed at the 889 Project. In a discussion between Nick Demos and Elizabeth Pottorff, verbal approval was given by Elizabeth to backfill and compact the excavation. The approval was given "at risk", that is, should analytical results from samples already collected indicate contamination that exceeds action levels, specific remediation would then be required. All analytical results from sampling during the project have now been reviewed and no exceedance was noted.

Contact Record Prepared By: Michael Bemski

Required Distribution:

S. Bell, RFFO
L. Brooks, K-H ESS
L. Butler, K-H RISS
C. Deck, K-H Legal
R. DiSalvo, RFFO
S. Gunderson, CDPHE
J. Legare, RFFO

D. Mayo, K-H RISS
J. Mead, K-H ESS
S. Nesta, K-H RISS
K. North, K-H ESS
T. Rehder, USEPA
D. Shelton, K-H
C. Spreng, CDPHE

Additional Distribution

(choose names as applicable):

M. Broussard, K-H RISS
J. Hindman, CDPHE
G. Kleeman, USEPA
D. Kruczek, CDPHE
L. Norland, K-H RISS
A. Primrose, K-H RISS
E. Pottorff, CDPHE
S. Tower, DOE

92

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE ER REGULATORY CONTACT RECORD

Date/Time: 09/19/02 10:28AM
Site Contact(s): Michael Bemski
Phone: 303-966-4090
Regulatory Contact: David Kruchek
Phone: 303-692-3328
Agency: Colorado Department of Public Health and Environment

Purpose of Contact: Approval for Tank 28 spill soil put back

Discussion

Per our telephone discussion of 09/17/02, we will put back the soil that had been picked-up in association with the spill of water from the two Tanks-28. The location for the put-back will be at the same location where the soil was collected, near the tall stack north of Bldg. 881. As discussed, the results from samples taken of the wet soil from the spill showed contaminants well below levels that would have required remediation.

Contact Record Prepared By: Michael Bemski

Required Distribution:

S. Bell, RFFO
L. Brooks, K-H ESS
L. Butler, K-H RISS
C. Deck, K-H Legal
R. DiSalvo, RFFO
S. Gunderson, CDPHE
J. Legare, RFFO

D. Mayo, K-H RISS
J. Mead, K-H ESS
S. Nesta, K-H RISS
K. North, K-H ESS
T. Rehder, USEPA
D. Shelton, K-H
C. Spreng, CDPHE

Additional Distribution

(choose names as applicable):

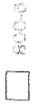
M. Broussard, K-H RISS
J. Hindman, CDPHE
G. Kleeman, USEPA
D. Kruchek, CDPHE
L. Norland, K-H RISS
A. Primrose, K-H RISS
E. Pottorff, CDPHE
S. Tower, DOE

93/93

Figure 1
IA Group 800-6 Location Map

EXPLANATION

IHSS Groupings



Standard Map Features

- Buildings and other structures
- Demolished buildings
- Solar Evaporation Ponds (SEPs)
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Paved roads
- Dirt roads
- Industrial Area Operable Unit Boundary

DATA SOURCE BASE FEATURES:

Historical Release Report (HRR)
2nd Annual Update
Individual Hazardous Substance Site (IHSS)
DOE 1992 HRR Report and Subsequent Updates
Buildings, fences, hydrography, roads and other features from the 1985 aerial photograph data contained in ECHO 85 as well as new data digitized from the orthophotographs, 1985



Scale = 1 : 6330
1 inch represents approximately 528 feet



State Plane Coordinates Projection
Colorado Central Zone
Datum: NAD27

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

Prepared by:



616 Dept. 808-866-7707

Prepared for:



September 23, 2002



NT: Srv W: projects\2002\02-0473\ia-800-6-am

Figure 2
IHSS Group 800-6
(800-164.3, UBC 889, and
OPWL Tanks 28 and 40)

KEY

-  FY 2002 IHSS location
-  FY 2002 PAC location
-  FY 2002 UBC location
-  Other IHSSs
-  Building/structure
-  Paved area
-  Dirt road
-  Stream, ditch, or other drainage feature



Scale = 1:350
 20 0 20 Feet

State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

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

Prepared by:



Prepared for:



Notification #02-02

September, 2002

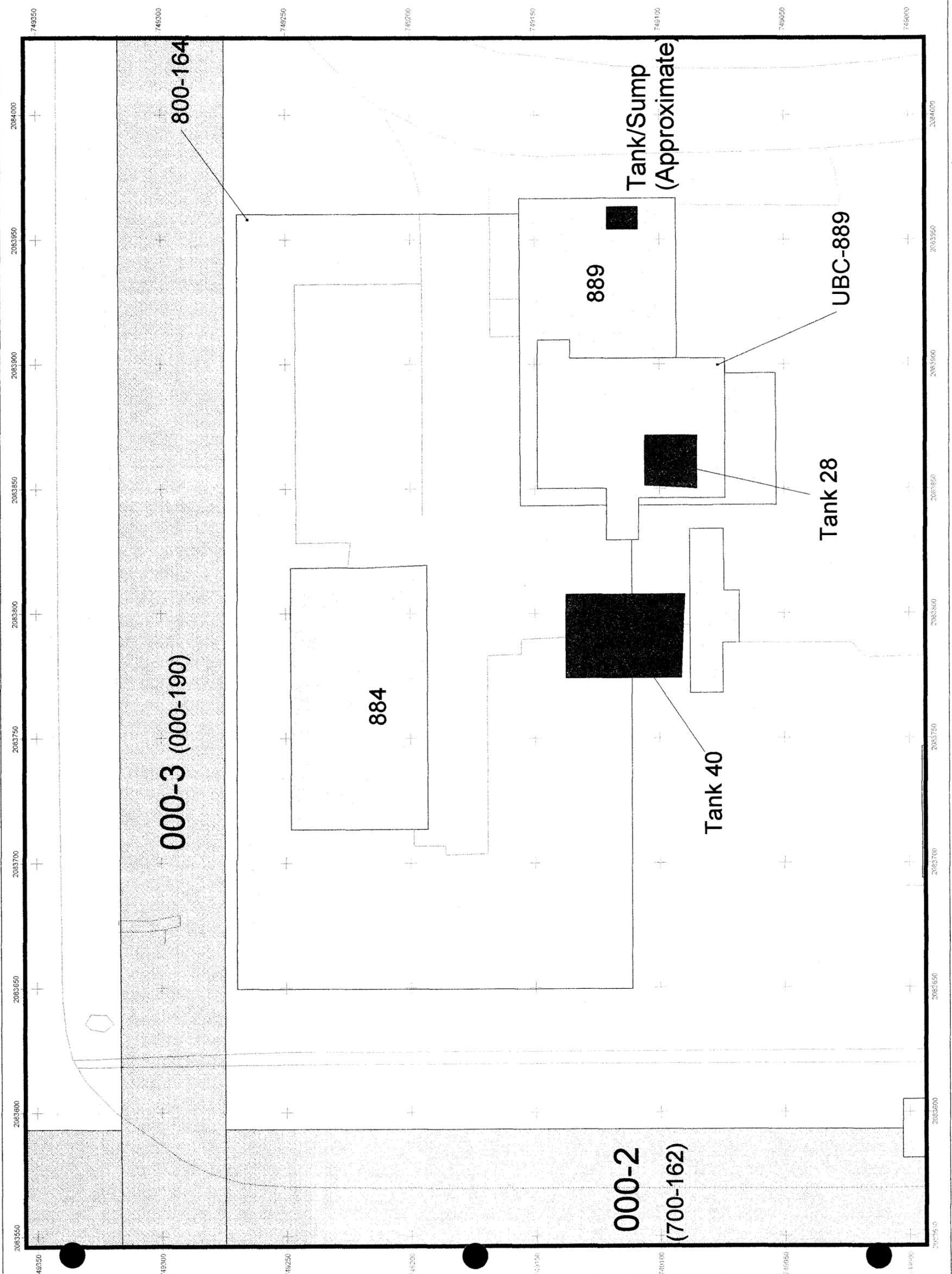


Figure 4
Location of Existing Sample Results Above Detection Limits or Background Levels for IA Group 800-6 (800-164.3, UBC 889, and OPWL Tanks 28 and 40)

KEY

- FY 2002 IHSS location
- FY 2002 PAC location
- FY 2002 UBC location
- Building/structure
- Paved area
- Dirt road
- Stream, ditch, or other drainage feature
- Existing soil sampling locations
- Both subsurface and surface soil
- Subsurface soil
- Surface soil
- Sediment

Scale = 1:400

20 0 20 40 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Prepared by:

Prepared for:

889closeoutexisting.apr September 2002

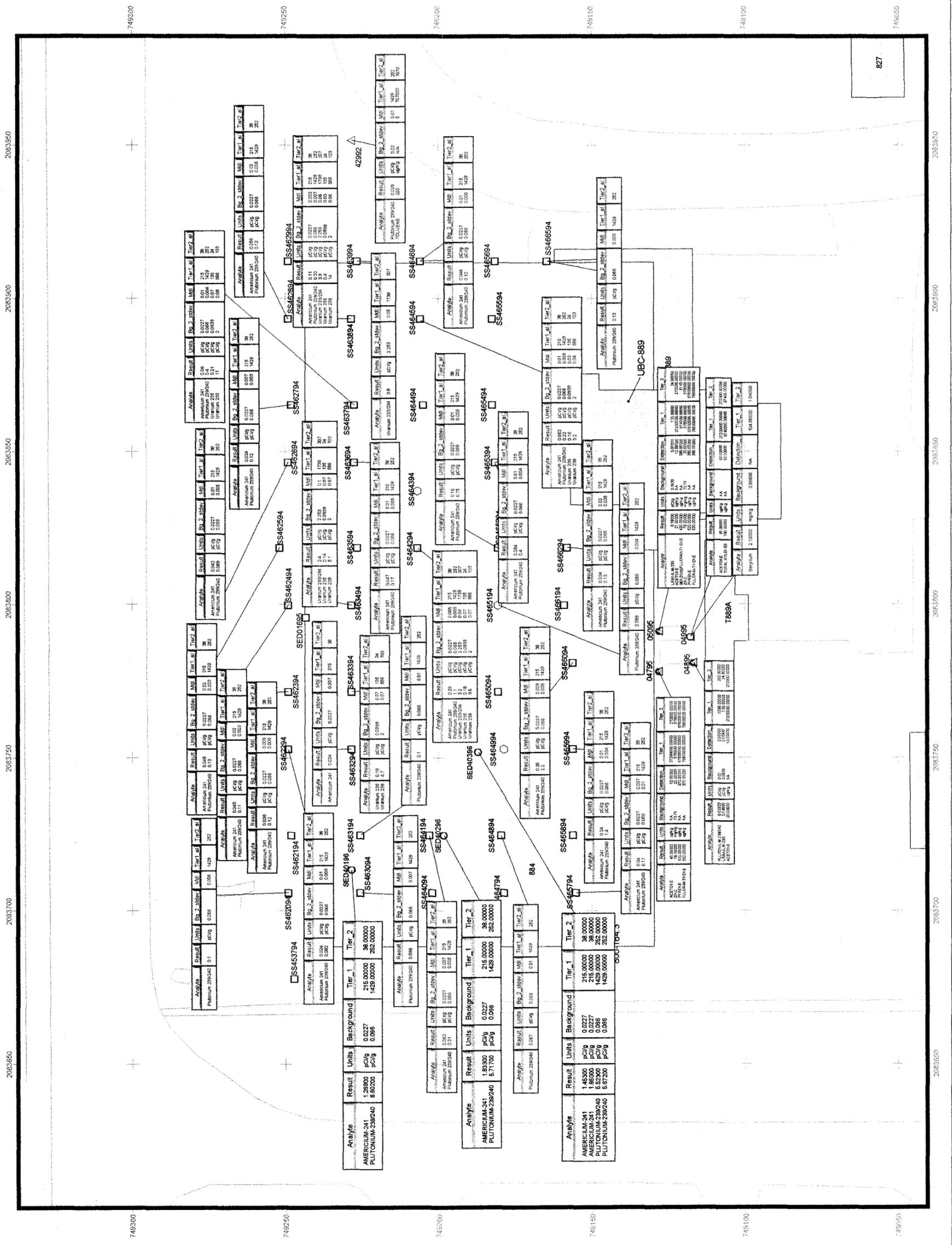
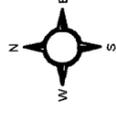


Figure 5
IHSS Group 800-6
Area of Concern

KEY

-  Area of Concern
-  FY 2002 IHSS location
-  FY 2002 PAC location
-  FY 2002 UBC location
-  Building/structure
-  Paved area
-  Dirt road
-  Stream, ditch, or other drainage feature
-  OPWL location (estimated)
-  OPWL tank location (estimated)



20 0 20 40 Feet

Scale = 1:

State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

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

Prepared by:



File:800-6 AOC 1.apr Date: 9/25/02

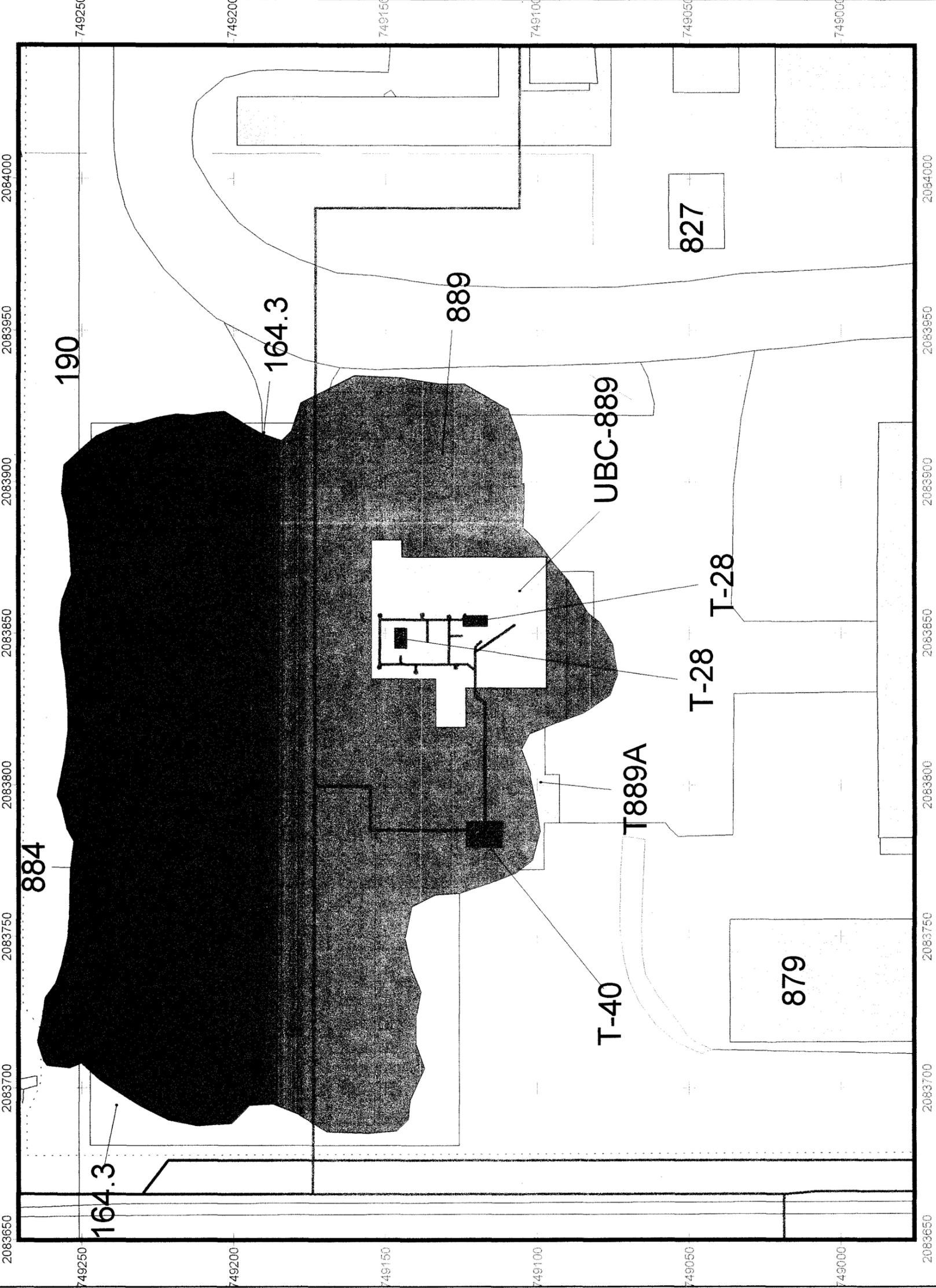


Figure 6
IHSS Group 800-6
Sumps, Tanks and
Process Lines Removed

- EXPLANATION**
- IHSS
 - Building 889 UBCS
 - Tanks / Sumps (removed)
 - Original Process Waste Lines (dashed where removed)
 - Approximate Location of New Process Waste Lines (dashed where removed)
 - Valve Vault Location
 - Transite Duct (removed)
 - Trench (removed)
 - Former Extent of 889 Slab
- Other Map Features**
- Buildings and other structures

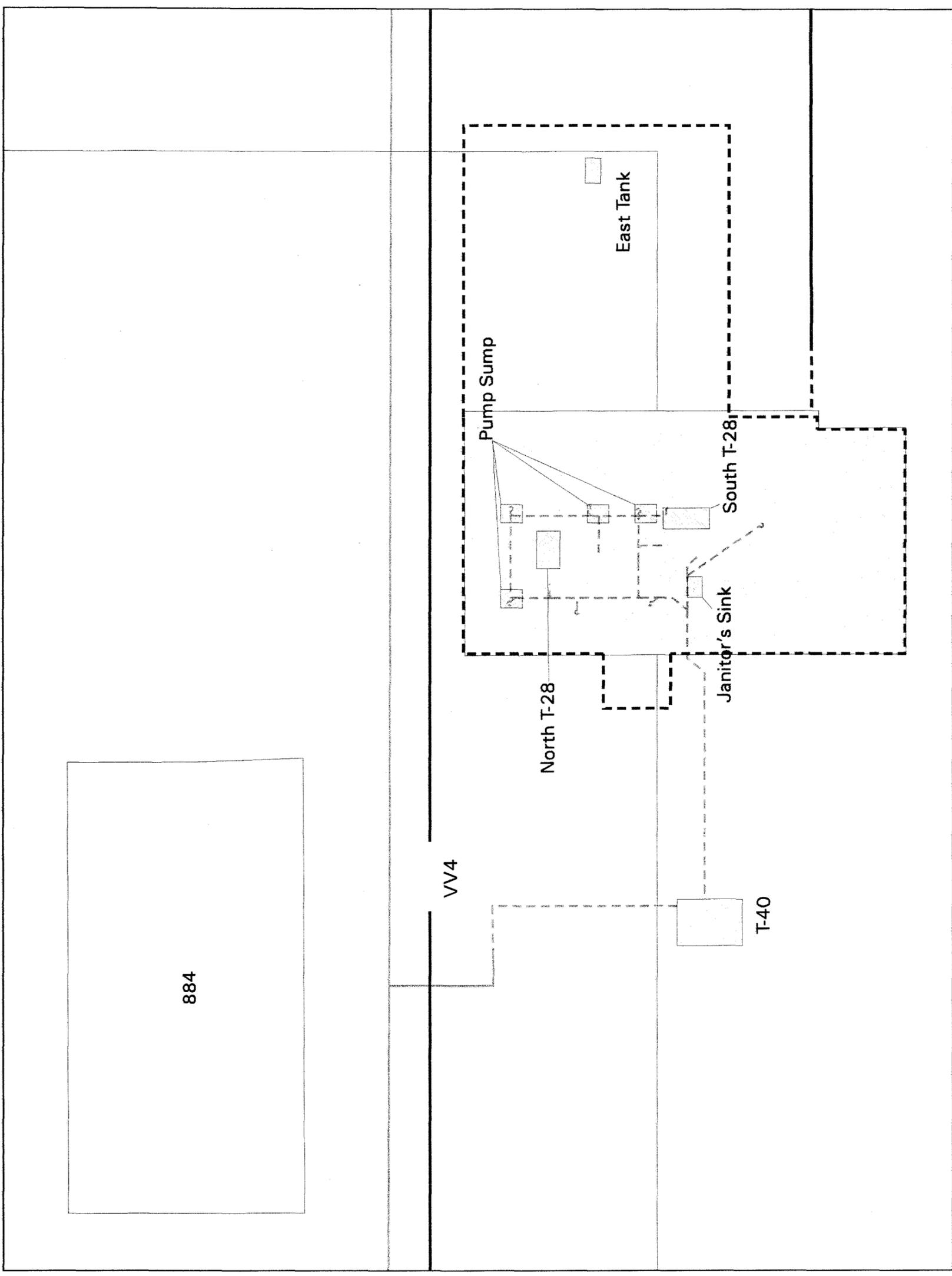
DATA SOURCE BASE FEATURES:
 The utility alarm lines shown correspond to the original process waste lines, fire alarm, and other utility alarm systems. They are shown as dashed lines where removed. Buildings, tanks, hydroponic racks, and other structures from 1994 aerial/ly-cue data captured by ERSI RSI, Las Vegas. Digitized from the orthophotographic, IRS.



Scale = 1 : 220
 1 inch represents approximately 18 feet



State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD27



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

Prepared by:
DynCorp
 THE ART OF TECHNOLOGY

GIS Dept. 803-866-7707
 Prepared for:

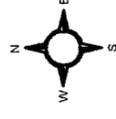
 KAISER-HILL
 COMPANY

September 20, 2002

Figure 9
IHSS Group 800-6
Residual Contamination
Tier II SOR

KEY

- Sample Locations
- .000 Non-Radionuclide SOR For Surface Soil
- .000 Non-Radionuclide SOR For Subsurface Soil
- IHSS location
- UBC location
- Building/structure
- Paved area
- Dirt road
- Stream, ditch, or other drainage feature
- ~ OPWL location (estimated)
- OPWL tank location (estimated)



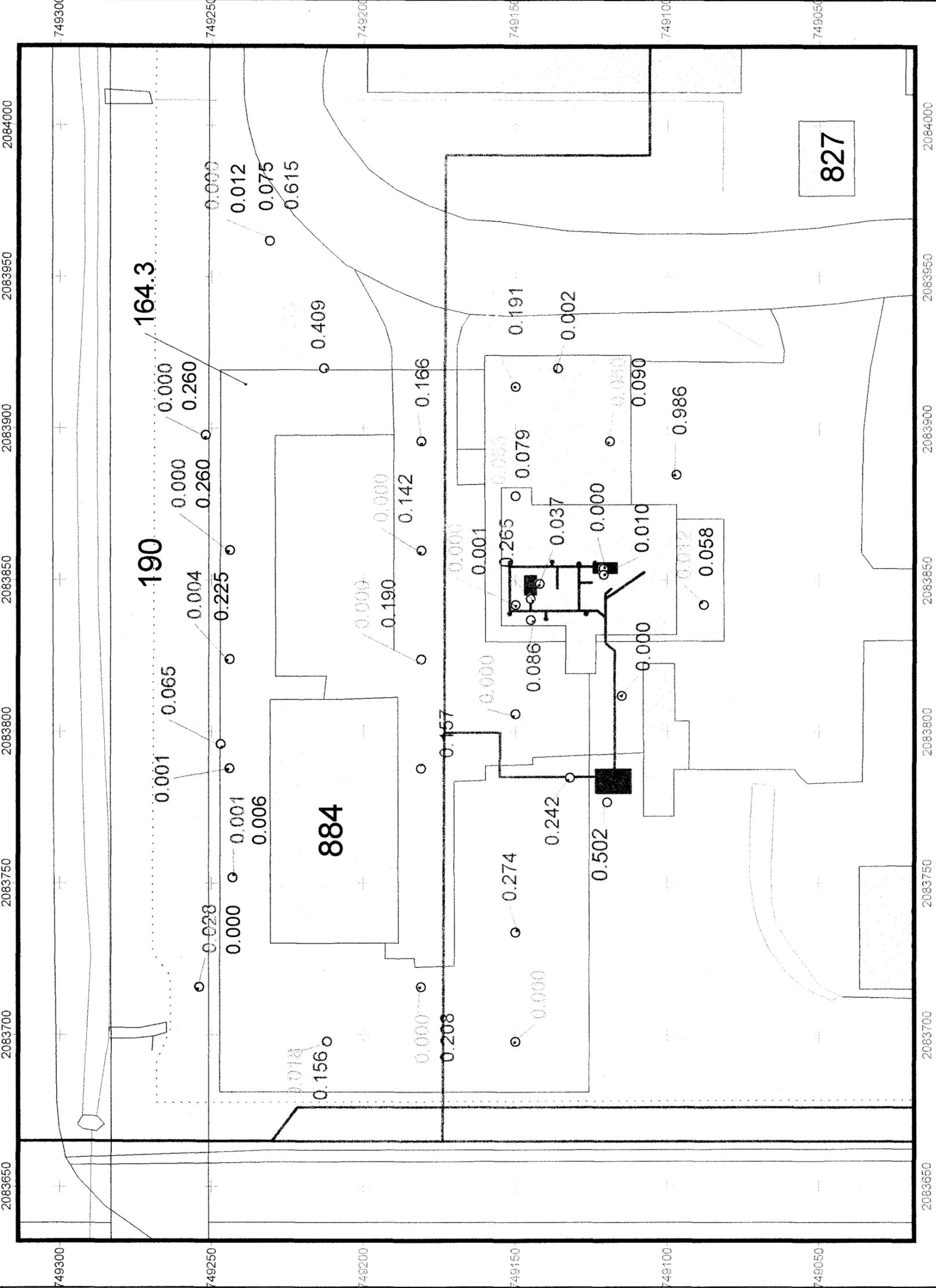
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 Colorado Central Zone
 Datum: NAD 27

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

Prepared by:



File:800-6 SOR.apr Date: 9/20/02



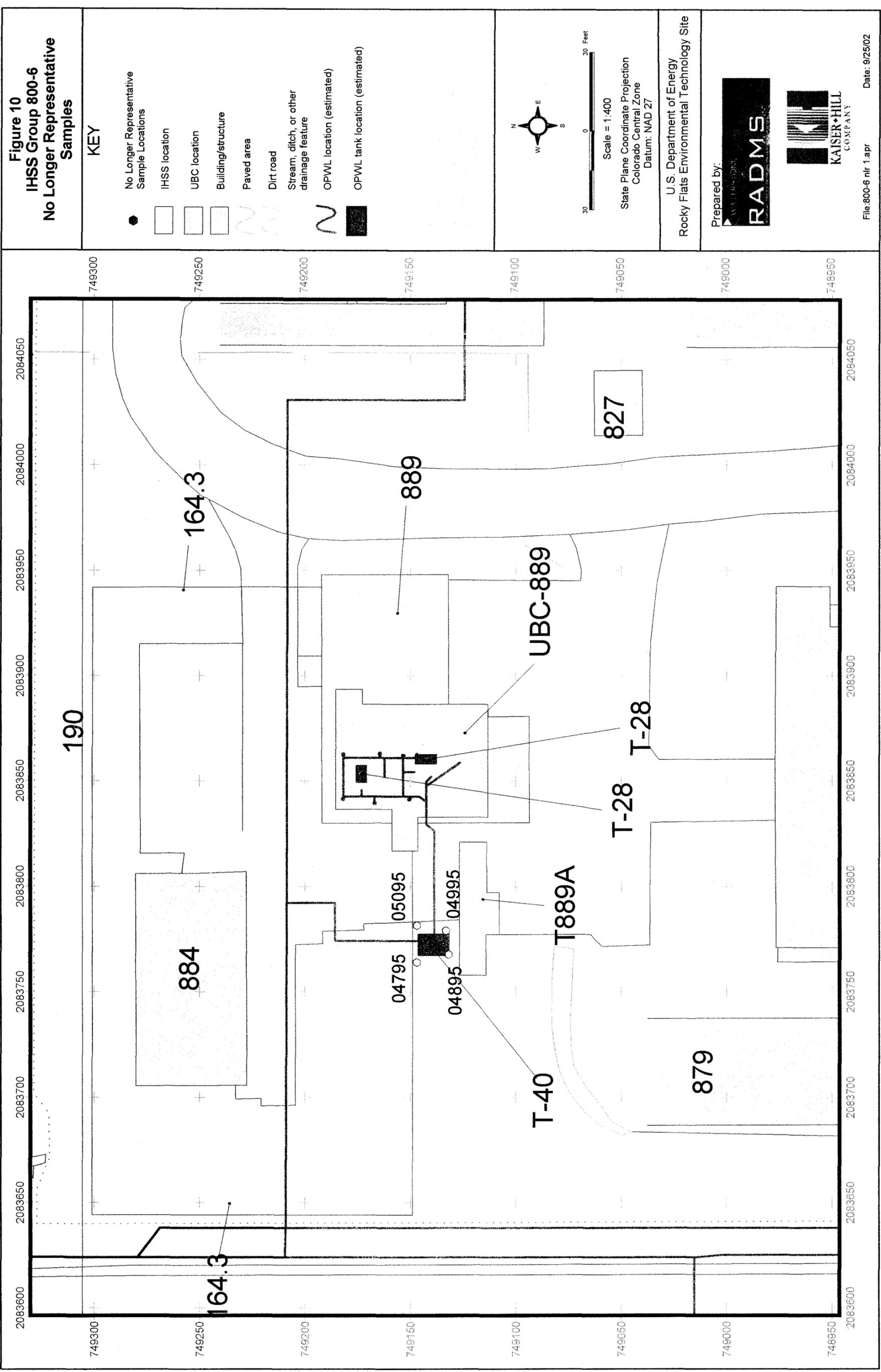


Figure 10
IHSS Group 800-6
No Longer Representative Samples

KEY

- No Longer Representative Sample Locations
- IHSS location
- UBC location
- Building/structure
- Paved area
- Dirt road
- Stream, ditch, or other drainage feature
- OPWL location (estimated)
- OPWL tank location (estimated)

Scale = 1:400
 State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

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

Prepared by:
RADMS
 AVALON ENVIRONMENTAL
KAISER HILL
 COMPANY

File 800-6 nlr 1.apr Date: 9/25/02

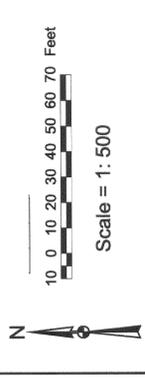
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Figure 3
Sample Results Above
Detection Limits or Background
for IA Group 800-6 (HSS 164.3,
UBC 889, Tank Groups
T-28 and T-40)

- KEY**
- IHSS location
 - PAC location
 - UBC location
 - Building/structure
 - Paved area
 - Dirt road
 - Stream, ditch, or other drainage feature
 - Original process waste line

- Existing soil sampling locations**
- Both subsurface and surface soil
 - Subsurface soil
 - Surface soil

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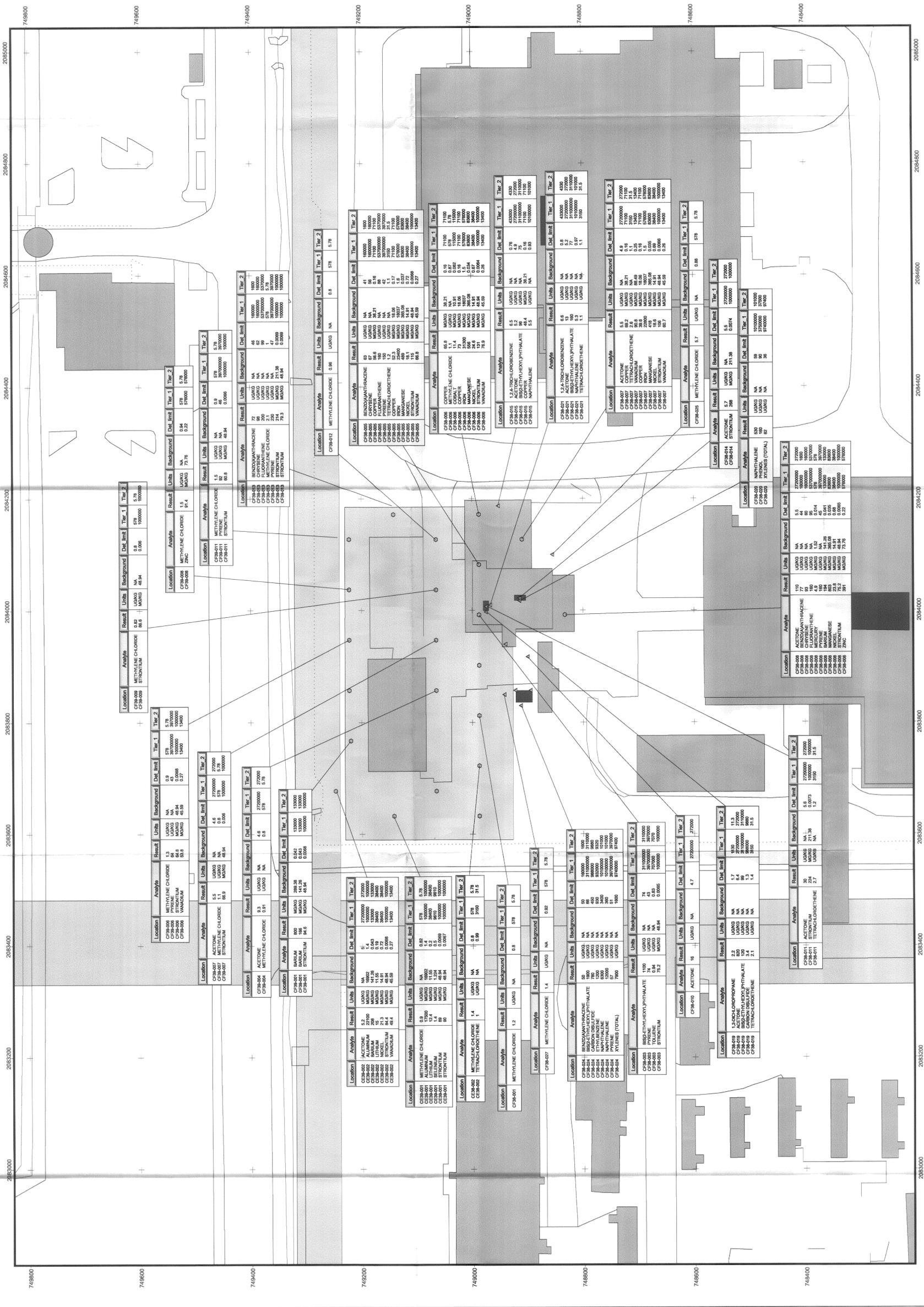
State Plane Coordinate Projection
 Colorado Central Zone
 Datum: NAD 27

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 Rocky Flats Environmental Technology Site

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File: 800-6 Sample Map Above background4.apr Date: 9/25/02

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Location	Analyte	Result	Units	Background	Det. limit	Tier-1	Tier-2
CFR-800	METHYLENE CHLORIDE	1.5	U/GMG	NA	0.06	578	578
CFR-800	ZINC	51.4	MG/KG	48.4	NA	578	578

Location	Analyte	Result	Units	Background	Det. limit	Tier-1	Tier-2
CFR-800	METHYLENE CHLORIDE	1.5	U/GMG	NA	0.06	578	578
CFR-800	STYRENE	0.9	U/GMG	NA	0.06	578	578
CFR-800	1,1-DICHLOROETHANE	0.27	U/GMG	NA	0.06	578	578

Location	Analyte	Result	Units	Background	Det. limit	Tier-1	Tier-2
CFR-800	METHYLENE CHLORIDE	1.5	U/GMG	NA	0.06	578	578
CFR-800	STYRENE	0.9	U/GMG	NA	0.06	578	578
CFR-800	1,1-DICHLOROETHANE	0.27	U/GMG	NA	0.06	578	578

Location	Analyte	Result	Units	Background	Det. limit	Tier-1	Tier-2
CFR-800	METHYLENE CHLORIDE	1.5	U/GMG	NA	0.06	578	578
CFR-800	STYRENE	0.9	U/GMG	NA	0.06	578	578
CFR-800	1,1-DICHLOROETHANE	0.27	U/GMG	NA	0.06	578	578

Location	Analyte	Result	Units	Background	Det. limit	Tier-1	Tier-2
CFR-800	METHYLENE CHLORIDE	1.5	U/GMG	NA	0.06	578	578
CFR-800	STYRENE	0.9	U/GMG	NA	0.06	578	578
CFR-800	1,1-DICHLOROETHANE	0.27	U/GMG	NA	0.06	578	578

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CFR-800	METHYLENE CHLORIDE	1.5	U/GMG	NA	0.06	578	578
CFR-800	STYRENE	0.9	U/GMG	NA	0.06	578	578
CFR-800	1,1-DICHLOROETHANE	0.27	U/GMG	NA	0.06	578	578

Location	Analyte	Result	Units	Background	Det. limit	Tier-1	Tier-2
CFR-800	METHYLENE CHLORIDE	1.5	U/GMG	NA	0.06	578	578
CFR-800	STYRENE	0.9	U/GMG	NA	0.06	578	578
CFR-800	1,1-DICHLOROETHANE	0.27	U/GMG	NA	0.06	578	578

Location	Analyte	Result	Units	Background	Det. limit	Tier-1	Tier-2
CFR-800	METHYLENE CHLORIDE	1.5	U/GMG	NA	0.06	578	578
CFR-800	STYRENE	0.9	U/GMG	NA	0.06	578	578
CFR-800	1,1-DICHLOROETHANE	0.27	U/GMG	NA	0.06	578	578

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CFR-800	1,1-DICHLOROETHANE	0.27	U/GMG	NA	0.06	578	578

Location	Analyte	Result	Units	Background	Det. limit	Tier-1	Tier-2
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CFR-800	STYRENE	0.9	U/GMG	NA	0.06	578	578
CFR-800	1,1-DICHLOROETHANE	0.27	U/GMG	NA	0.06	578	578

Location	Analyte	Result	Units	Background	Det. limit	Tier-1	Tier-2
CFR-800	METHYLENE CHLORIDE	1.5	U/GMG	NA	0.06	578	578
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CFR-800	1,1-DICHLOROETHANE	0.27	U/GMG	NA	0.06	578	578

Location	Analyte	Result	Units	Background	Det. limit	Tier-1	Tier-2
CFR-800	METHYLENE CHLORIDE	1.5	U/GMG	NA	0.06	578	578
CFR-800	STYRENE	0.9	U/GMG	NA	0.06	578	578
CFR-800	1,1-DICHLOROETHANE	0.27	U/GMG	NA	0.06	578	578

Figure 7
Residual Contamination in Northern Part
of IHSS Group 800-6

KEY

-  IHSS location
-  PAC location
-  UBC location
-  Building/structure
-  Paved area
-  Dirt road
-  Stream, ditch, or other drainage feature
-  Original process waste line

- Existing soil sampling locations
-  Both subsurface and surface soil
 -  Subsurface soil
 -  Surface soil
 -  Sediment Location

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Scale = 1:300



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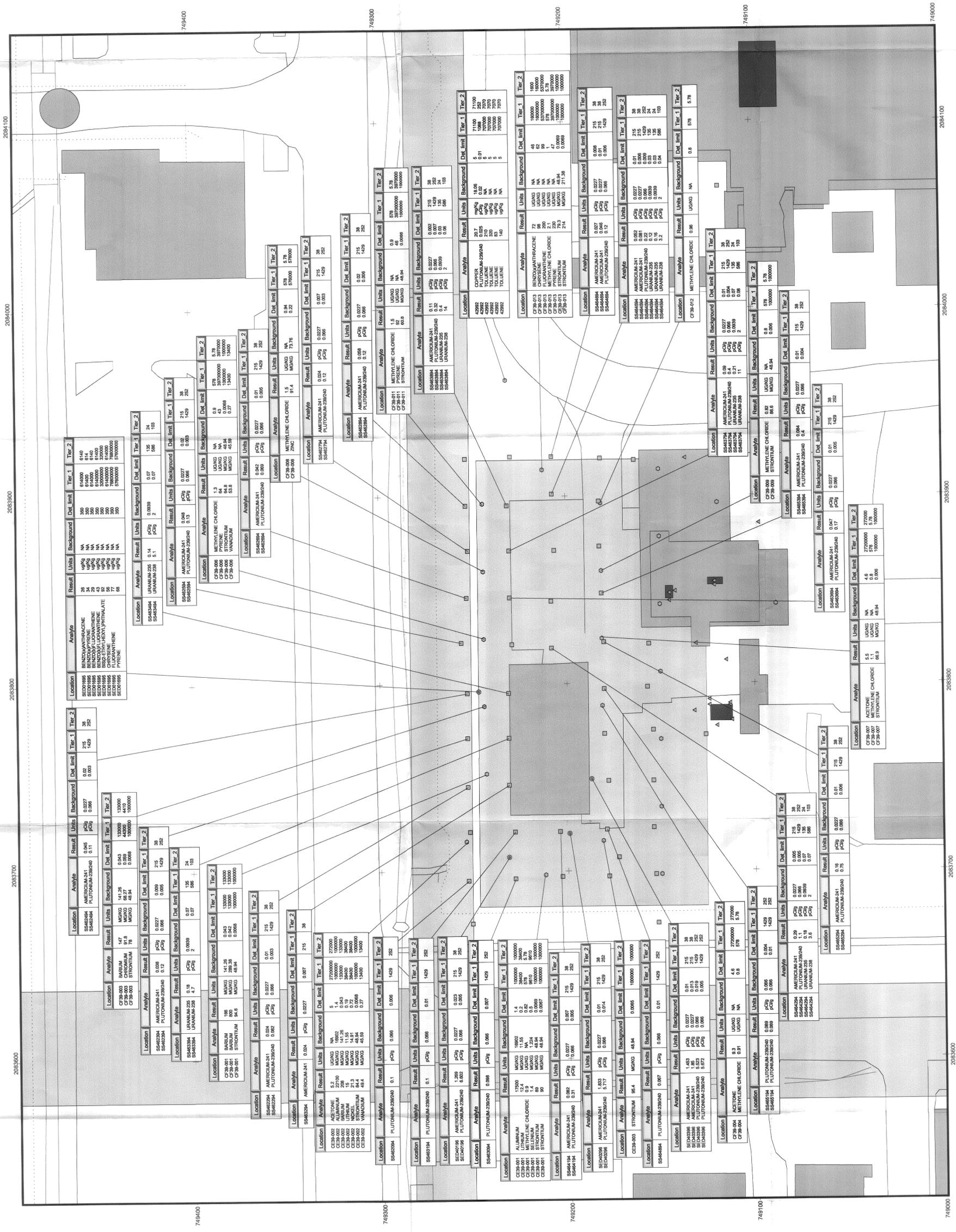


Figure 8
Residual Concentrations
In Southern Part
of IHSS Group 800-6

KEY

IHSS location

PAC location

UBC location

Building/structure

Paved area

Dirt road

Stream, ditch, or other
drainage feature

Original process waste line

Existing soil sampling locations

Both subsurface and
surface soil

Subsurface soil

Surface soil

Sediment Location

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