

**Data Summary Report  
IHSS Group 400-10**

**July 2003**

**Data Summary Report  
IHSS Group 400-10**

Approval received from the Colorado Department of Public Health and Environment.

July 15, 2003

Approval letter contained in the Administrative Record.

**July 2003**

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## ACRONYMS AND ABBREVIATIONS

AL	action level
AR	Administrative Record
CD	compact disk
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
DOE	U.S. Department of Energy
DQA	Data Quality Assessment
DQO	Data Quality Objective
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
HRR	Historical Release Report
IA	Industrial Area
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
K-H	Kaiser-Hill Company L.L.C.
LCS	laboratory control sample
mg/kg	milligram per kilogram
MS	matrix spike
MSD	matrix spike duplicate
NA	not applicable
ND	not detected
NFAA	No Further Accelerated Action
PAC	Potential Area of Concern
PARCCS	precision, accuracy, representativeness, completeness, comparability, and sensitivity
pCi/g	picocurie per gram
POC	Point of Compliance
QA	quality assurance
QC	quality control
REC	percent recovered
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RIN	report identification number
RPD	relative percent difference
SAP	Sampling Analysis Plan
SD	standard deviation
SVOC	semi-volatile organic compound
SWD	Soil Water Database
µg/kg	microgram per kilogram
V&V	verification and validation
VOC	volatile organic compound
WRW	Wildlife Refuge Worker

## **1.0 INTRODUCTION**

This data summary report summarizes characterization activities conducted at Individual Hazardous Substance Site (IHSS) Group 400-10 at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado. Characterization activities were planned and executed in accordance with the Industrial Area (IA) Sampling and Analysis Plan (SAP) (IASAP) (DOE 2001a) and IASAP Addendum #IA-02-01 (DOE 2001b).

IHSS Group 400-10 consists of the following Potential Area of Concern (PAC) and IHSSs:

- PAC 400-807 – Sandblasting Area;
- IHSS 120.2 – Fiberglass Area West of Building 664; and
- IHSS 600-161 – Radioactive Site West of Building.

The location of IHSS Group 400-10 is shown on Figure 1 and the PAC and IHSSs are shown on Figure 2.

## **2.0 SITE CHARACTERIZATION**

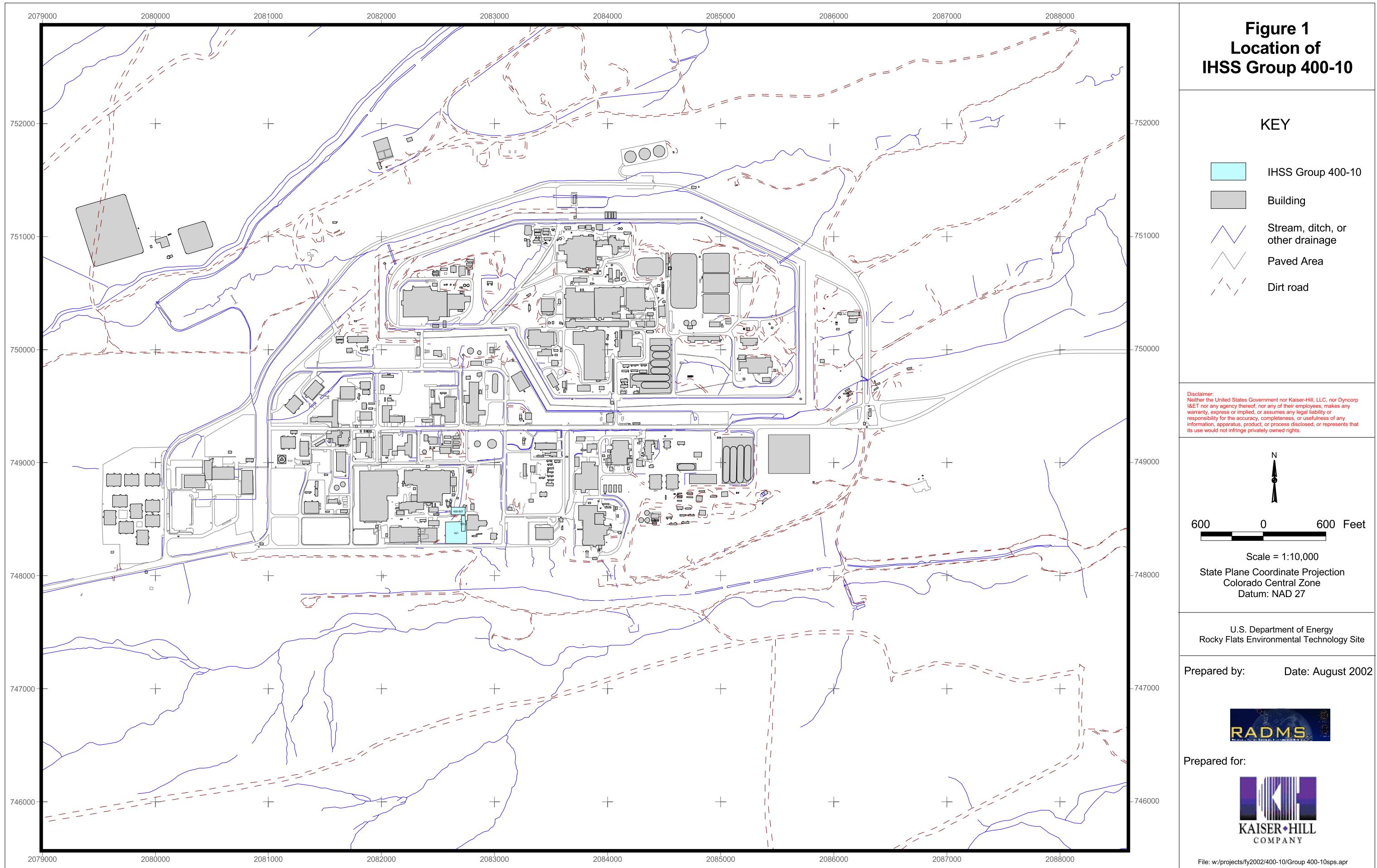
IHSS Group 400-10 consists of historical knowledge (DOE 1992, DOE 2001a) and 48 sampling locations with specifications as described in IASAP Addendum #IA-02-01 (DOE 2001b). The sampling specifications for the characterization samples collected are listed in Table 1. The location of these samples and analytical results are shown on Figures 3 and 4. Analytical results greater than background mean plus two standard deviations or method detection limits are presented in Table 2. Summary statistics are presented in Tables 3 through 6. Deviations from planned sampling specifications are presented in Table 7. A summary of validated analytical records is presented in Table 8 and exceptions to the data validation are presented in Table 9. Raw data are presented in Appendix A. No analytical results are above the RFCA Wildlife Refuge Worker (WRW) action levels (ALs). A comparison of the analytical results to the RFCA WRW ALs is presented in Appendix B.

Analytical results indicate that No Further Accelerated Action (NFAA) for IHSS Group 400-10 is warranted for the following reasons:

- All contaminant concentrations are less than WRW ALs.
- All contaminant concentrations are less than Ecological Receptor ALs.
- There is no identified potential to exceed surface water standards at a Point of Compliance POC from this IHSS Group.

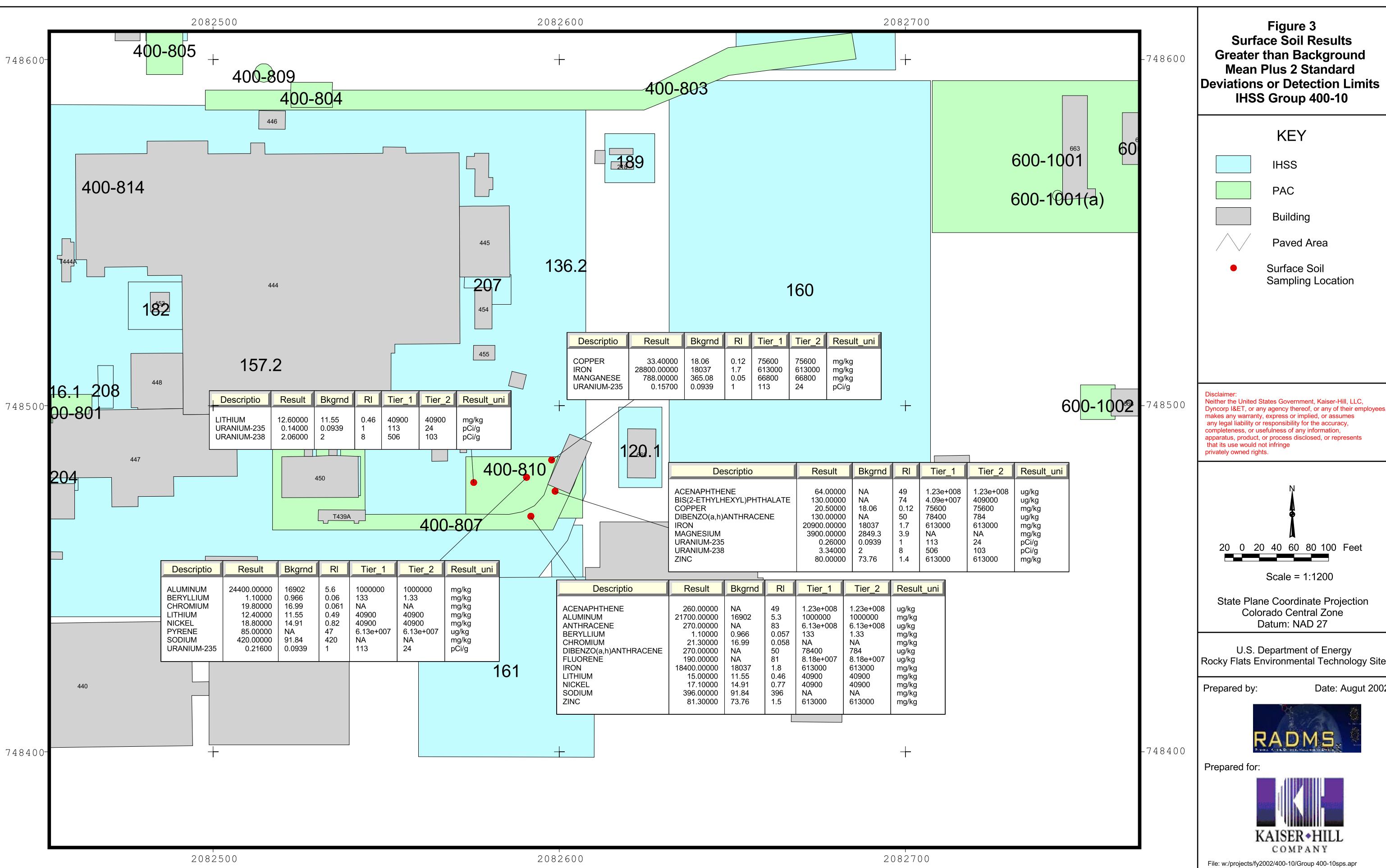
Approval of this Data Summary Report constitutes regulatory agency concurrence of this IHSS Group as an NFAA. This information and NFAA determination will be documented in the FY03 Historical Release Report (HRR).

**Figure 1**  
**Location of**  
**IHSS Group 400-10**



**Figure 2**  
**IHSS Group 400-10/IHSS & PAC**

**Figure 3**  
Surface Soil Results  
Greater than Background  
Mean Plus 2 Standard  
Deviations or Detection Limits  
IHSS Group 400-10

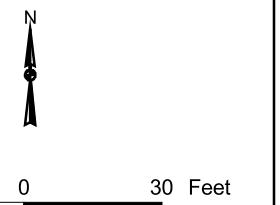


**Figure 4**  
Subsurface Soil Sampling  
Results Greater Than Background  
Mean Plus Two Standard Deviations  
or Detection Limits  
IA Group 400-10

**KEY**

- IHSS
- PAC
- Building
- Streams
- Paved Areas
- Fences
- Subsurface Soil Sampling Location

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Scale = 1:2,200  
State Plane Coordinate Projection  
Colorado Central Zone  
Datum: NAD 27

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

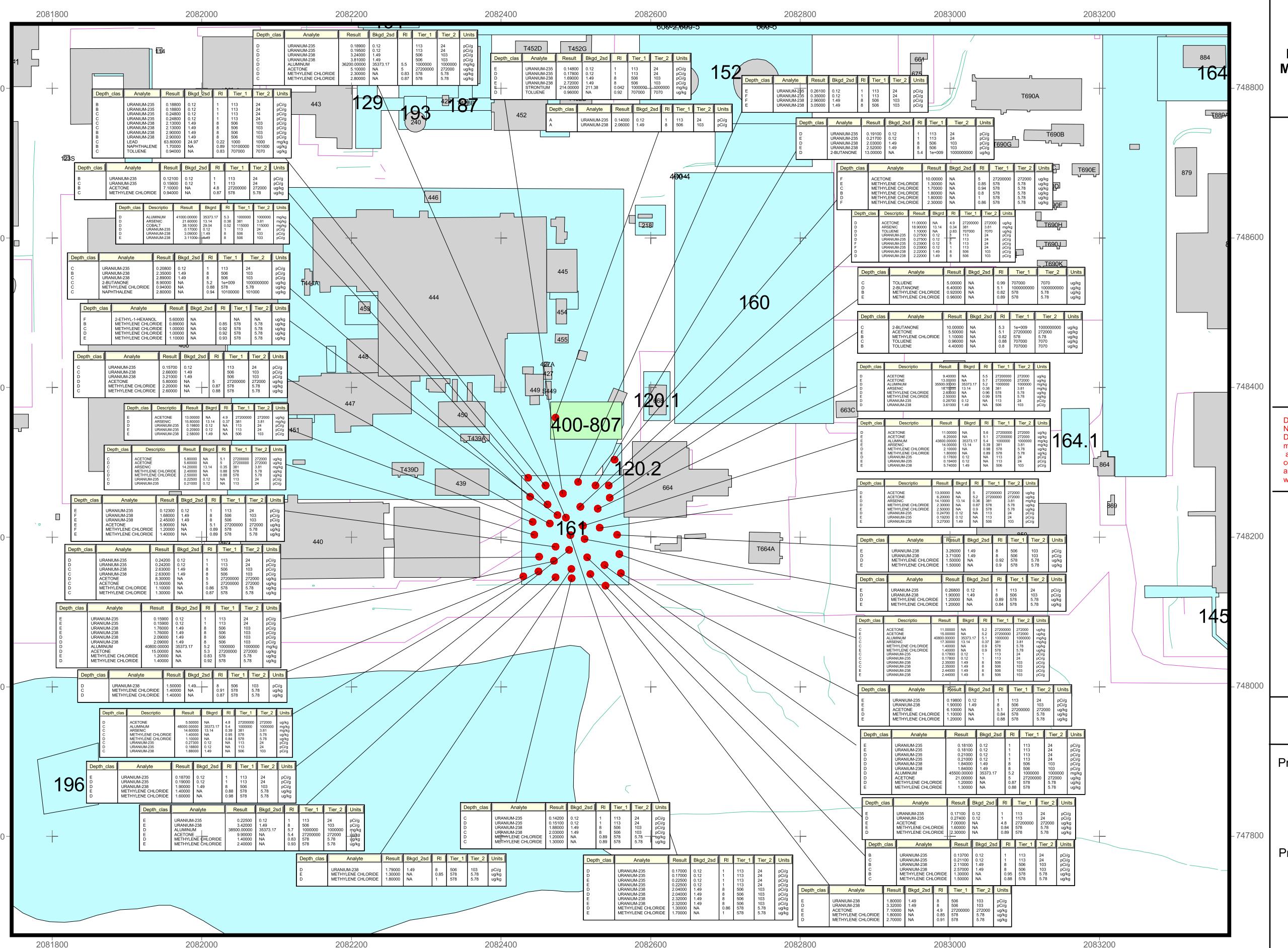
Prepared by: Date: August 2002



Prepared for:



File: w:/projects/fy2002/400-10/400-10sp.sps.apr



**Table 1**  
**IHSS Group 400-10—Characterization Sampling Specifications**

IHSS Group	IHSS/PAC/UBC Site	Location Code	Easting	Northing	Media	Depth Interval	Analyte	Laboratory Method
400-10	PAC 400-807 – Sandblasting Area	BZ35-A001	2082600.04	748530.03	surface soil	A	Metals Radionuclides SVOCs	6010 Alpha Spec 8270
		BZ35-A002	2082628.70	748549.76	surface soil	A	Metals Radionuclides SVOCs	6010 Alpha Spec 8270
		BZ35-A003	2082633.14	748514.01	surface soil	A	Metals Radionuclides SVOCs	6010 Alpha Spec 8270
		BZ35-A004	2082613.79	748483.81	surface soil	A	Metals Radionuclides SVOCs	6010 Alpha Spec 8270
		BZ35-A005	2082530.53	748477.75	surface soil	A	Metals Radionuclides SVOCs	6010 Alpha Spec 8270
		BZ35-A006	2082539	748524	surface soil	A	Metals Radionuclides SVOCs	6010 Alpha Spec 8270
		BZ35-A007	2082562.79	748544.18	surface soil	A	Metals Radionuclides SVOCs	6010 Alpha Spec 8270
	IHSS 120.2 – Fiberglass Area West of Building 664	BZ35-B008	2082651	748444	subsurface soil	B	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ35-C008	2082651	748444	subsurface soil	C, D, E, F	VOCs	8260
		BZ35-B010	2082642	748372	subsurface soil	B	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ35-B010	2082642	748372	subsurface soil	C, D, E, F	VOCs	8260
		BZ34-B001	2082558.48	748334.14	subsurface soil	B	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-B001	2082558.48	748334.14	subsurface soil	C, D, E, F	VOCs	8260

IHSS Group	IHSS/PAC/UBC Site	Location Code	Easting	Northing	Media	Depth Interval	Analyte	Laboratory Method
IHSS 161 – Radioactive Site West of Building 664		BZ35-B014	2082640	748395	SAMPLE NOT TAKEN			
		BZ35-B014	2082640	748395	SAMPLE NOT TAKEN			
		BY34-B001	2082524.00	748359.00	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BY34-B002	2082528.00	748323.00	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BY34-B003	2082539.00	748279.00	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BY34-B004	2082536.00	748252.00	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BY34-B005	2082507.00	748232.00	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BY34-B006	2082508.00	748260.00	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BY34-B007	2082496.00	748326.00	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BY34-B008	2082478.00	748223.00	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BY34-B009	SAMPLE NOT TAKEN					
		BY34-B011	2082499	748302	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BY35-B001	2082520	748395	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BY35-B002	2082491	748374	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260

IHSS Group	IHSS/PAC/UBC Site	Location Code	Easting	Northing	Media	Depth Interval	Analyte	Laboratory Method
		BY35-B003	2082487	748410	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-001	2082543	748339	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-B002	2082656	748302	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-B003	2082660	748265	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-B004	2082663	748229	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-B007	2082634	748205	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-B008	2082632	748244	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-B009	2082623	748315	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-B010	2082619	748351	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-B011	2082591	748319	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-012	2082594	748294	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-013	2082598	748259	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260

IHSS Group	IHSS/PAC/UBC Site	Location Code	Easting	Northing	Media	Depth Interval	Analyte	Laboratory Method
		BZ34-014	2082605	748227	subsurface Soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-017	2082570	748219	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-018	2082569	748237	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-019	2082565	748273	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-020	2082567	748301	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-021	2082559	748334	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-022	2082539	748221	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ34-0034	2082662	748229	SAMPLE NOT TAKEN			
		BZ35-011	2082615	748395	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ35-012	2082582	748402	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ35-013	2082553	748380	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ35-014	2082640	748395	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260
		BZ35-015	2082586	748355	subsurface soil	B, C, D, E, F	Metals Radionuclides VOCs	6010 Alpha Spec 8260



















**Table 3**  
**Summary Statistics for IHSS 120.2 Subsurface Soil**

Analyte	Total Number Samples Collected	Detection Frequency (%)	Maximum Concentration Detected	Tier I Action Level	Tier II Action Level	Subsurface Soil Background Concentration	Unit
2-Butanone	20	15	46	NA	NA	NA	ug/kg
2-Ethyl-1-Hexanol	1	100	5.6	NA	NA	NA	ug/kg
Acetone	20	30	230	27,200,000	272,000	NA	ug/kg
Methylene Chloride	20	60	2.3	578	5.78	NA	ug/kg
Thallium	4	25	2.9	NA	NA	1.84	mg/kg
Toluene	20	20	7.5	707,000	7,070	NA	ug/kg

**Table 4**  
**Summary Statistics for IHSS 161 Subsurface Soil**

Analyte	Total Number Samples Collected	Detection Frequency (%)	Maximum Concentration Detected	Tier I Action Level	Tier II Action Level	Subsurface Soil Background Concentration	Unit
2-Butanone	71	7	46	NA	NA	NA	ug/kg
Acetone	71	48	230	27,200,000	272,000	NA	ug/kg
Aluminum	57	16	48,000	1,000,000	1,000,000	35,373.17	mg/kg
Arsenic	57	16	21.6	381	3.81	13.14	mg/kg
Benzene 1,2,4-Trimethyl	71	1	2	NA	NA	NA	ug/kg
Calcium	57	2	217,000	NA	NA	39,382.27	mg/kg
Cobalt	57	2	38.1	123,000	123,000	29.04	mg/kg
Lead	57	2	63.8	1,000	1,000	24.97	mg/kg
Methylene Chloride	71	73	2.8	578	5.78	NA	ug/kg
n-Eicosane	1	100	8	NA	NA	NA	ug/kg
n-Tetradecane	1	100	10	NA	NA	NA	ug/kg
Naphthalene	71	4	6.5	10,100,000	101,000	NA	ug/kg
Strontium	57	2	214	1,000,000	1,000,000	211.38	mg/kg
Thallium	57	58	4.8	NA	NA	1.84	mg/kg
Toluene	71	7	7.5	707,000	7,070	NA	ug/kg
Uranium-235	81	72	0.35	113	24	0.12	pCi/g
Uranium-238	81	70	5.74	506	103	1.49	pCi/g

**Table 5**  
**Summary Statistics for PAC 400-807 Surface Soil**

Analyte	Total Number Samples Collected	Detection Frequency (%)	Maximum Concentration Detected	Tier I Action Level	Tier II Action Level	Surface Soil Background Concentration	Unit
9,10-Anthraquinone	1	100	1,300	NA	NA	NA	ug/kg
Acenaphthene	5	40	260	123,000,000	123,000,000	NA	ug/kg
Aluminum	6	33	24,400	1,000,000	1,000,000	16,902	mg/kg
Anthracene	5	40	440	613,000,000	613,000,000	NA	ug/kg
Benzo(a)anthracene	5	40	1,600	784,000	7840	NA	ug/kg
Benzo(a)Pyrene	5	40	970	78,400	784	NA	ug/kg
Benzo(b)Fluoranthene	5	40	1,100	784,000	7840	NA	ug/kg
Benzo(ghi)Perylene	5	40	620	NA	NA	NA	ug/kg
Benzo(k)Fluoranthene	5	40	1,300	7,840,000	78,400	NA	ug/kg
Beryllium	6	33	1.1	133	1.33	0.97	mg/kg
Bis(2-Ethylhexyl)Phthalate	5	40	570	40,900,000	409,000	NA	ug/kg
Calcium	6	50	25,800	NA	NA	4467	mg/kg
Chromium	6	33	21.3	NA	NA	16.99	mg/kg
Chrysene	5	40	2,100	78,400,000	784,000	NA	ug/kg
Copper	6	33	33.4	75,600	75,600	18.06	mg/kg
Dibeno(a,h)Anthracene	5	40	270	78,400	784	NA	ug/kg
Fluoranthene	5	40	4,100	81,800,000	81,800,000	NA	ug/kg
Fluorene	5	20	190	81,800,000	81,800,000	NA	ug/kg
Fluorenone	1	100	860	NA	NA	NA	ug/kg
Indeno(1,2,3-cd)Pyrene	5	40	570	784,000	7,840	NA	ug/kg
Iron	6	50	28,800	613,000	613,000	18,037	mg/kg
Lithium	6	50	15	40,900	40,900	11.55	mg/kg
Magnesium	6	50	9,980	NA	NA	2,849.3	mg/kg
Manganese	6	17	788	66,800	66,800	365.08	mg/kg

Analyte	Total Number Samples Collected	Detection Frequency (%)	Maximum Concentration Detected	Tier I Action Level	Tier II Action Level	Surface Soil Background Concentration	Unit
Nickel	6	33	18.8	40,900	40,900	14.91	mg/kg
p-Toluenesulfonamide	2	100	600	NA	NA	NA	ug/kg
Phenanthrene	5	60	1,500	NA	NA	NA	ug/kg
Potassium	6	17	3,320	NA	NA	2,967.2	mg/kg
Pyrene	5	60	4,000	61,300,000	61,300,000	NA	ug/kg
Sodium	6	100	1,720	NA	NA	91.84	mg/kg
Uranium-235	6	67	0.26	113	24	0.094	pCi/g
Uranium-238	6	33	3.34	506	103	2	pCi/g
Zinc	6	33	81.3	613,000	613,000	73.76	mg/kg

**Table 6**  
**Summary Statistics for PAC 400-807 Subsurface Soil**

Analyte	Total Number Samples Collected	Detection Frequency (%)	Maximum Concentration Detected	Tier I Action Level	Tier II Action Level	Subsurface Soil Background Concentration	Unit
Uranium-235	2	50	0.14	113	24	0.12	pCi/g
Uranium-238	2	50	2.06	506	103	1.49	pCi/g

#### 4.1 Subsurface Soil Risk Screen

Screen 1 – Are COC concentrations below Table 3 WRW Soil ALs?

Yes, all COC concentrations are well below Table 3 ALs for the WRW. (Screens 2 and 3 are bypassed)

Screen 4 – Is there an environmental pathway and sufficient quantity of COC that would cause exceedance of Surface Water Standards?

Migration via erosion and groundwater are the two possible pathways whereby surface water could become contaminated by soil from IHSS Group 400-10. Contaminant migration via erosion is unlikely because this IHSS Group is located in a flat-lying area not prone to landslides or erosion (Figure 1, RFCA Modification [DOE et al. 2003]).

Groundwater and surface water flow in this area is to the southeast towards the South Interceptor Ditch approximately 450 feet away. Groundwater monitoring results from nearby well P416889, indicate that all analytes are below reportable limits (DOE 2001c).. This well is within the composite IA volatile organic compound (VOC) plume and will be evaluated as part of groundwater plume remedial decision and future sitewide evaluation.

Surface water station GS22 is the closest surface water station to IHSS Group 400-10. And measures water from the 400 Area. Recent analytical results (DOE 2002a, 2002b, and 2003) indicate that all analytes are present at concentrations less than RFCA standards and ALs.

Screen 5 – Are COC concentrations below the Table 3 Soil Action Levels for ecological receptors?

Yes, all COC concentrations are less than the Table 3 ALs for ecological receptors.

#### 4.2 Summary

Analytical results and the soil risk screen indicate that an NFAA determination is justified for IHSS Group 400-10. Approval of this Data Summary Report constitutes regulatory agency concurrence that this IHSS Group is an NFAA site. This information and the NFAA determination will be documented in the FY03 HRR.

### 3.0 DEVIATIONS FROM PLANNED SAMPLING SPECIFICATIONS

Deviations from the planned sampling specifications described in IASAP Addendum #IA-02-01 (DOE 2001b) are presented in the following table.

**Table 7**  
**Deviations from Planned Sampling Specifications**

Sampling Location	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Comments
BZ35-001	2082600	748530	2082600.042	748530.030	No significant change
BZ35-002	2082629	748551	2082628.699	748549.759	No significant change

<b>Sampling Location</b>	<b>Planned Easting</b>	<b>Planned Northing</b>	<b>Actual Easting</b>	<b>Actual Northing</b>	<b>Comments</b>
BZ35-003	2082633	748516	2082633.128	748514.006	No significant change
BZ35-004	2082604	748494	2082613.790	748483.805	Relocated because of utilities
BZ35-005	2082542	748488	2082530.528	748477.754	Relocated because of utilities
BZ35-006	2082538	748524	2082539	748524	No significant change
BZ35-007	2082567	748545	2082562.788	748544.180	Relocated because of utilities
BZ35-008	2082641	748444	2082651	748444	Relocated because of utilities
BZ35-010	2082648	748372	2082642	748372	Relocated because of utilities
BZ34-001	2082652	748337	2082558.477	748334.135	No significant change
BY33-001	2082514	748159	NA	NA	Not taken
BY34-001	2082524	748359	2082524.00	748359.00	No significant change
BY34-002	2082528	748323	2082528.00	748323.00	No significant change
BY34-003	2082532	748288	2082539.00	748279.00	Relocated because of utilities
BY34-004	2082536	748252	2082536.00	748252.00	No significant change
BY34-005	2082507	748231	2082507.00	748232.00	No significant change
BY34-006	2082503	748267	2082508.00	748260.00	Relocated because of utilities
BY34-007	2082495	748338	2082496.00	748326.00	Relocated because of utilities
BY34-008	2082477	748210	2082478.00	748223.00	Relocated because of utilities
BY34-009	2082510	748195	NA	NA	Not taken
BY34-010	2082481	748174	NA	NA	Not taken
BY34-011	2082499	748302	2082499	748302	No significant change
BY35-001	2082520	748395	2082520	748395	No significant change
BY35-002	2082491	748374	2082491	748374	No significant change
BY35-003	2082487	748410	2082487	748410	No significant change
BZ33-001	2082671	748158	NA	NA	Not taken
BZ34-001	NA	NA	2082543	748339	Relocated because of utilities
BZ34-002	2082656	748301	2082656	748302	No significant change
BZ34-003	2082660	748265	2082660	748265	No significant change
BZ34-004	2082663	748229	2082663	748229	No significant change
BZ34-005	2082667	748194	2082634	748205	No significant change
BZ34-006	2082638	748172	2082632	748244	No significant change
BZ34-007	2082634	748208	2082623	748315	No significant change
BZ34-008	2082631	748244	2082619	748351	No significant change
BZ34-009	2082623	748315	2082591	748319	No significant change
BZ34-010	2082619	748351	2082594	748294	No significant change
BZ34-011	2082590	748330	2082598	748259	Relocated because of utilities
BZ34-012	2082594	748294	NA	NA	Not taken
BZ34-013	2082598	748259	NA	NA	Not taken
BZ34-014	2082601	748223	2082605	748227	No significant change
BZ34-015	2082605	748187	NA	NA	Not taken
BZ34-016	2082576	748166	NA	NA	Not taken
BZ34-017	2082572	748202	2082570	748219	Relocated because of utilities
BZ34-018	2082569	748237	2082569	748237	No significant change
BZ34-019	2082565	748273	2082565	748273	No significant change

<b>Sampling Location</b>	<b>Planned Easting</b>	<b>Planned Northing</b>	<b>Actual Easting</b>	<b>Actual Northing</b>	<b>Comments</b>
BZ34-020	2082561	748309	2082567	748301	Relocated because of utilities
BZ34-021	2082557	748345	2082559	748334	No significant change
BZ34-022	2082539	748216	2082539	748221	Relocated because of utilities
BZ34-023	2082543	748180	NA	NA	Not taken
BZ35-011	2082615	748387	2082615	748395	Relocated because of utilities
BZ35-012	2082582	748402	2082582	748402	No significant change
BZ35-013	2082553	748380	2082553	748380	No significant change
BZ35-014	2082644	748408	2082640	748395	Relocated because of utilities
BZ35-015	2082586	748366	2082586	748355	Relocated because of utilities
BZ34-034	NA	NA	2082662	748229	Not planned

NA = not applicable

## **4.0 DATA QUALITY ASSESSMENT**

The Data Quality Objectives (DQOs) for this project are described in the IASAP (DOE 2002). All DQOs for this project were achieved based on the following:

- Regulatory agency approved sampling program design (IASAP Addendum 02-01 [DOE 2001a]);
- Collection of samples in accordance with the sampling design;
- Results of the Data Quality Assessment as described in the following sections.

### **4.1 Data Quality Assessment Process**

The DQA process ensures that the type, quantity and quality of environmental data used in decision making are defensible, and is based on the following guidance and requirements:

- EPA QA/G-4, 1994a, Guidance for the Data Quality Objective Process;
- EPA QA/G-9, 1998, Guidance for the Data Quality Assessment Process; Practical Methods for Data Analysis; and
- DOE Order 414.1A, 1999, Quality Assurance.

Verification and validation (V&V) of the data are the primary components of the DQA. The final data are compared with original project DQOs and evaluated with respect to project decisions; uncertainty within the decisions; and quality criteria required for the data, specifically precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS). Validation criteria are consistent with the following RFETS-specific documents and industry guidelines:

- EPA 540/R-94/012, 1994b, USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review;
- EPA 540/R-94/013, 1994c, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review; and
- Kaiser-Hill Company, L.L.C.(K-H) V&V Guidelines:
  - General Guidelines for Data Verification and Validation, DA-GR01-v2, 2002a.
  - V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v3, 2002b.
  - V&V Guidelines for Volatile Organics, DA-SS01-v3, 2002c.
  - V&V Guidelines for Semivolatile Organics, DA-SS02-v1, 2002d.

- V&V Guidelines for Metals, DA-SS05-v1, 2002e.
- Lockheed-Martin, 1997, Evaluation of Radiochemical Data Usability, ES/ER/MS-5.

This report will be submitted to the Comprehensive Environmental, Response, Compensation and Liability Act (CERCLA) Administrative Record (AR) for permanent storage 30 days after being provided to CDPHE and/or U.S. EPA.

#### **4.2 Verification and Validation of Results**

Verification ensures that data produced and used by the project are documented and traceable in accordance with quality requirements. Validation consists of a technical review of all data that directly support the project decisions so that any limitations of the data relative to project goals are delineated and the associated data are qualified accordingly. The V&V process defines the criteria that constitute data quality, namely PARCCS parameters. Data traceability and archival are also addressed. V&V criteria include the following:

- Chain-of-custody;
- Preservation and hold-times;
- Instrument calibrations;
- Preparation blanks;
- Interference check samples (metals);
- Matrix spikes/matrix spike duplicates (MS/MSD);
- Laboratory control samples (LCS);
- 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 PARCCS parameters are satisfactory (i.e., within tolerances acceptable to the project). Satisfactory V&V of laboratory quality controls are captured through application of validation “flags” or qualifiers to individual records.

Raw hardcopy data (e.g., individual analytical data packages) are currently filed by RIN and are maintained by Kaiser-Hill Analytical Services Division; older hardcopies may reside in the Federal Center in Lakewood, Colorado. Electronic data are stored in the RFETS Soil and Water Database.

Both real and QC data, as of June 11, 2003 are included on the enclosed CDs.

#### 4.2.1 Accuracy

The following measures of accuracy were evaluated:

- Laboratory Control Sample Evaluation;
- Surrogate Evaluation;
- Field Blanks; and
- Sample Matrix Spike Evaluation.

Results are compared to method requirements and project goals. The results of these comparisons are summarized for RFCA COCs where the result could impact project decisions. Particular attention is paid to those values near ALs when quality control (QC) results could indicate unacceptable levels of uncertainty for decision-making purposes.

##### Laboratory Control Sample Evaluation

The frequency of LCS measurements, relative to each laboratory batch, is given in Table 8. LCS frequency was adequate based on at least one LCS per batch. The minimum and maximum LCS results are also tabulated, by chemical, for the entire project. While not all LCS results are within tolerances, project decisions based on AL exceedances were not affected. Any qualifications of results due to LCS performance exceeding upper or lower tolerance limits are captured in the V&V flags, described in the Completeness Section.

##### Surrogate Evaluation

The frequency of surrogate measurements, relative to each laboratory batch, is given in Table 9. Surrogate frequency was adequate based on at least one set per sample. The minimum and maximum surrogate results are also tabulated, by chemical, for the entire project. Any qualifications of results due to surrogate results are captured in the V&V flags, described in the Completeness Section.

##### Field Blank Evaluation

Results of the field blank analyses are given in Table 10. Detectable amounts of contaminants within the blanks, which could indicate possible cross-contamination of samples, are evaluated if the same contaminant is detected in the associated real samples. When the real result is less than 10 times the blank result for laboratory contaminants and 5 times the result for non-laboratory contaminants, the real result is eliminated. None of the chemicals detected in blanks were detected at concentrations greater than ALs, therefore no significant blank contamination is indicated. Soil removal decisions were based on plutonium soil activity.



CAS No.	Analyte	Result Type	Minimum	Maximum	Number of Laboratory Samples	Number of Laboratory Batches	Unit	Test Method
7440-48-4	Cobalt	LC	89	102	13	13	%REC	SW-846 6010/6010B
7440-50-8	Copper	LC	97	104.3	8	8	%REC	EPA 6200
7440-50-8	Copper	LC	93	105	13	13	%REC	SW-846 6010/6010B
57-12-5	Cyanide	LC	91.5	102.3	5	5	%REC	E335.3, E335.4, SM4500-CN C,E
57-12-5	Cyanide, Total	LC	88	103	9	9	%REC	E335.3, E335.4, SM4500-CN C,E
124-48-1	Dibromochloromethane	LC	86	98	6	6	%REC	SW-846 8260
100-41-4	Ethylbenzene	LC	87	108	6	6	%REC	SW-846 8260
87-68-3	Hexachlorobutadiene	LC	72	113	6	6	%REC	SW-846 8260
7439-89-6	Iron	LC	92.6	112	8	8	%REC	EPA 6200
7439-89-6	Iron	LC	93	102	13	13	%REC	SW-846 6010/6010B
7439-92-1	Lead	LC	95	113	8	8	%REC	EPA 6200
7439-92-1	Lead	LC	91	101	13	13	%REC	SW-846 6010/6010B
7439-93-2	Lithium	LC	96	111.3	8	8	%REC	EPA 6200
7439-93-2	Lithium	LC	89	101	13	13	%REC	SW-846 6010/6010B
7439-96-5	Manganese	LC	95	105.8	8	8	%REC	EPA 6200
7439-96-5	Manganese	LC	92	105	13	13	%REC	SW-846 6010/6010B
7439-97-6	Mercury	LC	100	107.2	8	8	%REC	EPA 6200
7439-97-6	Mercury	LC	98	102	9	9	%REC	SW-846 6010/6010B
75-09-2	Methylene Chloride	LC	79	102	6	6	%REC	SW-846 8260
7439-98-7	Molybdenum	LC	93	110	8	8	%REC	EPA 6200
7439-98-7	Molybdenum	LC	88	98	13	13	%REC	SW-846 6010/6010B
91-20-3	Naphthalene	LC	80	103	6	6	%REC	SW-846 8260
7440-02-0	Nickel	LC	94	110	8	8	%REC	EPA 6200
7440-02-0	Nickel	LC	90	100	13	13	%REC	SW-846 6010/6010B
621-64-7	N-Nitroso-Di-N-Propylamine	LC	74	74	1	1	%REC	SW-846 8270B
106-46-7	P-Dichlorobenzene	LC	69	69	1	1	%REC	SW-846 8270B
87-86-5	Pentachlorophenol	LC	66	66	1	1	%REC	SW-846 8270B
108-95-2	Phenol	LC	74	74	1	1	%REC	SW-846 8270B
100-02-7	P-Nitrophenol	LC	68	68	1	1	%REC	SW-846 8270B
129-00-0	Pyrene	LC	71	71	1	1	%REC	SW-846 8270B
7782-49-2	Selenium	LC	101	110.8	8	8	%REC	EPA 6200
7782-49-2	Selenium	LC	90	103	13	13	%REC	SW-846 6010/6010B
7440-22-4	Silver	LC	95	111	8	8	%REC	EPA 6200
7440-22-4	Silver	LC	88	104	13	13	%REC	SW-846 6010/6010B
7440-24-6	Strontium	LC	95	105.2	8	8	%REC	EPA 6200
7440-24-6	Strontium	LC	91	99	13	13	%REC	SW-846 6010/6010B
100-42-5	Styrene	LC	90	112	6	6	%REC	SW-846 8260
127-18-4	Tetrachloroethene	LC	82	107	6	6	%REC	SW-846 8260
7440-31-5	Tin	LC	95	111	8	8	%REC	EPA 6200
7440-31-5	Tin	LC	89	101	13	13	%REC	SW-846 6010/6010B
108-88-3	Toluene	LC	83	114	30	30	%REC	SW-846 8260
10061-02-6	trans-1,3-Dichloropropene	LC	89	106	6	6	%REC	SW-846 8260

CAS No.	Analyte	Result Type	Minimum	Maximum	Number of Laboratory Samples	Number of Laboratory Batches	Unit	Test Method
79-01-6	Trichloroethene	LC	81	112	30	30	%REC	SW-846 8260
7440-61-1	Uranium-238	LC	104	104	1	1	%REC	ALPHA SPEC
7440-62-2	Vanadium	LC	95	106	11	11	%REC	EPA 6200
7440-62-2	Vanadium	LC	93	103	13	13	%REC	SW-846 6010/6010B
75-01-4	Vinyl chloride	LC	89	111	6	6	%REC	SW-846 8260
1330-20-7	Xylene (total)	LC	86	108	6	6	%REC	SW-846 8260
7440-66-6	Zinc	LC	86.6	106.9	8	8	%REC	EPA 6200
7440-66-6	Zinc	LC	89	102	13	13	%REC	SW-846 6010/6010B

**Table 9**  
**Surrogate Recovery Summary**

VOC Surrogate Recoveries				
Number of Samples	Analyte	Minimum	Maximum	Unit Code
110	1,2-DICHLOROETHANE-D4	26.545	122	%REC
104	4-BROMOFLUOROBENZENE	19.983	107	%REC
109	TOLUENE-D8	23.032	113	%REC
SVOC Surrogate Recoveries				
Number of Samples	Analyte	Minimum	Maximum	Unit Code
8	TERPHENYL-D14	59	77	%REC
8	2-FLUOROBIPHENYL	58	74	%REC
8	2-FLUOROPHENOL	60	76	%REC
8	NITROBENZENE-D5	65	82	%REC

**Table 10**  
**Field Blank Summary**

Sample QC Code	Test Method Name	Analyte	Maximum Detected Value	Unit
RB	ALPHA SPEC	Uranium-234	0.0339	pCi/g
Field Blanks (Trip, Rinse, Field) results greater than detection limits (not *U* Qualified)				

Sample Matrix Spike Evaluation

The frequency of MS measurements, relative to each laboratory batch, was adequate based on at least one MS per batch. The minimum and maximum of MS results are summarized by chemical, for the entire project in Table 11. MS recoveries alone do not result in rejection of data; any qualifications due to matrix spike performance are included in the validation flags summarized in the Completeness Section.

**Table 11**  
**Sample Matrix Spike Evaluation**

CAS No.	Analyte	Result Type	Minimum	Maximum	Number of Laboratory Samples	Number of Laboratory Batches	Unit	Test Method
75-35-4	1,1-DICHLOROETHENE	MS	66	97	10	10	%REC	SW-846 8260
75-35-4	1,1-DICHLOROETHYLENE	MS	62.1	62.1	1	1	%REC	SW-846 8260 LOW LEVEL
120-82-1	1,2,4-TRICHLOROBENZENE	MS	60	60	1	1	%REC	SW-846 8270B
121-14-2	2,4-DINITROTOLUENE	MS	63	63	1	1	%REC	SW-846 8270B
95-57-8	2-CHLOROPHENOL	MS	68	68	1	1	%REC	SW-846 8270B
83-32-9	ACENAPHTHENE	MS	67	67	1	1	%REC	SW-846 8270B
7429-90-5	ALUMINUM	MS	96	957	12	12	%REC	SW-846 6010/6010B
7440-36-0	ANTIMONY	MS	26	94	12	12	%REC	SW-846 6010/6010B
7440-38-2	ARSENIC	MS	88	103	12	12	%REC	SW-846 6010/6010B
7440-39-3	BARIUM	MS	87	113	12	12	%REC	SW-846 6010/6010B
71-43-2	BENZENE	MS	58	100	10	10	%REC	SW-846 8260
71-43-2	BENZENE	MS	86.9	86.9	1	1	%REC	SW-846 8260 LOW LEVEL
7440-41-7	BERYLLIUM	MS	88	114	12	12	%REC	SW-846 6010/6010B
7440-43-9	CADMIUM	MS	77	95	12	12	%REC	SW-846 6010/6010B
108-90-7	CHLOROBENZENE	MS	26	98	10	10	%REC	SW-846 8260
108-90-7	CHLOROBENZENE	MS	111	111	1	1	%REC	SW-846 8260 LOW LEVEL
67-66-3	CHLOROFORM	MS	107	107	1	1	%REC	SW-846 8260 LOW LEVEL
7440-48-4	COBALT	MS	87	97	12	12	%REC	SW-846 6010/6010B
7440-50-8	COPPER	MS	92	116	12	12	%REC	SW-846 6010/6010B
57-12-5	CYANIDE, TOTAL	MS	94	94	1	1	%REC	E335.3, E335.4, SM4500-CN C,E
57-12-5	CYANIDE, TOTAL	MS	91	99	4	4	%REC	EPA 335.3
7439-89-6	IRON	MS	98	897	10	10	%REC	SW-846 6010/6010B
7439-92-1	LEAD	MS	76	100	12	12	%REC	SW-846 6010/6010B
7439-93-2	LITHIUM	MS	92	125	12	12	%REC	SW-846 6010/6010B
7439-96-5	MANGANESE	MS	46	398	11	11	%REC	SW-846 6010/6010B
7439-97-6	MERCURY	MS	94	94	1	1	%REC	EPA 600
7439-97-6	MERCURY	MS	78	136	9	9	%REC	SW-846 6010/6010B
7439-98-7	MOLYBDENUM	MS	77	98	12	12	%REC	SW-846 6010/6010B
7440-02-0	NICKEL	MS	91	116	12	12	%REC	SW-846 6010/6010B
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	MS	70	70	1	1	%REC	SW-846 8270B
106-46-7	P-DICHLOROBENZENE	MS	58	58	1	1	%REC	SW-846 8270B
87-86-5	PENTACHLOROPHENOL	MS	46	46	1	1	%REC	SW-846 8270B
108-95-2	PHENOL	MS	70	70	1	1	%REC	SW-846 8270B
100-02-7	P-NITROPHENOL	MS	57	57	1	1	%REC	SW-846 8270B
129-00-0	PYRENE	MS	64	64	1	1	%REC	SW-846 8270B
7782-49-2	SELENIUM	MS	85	99	12	12	%REC	SW-846 6010/6010B
7440-22-4	SILVER	MS	83	105	12	12	%REC	SW-846 6010/6010B
7440-24-6	STRONTIUM	MS	89	120	12	12	%REC	SW-846 6010/6010B
7440-31-5	TIN	MS	82	99	12	12	%REC	SW-846 6010/6010B
108-88-3	TOLUENE	MS	46	102	10	10	%REC	SW-846 8260
108-88-3	TOLUENE	MS	101	101	1	1	%REC	SW-846 8260 LOW LEVEL
79-01-6	TRICHLOROETHENE	MS	57	98	10	10	%REC	SW-846 8260
79-01-6	TRICHLOROETHYLENE	MS	96.8	96.8	1	1	%REC	SW-846 8260 LOW LEVEL

CAS No.	Analyte	Result Type	Minimum	Maximum	Number of Laboratory Samples	Number of Laboratory Batches	Unit	Test Method
7440-62-2	VANADIUM	MS	94	147	12	12	%REC	SW-846 6010/6010B
7440-66-6	ZINC	MS	72	117	12	12	%REC	SW-846 6010/6010B

#### 4.2.2 Precision

##### Matrix Spike Duplicate Evaluation

Laboratory precision is measured through use of MSD. The frequency of MSD measurements was adequate based on at least one MS per batch as shown in Table 12. Relative percent differences (RPDs) exceeding 35 percent do not affect project decisions because all real sample results (Table 13) were repeatable below ALs.

**Table 12**  
**Sample Matrix Spike Duplicate Evaluation**

Analyte Name	Number of Sample Pairs	Number of Laboratory Batches	Max RPD (%)
1,1-DICHLOROETHENE	10	10	11
1,1-DICHLOROETHYLENE	1	1	4
1,2,4-TRICHLOROBENZENE	1	1	6
2,4-DINITROTOLUENE	1	1	9
2-CHLOROPHENOL	1	1	7
ACENAPHTHENE	1	1	6
ALUMINUM	12	12	187
ANTIMONY	12	12	38
ARSENIC	12	12	5
BARIUM	12	12	34
BENZENE	1	1	2
BENZENE	10	10	15
BERYLLIUM	12	12	7
CADMIUM	12	12	5
CHLOROBENZENE	1	1	2
CHLOROBENZENE	10	10	14
CHLOROFORM	1	1	2
COBALT	12	12	22
COPPER	12	12	30
CYANIDE, TOTAL	1	1	6
IRON	8	8	153
LEAD	12	12	12
LITHIUM	12	12	12
MANGANESE	11	11	70
MERCURY	9	9	42
MERCURY	1	1	3
MOLYBDENUM	12	12	12
NICKEL	12	12	35

Analyte Name	Number of Sample Pairs	Number of Laboratory Batches	Max RPD (%)
N-NITROSO-DI-N-PROPYLAMINE	1	1	6
P-DICHLOROBENZENE	1	1	13
PENTACHLOROPHENOL	1	1	6
PHENOL	1	1	8
P-NITROPHENOL	1	1	12
PYRENE	1	1	6
SELENIUM	12	12	6
SILVER	12	12	5
STRONTIUM	12	12	12
TIN	12	12	8
TOLUENE	10	10	11
TOLUENE	1	1	3
TRICHLOROETHENE	10	10	12
TRICHLOROETHYLENE	1	1	3
VANADIUM	12	12	29
ZINC	12	12	24

#### Field Duplicate Evaluation

Field duplicate results reflect sampling precision, or overall repeatability of the sampling process. The frequency of field duplicate collection should exceed 1 field duplicate per 20 real samples, or 5 percent. Table 13 indicates that duplicate sampling frequencies were adequate except for VOCs. Because all VOC sample results were repeatable at concentrations below their respective action levels, the deficiency in VOC duplicate samples is not significant, and does not affect project decisions.

A common metric for evaluating precision is the RPD value; RPD values are given in Table 14. Ideally, RPDs of less than 35 percent (in soil) indicate satisfactory precision. Values exceeding 35 percent only affect project decisions if the imprecision is great enough to cause contradictory decisions relative to the COC (i.e., one sample indicates clean soil whereas the QC partner does not). As indicated by the data in Table 14, a number of analytes, generally VOCs and SVOCs, have RPDs greater than 35 percent. However, none of these analytes were at concentrations greater than ALs and therefore project decisions were not affected.

**Table 13**  
**Field Duplicate Sample Frequency**

Test Method Name	Sample Code	Number of Samples	% Duplicate Samples
GAMMA SPECTROSCOPY	REAL	41	50
GAMMA SPECTROSCOPY	DUP	2	
SW-846 6010/6010B	REAL	47	6
SW-846 6010/6010B	DUP	3	

SW-846 8260	REAL	37	3
SW-846 8260	DUP	1	
SW-846 8270B	REAL	7	14
SW-846 8270B	DUP	1	

**Table 14**  
**Field Duplicate Evaluation**

Analyte	Max of RPD %
1,1,1-TRICHLOROETHANE	2
1,1,2,2-TETRACHLOROETHANE	2
1,1,2-TRICHLOROETHANE	2
1,1-DICHLOROETHANE	2
1,1-DICHLOROETHENE	2
1,2,4-TRICHLOROBENZENE	3
1,2-DICHLOROETHANE	2
1,2-DICHLOROPROPANE	2
2,4,5-TRICHLOROPHENOL	3
2,4,6-TRICHLOROPHENOL	3
2,4-DICHLOROPHENOL	3
2,4-DIMETHYLPHENOL	3
2,4-DINITROPHENOL	0
2,4-DINITROTOLUENE	3
2,6-DINITROTOLUENE	3
2-BUTANONE	0
2-CHLORONAPHTHALENE	3
2-CHLOROPHENOL	3
2-NITROANILINE	0
4-CHLOROANILINE	3
4-METHYL-2-PENTANONE	0
ACENAPHTHENE	3
ACETONE	20
ALUMINUM	27
ANTHRACENE	3
ANTIMONY	55
ARSENIC	67
BARIUM	60
BENZENE	2
BENZO(A)ANTHRACENE	3
BENZO(A)PYRENE	3
BENZO(B)FLUORANTHENE	3
BENZO(K)FLUORANTHENE	3
BENZOIC ACID	0
BERYLLIUM	27
BIS(2-ETHYLHEXYL)PHTHALATE	3
BROMODICHLOROMETHANE	2
BROMOFORM	2

BROMOMETHANE	2
BUTYLBENZYLPHTHALATE	3
CARBON DISULFIDE	2
CARBON TETRACHLORIDE	2
CHLOROBENZENE	2
CHLOROETHANE	2
CHLOROFORM	2
CHLOROMETHANE	2
CHRYSENE	3
CIS-1,3-DICHLOROPROPENE	2
COBALT	110
COPPER	30
DIBENZ(A,H)ANTHRACENE	3
ISOPHORONE	3
LEAD	197
LITHIUM	30
MANGANESE	98
MERCURY	164
METHYLENE CHLORIDE	17
MOLYBDENUM	139
NAPHTHALENE	3
NICKEL	125
NITROBENZENE	3
IRON	21
N-NITROSODIPHENYLAMINE	3
PENTACHLOROPHENOL	0
PHENOL	3
PYRENE	3
SELENIUM	16
SILVER	11
STRONTIUM	52
TETRACHLOROETHENE	2
TIN	13
TOLUENE	2
TRANS-1,3-DICHLOROPROPENE	2
TRICHLOROETHENE	2
VANADIUM	37
VINYL CHLORIDE	2
ZINC	22

#### Completeness

Based on original project DQOs, a minimum of 25 percent of ER Program analytical (and radiological) results must be formally verified and validated. Of that percentage, no more than 10 percent of the results may be rejected, which ensures that analytical laboratory practices are consistent with quality requirements. Table 15 shows the number of validated records (codes without “1”), verified records (codes with “1”), and rejected records for each analytical group.

Validation frequency goals were attained for all groups except radionuclides and <1% of the data were rejected for each group. Validation frequency of radionuclides via alpha spectroscopy is better than 25 percent for the ER Program as a whole (approximately 52 percent). Checks on flags applied to radionuclide gamma spectroscopy results in hardcopy data packages indicate at least a 25 percent validation frequency. Those flags have not yet been uploaded to the digital records in the RFETS Soil Water Database (SWD). As a result, the percentages of validation appear low in Table 15. As additional V&V information is received, IHSS Group 400-10 records will be updated in SWD. Data qualified as a result of additional data qualification will be assessed as part of the Comprehensive Risk Assessment process. In summary, validation frequencies and results were satisfactory for all analytical groups.

Less than 1% of the data were rejected. Because the frequency of validation is within program quality requirements of RFETS validation goal of 25 percent of all analytical records the results indicate that these data are adequate.

#### 4.2.3 Sensitivity

Reporting limits, in units of ug/kg for organics, mg/kg for metals, and pCi/g for radionuclides, were compared with proposed RFCA WRW and Ecological Receptor ALs. Adequate sensitivities of analytical methods were attained for all COCs that affect project decisions. “Adequate” sensitivity is defined as a reporting limit less than an analyte’s associated AL, typically less than one-half the AL.

### 4.3 Summary of Data Quality

The RPDs greater than 35 percent indicate that the sampling precision limits some analytes has been exceeded. However, the imprecision does not affect project decisions. Less than 1 percent of the records were rejected. Compliance with the program quality requirements and the RFETS validation goal of 25 percent of all program analytical records indicates that the unvalidated data are adequate for project decisions. If additional V&V information is received, IHSS Group 400-10 records will be updated in the Soil Water Database. Data qualified as a result of additional data qualification will be assessed as part of the Comprehensive Risk Assessment process. Data collected and used for IHSS Group 400-10 is adequate for decision-making.

**Table 15**  
**Validation and Verification Summary**

Validation Code	Number of Records	Radionuclides	Metals	SVOCs	VOCs
No V&V	1030	1025	0	0	5
J	870	0	867	0	3
J1	48	0	48	0	0
R	30	0	30	0	0
V	6896	0	1183	474	5239
V1	72	0	72	0	0
JB	46	0	0	0	46
UJ	353	0	152	0	201
UJ1	4	0	4	0	0
Total	9349	1025	2356	474	5494
Total Validated	7842	0	2080	474	5288
% Validated	84%	0%	88%	100%	96%
Total Verified	8319	0	2356	474	5489
% Verified	89%	0%	100%	100%	100%
% Rejected	0.32%	0.00%	1.27%	0.00%	0.00%

KEY:  
 1, V1 - Verified  
 J, J1 - Estimated  
 UJ, UJ1 - Estimated detection limit  
 V - Validated  
 R - Rejected

## **5.0 REFERENCES**

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