Data Summary Report
IHSS Group 600-5

PAC 600-1004 – Central Avenue Ditch Cleaning

July 2004

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Approval received from the Colorado Department of Public Health and Environment
June 18, 2004.
Approval letter contained in the Administrative Record.

July 2004

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Compact Disc Containing Standardized Real and Quality Control Data

ACRONYMS

AAESE	Accelerated Action Ecological Screening Evaluation
AL	action level
AR	Administrative Record
ASD	Analytical Services Division
CAS No.	Chemical Abstract Service Number
CD	compact disk
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	contaminant of concern
CRA	Comprehensive Risk Assessment
DOE	U.S. Department of Energy
DQA	Data Quality Assessment
DQO	data quality objective
EB	equipment blank
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ER RSOP	Environmental Restoration RSOP for Routine Soil Remediation
FB	field blank
ft	feet
FY	Fiscal Year
HRR	Historical Release Report
IA	Industrial Area
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
IM/IRA	Interim Measure/Interim Remedial Action
IMP	Integrated Monitoring Program
K-H	Kaiser-Hill Company, L.L.C.
LCS	laboratory control sample
ug/kg	micrograms per kilogram
ug/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
NA	not applicable
NFAA	No Further Accelerated Action
PAC	Potential Area of Concern
PARCCS	precision, accuracy, representativeness, completeness, comparability, and sensitivity
pCi/g	picocuries per gram
pCi/L	picocuries per liter
QC	Quality Control
RFCA	Rocky Flats Cleanup Agreement

RFETS or Site	Rocky Flats Environmental Technology Site
RIN	report identification number
RL	Reporting Limit
RNS	rinse blank
RPD	relative percent difference
RSOP	RFCA Standard Operating Protocol
SAP	Sampling and Analysis Plan
SBD	sample beginning depth
SED	sample end depth
SOR	sum of ratios
SSRS	Subsurface Soil Risk Screen
SVOC	semivolatile organic compound
SWD	Soil Water Database
TB	trip blank
V&V	verification and validation
VOC	volatile organic compound
WRW	wildlife refuge worker

1.0 INTRODUCTION

This Data Summary Report summarizes accelerated action characterization conducted at Individual Hazardous Substance Site (IHSS) Group 600-5 at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado. These activities were planned and executed in accordance with the Industrial Area (IA) Sampling and Analysis Plan (SAP) (IASAP) (DOE 2001) and IASAP Addendum #IA-04-09 (DOE 2004). Results are compared to wildlife refuge worker (WRW) action levels (ALs) described in the Rocky Flats Cleanup Agreement (RFCA) Modification (DOE et al. 2003). Potential ecological risk associated with the results will be evaluated in the Accelerated Action Ecological Screening Evaluation (AAESE) and the ecological portion of the Sitewide Comprehensive Risk Assessment (CRA).

This IHSS Group consists of one Potential Area of Concern (PAC):

- PAC 600-1004 – Central Avenue Ditch Cleaning.

The location of IHSS Group 600-5 and PAC 600-1004 are shown on Figure 1.

Approval of this Data Summary Report constitutes regulatory agency concurrence of IHSS Group 600-5 as a No Further Accelerated Action (NFAA) Site. This information and NFAA determination will be documented in the Fiscal Year (FY) 2004 Historical Release Report (HRR).

2.0 SITE CHARACTERIZATION

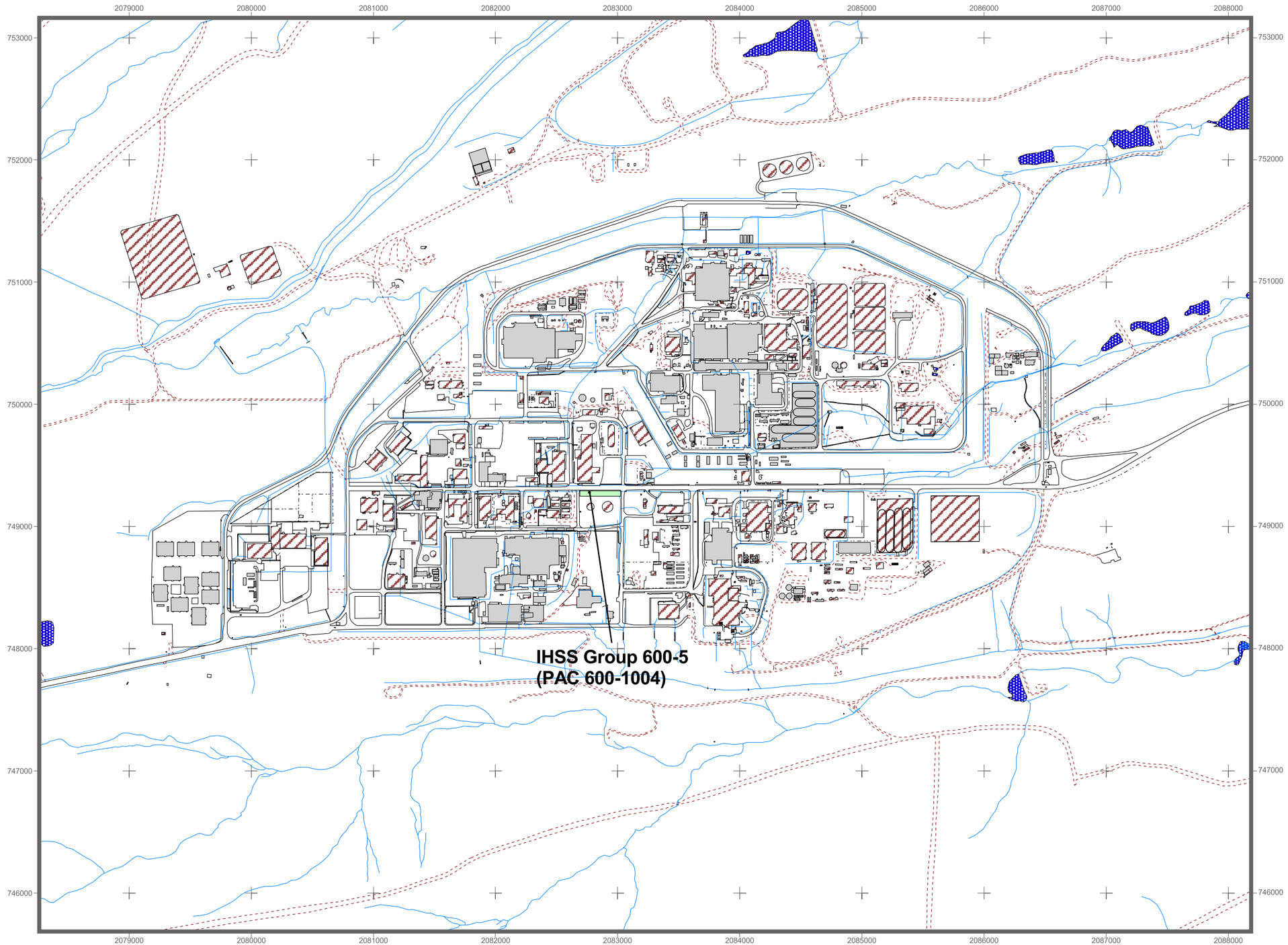
IHSS Group 600-5 information consists of historical knowledge (DOE 1992-2003), historical sampling data, and recent sampling data. Historical information and data are summarized in Section 2.1. Characterization data collected in accordance with IASAP Addendum #IA-04-09 (DOE 2004) are presented in Section 2.2.

2.1 Historical Information and Data

PAC 600-1004 is an area of potentially contaminated soil previously removed from the Central Avenue Ditch, and spread on the level area adjacent to the two large fuel oil tanks that were located at the southwestern corner of Central Avenue and Seventh Street (IHSS 152). This activity was observed by the Colorado Department of Health (now the Colorado Department of Public Health and Environment [CDPHE]) in September 1993, and the operation was immediately shut down due to the potential of cross-contaminating IHSSs. PAC 600-1004 is the area where the excavated soil was spread, and is designated as Central Avenue Ditch Cleaning.

Existing information and data for this IHSS are available in Appendix C of the IASAP (DOE 2001), the Historical Release Reports (HRRs) (DOE 1992-2003), and the Final Closeout Report for IHSS Group 600-2 (PAC 400-802, Storage Shed South of Building 334) (DOE 2003a).

Figure 1
IHSS Group 600-5
Location Map



KEY

- Dirt road
- Paved road
- Stream, drainage, or ditch
- Fence
- PAC
- Pond

Structure

- Demolished
- Standing

N
W E
S

500 0 500 1000 Feet

Scale = 1:10,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Prepared by:

RADMS

Date: May 2004

Prepared for:

KAISER•HILL COMPANY

File: w:\projects\fy2004\600-5\data_summary\av_projects\600-5_dsr_041904.apr

2.2 Accelerated Action Characterization Data

The characterization of PAC 600-1004 involved 14 sampling locations. Sampling and analysis specifications for 9 of these locations (BZ39-034, CA39-013-01, CA39-014, CA39-015, CA39-016, CB39-005, CB39-006, CB39-007, and CB39-008) were described in IASAP Addendum #IA-04-09 (DOE 2004). Deviations from these specifications are summarized in Table 1. Deviations associated with the 5 other locations (BZ39-005, CA39-000, CA39-002, CA39-012, and CA39-013) are discussed as part of the Final Closeout Report for IHSS Group 600-2 (PAC 400-802, Storage Shed South of Building 334) (DOE 2003a). These deviations were documented and approved in an ER Regulatory Contact Record dated April 13, 2004 (Appendix A). A summary of the actual sampling and analysis is presented in Table 2.

Accelerated action soil sampling locations and analytical results for IHSS Group 600-5 are summarized in Table 3, and shown on Figures 2 and 3 for surface and subsurface soil, respectively. Only results greater than background means plus two standard deviations or reporting limits (RLs) are shown. Data show that all contaminant concentrations are less than RFCA WRW ALs. The data, retrieved from the RFETS Soil Water Database (SWD) are provided on the enclosed compact disc. The compact disc contains standardized real and quality control (QC) data (Chemical Abstracts Service numbers [CAS No.], analyte names, and units).

Table 1
IHSS Group 600-5 Characterization Sampling Deviations

IHSS/PAC/UBC Site	Location	Proposed Northing	Proposed Easting	Actual Northing	Actual Easting	Media	Actual Depth (ft)	Actual Analyte	Comments
PAC 600-1004	BZ39-034	749278.927	2082701.224	749272.940	2082701.365	Surface soil	0.0-0.5	Metals Radionuclides SVOCs	Biased sample relocated 6 feet south of location in approved SAP (this location did not target a specific release, was intended for additional aerial coverage only). B interval shortened due to sampling refusal.
						Subsurface soil	0.5-1.0	Metals Radionuclides SVOCs VOCs	
	CA39-013-01	749248.448	2082873.101	749248.424	2082873.061	Surface soil	0.0-0.5	Metals Radionuclides SVOCs	B interval shortened due to sampling refusal.
						Subsurface soil	0.5-1.5	Metals Radionuclides SVOCs VOCs	
	CA39-014	749273.510	2082847.257	749273.462	2082847.279	Surface soil	0.0-0.5	Metals Radionuclides SVOCs	B interval shortened due to sampling refusal.
						Subsurface soil	0.5-1.5	Metals Radionuclides SVOCs VOCs	
	CA39-015	749258.298	2082907.727	749258.328	2082907.733	Surface soil	0.0-0.5	Metals Radionuclides SVOCs	B interval shortened due to sampling refusal.
						Subsurface soil	0.5-2.0	Metals Radionuclides SVOCs VOCs	
	CA39-016	749283.360	2082881.883	749274.662	2082882.379	Surface soil	0.0-0.5	Metals Radionuclides SVOCs	Statistical sample relocated 8.5 feet south of proposed location due to utility corridor interference. B interval shortened due to sampling refusal.
						Subsurface soil	0.5-2.0	Metals Radionuclides SVOCs VOCs	

IHSS/PAC/UBC Site	Location	Proposed Northing	Proposed Easting	Actual Northing	Actual Easting	Media	Actual Depth (ft)	Actual Analyte	Comments
	CB39-005	749268.148	2082942.353	749268.185	2082942.394	Surface soil	0.0-0.5	Metals Radionuclides SVOCs	B interval shortened due to sampling refusal.
						Subsurface soil	0.5-2.0	Metals Radionuclides SVOCs VOCs	
	CB39-006	749252.936	2083002.823	749252.906	2083002.891	Surface soil	0.0-0.5	Metals Radionuclides SVOCs	No deviations from the planned sampling specification.
						Subsurface soil	0.5-2.5	Metals Radionuclides SVOCs VOCs	
	CB39-007	749277.998	2082976.979	749277.977	2082977.024	Surface soil	0.0-0.5	Metals Radionuclides SVOCs	B interval shortened due to sampling refusal.
						Subsurface soil	0.5-1.5	Metals Radionuclides SVOCs VOCs	
	CB39-008	749287.848	2083011.606	749281.859	2083011.585	Surface soil	0.0-0.5	Metals Radionuclides SVOCs	Statistical sample relocated 3.5 feet south of proposed location due to utility corridor interference.
						Subsurface soil	0.5-2.5	Metals Radionuclides SVOCs VOCs	

Table 2
IHSS Group 600-5 Sampling and Analysis Summary

IHSS Group	Category	Total Number of Samples Collected
600-5	Number of Sampling Locations	9
	Number of Samples	18
	Number of Metal Analyses	18
	Number of Radionuclide Analyses	18
	Number of SVOC Analyses	18
	Number of VOC Analyses	9
600-2	Number of Sampling Locations	5
	Number of Samples	10
	Number of Metal Analyses	6
	Number of Radionuclide Analyses	8
	Number of SVOC Analyses	6
	Number of VOC Analyses	8

Table 3
IHSS Group 600-5 Results Greater Than Background Means Plus Two Standard Deviations or Reporting Limits

IHSS, PAC, or UBC Site	Location Code	Actual Easting	Actual Northing	Start Depth (ft)	End Depth (ft)	Analyte	Result	Reporting Limit	Background Mean Plus Two Standard Deviations	WRW AL	Units
PAC 600-1004	BZ39-034	749278.910	2082701.200	0.00	0.50	Acenaphthene	130.000	32.000	-	40800000.000	ug/kg
	BZ39-034	749278.910	2082701.200	0.00	0.50	Anthracene	240.000	25.000	-	204000000.000	ug/kg
	BZ39-034	749278.910	2082701.200	0.00	0.50	Benzo(a)anthracene	760.000	26.000	-	34900.000	ug/kg
	BZ39-034	749278.910	2082701.200	0.00	0.50	Benzo(a)pyrene	890.000	42.000	-	3490.000	ug/kg
	BZ39-034	749278.910	2082701.200	0.00	0.50	Benzo(b)fluoranthene	650.000	30.000	-	34900.000	ug/kg

IHSS, PAC, or UBC Site	Location Code	Actual Easting	Actual Northing	Start Depth (ft)	End Depth (ft)	Analyte	Result	Reporting Limit	Background Mean Plus Two Standard Deviations	WRW AL	Units
	BZ39-034	749278.910	2082701.200	0.00	0.50	Benzo(k)fluoranthene	820.000	33.000	-	349000.000	ug/kg
	BZ39-034	749278.910	2082701.200	0.00	0.50	Chrysene	930.000	29.000	-	3490000.000	ug/kg
	BZ39-034	749278.910	2082701.200	0.00	0.50	Dibenz(a,h)anthracene	310.000	26.000	-	3490.000	ug/kg
	BZ39-034	749278.910	2082701.200	0.00	0.50	Fluoranthene	1800.000	24.000	-	27200000.000	ug/kg
	BZ39-034	749278.910	2082701.200	0.00	0.50	Fluorene	110.000	35.000	-	40800000.000	ug/kg
	BZ39-034	749278.910	2082701.200	0.00	0.50	Indeno(1,2,3-cd)pyrene	590.000	24.000	-	34900.000	ug/kg
	BZ39-034	749278.910	2082701.200	0.00	0.50	Pyrene	1400.000	140.000	-	22100000.000	ug/kg
	BZ39-034	*749278.910*	*2082701.200*	*0.00*	*0.50*	*Uranium-234*	*3.373*	-	*2.253*	*300.000*	*pCi/g*
	BZ39-034	749278.910	2082701.200	0.00	0.50	Uranium-235	0.240	-	0.094	8.000	pCi/g
	BZ39-034	749278.910	2082701.200	0.00	0.50	Uranium-238	3.373	-	2.000	351.000	pCi/g
	BZ39-034	749278.910	2082701.200	0.50	1.00	Benzo(a)anthracene	47.000	28.000	-	34900.000	ug/kg
	BZ39-034	749278.910	2082701.200	0.50	1.00	Benzo(k)fluoranthene	53.000	36.000	-	349000.000	ug/kg
	BZ39-034	749278.910	2082701.200	0.50	1.00	Chrysene	56.000	31.000	-	3490000.000	ug/kg
	BZ39-034	749278.910	2082701.200	0.50	1.00	Fluoranthene	96.000	25.000	-	27200000.000	ug/kg
	BZ39-034	749278.910	2082701.200	0.50	1.00	Uranium-235	0.172	-	0.120	8.000	pCi/g
	BZ39-034	749278.910	2082701.200	0.50	1.00	Uranium-238	2.269	-	1.490	351.000	pCi/g
	CA39-013-01	749248.424	2082873.061	0.00	0.50	Benzo(a)anthracene	100.000	29.000	-	34900.000	ug/kg
	CA39-013-01	749248.424	2082873.061	0.00	0.50	Benzo(a)pyrene	130.000	46.000	-	3490.000	ug/kg
	CA39-013-01	749248.424	2082873.061	0.00	0.50	Benzo(b)fluoranthene	93.000	33.000	-	34900.000	ug/kg
	CA39-013-01	749248.424	2082873.061	0.00	0.50	Benzo(k)fluoranthene	110.000	37.000	-	349000.000	ug/kg
	CA39-013-01	749248.424	2082873.061	0.00	0.50	Chrysene	120.000	32.000	-	3490000.000	ug/kg
	CA39-013-01	749248.424	2082873.061	0.00	0.50	Fluoranthene	150.000	26.000	-	27200000.000	ug/kg
	CA39-013-01	749248.424	2082873.061	0.00	0.50	Indeno(1,2,3-cd)pyrene	110.000	26.000	-	34900.000	ug/kg
	CA39-013-01	*749248.424*	*2082873.061*	*0.00*	*0.50*	*Uranium-234*	*4.545*	-	*2.253*	*300.000*	*pCi/g*
	CA39-013-01	749248.424	2082873.061	0.00	0.50	Uranium-235	0.276	-	0.094	8.000	pCi/g
	CA39-013-01	749248.424	2082873.061	0.00	0.50	Uranium-238	4.545	-	2.000	351.000	pCi/g

IHSS, PAC, or UBC Site	Location Code	Actual Easting	Actual Northing	Start Depth (ft)	End Depth (ft)	Analyte	Result	Reporting Limit	Background Mean Plus Two Standard Deviations	WRW AL	Units
	CA39-013-01	*749248.424*	*2082873.061*	*0.50*	*1.50*	*Uranium-234*	*4.280*	-	*2.640*	*300.000*	*pCi/g*
	CA39-013-01	749248.424	2082873.061	0.50	1.50	Uranium-235	0.272	-	0.120	8.000	pCi/g
	CA39-013-01	749248.424	2082873.061	0.50	1.50	Uranium-238	4.280	-	1.490	351.000	pCi/g
	CA39-013-01	749248.424	2082873.061	0.50	1.50	Zinc	150.000	-	139.100	307000.000	mg/kg
	CA39-014	749273.462	2082847.279	0.00	0.50	Acenaphthene	63.000	33.000	-	40800000.000	ug/kg
	CA39-014	749273.462	2082847.279	0.00	0.50	Anthracene	210.000	25.000	-	204000000.000	ug/kg
	CA39-014	749273.462	2082847.279	0.00	0.50	Benzo(a)anthracene	530.000	26.000	-	34900.000	ug/kg
	CA39-014	749273.462	2082847.279	0.00	0.50	Benzo(a)pyrene	460.000	43.000	-	3490.000	ug/kg
	CA39-014	749273.462	2082847.279	0.00	0.50	Benzo(b)fluoranthene	370.000	31.000	-	34900.000	ug/kg
	CA39-014	749273.462	2082847.279	0.00	0.50	Benzo(k)fluoranthene	470.000	34.000	-	349000.000	ug/kg
	CA39-014	749273.462	2082847.279	0.00	0.50	Chrysene	590.000	30.000	-	3490000.000	ug/kg
	CA39-014	749273.462	2082847.279	0.00	0.50	Dibenz(a,h)anthracene	140.000	26.000	-	3490.000	ug/kg
	CA39-014	749273.462	2082847.279	0.00	0.50	Fluoranthene	1300.000	24.000	-	27200000.000	ug/kg
	CA39-014	749273.462	2082847.279	0.00	0.50	Fluorene	68.000	36.000	-	40800000.000	ug/kg
	CA39-014	749273.462	2082847.279	0.00	0.50	Indeno(1,2,3-cd)pyrene	290.000	24.000	-	34900.000	ug/kg
	CA39-014	749273.462	2082847.279	0.00	0.50	Pyrene	1000.000	140.000	-	22100000.000	ug/kg
	CA39-014	749273.462	2082847.279	0.00	0.50	Uranium-235	0.148	-	0.094	8.000	pCi/g
	CA39-014	749273.462	2082847.279	0.50	1.50	Acenaphthene	90.000	32.000	-	40800000.000	ug/kg
	CA39-014	749273.462	2082847.279	0.50	1.50	Anthracene	110.000	25.000	-	204000000.000	ug/kg
	CA39-014	749273.462	2082847.279	0.50	1.50	Benzo(a)anthracene	150.000	26.000	-	34900.000	ug/kg
	CA39-014	749273.462	2082847.279	0.50	1.50	Benzo(a)pyrene	160.000	42.000	-	3490.000	ug/kg
	CA39-014	749273.462	2082847.279	0.50	1.50	Benzo(b)fluoranthene	94.000	30.000	-	34900.000	ug/kg
	CA39-014	749273.462	2082847.279	0.50	1.50	Benzo(k)fluoranthene	140.000	33.000	-	349000.000	ug/kg
	CA39-014	749273.462	2082847.279	0.50	1.50	Chrysene	170.000	29.000	-	3490000.000	ug/kg
	CA39-014	749273.462	2082847.279	0.50	1.50	Dibenzofuran	39.000	37.000	-	2950000.000	ug/kg
	CA39-014	749273.462	2082847.279	0.50	1.50	Fluoranthene	420.000	24.000	-	27200000.000	ug/kg

IHSS, PAC, or UBC Site	Location Code	Actual Easting	Actual Northing	Start Depth (ft)	End Depth (ft)	Analyte	Result	Reporting Limit	Background Mean Plus Two Standard Deviations	WRW AL	Units
	CA39-014	749273.462	2082847.279	0.50	1.50	Fluorene	77.000	35.000	-	40800000.000	ug/kg
	CA39-014	749273.462	2082847.279	0.50	1.50	Naphthalene	63.000	33.000	-	3090000.000	ug/kg
	CA39-014	749273.462	2082847.279	0.50	1.50	Pyrene	370.000	140.000	-	22100000.000	ug/kg
	CA39-015	749258.328	2082907.733	0.00	0.50	Acenaphthene	62.000	35.000	-	40800000.000	ug/kg
	CA39-015	749258.328	2082907.733	0.00	0.50	Anthracene	61.000	27.000	-	204000000.000	ug/kg
	CA39-015	749258.328	2082907.733	0.00	0.50	Benzo(a)anthracene	120.000	28.000	-	34900.000	ug/kg
	CA39-015	749258.328	2082907.733	0.00	0.50	Benzo(a)pyrene	140.000	46.000	-	3490.000	ug/kg
	CA39-015	749258.328	2082907.733	0.00	0.50	Benzo(b)fluoranthene	88.000	33.000	-	34900.000	ug/kg
	CA39-015	749258.328	2082907.733	0.00	0.50	Benzo(k)fluoranthene	89.000	36.000	-	349000.000	ug/kg
	CA39-015	749258.328	2082907.733	0.00	0.50	bis(2-Ethylhexyl)phthalate	94.000	82.000	-	1970000.000	ug/kg
	CA39-015	749258.328	2082907.733	0.00	0.50	Chrysene	140.000	32.000	-	3490000.000	ug/kg
	CA39-015	749258.328	2082907.733	0.00	0.50	Fluoranthene	280.000	26.000	-	27200000.000	ug/kg
	CA39-015	749258.328	2082907.733	0.00	0.50	Plutonium-239/240	0.578	-	0.066	50.000	pCi/g
	CA39-015	749258.328	2082907.733	0.00	0.50	Pyrene	260.000	150.000	-	22100000.000	ug/kg
	CA39-015	749258.328	2082907.733	0.50	2.00	2-Methylnaphthalene	40.000	35.000	-	20400000.000	ug/kg
	CA39-015	749258.328	2082907.733	0.50	2.00	Acenaphthene	200.000	34.000	-	40800000.000	ug/kg
	CA39-015	749258.328	2082907.733	0.50	2.00	Anthracene	190.000	26.000	-	204000000.000	ug/kg
	CA39-015	749258.328	2082907.733	0.50	2.00	Benzo(a)anthracene	350.000	27.000	-	34900.000	ug/kg
	CA39-015	749258.328	2082907.733	0.50	2.00	Benzo(a)pyrene	360.000	44.000	-	3490.000	ug/kg
	CA39-015	749258.328	2082907.733	0.50	2.00	Benzo(b)fluoranthene	310.000	32.000	-	34900.000	ug/kg
	CA39-015	749258.328	2082907.733	0.50	2.00	Benzo(k)fluoranthene	280.000	35.000	-	349000.000	ug/kg
	CA39-015	749258.328	2082907.733	0.50	2.00	Chrysene	400.000	31.000	-	3490000.000	ug/kg
	CA39-015	749258.328	2082907.733	0.50	2.00	Dibenzofuran	66.000	40.000	-	2950000.000	ug/kg
	CA39-015	749258.328	2082907.733	0.50	2.00	Fluoranthene	990.000	25.000	-	27200000.000	ug/kg
	CA39-015	749258.328	2082907.733	0.50	2.00	Fluorene	150.000	38.000	-	40800000.000	ug/kg
	CA39-015	749258.328	2082907.733	0.50	2.00	Indeno(1,2,3-cd)pyrene	270.000	25.000	-	34900.000	ug/kg

IHSS, PAC, or UBC Site	Location Code	Actual Easting	Actual Northing	Start Depth (ft)	End Depth (ft)	Analyte	Result	Reporting Limit	Background Mean Plus Two Standard Deviations	WRW AL	Units
	CA39-015	749258.328	2082907.733	0.50	2.00	Naphthalene	110.000	35.000	-	3090000.000	ug/kg
	CA39-015	749258.328	2082907.733	0.50	2.00	Pyrene	890.000	150.000	-	22100000.000	ug/kg
	CA39-016	749274.662	2082882.379	0.00	0.50	Anthracene	43.000	24.000	-	204000000.000	ug/kg
	CA39-016	749274.662	2082882.379	0.00	0.50	Benzo(a)anthracene	110.000	25.000	-	34900.000	ug/kg
	CA39-016	749274.662	2082882.379	0.00	0.50	Benzo(a)pyrene	140.000	40.000	-	3490.000	ug/kg
	CA39-016	749274.662	2082882.379	0.00	0.50	Benzo(b)fluoranthene	100.000	29.000	-	34900.000	ug/kg
	CA39-016	749274.662	2082882.379	0.00	0.50	Benzo(k)fluoranthene	140.000	32.000	-	349000.000	ug/kg
	CA39-016	749274.662	2082882.379	0.00	0.50	bis(2-Ethylhexyl)phthalate	130.000	72.000	-	1970000.000	ug/kg
	CA39-016	749274.662	2082882.379	0.00	0.50	Chrysene	140.000	28.000	-	3490000.000	ug/kg
	CA39-016	749274.662	2082882.379	0.00	0.50	Fluoranthene	270.000	23.000	-	27200000.000	ug/kg
	CA39-016	749274.662	2082882.379	0.00	0.50	Indeno(1,2,3-cd)pyrene	86.000	23.000	-	34900.000	ug/kg
	CA39-016	749274.662	2082882.379	0.00	0.50	Pyrene	240.000	130.000	-	22100000.000	ug/kg
	CA39-016	749274.662	2082882.379	0.00	0.50	Uranium-235	0.138	-	0.094	8.000	pCi/g
	CA39-016	749274.662	2082882.379	0.50	2.00	Benzo(a)anthracene	120.000	25.000	-	34900.000	ug/kg
	CA39-016	749274.662	2082882.379	0.50	2.00	Benzo(a)pyrene	140.000	41.000	-	3490.000	ug/kg
	CA39-016	749274.662	2082882.379	0.50	2.00	Benzo(b)fluoranthene	150.000	30.000	-	34900.000	ug/kg
	CA39-016	749274.662	2082882.379	0.50	2.00	Benzo(k)fluoranthene	99.000	33.000	-	349000.000	ug/kg
	CA39-016	749274.662	2082882.379	0.50	2.00	Chrysene	160.000	29.000	-	3490000.000	ug/kg
	CA39-016	749274.662	2082882.379	0.50	2.00	Fluoranthene	270.000	23.000	-	27200000.000	ug/kg
	CA39-016	749274.662	2082882.379	0.50	2.00	Indeno(1,2,3-cd)pyrene	110.000	23.000	-	34900.000	ug/kg
	CA39-016	749274.662	2082882.379	0.50	2.00	Pyrene	250.000	140.000	-	22100000.000	ug/kg
	CA39-016	749274.662	2082882.379	0.50	2.00	Uranium-235	0.150	-	0.120	8.000	pCi/g
	CB39-005	749268.185	2082942.394	0.00	0.50	Acenaphthene	220.000	36.000	-	40800000.000	ug/kg
	CB39-005	749268.185	2082942.394	0.00	0.50	Anthracene	240.000	27.000	-	204000000.000	ug/kg
	CB39-005	749268.185	2082942.394	0.00	0.50	Benzo(a)anthracene	510.000	29.000	-	34900.000	ug/kg
	CB39-005	749268.185	2082942.394	0.00	0.50	Benzo(a)pyrene	550.000	47.000	-	3490.000	ug/kg

IHSS, PAC, or UBC Site	Location Code	Actual Easting	Actual Northing	Start Depth (ft)	End Depth (ft)	Analyte	Result	Reporting Limit	Background Mean Plus Two Standard Deviations	WRW AL	Units
	CB39-005	749268.185	2082942.394	0.00	0.50	Benzo(b)fluoranthene	390.000	33.000	-	34900.000	ug/kg
	CB39-005	749268.185	2082942.394	0.00	0.50	Benzo(k)fluoranthene	510.000	37.000	-	349000.000	ug/kg
	CB39-005	749268.185	2082942.394	0.00	0.50	bis(2-Ethylhexyl)phthalate	96.000	83.000	-	1970000.000	ug/kg
	CB39-005	749268.185	2082942.394	0.00	0.50	Chrysene	630.000	32.000	-	3490000.000	ug/kg
	CB39-005	749268.185	2082942.394	0.00	0.50	Dibenzofuran	72.000	42.000	-	2950000.000	ug/kg
	CB39-005	749268.185	2082942.394	0.00	0.50	Fluoranthene	1400.000	26.000	-	27200000.000	ug/kg
	CB39-005	749268.185	2082942.394	0.00	0.50	Fluorene	160.000	39.000	-	40800000.000	ug/kg
	CB39-005	749268.185	2082942.394	0.00	0.50	Indeno(1,2,3-cd)pyrene	420.000	26.000	-	34900.000	ug/kg
	CB39-005	749268.185	2082942.394	0.00	0.50	Iron	20000.000	-	18037.000	307000.000	mg/kg
	CB39-005	749268.185	2082942.394	0.00	0.50	Naphthalene	79.000	37.000	-	3090000.000	ug/kg
	CB39-005	749268.185	2082942.394	0.00	0.50	Pyrene	1200.000	160.000	-	22100000.000	ug/kg
	CB39-005	*749268.185*	*2082942.394*	*0.00*	*0.50*	*Uranium-234*	*4.753*	-	*2.253*	*300.000*	*pCi/g*
	CB39-005	749268.185	2082942.394	0.00	0.50	Uranium-235	0.365	-	0.094	8.000	pCi/g
	CB39-005	749268.185	2082942.394	0.00	0.50	Uranium-238	4.753	-	2.000	351.000	pCi/g
	CB39-005	749268.185	2082942.394	0.50	2.00	Acenaphthene	150.000	33.000	-	40800000.000	ug/kg
	CB39-005	749268.185	2082942.394	0.50	2.00	Anthracene	170.000	26.000	-	204000000.000	ug/kg
	CB39-005	749268.185	2082942.394	0.50	2.00	Benzo(a)anthracene	360.000	27.000	-	34900.000	ug/kg
	CB39-005	749268.185	2082942.394	0.50	2.00	Benzo(a)pyrene	430.000	43.000	-	3490.000	ug/kg
	CB39-005	749268.185	2082942.394	0.50	2.00	Benzo(b)fluoranthene	390.000	31.000	-	34900.000	ug/kg
	CB39-005	749268.185	2082942.394	0.50	2.00	Benzo(k)fluoranthene	310.000	34.000	-	349000.000	ug/kg
	CB39-005	749268.185	2082942.394	0.50	2.00	Chrysene	450.000	30.000	-	3490000.000	ug/kg
	CB39-005	749268.185	2082942.394	0.50	2.00	Dibenzofuran	48.000	39.000	-	2950000.000	ug/kg
	CB39-005	749268.185	2082942.394	0.50	2.00	Fluoranthene	1100.000	24.000	-	27200000.000	ug/kg
	CB39-005	749268.185	2082942.394	0.50	2.00	Fluorene	110.000	37.000	-	40800000.000	ug/kg
	CB39-005	749268.185	2082942.394	0.50	2.00	Indeno(1,2,3-cd)pyrene	300.000	24.000	-	34900.000	ug/kg
	CB39-005	749268.185	2082942.394	0.50	2.00	Pyrene	890.000	140.000	-	22100000.000	ug/kg

IHSS, PAC, or UBC Site	Location Code	Actual Easting	Actual Northing	Start Depth (ft)	End Depth (ft)	Analyte	Result	Reporting Limit	Background Mean Plus Two Standard Deviations	WRW AL	Units
	CB39-005	*749268.185*	*2082942.394*	*0.50*	*2.00*	*Uranium-234*	*5.150*	-	*2.640*	*300.000*	*pCi/g*
	CB39-005	749268.185	2082942.394	0.50	2.00	Uranium-235	0.271	-	0.120	8.000	pCi/g
	CB39-005	749268.185	2082942.394	0.50	2.00	Uranium-238	5.150	-	1.490	351.000	pCi/g
	CB39-006	749252.906	2083002.891	0.00	0.50	Benzo(a)anthracene	72.000	28.000	-	34900.000	ug/kg
	CB39-006	749252.906	2083002.891	0.00	0.50	Benzo(b)fluoranthene	60.000	33.000	-	34900.000	ug/kg
	CB39-006	749252.906	2083002.891	0.00	0.50	Benzo(k)fluoranthene	80.000	36.000	-	349000.000	ug/kg
	CB39-006	749252.906	2083002.891	0.00	0.50	Chrysene	93.000	32.000	-	3490000.000	ug/kg
	CB39-006	749252.906	2083002.891	0.00	0.50	Fluoranthene	150.000	26.000	-	27200000.000	ug/kg
	CB39-006	*749252.906*	*2083002.891*	*0.00*	*0.50*	*Uranium-234*	*2.375*	-	*2.253*	*300.000*	*pCi/g*
	CB39-006	749252.906	2083002.891	0.00	0.50	Uranium-235	0.128	-	0.094	8.000	pCi/g
	CB39-006	749252.906	2083002.891	0.00	0.50	Uranium-238	2.375	-	2.000	351.000	pCi/g
	CB39-006	749252.906	2083002.891	0.50	2.50	Uranium-235	0.162	-	0.120	8.000	pCi/g
	CB39-006	749252.906	2083002.891	0.50	2.50	Uranium-238	1.979	-	1.490	351.000	pCi/g
	CB39-007	749277.977	2082977.024	0.00	0.50	Acenaphthene	110.000	33.000	-	40800000.000	ug/kg
	CB39-007	749277.977	2082977.024	0.00	0.50	Anthracene	160.000	25.000	-	204000000.000	ug/kg
	CB39-007	749277.977	2082977.024	0.00	0.50	Benzo(a)anthracene	430.000	26.000	-	34900.000	ug/kg
	CB39-007	749277.977	2082977.024	0.00	0.50	Benzo(a)pyrene	520.000	43.000	-	3490.000	ug/kg
	CB39-007	749277.977	2082977.024	0.00	0.50	Benzo(b)fluoranthene	360.000	31.000	-	34900.000	ug/kg
	CB39-007	749277.977	2082977.024	0.00	0.50	Benzo(k)fluoranthene	500.000	34.000	-	349000.000	ug/kg
	CB39-007	749277.977	2082977.024	0.00	0.50	Chrysene	510.000	29.000	-	3490000.000	ug/kg
	CB39-007	749277.977	2082977.024	0.00	0.50	Dibenz(a,h)anthracene	170.000	26.000	-	3490.000	ug/kg
	CB39-007	749277.977	2082977.024	0.00	0.50	Fluoranthene	960.000	24.000	-	27200000.000	ug/kg
	CB39-007	749277.977	2082977.024	0.00	0.50	Fluorene	81.000	36.000	-	40800000.000	ug/kg
	CB39-007	749277.977	2082977.024	0.00	0.50	Indeno(1,2,3-cd)pyrene	390.000	24.000	-	34900.000	ug/kg
	CB39-007	749277.977	2082977.024	0.00	0.50	Pyrene	870.000	140.000	-	22100000.000	ug/kg
	CB39-007	749277.977	2082977.024	0.00	0.50	Uranium-235	0.116	-	0.094	8.000	pCi/g

IHSS, PAC, or UBC Site	Location Code	Actual Easting	Actual Northing	Start Depth (ft)	End Depth (ft)	Analyte	Result	Reporting Limit	Background Mean Plus Two Standard Deviations	WRW AL	Units
	CB39-007	749277.977	2082977.024	0.50	1.50	Acenaphthene	93.000	32.000	-	40800000.000	ug/kg
	CB39-007	749277.977	2082977.024	0.50	1.50	Anthracene	140.000	25.000	-	204000000.000	ug/kg
	CB39-007	749277.977	2082977.024	0.50	1.50	Benzo(a)anthracene	410.000	26.000	-	34900.000	ug/kg
	CB39-007	749277.977	2082977.024	0.50	1.50	Benzo(a)pyrene	460.000	42.000	-	3490.000	ug/kg
	CB39-007	749277.977	2082977.024	0.50	1.50	Benzo(b)fluoranthene	360.000	30.000	-	34900.000	ug/kg
	CB39-007	749277.977	2082977.024	0.50	1.50	Benzo(k)fluoranthene	400.000	33.000	-	349000.000	ug/kg
	CB39-007	749277.977	2082977.024	0.50	1.50	Chrysene	520.000	29.000	-	3490000.000	ug/kg
	CB39-007	749277.977	2082977.024	0.50	1.50	Fluoranthene	940.000	24.000	-	27200000.000	ug/kg
	CB39-007	749277.977	2082977.024	0.50	1.50	Fluorene	71.000	35.000	-	40800000.000	ug/kg
	CB39-007	749277.977	2082977.024	0.50	1.50	Indeno(1,2,3-cd)pyrene	320.000	24.000	-	34900.000	ug/kg
	CB39-007	749277.977	2082977.024	0.50	1.50	Pyrene	770.000	140.000	-	22100000.000	ug/kg
	CB39-007	749277.977	2082977.024	0.50	1.50	Uranium-235	0.174	-	0.120	8.000	pCi/g
	CB39-008	749281.859	2083011.585	0.00	0.50	2-Methylnaphthalene	60.000	33.000	-	20400000.000	ug/kg
	CB39-008	749281.859	2083011.585	0.00	0.50	Acenaphthene	270.000	32.000	-	40800000.000	ug/kg
	CB39-008	749281.859	2083011.585	0.00	0.50	Anthracene	280.000	24.000	-	204000000.000	ug/kg
	CB39-008	749281.859	2083011.585	0.00	0.50	Benzo(a)anthracene	680.000	25.000	-	34900.000	ug/kg
	CB39-008	749281.859	2083011.585	0.00	0.50	Benzo(a)pyrene	720.000	41.000	-	3490.000	ug/kg
	CB39-008	749281.859	2083011.585	0.00	0.50	Benzo(b)fluoranthene	630.000	30.000	-	34900.000	ug/kg
	CB39-008	749281.859	2083011.585	0.00	0.50	Benzo(k)fluoranthene	570.000	33.000	-	349000.000	ug/kg
	CB39-008	749281.859	2083011.585	0.00	0.50	bis(2-Ethylhexyl)phthalate	180.000	74.000	-	1970000.000	ug/kg
	CB39-008	749281.859	2083011.585	0.00	0.50	Chrysene	820.000	29.000	-	3490000.000	ug/kg
	CB39-008	749281.859	2083011.585	0.00	0.50	Fluoranthene	1600.000	23.000	-	27200000.000	ug/kg
	CB39-008	749281.859	2083011.585	0.00	0.50	Fluorene	190.000	35.000	-	40800000.000	ug/kg
	CB39-008	749281.859	2083011.585	0.00	0.50	Indeno(1,2,3-cd)pyrene	490.000	23.000	-	34900.000	ug/kg
	CB39-008	749281.859	2083011.585	0.00	0.50	Naphthalene	150.000	33.000	-	3090000.000	ug/kg
	CB39-008	749281.859	2083011.585	0.00	0.50	Pyrene	1300.000	140.000	-	22100000.000	ug/kg

IHSS, PAC, or UBC Site	Location Code	Actual Easting	Actual Northing	Start Depth (ft)	End Depth (ft)	Analyte	Result	Reporting Limit	Background Mean Plus Two Standard Deviations	WRW AL	Units
	CB39-008	749281.859	2083011.585	0.00	0.50	Zinc	130.000	-	73.760	307000.000	mg/kg
	CB39-008	749281.859	2083011.585	0.50	2.50	Acenaphthene	73.000	31.000	-	40800000.000	ug/kg
	CB39-008	749281.859	2083011.585	0.50	2.50	Anthracene	92.000	24.000	-	204000000.000	ug/kg
	CB39-008	749281.859	2083011.585	0.50	2.50	Benzo(a)anthracene	260.000	25.000	-	34900.000	ug/kg
	CB39-008	749281.859	2083011.585	0.50	2.50	Benzo(a)pyrene	280.000	41.000	-	3490.000	ug/kg
	CB39-008	749281.859	2083011.585	0.50	2.50	Benzo(b)fluoranthene	200.000	29.000	-	34900.000	ug/kg
	CB39-008	749281.859	2083011.585	0.50	2.50	Benzo(k)fluoranthene	250.000	33.000	-	349000.000	ug/kg
	CB39-008	749281.859	2083011.585	0.50	2.50	bis(2-Ethylhexyl)phthalate	79.000	73.000	-	1970000.000	ug/kg
	CB39-008	749281.859	2083011.585	0.50	2.50	Chrysene	320.000	28.000	-	3490000.000	ug/kg
	CB39-008	749281.859	2083011.585	0.50	2.50	Fluoranthene	650.000	23.000	-	27200000.000	ug/kg
	CB39-008	749281.859	2083011.585	0.50	2.50	Fluorene	57.000	35.000	-	40800000.000	ug/kg
	CB39-008	749281.859	2083011.585	0.50	2.50	Indeno(1,2,3-cd)pyrene	200.000	23.000	-	34900.000	ug/kg
	CB39-008	749281.859	2083011.585	0.50	2.50	Lead	63.100	-	24.970	1000.000	mg/kg
	CB39-008	749281.859	2083011.585	0.50	2.50	Pyrene	580.000	140.000	-	22100000.000	ug/kg
	CB39-008	749281.859	2083011.585	0.50	2.50	Zinc	150.000	-	139.100	307000.000	mg/kg
IHSS 157.1	BZ39-005	749251.806	2082717.533	0.00	0.50	Acenaphthene	130.000	46.000	-	40800000.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.00	0.50	Anthracene	170.000	79.000	-	204000000.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.00	0.50	Benzo(a)anthracene	340.000	39.000	-	34900.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.00	0.50	Benzo(a)pyrene	400.000	95.000	-	3490.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.00	0.50	Benzo(b)fluoranthene	340.000	100.000	-	34900.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.00	0.50	Benzo(k)fluoranthene	330.000	94.000	-	349000.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.00	0.50	Chrysene	410.000	54.000	-	3490000.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.00	0.50	Fluoranthene	980.000	85.000	-	27200000.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.00	0.50	Indeno(1,2,3-cd)pyrene	300.000	48.000	-	34900.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.00	0.50	Pyrene	780.000	40.000	-	22100000.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.00	0.50	**Uranium-235	0.095	-	0.094	8.000	pCi/g

IHSS, PAC, or UBC Site	Location Code	Actual Easting	Actual Northing	Start Depth (ft)	End Depth (ft)	Analyte	Result	Reporting Limit	Background Mean Plus Two Standard Deviations	WRW AL	Units
	BZ39-005	749251.806	2082717.533	0.50	0.58	Acenaphthene	120.000	47.000	-	40800000.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.50	0.58	Anthracene	280.000	80.000	-	204000000.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.50	0.58	Benzo(a)anthracene	820.000	40.000	-	34900.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.50	0.58	Benzo(a)pyrene	890.000	96.000	-	3490.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.50	0.58	Benzo(b)fluoranthene	700.000	100.000	-	34900.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.50	0.58	Benzo(k)fluoranthene	720.000	95.000	-	349000.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.50	0.58	Chrysene	960.000	55.000	-	3490000.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.50	0.58	Fluoranthene	1600.000	86.000	-	27200000.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.50	0.58	Indeno(1,2,3-cd)pyrene	660.000	49.000	-	34900.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.50	0.58	Lead	39.100	-	24.970	1000.000	mg/kg
	BZ39-005	749251.806	2082717.533	0.50	0.58	Pyrene	1600.000	41.000	-	22100000.000	ug/kg
	BZ39-005	749251.806	2082717.533	0.50	0.58	Tetrachloroethene	1.900	1.000	-	615000.000	ug/kg
	CA39-000	749277.090	2082768.855	0.00	0.33	Anthracene	86.000	80.000	-	204000000.000	ug/kg
	CA39-000	749277.090	2082768.855	0.00	0.33	Benzo(a)anthracene	300.000	40.000	-	34900.000	ug/kg
	CA39-000	749277.090	2082768.855	0.00	0.33	Benzo(a)pyrene	330.000	96.000	-	3490.000	ug/kg
	CA39-000	749277.090	2082768.855	0.00	0.33	Benzo(b)fluoranthene	240.000	100.000	-	34900.000	ug/kg
	CA39-000	749277.090	2082768.855	0.00	0.33	Benzo(k)fluoranthene	260.000	95.000	-	349000.000	ug/kg
	CA39-000	749277.090	2082768.855	0.00	0.33	Chrysene	330.000	55.000	-	3490000.000	ug/kg
	CA39-000	749277.090	2082768.855	0.00	0.33	Fluoranthene	650.000	86.000	-	27200000.000	ug/kg
	CA39-000	749277.090	2082768.855	0.00	0.33	Indeno(1,2,3-cd)pyrene	250.000	49.000	-	34900.000	ug/kg
	CA39-000	749277.090	2082768.855	0.00	0.33	Pyrene	630.000	41.000	-	22100000.000	ug/kg
	CA39-000	749277.090	2082768.855	0.00	0.33	**Uranium-235	0.168	-	0.094	8.000	pCi/g
PAC 400-802	CA39-002	749253.099	2082801.073	0.00	0.50	Antimony	10.000	-	0.470	409.000	mg/kg
	CA39-002	749253.099	2082801.073	0.00	0.50	Barium	607.000	-	141.260	26400.000	mg/kg
	CA39-002	749253.099	2082801.073	0.00	0.50	Benzo(a)anthracene	48.000	41.000	-	34900.000	ug/kg
	CA39-002	749253.099	2082801.073	0.00	0.50	bis(2-Ethylhexyl)phthalate	160.000	72.000	-	1970000.000	ug/kg

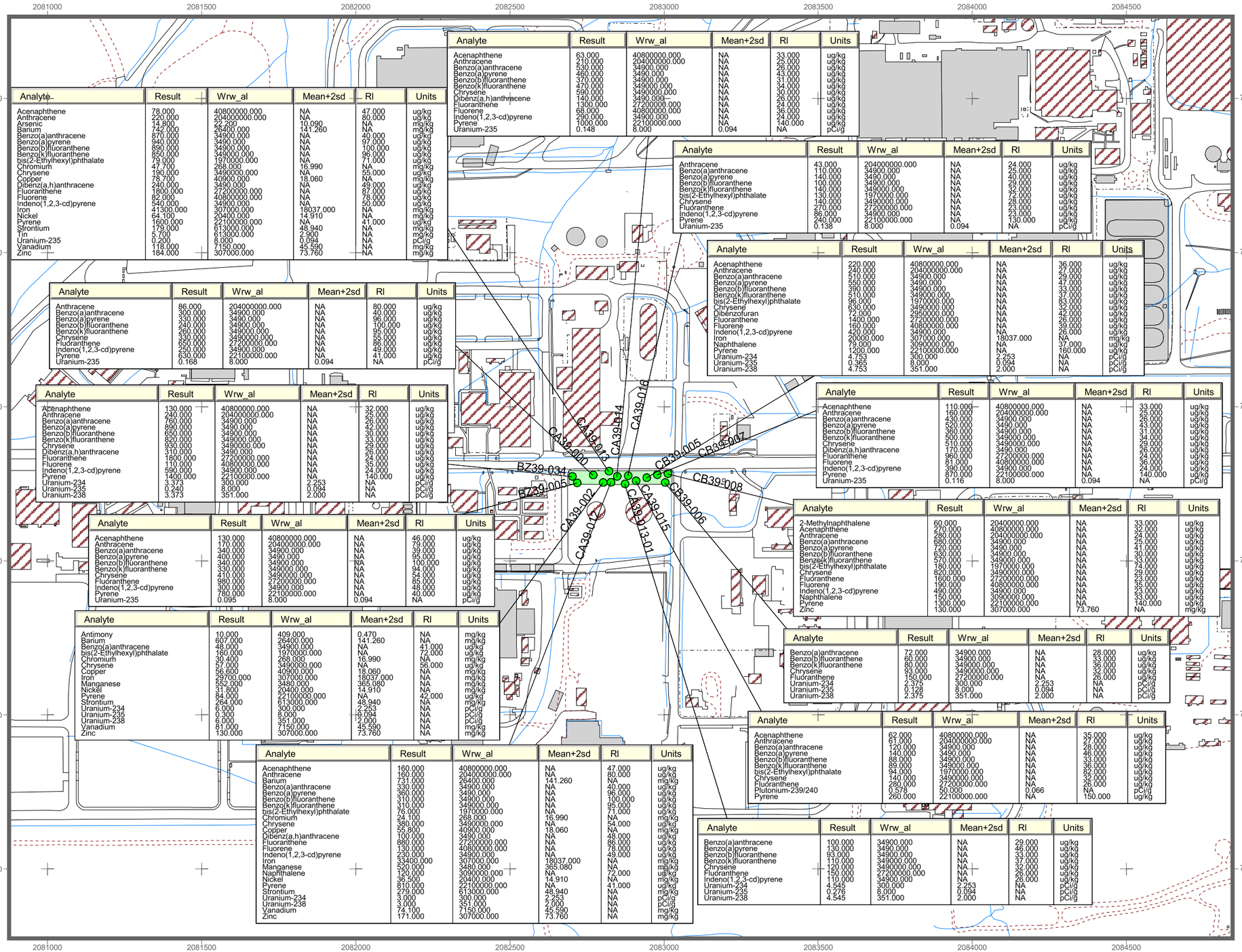
IHSS, PAC, or UBC Site	Location Code	Actual Easting	Actual Northing	Start Depth (ft)	End Depth (ft)	Analyte	Result	Reporting Limit	Background Mean Plus Two Standard Deviations	WRW AL	Units
	CA39-002	749253.099	2082801.073	0.00	0.50	Chromium	30.400	-	16.990	268.000	mg/kg
	CA39-002	749253.099	2082801.073	0.00	0.50	Chrysene	57.000	56.000	-	3490000.000	ug/kg
	CA39-002	749253.099	2082801.073	0.00	0.50	Copper	56.600	-	18.060	40900.000	mg/kg
	CA39-002	749253.099	2082801.073	0.00	0.50	Iron	29700.000	-	18037.000	307000.000	mg/kg
	CA39-002	749253.099	2082801.073	0.00	0.50	Manganese	552.000	-	365.080	3480.000	mg/kg
	CA39-002	749253.099	2082801.073	0.00	0.50	Nickel	31.800	-	14.910	20400.000	mg/kg
	CA39-002	749253.099	2082801.073	0.00	0.50	Pyrene	84.000	42.000	-	22100000.000	ug/kg
	CA39-002	749253.099	2082801.073	0.00	0.50	Strontium	264.000	-	48.940	613000.000	mg/kg
	CA39-002	*749253.099*	*2082801.073*	*0.00*	*0.50*	*Uranium-234*	*6.000*	-	*2.253*	*300.000*	*pCi/g*
	CA39-002	749253.099	2082801.073	0.00	0.50	Uranium-235	0.300	-	0.094	8.000	pCi/g
	CA39-002	749253.099	2082801.073	0.00	0.50	Uranium-238	6.000	-	2.000	351.000	pCi/g
	CA39-002	749253.099	2082801.073	0.00	0.50	Vanadium	81.000	-	45.590	7150.000	mg/kg
	CA39-002	749253.099	2082801.073	0.00	0.50	Zinc	130.000	-	73.760	307000.000	mg/kg
	CA39-002	749253.099	2082801.073	0.50	2.50	Naphthalene	5.100	5.100	-	3090000.000	ug/kg
	CA39-002	749253.099	2082801.073	0.50	2.50	Uranium-235	0.200	-	0.120	8.000	pCi/g
	CA39-012	749254.559	2082827.131	0.00	0.40	Acenaphthene	160.000	47.000	-	40800000.000	ug/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Anthracene	160.000	80.000	-	204000000.000	ug/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Barium	731.000	-	141.260	26400.000	mg/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Benzo(a)anthracene	330.000	40.000	-	34900.000	ug/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Benzo(a)pyrene	360.000	96.000	-	3490.000	ug/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Benzo(b)fluoranthene	310.000	100.000	-	34900.000	ug/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Benzo(k)fluoranthene	310.000	95.000	-	349000.000	ug/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	bis(2-Ethylhexyl)phthalate	76.000	71.000	-	1970000.000	ug/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Chromium	24.100	-	16.990	268.000	mg/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Chrysene	380.000	54.000	-	3490000.000	ug/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Copper	55.800	-	18.060	40900.000	mg/kg

IHSS, PAC, or UBC Site	Location Code	Actual Easting	Actual Northing	Start Depth (ft)	End Depth (ft)	Analyte	Result	Reporting Limit	Background Mean Plus Two Standard Deviations	WRW AL	Units
	CA39-012	749254.559	2082827.131	0.00	0.40	Dibenz(a,h)anthracene	100.000	48.000	-	3490.000	ug/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Fluoranthene	880.000	86.000	-	27200000.000	ug/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Fluorene	130.000	78.000	-	40800000.000	ug/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Indeno(1,2,3-cd)pyrene	230.000	49.000	-	34900.000	ug/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Iron	33400.000	-	18037.000	307000.000	mg/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Manganese	520.000	-	365.080	3480.000	mg/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Naphthalene	120.000	72.000	-	3090000.000	ug/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Nickel	36.500	-	14.910	20400.000	mg/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Pyrene	810.000	41.000	-	22100000.000	ug/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Strontium	279.000	-	48.940	613000.000	mg/kg
	CA39-012	*749254.559*	*2082827.131*	*0.00*	*0.40*	*Uranium-234*	*3.000*	-	*2.253*	*300.000*	*pCi/g*
	CA39-012	749254.559	2082827.131	0.00	0.40	Uranium-238	3.000	-	2.000	351.000	pCi/g
	CA39-012	749254.559	2082827.131	0.00	0.40	Vanadium	74.100	-	45.590	7150.000	mg/kg
	CA39-012	749254.559	2082827.131	0.00	0.40	Zinc	171.000	-	73.760	307000.000	mg/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Acenaphthene	78.000	47.000	-	40800000.000	ug/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Anthracene	220.000	80.000	-	204000000.000	ug/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Arsenic	14.800	-	10.090	22.200	mg/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Barium	742.000	-	141.260	26400.000	mg/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Benzo(a)anthracene	870.000	40.000	-	34900.000	ug/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Benzo(a)pyrene	940.000	97.000	-	3490.000	ug/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Benzo(b)fluoranthene	890.000	100.000	-	34900.000	ug/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Benzo(k)fluoranthene	850.000	96.000	-	349000.000	ug/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	bis(2-Ethylhexyl)phthalate	79.000	71.000	-	1970000.000	ug/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Chromium	47.700	-	16.990	268.000	mg/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Chrysene	190.000	55.000	-	3490000.000	ug/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Copper	78.700	-	18.060	40900.000	mg/kg

IHSS, PAC, or UBC Site	Location Code	Actual Easting	Actual Northing	Start Depth (ft)	End Depth (ft)	Analyte	Result	Reporting Limit	Background Mean Plus Two Standard Deviations	WRW AL	Units
	CA39-013	749289.822	2082820.485	0.00	0.50	Dibenz(a,h)anthracene	240.000	49.000	-	3490.000	ug/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Fluoranthene	1800.000	87.000	-	27200000.000	ug/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Fluorene	82.000	78.000	-	40800000.000	ug/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Indeno(1,2,3-cd)pyrene	540.000	50.000	-	34900.000	ug/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Iron	41300.000	-	18037.000	307000.000	mg/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Nickel	64.100	-	14.910	20400.000	mg/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Pyrene	1600.000	41.000	-	22100000.000	ug/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Strontium	179.000	-	48.940	613000.000	mg/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Tin	5.700	-	2.900	613000.000	mg/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Uranium-235	0.200	-	0.094	8.000	pCi/g
	CA39-013	749289.822	2082820.485	0.00	0.50	Vanadium	118.000	-	45.590	7150.000	mg/kg
	CA39-013	749289.822	2082820.485	0.00	0.50	Zinc	184.000	-	73.760	307000.000	mg/kg
	CA39-013	*749289.822*	*2082820.485*	*0.50*	*0.80*	*Uranium-234*	*5.000*	-	*2.640*	*300.000*	*pCi/g*
	CA39-013	749289.822	2082820.485	0.50	0.80	**Uranium-235	0.224	-	0.120	8.000	pCi/g
	CA39-013	749289.822	2082820.485	0.50	0.80	Uranium-238	5.000	-	1.490	351.000	pCi/g

Italic type denotes values derived from HPGe measurement.
** denotes values which are not dry weight corrected.

Figure 2
IHSS Group 600-5 Surface Soil Results Greater Than Background Means Plus Two Standard Deviations or Reporting Limits



Analyte	Result	Wrw_al	Mean+2sd	RI	Units
Acenaphthene	78.000	40800000.000	NA	47.000	ug/kg
Anthracene	220.000	2040000000.000	NA	80.000	ug/kg
Arsenic	14.800	22.200	10.090	NA	mg/kg
Barium	742.000	26400.000	141.260	NA	mg/kg
Benzo(a)anthracene	870.000	34900.000	NA	40.000	ug/kg
Benzo(a)pyrene	940.000	3490.000	NA	97.000	ug/kg
Benzo(b)fluoranthene	890.000	34900.000	NA	100.000	ug/kg
Benzo(k)fluoranthene	850.000	349000.000	NA	96.000	ug/kg
bis(2-Ethylhexyl)phthalate	79.000	1970000.000	NA	71.000	ug/kg
Chromium	47.700	268.000	16.990	NA	mg/kg
Chrysene	190.000	34900000.000	NA	55.000	ug/kg
Copper	78.700	40900.000	18.060	NA	mg/kg
Dibenz(a,h)anthracene	240.000	3490.000	NA	49.000	ug/kg
Fluoranthene	1800.000	27200000.000	NA	87.000	ug/kg
Fluorene	82.000	40800000.000	NA	78.000	ug/kg
Indeno(1,2,3-cd)pyrene	540.000	34900.000	NA	50.000	ug/kg
Iron	41300.000	307000.000	18037.000	NA	mg/kg
Nickel	64.100	20400.000	14.910	NA	mg/kg
Pyrene	1600.000	22100000.000	NA	41.000	ug/kg
Strontium	179.000	613000.000	48.940	NA	mg/kg
Tin	5.700	613000.000	2.900	NA	mg/kg
Uranium-235	0.200	8.000	0.094	NA	pCi/g
Vanadium	118.000	7150.000	45.590	NA	mg/kg
Zinc	184.000	307000.000	73.760	NA	mg/kg

Analyte	Result	Wrw_al	Mean+2sd	RI	Units
Acenaphthene	63.000	40800000.000	NA	33.000	ug/kg
Anthracene	210.000	2040000000.000	NA	25.000	ug/kg
Benzo(a)anthracene	530.000	34900.000	NA	26.000	ug/kg
Benzo(a)pyrene	460.000	3490.000	NA	43.000	ug/kg
Benzo(b)fluoranthene	370.000	34900.000	NA	31.000	ug/kg
Benzo(k)fluoranthene	470.000	349000.000	NA	34.000	ug/kg
Chrysene	590.000	34900000.000	NA	36.000	ug/kg
Dibenz(a,h)anthracene	140.000	3490.000	NA	26.000	ug/kg
Fluoranthene	1300.000	27200000.000	NA	24.000	ug/kg
Fluorene	68.000	40800000.000	NA	36.000	ug/kg
Indeno(1,2,3-cd)pyrene	290.000	34900.000	NA	24.000	ug/kg
Pyrene	1000.000	22100000.000	NA	140.000	ug/kg
Uranium-235	0.148	8.000	0.094	NA	pCi/g

Analyte	Result	Wrw_al	Mean+2sd	RI	Units
Anthracene	43.000	2040000000.000	NA	24.000	ug/kg
Benzo(a)anthracene	110.000	34900.000	NA	25.000	ug/kg
Benzo(a)pyrene	140.000	3490.000	NA	40.000	ug/kg
Benzo(b)fluoranthene	100.000	34900.000	NA	29.000	ug/kg
Benzo(k)fluoranthene	140.000	349000.000	NA	32.000	ug/kg
bis(2-Ethylhexyl)phthalate	130.000	1970000.000	NA	72.000	ug/kg
Chrysene	140.000	3490000.000	NA	28.000	ug/kg
Fluoranthene	270.000	27200000.000	NA	23.000	ug/kg
Indeno(1,2,3-cd)pyrene	86.000	34900.000	NA	23.000	ug/kg
Pyrene	240.000	22100000.000	NA	130.000	ug/kg
Uranium-235	0.138	8.000	0.094	NA	pCi/g

Analyte	Result	Wrw_al	Mean+2sd	RI	Units
Acenaphthene	220.000	40800000.000	NA	36.000	ug/kg
Anthracene	740.000	2040000000.000	NA	27.000	ug/kg
Benzo(a)anthracene	510.000	34900.000	NA	29.000	ug/kg
Benzo(a)pyrene	550.000	3490.000	NA	47.000	ug/kg
Benzo(b)fluoranthene	390.000	34900.000	NA	33.000	ug/kg
Benzo(k)fluoranthene	510.000	349000.000	NA	37.000	ug/kg
bis(2-Ethylhexyl)phthalate	96.000	1970000.000	NA	83.000	ug/kg
Chrysene	630.000	34900000.000	NA	32.000	ug/kg
Dibenzofuran	72.000	2950000.000	NA	42.000	ug/kg
Fluoranthene	1400.000	27200000.000	NA	26.000	ug/kg
Fluorene	160.000	40800000.000	NA	39.000	ug/kg
Indeno(1,2,3-cd)pyrene	420.000	34900.000	NA	26.000	ug/kg
Iron	20000.000	307000.000	18037.000	NA	mg/kg
Naphthalene	79.000	3090000.000	NA	37.000	ug/kg
Pyrene	1200.000	22100000.000	NA	160.000	ug/kg
Uranium-234	4.753	300.000	2.253	NA	pCi/g
Uranium-235	0.365	8.000	0.094	NA	pCi/g
Uranium-238	4.753	351.000	2.000	NA	pCi/g

Analyte	Result	Wrw_al	Mean+2sd	RI	Units
Anthracene	86.000	204000000.000	NA	80.000	ug/kg
Benzo(a)anthracene	300.000	34900.000	NA	40.000	ug/kg
Benzo(a)pyrene	330.000	3490.000	NA	96.000	ug/kg
Benzo(b)fluoranthene	240.000	34900.000	NA	100.000	ug/kg
Benzo(k)fluoranthene	260.000	349000.000	NA	95.000	ug/kg
Chrysene	330.000	34900000.000	NA	55.000	ug/kg
Fluoranthene	650.000	27200000.000	NA	86.000	ug/kg
Indeno(1,2,3-cd)pyrene	250.000	34900.000	NA	49.000	ug/kg
Pyrene	630.000	22100000.000	NA	41.000	ug/kg
Uranium-235	0.168	8.000	0.094	NA	pCi/g

Analyte	Result	Wrw_al	Mean+2sd	RI	Units
Acenaphthene	130.000	40800000.000	NA	32.000	ug/kg
Anthracene	240.000	2040000000.000	NA	25.000	ug/kg
Benzo(a)anthracene	760.000	34900.000	NA	26.000	ug/kg
Benzo(a)pyrene	890.000	3490.000	NA	42.000	ug/kg
Benzo(b)fluoranthene	650.000	34900.000	NA	31.000	ug/kg
Benzo(k)fluoranthene	820.000	349000.000	NA	33.000	ug/kg
Chrysene	930.000	34900000.000	NA	29.000	ug/kg
Dibenz(a,h)anthracene	310.000	3490.000	NA	26.000	ug/kg
Fluoranthene	1800.000	27200000.000	NA	24.000	ug/kg
Fluorene	110.000	40800000.000	NA	35.000	ug/kg
Indeno(1,2,3-cd)pyrene	590.000	34900.000	NA	24.000	ug/kg
Pyrene	1400.000	22100000.000	NA	140.000	ug/kg
Uranium-234	3.373	300.000	2.253	NA	pCi/g
Uranium-235	0.240	8.000	0.094	NA	pCi/g
Uranium-238	3.373	351.000	2.000	NA	pCi/g

Analyte	Result	Wrw_al	Mean+2sd	RI	Units
Acenaphthene	110.000	40800000.000	NA	33.000	ug/kg
Anthracene	160.000	2040000000.000	NA	25.000	ug/kg
Benzo(a)anthracene	430.000	34900.000	NA	26.000	ug/kg
Benzo(a)pyrene	520.000	3490.000	NA	43.000	ug/kg
Benzo(b)fluoranthene	360.000	34900.000	NA	31.000	ug/kg
Benzo(k)fluoranthene	500.000	349000.000	NA	34.000	ug/kg
Chrysene	510.000	34900000.000	NA	29.000	ug/kg
Dibenz(a,h)anthracene	170.000	3490.000	NA	26.000	ug/kg
Fluoranthene	960.000	27200000.000	NA	24.000	ug/kg
Fluorene	81.000	40800000.000	NA	36.000	ug/kg
Indeno(1,2,3-cd)pyrene	390.000	34900.000	NA	24.000	ug/kg
Pyrene	870.000	22100000.000	NA	140.000	ug/kg
Uranium-235	0.116	8.000	0.094	NA	pCi/g

Analyte	Result	Wrw_al	Mean+2sd	RI	Units
Acenaphthene	130.000	40800000.000	NA	46.000	ug/kg
Anthracene	170.000	2040000000.000	NA	79.000	ug/kg
Benzo(a)anthracene	340.000	34900.000	NA	39.000	ug/kg
Benzo(a)pyrene	400.000	3490.000	NA	95.000	ug/kg
Benzo(b)fluoranthene	340.000	34900.000	NA	100.000	ug/kg
Benzo(k)fluoranthene	330.000	349000.000	NA	94.000	ug/kg
Chrysene	410.000	34900000.000	NA	54.000	ug/kg
Fluoranthene	980.000	27200000.000	NA	85.000	ug/kg
Indeno(1,2,3-cd)pyrene	300.000	34900.000	NA	48.000	ug/kg
Pyrene	780.000	22100000.000	NA	40.000	ug/kg
Uranium-235	0.095	8.000	0.094	NA	pCi/g

Analyte	Result	Wrw_al	Mean+2sd	RI	Units
2-Methylnaphthalene	60.000	20400000.000	NA	33.000	ug/kg
Acenaphthene	270.000	40800000.000	NA	32.000	ug/kg
Anthracene	280.000	2040000000.000	NA	24.000	ug/kg
Benzo(a)anthracene	680.000	34900.000	NA	25.000	ug/kg
Benzo(a)pyrene	720.000	3490.000	NA	41.000	ug/kg
Benzo(b)fluoranthene	630.000	34900.000	NA	30.000	ug/kg
Benzo(k)fluoranthene	570.000	349000.000	NA	33.000	ug/kg
bis(2-Ethylhexyl)phthalate	180.000	1970000.000	NA	74.000	ug/kg
Chrysene	820.000	34900000.000	NA	29.000	ug/kg
Fluoranthene	1600.000	27200000.000	NA	23.000	ug/kg
Fluorene	190.000	40800000.000	NA	35.000	ug/kg
Indeno(1,2,3-cd)pyrene	490.000	34900.000	NA	23.000	ug/kg
Naphthalene	150.000	3090000.000	NA	33.000	ug/kg
Pyrene	1300.000	22100000.000	NA	140.000	ug/kg
Zinc	130.000	307000.000	73.760	NA	mg/kg

Analyte	Result	Wrw_al	Mean+2sd	RI	Units
Antimony	10.000	409.000	0.470	NA	mg/kg
Barium	607.000	26400.000	141.260	NA	mg/kg
Benzo(a)anthracene	48.000	34900.000	NA	41.000	ug/kg
bis(2-Ethylhexyl)phthalate	160.000	1970000.000	NA	72.000	ug/kg
Chromium	30.400	268.000	16.990	NA	mg/kg
Chrysene	57.000	3490000.000	NA	56.000	ug/kg
Copper	56.600	40900.000	18.060	NA	mg/kg
Iron	29700.000	307000.000	18037.000	NA	mg/kg
Manganese	552.000	3480.000	365.080	NA	mg/kg
Nickel	31.800	20400.000	14.910	NA	mg/kg
Pyrene	84.000	22100000.000	NA	42.000	ug/kg
Strontium	264.000	613000.000	48.940	NA	mg/kg
Uranium-234	6.000	300.000	2.253	NA	pCi/g
Uranium-235	0.300	8.000	0.094	NA	pCi/g
Uranium-238	6.000	351.000	2.000	NA	pCi/g
Vanadium	81.000	7150.000	45.590	NA	mg/kg
Zinc	130.000	307000.000	73.760	NA	mg/kg

Analyte	Result	Wrw_al	Mean+2sd	RI	Units
Benzo(a)anthracene	72.000	34900.000	NA	28.000	ug/kg
Benzo(b)fluoranthene	60.000	34900.000	NA	33.000	ug/kg
Benzo(k)fluoranthene	80.000	349000.000	NA	36.000	ug/kg
Chrysene	93.000	3490000.000	NA	32.000	ug/kg
Fluoranthene	150.000	27200000.000	NA	26.000	ug/kg
Uranium-234	2.375	300.000	2.253	NA	pCi/g
Uranium-235	0.128	8.000	0.094	NA	pCi/g
Uranium-238	2.375	351.000	2.000	NA	pCi/g

Analyte	Result	Wrw_al	Mean+2sd	RI	Units
Acenaphthene	62.000	40800000.000	NA	35.000	ug/kg
Anthracene	61.000	2040000000.000	NA	27.000	ug/kg
Benzo(a)anthracene	120.000	34900.000	NA	28.000	ug/kg
Benzo(a)pyrene	140.000	3490.000	NA	46.000	ug/kg
Benzo(b)fluoranthene	88.000	34900.000	NA	33.000	ug/kg
Benzo(k)fluoranthene	89.000	349000.000	NA	36.000	ug/kg
bis(2-Ethylhexyl)phthalate	94.000	1970000.000	NA	82.000	ug/kg
Chrysene	140.000	3490000.000	NA	32.000	ug/kg
Fluoranthene	280.000	27200000.000	NA	26.000	ug/kg
Plutonium-239/240	0.578	50.000	0.066	NA	pCi/g
Pyrene	260.000	22100000.000	NA	150.000	ug/kg

Analyte	Result	Wrw_al	Mean+2sd	RI	Units
Benzo(a)anthracene	100.000	34900.000	NA	29.000	ug/kg
Benzo(a)pyrene	130.000	3490.000	NA	46.000	ug/kg
Benzo(b)fluoranthene	93.000	34900.000	NA	33.000	ug/kg
Benzo(k)fluoranthene	110.000	349000.000	NA	37.000	ug/kg
Chrysene	120.000	34900000.000	NA	32.000	ug/kg
Fluoranthene	150.000	27200000.000	NA	26.000	ug/kg
Indeno(1,2,3-cd)pyrene	110.000	34900.000	NA	26.000	ug/kg
Uranium-234	4.545	300.000	2.253	NA	pCi/g
Uranium-235	0.276	8.000	0.094	NA	pCi/g
Uranium-238	4.545	351.000	2.000	NA	pCi/g

Analyte	Result	Wrw_al	Mean+2sd	RI	Units
Acenaphthene	160.000	40800000.000	NA	47.000	ug/kg
Anthracene	160.000	2040000000.000	NA	80.000	ug/kg
Barium	731.000	26400.000	141.260	NA	mg/kg
Benzo(a)anthracene	330.000	34900.000	NA	40.000	ug/kg
Benzo(a)pyrene	360.000	3490.000	NA	96.000	ug/kg
Benzo(b)fluoranthene	310.000	34900.000	NA	100.000	ug/kg
Benzo(k)fluoranthene	310.000	349000.000	NA	95.000	ug/kg
bis(2-Ethylhexyl)phthalate	76.000	1970000.000	NA	71.000	ug/kg
Chromium	24.100	268.000	16.990	NA	mg/kg
Chrysene	380.000	34900000.000	NA	54.000	ug/kg
Copper	55.800	40900.000	18.060	NA	mg/kg
Dibenz(a,h)anthracene	100.000	3490.000	NA	48.000	ug/kg
Fluoranthene	680.000	27200000.000	NA	86.000	ug/kg
Fluorene	130.000	40800000.000	NA	78.000	ug/kg
Indeno(1,2,3-cd)pyrene	230.000	34900.000	NA	49.000	ug/kg
Iron	33400.000	307000.000	18037.000	NA	mg/kg
Manganese	520.000	3480.000	365.080	NA	mg/kg
Naphthalene	120.000	3090000.000	NA	72.000	ug/kg
Nickel	36.500	20400.000	14.910	NA	mg/kg
Pyrene	810.000	22100000.000	NA	41.000	ug/kg
Strontium	279.000	613000.000	48.940	NA	mg/kg
Uranium-234	3.000	300.000	2.253	NA	pCi/g
Uranium-238	3.000	351.000	2.000	NA	pCi/g
Vanadium	74.100	7150.000	45.590	NA	mg/kg
Zinc	171.000	307000.000	73.760	NA	mg/kg

KEY

Sampling Location
- Detected Above WRW AL
- Detected Above Background or RL
- Detected Below Background

Dirt road

Paved road

Stream, drainage, or ditch

Fence

PAC 600-1004

Structure
- Demolished
- Standing

N
W E
S

200 0 200 400 Feet

Scale = 1:4,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Prepared by:

RADMS

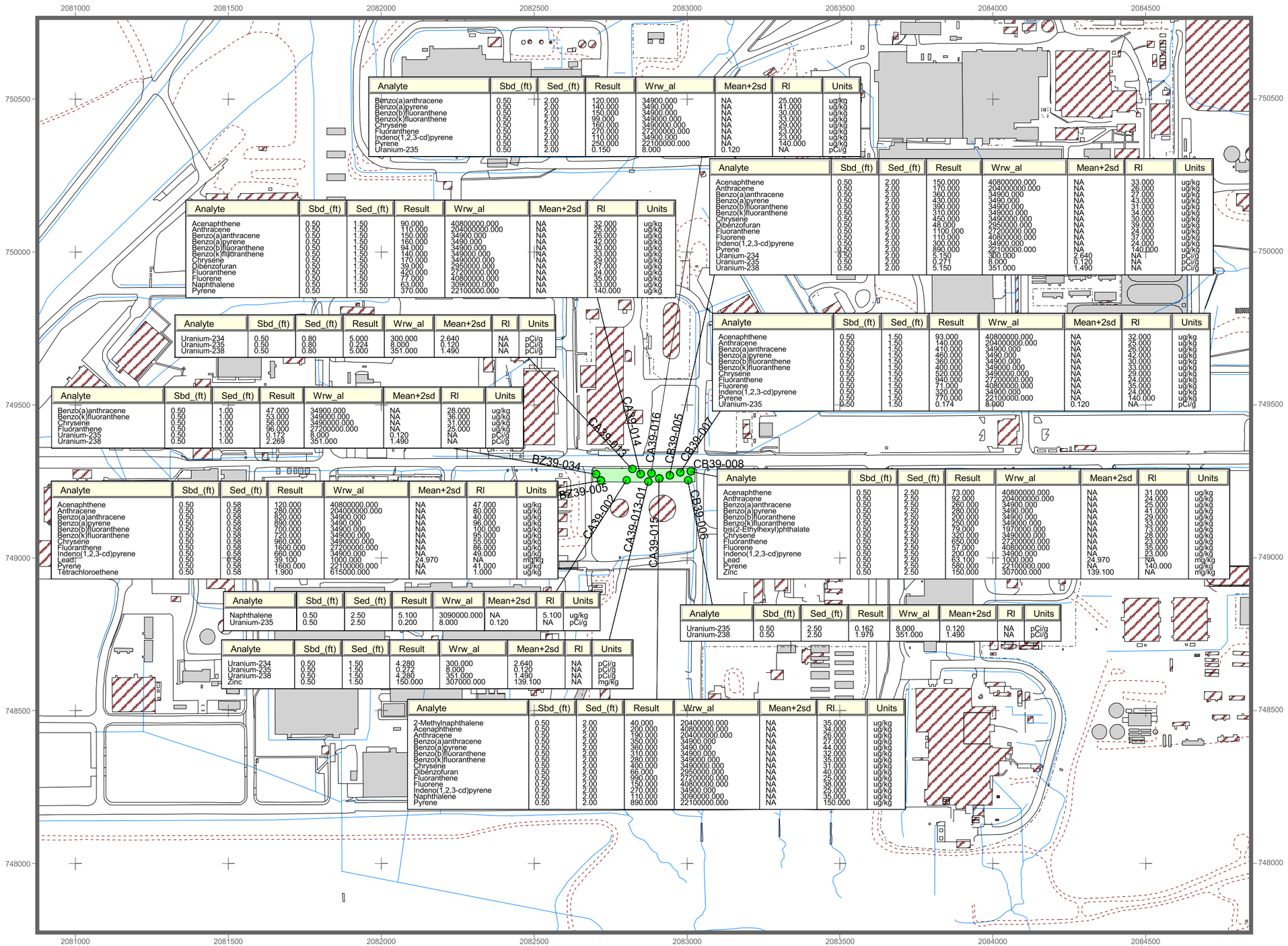
Date: May 2004

Prepared for:

KAISER•HILL COMPANY

File: w:\projects\fy2004\600-5\data_summary\av_projects\600-5_dsr_041904.apr

Figure 3
IHSS Group 600-5 Subsurface Soil Results Greater Than Background Means Plus Two Standard Deviations or Reporting Limits



Analyte	Sbd_(ft)	Sed_(ft)	Result	Wrw_al	Mean+2sd	Rl	Units
Benzo(a)anthracene	0.50	2.00	120.000	34900.000	NA	25.000	ug/kg
Benzo(a)pyrene	0.50	2.00	140.000	3490.000	NA	41.000	ug/kg
Benzo(b)fluoranthene	0.50	2.00	150.000	34900.000	NA	30.000	ug/kg
Benzo(k)fluoranthene	0.50	2.00	99.000	349000.000	NA	33.000	ug/kg
Chrysene	0.50	2.00	160.000	3490000.000	NA	29.000	ug/kg
Fluoranthene	0.50	2.00	270.000	27200000.000	NA	23.000	ug/kg
Indeno(1,2,3-cd)pyrene	0.50	2.00	110.000	34900.000	NA	23.000	ug/kg
Pyrene	0.50	2.00	250.000	22100000.000	NA	140.000	ug/kg
Uranium-235	0.50	2.00	0.150	8.000	0.120	NA	pCi/g

Analyte	Sbd_(ft)	Sed_(ft)	Result	Wrw_al	Mean+2sd	Rl	Units
Acenaphthene	0.50	2.00	150.000	40800000.000	NA	33.000	ug/kg
Anthracene	0.50	2.00	170.000	204000000.000	NA	26.000	ug/kg
Benzo(a)anthracene	0.50	2.00	390.000	34900.000	NA	27.000	ug/kg
Benzo(a)pyrene	0.50	2.00	430.000	3490.000	NA	43.000	ug/kg
Benzo(b)fluoranthene	0.50	2.00	390.000	34900.000	NA	31.000	ug/kg
Benzo(k)fluoranthene	0.50	2.00	310.000	349000.000	NA	34.000	ug/kg
Chrysene	0.50	2.00	450.000	3490000.000	NA	30.000	ug/kg
Dibenzofuran	0.50	2.00	48.000	2950000.000	NA	39.000	ug/kg
Fluoranthene	0.50	2.00	1100.000	27200000.000	NA	24.000	ug/kg
Fluorene	0.50	2.00	110.000	40800000.000	NA	37.000	ug/kg
Indeno(1,2,3-cd)pyrene	0.50	2.00	300.000	34900.000	NA	24.000	ug/kg
Pyrene	0.50	2.00	890.000	22100000.000	NA	140.000	ug/kg
Uranium-234	0.50	2.00	5.150	300.000	2.640	NA	pCi/g
Uranium-235	0.50	2.00	0.271	8.000	0.120	NA	pCi/g
Uranium-238	0.50	2.00	5.150	351.000	1.490	NA	pCi/g

Analyte	Sbd_(ft)	Sed_(ft)	Result	Wrw_al	Mean+2sd	Rl	Units
Acenaphthene	0.50	1.50	90.000	40800000.000	NA	32.000	ug/kg
Anthracene	0.50	1.50	110.000	204000000.000	NA	25.000	ug/kg
Benzo(a)anthracene	0.50	1.50	150.000	34900.000	NA	26.000	ug/kg
Benzo(a)pyrene	0.50	1.50	160.000	3490.000	NA	42.000	ug/kg
Benzo(b)fluoranthene	0.50	1.50	94.000	34900.000	NA	30.000	ug/kg
Benzo(k)fluoranthene	0.50	1.50	140.000	349000.000	NA	33.000	ug/kg
Chrysene	0.50	1.50	170.000	3490000.000	NA	29.000	ug/kg
Dibenzofuran	0.50	1.50	39.000	2950000.000	NA	37.000	ug/kg
Fluoranthene	0.50	1.50	420.000	27200000.000	NA	24.000	ug/kg
Fluorene	0.50	1.50	77.000	40800000.000	NA	35.000	ug/kg
Naphthalene	0.50	1.50	63.000	3090000.000	NA	33.000	ug/kg
Pyrene	0.50	1.50	370.000	22100000.000	NA	140.000	ug/kg

Analyte	Sbd_(ft)	Sed_(ft)	Result	Wrw_al	Mean+2sd	Rl	Units
Uranium-234	0.50	0.80	5.000	300.000	2.640	NA	pCi/g
Uranium-235	0.50	0.80	0.224	8.000	0.120	NA	pCi/g
Uranium-238	0.50	0.80	5.000	351.000	1.490	NA	pCi/g

Analyte	Sbd_(ft)	Sed_(ft)	Result	Wrw_al	Mean+2sd	Rl	Units
Acenaphthene	0.50	1.50	93.000	40800000.000	NA	32.000	ug/kg
Anthracene	0.50	1.50	140.000	204000000.000	NA	25.000	ug/kg
Benzo(a)anthracene	0.50	1.50	410.000	34900.000	NA	26.000	ug/kg
Benzo(a)pyrene	0.50	1.50	460.000	3490.000	NA	42.000	ug/kg
Benzo(b)fluoranthene	0.50	1.50	360.000	34900.000	NA	30.000	ug/kg
Benzo(k)fluoranthene	0.50	1.50	400.000	349000.000	NA	33.000	ug/kg
Chrysene	0.50	1.50	520.000	3490000.000	NA	29.000	ug/kg
Fluoranthene	0.50	1.50	940.000	27200000.000	NA	24.000	ug/kg
Fluorene	0.50	1.50	71.000	40800000.000	NA	35.000	ug/kg
Indeno(1,2,3-cd)pyrene	0.50	1.50	320.000	34900.000	NA	24.000	ug/kg
Pyrene	0.50	1.50	770.000	22100000.000	NA	140.000	ug/kg
Uranium-235	0.50	1.50	0.174	8.000	0.120	NA	pCi/g

Analyte	Sbd_(ft)	Sed_(ft)	Result	Wrw_al	Mean+2sd	Rl	Units
Benzo(a)anthracene	0.50	1.00	47.000	34900.000	NA	28.000	ug/kg
Benzo(k)fluoranthene	0.50	1.00	53.000	349000.000	NA	36.000	ug/kg
Chrysene	0.50	1.00	58.000	3490000.000	NA	31.000	ug/kg
Fluoranthene	0.50	1.00	96.000	27200000.000	NA	25.000	ug/kg
Uranium-235	0.50	1.00	0.172	8.000	0.120	NA	pCi/g
Uranium-238	0.50	1.00	2.269	351.000	1.490	NA	pCi/g

Analyte	Sbd_(ft)	Sed_(ft)	Result	Wrw_al	Mean+2sd	Rl	Units
Acenaphthene	0.50	2.50	73.000	40800000.000	NA	31.000	ug/kg
Anthracene	0.50	2.50	92.000	204000000.000	NA	24.000	ug/kg
Benzo(a)anthracene	0.50	2.50	260.000	34900.000	NA	25.000	ug/kg
Benzo(a)pyrene	0.50	2.50	280.000	3490.000	NA	41.000	ug/kg
Benzo(b)fluoranthene	0.50	2.50	250.000	34900.000	NA	28.000	ug/kg
Benzo(k)fluoranthene	0.50	2.50	250.000	349000.000	NA	33.000	ug/kg
bis(2-Ethylhexyl)phthalate	0.50	2.50	79.000	1970000.000	NA	73.000	ug/kg
Chrysene	0.50	2.50	320.000	3490000.000	NA	28.000	ug/kg
Fluoranthene	0.50	2.50	650.000	27200000.000	NA	23.000	ug/kg
Fluorene	0.50	2.50	57.000	40800000.000	NA	35.000	ug/kg
Indeno(1,2,3-cd)pyrene	0.50	2.50	200.000	34900.000	NA	23.000	ug/kg
Lead	0.50	2.50	63.100	1000.000	24.970	NA	mg/kg
Pyrene	0.50	2.50	580.000	22100000.000	NA	140.000	ug/kg
Zinc	0.50	2.50	150.000	307000.000	139.100	NA	mg/kg

Analyte	Sbd_(ft)	Sed_(ft)	Result	Wrw_al	Mean+2sd	Rl	Units
Benzo(a)anthracene	0.50	0.58	120.000	40800000.000	NA	47.000	ug/kg
Anthracene	0.50	0.58	280.000	204000000.000	NA	80.000	ug/kg
Benzo(a)anthracene	0.50	0.58	820.000	34900.000	NA	40.000	ug/kg
Benzo(a)pyrene	0.50	0.58	890.000	3490.000	NA	96.000	ug/kg
Benzo(b)fluoranthene	0.50	0.58	700.000	34900.000	NA	100.000	ug/kg
Benzo(k)fluoranthene	0.50	0.58	720.000	349000.000	NA	95.000	ug/kg
Chrysene	0.50	0.58	960.000	3490000.000	NA	55.000	ug/kg
Fluoranthene	0.50	0.58	1600.000	27200000.000	NA	86.000	ug/kg
Indeno(1,2,3-cd)pyrene	0.50	0.58	660.000	34900.000	NA	49.000	ug/kg
Lead	0.50	0.58	39.100	1000.000	24.970	NA	mg/kg
Pyrene	0.50	0.58	1600.000	22100000.000	NA	41.000	ug/kg
Tetrachloroethene	0.50	0.58	1.900	615000.000	NA	1.000	ug/kg

Analyte	Sbd_(ft)	Sed_(ft)	Result	Wrw_al	Mean+2sd	Rl	Units
Naphthalene	0.50	2.50	5.100	3090000.000	NA	5.100	ug/kg
Uranium-235	0.50	2.50	0.200	8.000	0.120	NA	pCi/g

Analyte	Sbd_(ft)	Sed_(ft)	Result	Wrw_al	Mean+2sd	Rl	Units
Uranium-234	0.50	1.50	4.280	300.000	2.640	NA	pCi/g
Uranium-235	0.50	1.50	0.272	8.000	0.120	NA	pCi/g
Uranium-238	0.50	1.50	4.280	351.000	1.490	NA	pCi/g
Zinc	0.50	1.50	150.000	307000.000	139.100	NA	mg/kg

Analyte	Sbd_(ft)	Sed_(ft)	Result	Wrw_al	Mean+2sd	Rl	Units
Uranium-235	0.50	2.50	0.162	8.000	0.120	NA	pCi/g
Uranium-238	0.50	2.50	1.979	351.000	1.490	NA	pCi/g

Analyte	Sbd_(ft)	Sed_(ft)	Result	Wrw_al	Mean+2sd	Rl	Units
2-Methylnaphthalene	0.50	2.00	40.000	20400000.000	NA	35.000	ug/kg
Acenaphthene	0.50	2.00	200.000	40800000.000	NA	34.000	ug/kg
Anthracene	0.50	2.00	190.000	204000000.000	NA	26.000	ug/kg
Benzo(a)anthracene	0.50	2.00	350.000	34900.000	NA	27.000	ug/kg
Benzo(a)pyrene	0.50	2.00	360.000	3490.000	NA	44.000	ug/kg
Benzo(b)fluoranthene	0.50	2.00	310.000	34900.000	NA	32.000	ug/kg
Benzo(k)fluoranthene	0.50	2.00	280.000	349000.000	NA	35.000	ug/kg
Chrysene	0.50	2.00	400.000	3490000.000	NA	31.000	ug/kg
Dibenzofuran	0.50	2.00	66.000	2950000.000	NA	40.000	ug/kg
Fluoranthene	0.50	2.00	990.000	27200000.000	NA	25.000	ug/kg
Fluorene	0.50	2.00	150.000	40800000.000	NA	38.000	ug/kg
Indeno(1,2,3-cd)pyrene	0.50	2.00	270.000	34900.000	NA	25.000	ug/kg
Naphthalene	0.50	2.00	110.000	3090000.000	NA	35.000	ug/kg
Pyrene	0.50	2.00	890.000	22100000.000	NA	150.000	ug/kg

KEY

Sampling Location
- Detected Above WRW AL
- Detected Above Background or RL
- Detected Below Background

Dirt road

Paved road

Stream, drainage, or ditch

Fence

PAC 600-1004

Structure
- Demolished
- Standing

N
W E
S

200 0 200 400 Feet

Scale = 1:4,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Prepared by:

RADMS

Date: May 2004

Prepared for:

KAISER•HILL COMPANY

File: w:\projects\fy2004\600-5\data_summary\av_projects\600-5_dsr_041904.apr

2.3 Sums of Ratios

RFCA sums of ratios (SORs) were calculated for the IHSS Group 600-5 surface soil sampling locations (to 3 feet). SOR calculations were based on accelerated action analytical data for the radionuclides of concern (americium-241, plutonium-239/240, uranium-234, uranium-235, and uranium-238) with activities greater than background means plus two standard deviations. Table 4 presents the SORs. All radionuclide SORs are less than 1.

Table 4
RFCA SORs Based on IHSS Group 600-5 Radionuclide Activities

Location	Start Depth (ft)	End Depth (ft)	SOR
BZ39-005	0.00	0.50	0.01
BZ39-034	0.00	0.50	0.05
BZ39-034	0.50	1.00	0.03
CA39-000	0.00	0.33	0.02
CA39-002	0.00	0.50	0.07
CA39-002	0.50	2.50	0.03
CA39-012	0.00	0.40	0.02
CA39-013	0.00	0.50	0.03
CA39-013	0.50	0.80	0.06
CA39-013-01	0.00	0.50	0.06
CA39-013-01	0.50	1.50	0.06
CA39-014	0.00	0.50	0.02
CA39-015	0.00	0.50	0.00
CA39-016	0.00	0.50	0.02
CA39-016	0.50	2.00	0.02
CB39-005	0.00	0.50	0.08
CB39-005	0.50	2.00	0.07
CB39-006	0.00	0.50	0.03
CB39-006	0.50	2.50	0.03
CB39-007	0.00	0.50	0.01
CB39-007	0.50	1.50	0.02

SORs for non-radionuclides were calculated for all surface soil sampling locations where analyte concentrations were detected at 10 percent or more of a contaminant's WRW AL. SORs for non-radionuclides are presented in Table 5. As shown, all SORs for non-radionuclides in surface soil are less than 1. Subsurface soil SORs for non-radionuclides were not calculated because subsurface soil concentrations are evaluated as part of the Subsurface Soil Risk Screen (SSRS) in Section 3.0.

Table 5
IHSS Group 600-5 Non-Radionuclide Surface Soil SORs

Location Code	SOR to WRW
CA39-002	0.113
CA39-013	0.178

2.4 Summary Statistics

Summary statistics for analytes detected above background means plus two standard deviations or RLs were calculated by analyte for the IHSS Group 600-5 sampling locations and are presented in Tables 6 and 7 for surface and subsurface soil, respectively.

Table 6
Surface Soil Summary Statistics

Analyte	Number of Samples	Detection Frequency	Mean Concentration	Maximum Concentration	WRW AL	Background Mean Plus Two Standard Deviations	RL	Unit
2-Methylnaphthalene	14	7.14%	60.000	60.000	20400000	-	33.000	ug/kg
Acenaphthene	14	64.29%	135.889	270.000	40800000	-	37.889	ug/kg
Anthracene	14	78.57%	170.000	280.000	204000000	-	45.091	ug/kg
Antimony	14	7.14%	10.000	10.000	409	0.470	-	mg/kg
Arsenic	14	7.14%	14.800	14.800	22.2	10.090	-	mg/kg
Barium	14	21.43%	693.333	742.000	26400	141.260	-	mg/kg
Benzo(a)anthracene	14	100.00%	371.429	870.000	34900	-	31.571	ug/kg
Benzo(a)pyrene	14	85.71%	465.000	940.000	3490	-	61.000	ug/kg
Benzo(b)fluoranthene	14	92.86%	347.769	890.000	34900	-	52.538	ug/kg
Benzo(k)fluoranthene	14	92.86%	387.615	850.000	349000	-	53.231	ug/kg
bis(2-Ethylhexyl)phthalate	14	50.00%	116.429	180.000	1970000	-	75.000	ug/kg
Chromium	14	21.43%	34.067	47.700	268	16.990	-	mg/kg
Chrysene	14	100.00%	381.429	930.000	3490000	-	39.071	ug/kg
Copper	14	21.43%	63.700	78.700	40900	18.060	-	mg/kg
Dibenz(a,h)anthracene	14	35.71%	192.000	310.000	3490	-	35.000	ug/kg
Dibenzofuran	14	7.14%	72.000	72.000	2950000	-	42.000	ug/kg
Fluoranthene	14	92.86%	940.000	1800.000	27200000	-	43.538	ug/kg
Fluorene	14	50.00%	117.286	190.000	40800000	-	48.143	ug/kg
Indeno(1,2,3-cd)pyrene	14	78.57%	336.000	590.000	34900	-	33.273	ug/kg
Iron	14	28.57%	31100.000	41300.000	307000	18037.000	-	mg/kg
Manganese	14	14.29%	536.000	552.000	3480	365.080	-	mg/kg
Naphthalene	14	21.43%	116.333	150.000	3090000	-	47.333	ug/kg
Nickel	14	21.43%	44.133	64.100	20400	14.910	-	mg/kg
Plutonium-239/240	14	7.14%	0.578	0.578	50	0.066	-	pCi/g
Pyrene	14	85.71%	847.833	1600.000	22100000	-	100.417	ug/kg
Strontium	14	21.43%	240.667	279.000	613000	48.940	-	mg/kg

Analyte	Number of Samples	Detection Frequency	Mean Concentration	Maximum Concentration	WRW AL	Background Mean Plus Two Standard Deviations	RL	Unit
Tin	14	7.14%	5.700	5.700	613000	2.900	-	mg/kg
Uranium-234	14	42.86%	4.008	6.000	300	2.253	-	pCi/g
Uranium-235	14	78.57%	0.198	0.365	8	0.094	-	pCi/g
Uranium-238	14	42.86%	4.008	6.000	351	2.000	-	pCi/g
Vanadium	14	21.43%	91.033	118.000	7150	45.590	-	mg/kg
Zinc	14	28.57%	153.750	184.000	307000	73.760	-	mg/kg

Table 7
Subsurface Soil Summary Statistics

Analyte	Number of Samples	Detection Frequency	Mean Concentration	Maximum Concentration	WRW AL	Background Mean Plus Two Standard Deviations	RL	Unit
2-Methylnaphthalene	10	10.00%	40.000	40.000	20400000	-	35.000	ug/kg
Acenaphthene	10	60.00%	121.000	200.000	40800000	-	34.833	ug/kg
Anthracene	10	60.00%	163.667	280.000	204000000	-	34.333	ug/kg
Benzo(a)anthracene	10	80.00%	314.625	820.000	34900	-	28.000	ug/kg
Benzo(a)pyrene	10	70.00%	388.571	890.000	3490	-	49.857	ug/kg
Benzo(b)fluoranthene	10	70.00%	314.857	700.000	34900	-	40.286	ug/kg
Benzo(k)fluoranthene	10	80.00%	281.500	720.000	349000	-	41.500	ug/kg
bis(2-Ethylhexyl)phthalate	10	10.00%	79.000	79.000	1970000	-	73.000	ug/kg
Chrysene	10	80.00%	379.500	960.000	3490000	-	32.750	ug/kg
Dibenzofuran	10	30.00%	51.000	66.000	2950000	-	38.667	ug/kg
Fluoranthene	10	80.00%	758.250	1600.000	27200000	-	31.750	ug/kg
Fluorene	10	50.00%	93.000	150.000	40800000	-	36.000	ug/kg
Indeno(1,2,3-cd)pyrene	10	60.00%	310.000	660.000	34900	-	28.000	ug/kg
Lead	10	20.00%	51.100	63.100	1000	24.970	-	mg/kg
Naphthalene	12	25.00%	59.367	110.000	3090000	-	24.367	ug/kg
Pyrene	10	70.00%	764.286	1600.000	22100000	-	127.286	ug/kg
Tetrachloroethene	12	8.33%	1.900	1.900	615000	-	1.000	ug/kg
Uranium-234	12	25.00%	4.810	5.150	300	2.640	-	pCi/g
Uranium-235	12	66.67%	0.203	0.272	8	0.120	-	pCi/g
Uranium-238	12	41.67%	3.736	5.150	351	1.490	-	pCi/g
Zinc	10	20.00%	150.000	150.000	307000	139.100	-	mg/kg

3.0 SUBSURFACE SOIL RISK SCREEN

The SSRS follows the steps identified on Figure 3 in Attachment 5 of the RFCA Modification (DOE et al. 2003):

Screen 1 – Are the COC concentrations below RFCA Table 3 WRW soil ALs?

Yes. All subsurface soil results are less than RFCA WRW ALs.

Screen 2 – Is there a potential for subsurface soil to become surface soil (landslide and erosion areas identified on Figure 1)?

No. Based upon Figure 1 of RFCA Modification Attachment 5 (DOE et al. 2003), the entire IHSS Group is not located in an area considered prone to landslides or erosion.

Screen 3 – Does subsurface soil radiological contamination exceed criteria in Section 5.3 and Attachment 14?

No. All radiological activities in this IHSS Group were below criteria specified in Section 5.3 and Attachment 14.

Screen 4 – Is there an environmental pathway and sufficient quantity of COCs that would cause an exceedance of the surface water standard?

Contaminant migration via erosion and groundwater are the two possible pathways whereby surface water could become contaminated by IHSS Group 600-5 COCs. Migration via erosion is unlikely because IHSS Group 600-5 is not located in an area prone to landslides or erosion.

Surface water runoff from PAC 600-1004 flows to the Central Avenue Ditch located immediately adjacent to the north. Gaging station GS30 is located on the northeast corner of PAC 600-1004 within the Central Avenue Ditch. Surface water data in SWD does not indicate any AL exceedances at this location. Three gaging stations (GS38, GS27, and GS28) are located within 1,000-feet downgradient of PAC 600-1004. These three locations are Performance Monitoring Locations, which are part of the Integrated Monitoring Program (IMP) (DOE 2003b). These gaging stations reflect surface water conditions in this area of the IA. Surface water quality at these locations may not be attributed to any single upgradient IHSS Group. Surface water AL exceedances at these three locations are summarized in Table 8.

Table 8
Surface Water Exceedance Summary

Location Code	Analyte	Result Range	Surface Water Action Level	Detection Limit	Background	Result Unit
Total Results						
GS27	Aluminum	5.200 - 46.000	0.087	-	3.447	mg/L
GS27	Americium-241	0.155 - 27.330	0.15	-	0.020	pCi/L
GS27	Arsenic	0.007 - 0.017	0.000018	-	0.005	mg/L
GS27	Copper	0.043 - 0.088	0.016	-	0.015	mg/L
GS27	Lead	0.007 - 0.100	0.0065	-	0.007	mg/L
GS27	Plutonium-239/240	0.154 - 90.000	0.15	-	0.020	pCi/L
GS27	Zinc	0.360 - 0.860	0.141	-	0.155	mg/L
GS28	Aluminum	3.800 - 7.200	0.087	-	3.447	mg/L
GS28	Americium-241	0.189 - 0.240	0.15	-	0.020	pCi/L
GS28	Copper	0.024	0.016	-	0.015	mg/L
GS28	Lead	0.007 - 0.011	0.0065	-	0.007	mg/L
GS28	Plutonium-239/240	0.171 - 0.852	0.15	-	0.020	pCi/L

Location Code	Analyte	Result Range	Surface Water Action Level	Detection Limit	Background	Result Unit
GS28	Zinc	0.159 - 0.211	0.141	-	0.155	mg/L
GS38	Aluminum	4.405 - 16.400	0.087	-	3.447	mg/L
GS38	Arsenic	0.006 - 0.007	0.000018	-	0.005	mg/L
GS38	Copper	0.018 - 0.039	0.016	-	0.015	mg/L
GS38	Lead	0.008 - 0.036	0.0065	-	0.007	mg/L
GS38	Plutonium-239/240	0.174 - 0.345	0.15	-	0.020	pCi/L
GS38	Zinc	0.161 - 0.688	0.141	-	0.155	mg/L

Groundwater flow in this area is to the northeast towards South Walnut Creek, approximately 3,000 feet away. One groundwater monitoring well (85202) is located directly south of PAC 600-1004. Three groundwater wells (84402, P215789, and 84502) are located downgradient (within 550 feet) of PAC 600-1004. Groundwater data, retrieved from SWD on May 20, 2004, was reviewed for these wells. Tier I and Tier II groundwater AL exceedances for these wells are summarized in Table 9. No AL exceedances were detected in well 84502. These wells reflect groundwater conditions in this area of the IA. Groundwater quality at these locations may not be attributed to any single upgradient IHSS Group. Monitoring wells around the area will continue to be sampled as part of the IMP (DOE 2003b). Further groundwater evaluation will be part of the groundwater plume Interim Measure/Interim Remedial Action (IM/IRA).

Table 9
Groundwater Exceedance Summary

Location Code	Analyte	Result Range	Background	Detection Limit	Tier I	Tier II	Units
Dissolved Results							
P215789	Thallium	0.005	0.005	-	0.2	0.002	mg/L
Total Results							
84402	Trichloroethene	13.000 - 107.000	-	0.220 - 0.230	500	5	ug/L
85202	Tetrachloroethene	22.000 - 78.000	-	0.200 - 1.100	500	5	ug/L
85202	Trichloroethene	30.000 - 35.000	-	0.200 - 0.240	500	5	ug/L
85202	Vinyl chloride	8.100 - 16.000	-	0.260 - 0.300	200	2	ug/L
P215789	1,1-Dichloroethene	7.010 - 98.000	-	0.200 - 25.000	700	7	ug/L
P215789	Aluminum	95.200	11.240	-	3650	36.5	mg/L
P215789	Barium	2.010	0.193	-	200	2	mg/L
P215789	bis(2-Ethylhexyl)phthalate	13.000 - 15.000	-	10.000	600	6	ug/L
P215789	Lead	0.040	0.011	-	1.5	0.015	mg/L
P215789	Manganese	3.220 - 4.620	0.296	-	172	1.72	mg/L
P215789	Methylene chloride	25.000	-	25.000	500	5	ug/L
P215789	Radium-226	22.000	0.620	-	2000	20	pCi/L
P215789	Tetrachloroethene	6.000 - 24.000	-	0.100 - 25.000	500	5	ug/L
P215789	Trichloroethene	476.000 - 1500.000	-	0.100 - 50.000	500	5	ug/L

4.0 NFAA SUMMARY

Based on analytical results and the SSRS, action is not required, and an NFAA determination is justified for IHSS Group 600-5 because of the following:

- Concentrations of COCs were not detected above RFCA WRW ALs.
- Migration of contaminants to surface water through erosion is unlikely because the area is not prone to landslides or erosion.
- Migration of contaminants in groundwater will not likely impact surface water because of the low levels of soil contamination found in IHSS Group 600-5. The groundwater contamination is considered part of the IA Plume, which will be further evaluated in a future decision document.

Approval of this Data Summary Report constitutes regulatory agency concurrence that IHSS Group 600-5 is an NFAA site. This information and the NFAA determination will be documented in the FY04 HRR. Ecological factors will be evaluated in the AAESE and the CRA.

5.0 DATA QUALITY ASSESSMENT

The data quality objectives (DQOs) for this project are described in the IASAP (DOE 2001). All DQOs for this project were achieved based on the following:

- Regulatory agency-approved sampling program design (IASAP Addendum #IA-04-09 [DOE 2004]), modified due to field conditions, in accordance with the IASAP (DOE 2001);
- Collection of samples in accordance with the sampling design; and
- Results of the Data Quality Assessment (DQA), as described in the following sections.

5.1 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:

- U.S. Environmental Protection Agency (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
- U.S. Department of Energy (DOE) Order 414.1A, 1999, Quality Assurance.

Verification and validation (V&V) of 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;
- Kaiser-Hill Company, L.L.C. (K-H) V&V Guidelines:
  - General Guidelines for Data Verification and Validation, DA-GR01-v1, 2002a
  - V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v1, 2002b
  - V&V Guidelines for Volatile Organics, DA-SS01-v1, 2002c
  - V&V Guidelines for Semivolatile Organics, DA-SS02-v1, 2002d
  - V&V Guidelines for Metals, DA-SS05-v1, 2002e; and
- 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 the Colorado Department of Public Health and Environment (CDPHE) and/or EPA.

5.2 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/MSDs);
- Laboratory control samples (LCSs);
- 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 hard-copy data (for example, individual analytical data packages) are currently filed by report identification number (RIN) and maintained by K-H Analytical Services Division (ASD); older hard copies may reside in the Federal Center in Lakewood, Colorado. Electronic data are stored in the RFETS SWD.

Both real and QC data are included on the enclosed CD.

5.2.1 Accuracy

The following measures of accuracy were evaluated:

- LCS evaluation;
- Surrogate evaluation;
- Field blank evaluation; and
- Sample MS 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 QC results could indicate unacceptable levels of uncertainty for decision-making purposes.

Laboratory Control Sample Evaluation

The frequency of LCS measurements is presented in Table 10. As indicated in Table 10 LCSs were run for all methods except gamma spectroscopy and SW-846-6020 (metals by XRF). The onsite laboratories are not required to provide these data.

The minimum and maximum LCS results are tabulated by chemical for the entire project in Table 11. While not all LCS results are within tolerances, project decisions based on AL exceedances were not affected. LCS results that were outside of tolerances were reviewed to determine whether a potential bias might be indicated. LCS recoveries are not indicative of matrix effects because they are not prepared using site samples. LCS

results do indicate whether the laboratory may be introducing a bias in the results. Recoveries reported above the upper limit may indicate the actual sample results are less than reported. Because this is environmentally conservative, no further action is needed. The analytes with unacceptable low recoveries were evaluated. If the highest sample result divided by the lowest LCS recovery for that analyte is less than the AL, no further action is taken because any indicated bias is not great enough to make a falsely low sample result be above the AL. As a result of these analyses, the LCS recoveries for this project did not impact project decisions. Any qualifications of individual results due to LCS performance exceeding upper or lower tolerance limits are captured in the V&V flags, described in the Completeness Section 5.2.3.

Table 10
LCS Frequency

Test Method	Lab Batch	Laboratory Control Standards
ALPHA SPEC	4117265	Yes
ALPHA SPEC	4117267	Yes
ALPHA SPEC	4117272	Yes
SW-846 6010/6010B	20040428B209TMI	Yes
SW-846 6010/6010B	20040429A212TMI	Yes
SW-846 6010/6010B	2196214	Yes
SW-846 6010/6010B	2200312	Yes
SW-846 8260	2198231	Yes
SW-846 8260	4111459	Yes
SW-846 8260	MS1 VOA_040414A	Yes
SW-846 8260	MS2 VOA_020812A	Yes
SW-846 8260	MS3 VOA_020806A	Yes
SW-846 8270	4110546	Yes
SW-846 8270B	2199142	Yes
SW-846 8270B	2213156	Yes
SW-846 8270B	2220258	Yes

Table 11
LCS Evaluation Summary

Test Method	CAS No.	Analyte	Minimum (%REC)	Maximum (%REC)
SW-846 8260	71-55-6	1,1,1-Trichloroethane	83	97.11
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	85.05	103.6
SW-846 8260	79-00-5	1,1,2-Trichloroethane	83.33	103.9
SW-846 8260	75-34-3	1,1-Dichloroethane	96.6	101.1
SW-846 8260	75-35-4	1,1-Dichloroethene	78	114.6
SW-846 8270	120-82-1	1,2,4-Trichlorobenzene	77	77
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	96.84	99.11

Test Method	CAS No.	Analyte	Minimum (%REC)	Maximum (%REC)
SW-846 8270B	120-82-1	1,2,4-Trichlorobenzene	65	77
SW-846 8260	95-50-1	1,2-Dichlorobenzene	89.62	97.03
SW-846 8260	107-06-2	1,2-Dichloroethane	84.9	99.32
SW-846 8260	78-87-5	1,2-Dichloropropane	98.25	102
SW-846 8260	106-46-7	1,4-Dichlorobenzene	91	96.51
SW-846 8270B	106-46-7	1,4-Dichlorobenzene	63	70
SW-846 8270	95-95-4	2,4,5-Trichlorophenol	81	81
SW-846 8270	88-06-2	2,4,6-Trichlorophenol	81	81
SW-846 8270	120-83-2	2,4-Dichlorophenol	79	79
SW-846 8270	105-67-9	2,4-Dimethylphenol	78	78
SW-846 8270	51-28-5	2,4-Dinitrophenol	68	68
SW-846 8270B	121-14-2	2,4-Dinitrotoluene	70	88
SW-846 8270	121-14-2	2,4-Dinitrotoluene	82	82
SW-846 8270	606-20-2	2,6-Dinitrotoluene	84	84
SW-846 8260	78-93-3	2-Butanone	53.23	106.8
SW-846 8270	91-58-7	2-Chloronaphthalene	79	79
SW-846 8270	95-57-8	2-Chlorophenol	80	80
SW-846 8270B	95-57-8	2-Chlorophenol	70	82
SW-846 8270	91-57-6	2-Methylnaphthalene	79	79
SW-846 8270	95-48-7	2-Methylphenol	79	79
SW-846 8270	88-74-4	2-Nitroaniline	80	80
SW-846 8270	91-94-1	3,3'-Dichlorobenzidine	72	72
SW-846 8270	534-52-1	4,6-Dinitro-2-methylphenol	69	69
SW-846 8270	106-47-8	4-Chloroaniline	63	63
SW-846 8260	108-10-1	4-Methyl-2-pentanone	63.22	98
SW-846 8270	106-44-5	4-Methylphenol	81	81
SW-846 8270	100-02-7	4-Nitrophenol	85	85
SW-846 8270B	100-02-7	4-Nitrophenol	71	85
SW-846 8270B	83-32-9	Acenaphthene	65	80
SW-846 8270	83-32-9	Acenaphthene	78	78
SW-846 8260	67-64-1	Acetone	51.49	135.1
SW-846 6010/6010B	7429-90-5	Aluminum	94	113
SW-846 8270	120-12-7	Anthracene	82	82
SW-846 6010/6010B	7440-36-0	Antimony	94	114
SW-846 6010/6010B	7440-38-2	Arsenic	92	93.7
SW-846 6010/6010B	7440-39-3	Barium	97	109
SW-846 8260	71-43-2	Benzene	89.11	104
SW-846 8270	56-55-3	Benzo(a)anthracene	78	78
SW-846 8270	50-32-8	Benzo(a)pyrene	82	82
SW-846 8270	205-99-2	Benzo(b)fluoranthene	74	74
SW-846 8270	207-08-9	Benzo(k)fluoranthene	81	81
SW-846 8270	65-85-0	Benzoic Acid	56	56

Test Method	CAS No.	Analyte	Minimum (%REC)	Maximum (%REC)
SW-846 8270	100-51-6	Benzyl Alcohol	86	86
SW-846 6010/6010B	7440-41-7	Beryllium	87	93.9
SW-846 8270	111-44-4	bis(2-Chloroethyl)ether	76	76
SW-846 8270	39638-32-9	bis(2-Chloroisopropyl)ether	77	77
SW-846 8270	117-81-7	bis(2-Ethylhexyl)phthalate	79	79
SW-846 8260	75-27-4	Bromodichloromethane	87.24	101.4
SW-846 8260	75-25-2	Bromoform	79.1	99.54
SW-846 8260	74-83-9	Bromomethane	88.01	130.3
SW-846 8270	85-68-7	Butylbenzylphthalate	84	84
SW-846 6010/6010B	7440-43-9	Cadmium	91	99.7
SW-846 8260	75-15-0	Carbon Disulfide	74	122.4
SW-846 8260	56-23-5	Carbon Tetrachloride	81	96.3
SW-846 8260	108-90-7	Chlorobenzene	95.64	104.3
SW-846 8260	75-00-3	Chloroethane	92.34	124.2
SW-846 8260	67-66-3	Chloroform	85.81	98.85
SW-846 8260	74-87-3	Chloromethane	75.14	158.5
SW-846 6010/6010B	7440-47-3	Chromium	93	105
SW-846 8270	218-01-9	Chrysene	76	76
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	90.2	99.46
SW-846 6010/6010B	7440-48-4	Cobalt	89	112
SW-846 6010/6010B	7440-50-8	Copper	98	110
SW-846 8270	84-74-2	Di-n-butylphthalate	87	87
SW-846 8270	117-84-0	Di-n-octylphthalate	76	76
SW-846 8270	53-70-3	Dibenz(a,h)anthracene	74	74
SW-846 8270	132-64-9	Dibenzofuran	81	81
SW-846 8260	124-48-1	Dibromochloromethane	85.35	100.2
SW-846 8270	84-66-2	Diethylphthalate	79	79
SW-846 8270	131-11-3	Dimethylphthalate	79	79
SW-846 8260	100-41-4	Ethylbenzene	96.39	101.5
SW-846 8270	206-44-0	Fluoranthene	84	84
SW-846 8270	86-73-7	Fluorene	77	77
SW-846 8270	118-74-1	Hexachlorobenzene	80	80
SW-846 8260	87-68-3	Hexachlorobutadiene	94.82	95
SW-846 8270	87-68-3	Hexachlorobutadiene	78	78
SW-846 8270	77-47-4	Hexachlorocyclopentadiene	66	66
SW-846 8270	67-72-1	Hexachloroethane	78	78
SW-846 8270	193-39-5	Indeno(1,2,3-cd)pyrene	75	75
SW-846 6010/6010B	7439-89-6	Iron	94	189
SW-846 8270	78-59-1	Isophorone	80	80
SW-846 6010/6010B	7439-92-1	Lead	93	108
SW-846 6010/6010B	7439-93-2	Lithium	94	109
SW-846 6010/6010B	7439-96-5	Manganese	92	109

Test Method	CAS No.	Analyte	Minimum (%REC)	Maximum (%REC)
SW-846 6010/6010B	7439-97-6	Mercury	98	100
SW-846 8260	75-09-2	Methylene chloride	85.56	103
SW-846 6010/6010B	7439-98-7	Molybdenum	88	105
SW-846 8270	86-30-6	n-Nitrosodiphenylamine	86	86
SW-846 8270	621-64-7	n-Nitrosodipropylamine	81	81
SW-846 8270B	621-64-7	n-Nitrosodipropylamine	67	75
SW-846 8270	91-20-3	Naphthalene	77	77
SW-846 8260	91-20-3	Naphthalene	96.75	99.3
SW-846 6010/6010B	7440-02-0	Nickel	94	106
SW-846 8270	98-95-3	Nitrobenzene	79	79
SW-846 8270B	87-86-5	Pentachlorophenol	56	69
SW-846 8270	87-86-5	Pentachlorophenol	68	68
SW-846 8270B	108-95-2	Phenol	70	80
SW-846 8270	108-95-2	Phenol	79	79
SW-846 8270	129-00-0	Pyrene	75	75
SW-846 8270B	129-00-0	Pyrene	63	72
SW-846 6010/6010B	7782-49-2	Selenium	85.1	93
SW-846 6010/6010B	7440-22-4	Silver	97.4	102
SW-846 6010/6010B	7440-24-6	Strontium	97	109
SW-846 8260	100-42-5	Styrene	97	109
SW-846 8260	127-18-4	Tetrachloroethene	87.14	99.15
SW-846 6010/6010B	7440-31-5	Tin	89	101
SW-846 8260	108-88-3	Toluene	92.06	115.6
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	88.9	101.7
SW-846 8260	79-01-6	Trichloroethene	89.8	99.19
SW-846 6010/6010B	11-09-6	Uranium, Total	101	109
SW-846 6010/6010B	7440-62-2	Vanadium	80.4	91
SW-846 8260	75-01-4	Vinyl chloride	87.77	151.7
SW-846 8260	1330-20-7	Xylene	90.2	99.93
SW-846 6010/6010B	7440-66-6	Zinc	85	110

Surrogate Evaluation

The frequency of surrogate measurements relative to each laboratory batch is given in Table 12. The minimum and maximum surrogate results are tabulated by chemical for the entire project. Surrogates are added to every sample, and therefore surrogate recoveries only impact individual samples. Unacceptable surrogate recoveries can indicate potential matrix effects. Surrogate recoveries reported above 100 percent may indicate the actual sample results are less than reported. Because this is environmentally conservative, no further action is needed. Therefore, only the lowest recoveries were evaluated. If the maximum sample result recovery is less than the WRW AL for that analyte, no further action is taken because any indicated bias is not great enough to correct affect project decisions. The highest and lowest surrogate recoveries for this

project were reviewed, and the associated samples results were not near enough to the AL to indicate project decisions would be impacted. Any qualifications of results due to surrogate results are captured in the V&V flags, described in Section 5.2.3.

Table 12
Surrogate Recovery Summary

Number of Samples	Analyte	Minimum (%REC)	Maximum (%REC)
VOC Surrogate Recoveries			
12	4-Bromofluorobenzene	87	114.9
12	Deuterated 1,2-dichloroethane	92	125.1
12	Deuterated Toluene	92.77	110.5
SVOC Surrogate Recoveries			
24	2-Fluorobiphenyl	49	75
24	2-Fluorophenol	61	86
24	Deuterated Nitrobenzene	60	82
24	p-Terphenyl-d14	51	86

Field Blank Evaluation

Results of the field blank analyses are given in Table 13. 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 were detected in the blanks at concentrations greater than one-tenth the AL. Therefore, no sample results at or above the AL could have been impacted by the blanks.

Table 13
Field QA Summary

Laboratory	CAS No.	Analyte	Sample QC Code	Detected Value	Result Unit
URS	78-93-3	2-Butanone	FB	4	ug/L
URS	78-93-3	2-Butanone	TB	5	ug/L
URS	71-43-2	Benzene	TB	0.91	ug/L
URS	108-90-7	Chlorobenzene	TB	1.2	ug/L
URS	108-88-3	Toluene	TB	1.3	ug/L
URS	15117-96-1	Uranium-235	EB	0.201	pCi/g
URS	15117-96-1	Uranium-235	FB	0.127	pCi/g
URS	15117-96-1	Uranium-235	RNS	0.179	pCi/g
URS	7440-61-1	Uranium-238	EB	2.05	pCi/g
URS	7440-61-1	Uranium-238	FB	2.27	pCi/g
URS	7440-61-1	Uranium-238	RNS	3.95	pCi/g

Field Blanks (TB = Trip, RNS = Rinse, FB = Field, EB = Equipment Blank) results greater than detection limits (not *U* Qualified)

Sample Matrix Spike Evaluation

The minimum and maximum MS results are summarized by chemical for the entire project in Table 14. Organic analytes with unacceptable low recoveries resulted in a review of the LCS recoveries. According to the EPA data validation guidelines, if organic matrix spike recoveries are low, then the LCS recovery is to be checked and, if acceptable, no action is to be taken. While LCS recoveries for 1,2,4-trichlorobenzene, benzoic acid, hexachlorobutadiene, hexachlorocyclopentadiene, and pentachlorophenol had low recoveries, these checks indicate no decisions were impacted for organic analytes, therefore no action was taken.

For inorganics, the associated sample results were divided by the lowest percent recovery for each analyte. If the resulting number is less than the AL, decisions were not impacted, therefore no action was taken. For this project, antimony, copper, iron, and zinc had low recoveries and were checked using the above methodoloty. For these analytes, the AL was at least a factor of three times higher than the highest sample result, therefore no decisions were impacted.

Table 14
Sample MS Evaluation Summary

Test Method Name	CAS	Analyte	Minimum (%REC)	Maximum (%REC)	Number of Laboratory Samples	Number of Laboratory Batches
SW-846 8260	71-55-6	1,1,1-Trichloroethane	88.69	89.76	2	2
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	82.21	101.5	2	2
SW-846 8260	79-00-5	1,1,2-Trichloroethane	89.44	99.62	2	2
SW-846 8260	75-34-3	1,1-Dichloroethane	87.08	88.46	2	2
SW-846 8260	75-35-4	1,1-Dichloroethene	74.5	86.48	2	2
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	47.58	76.25	2	2
SW-846 8270	120-82-1	1,2,4-Trichlorobenzene	67	67	1	1
SW-846 8260	95-50-1	1,2-Dichlorobenzene	66.9	90.78	2	2
SW-846 8260	107-06-2	1,2-Dichloroethane	91.58	100.8	2	2
SW-846 8260	78-87-5	1,2-Dichloropropane	84.06	91.93	2	2
SW-846 8260	106-46-7	1,4-Dichlorobenzene	66.4	91.62	2	2
SW-846 8270	95-95-4	2,4,5-Trichlorophenol	66	66	1	1
SW-846 8270	88-06-2	2,4,6-Trichlorophenol	65	65	1	1
SW-846 8270	120-83-2	2,4-Dichlorophenol	63	63	1	1
SW-846 8270	105-67-9	2,4-Dimethylphenol	66	66	1	1
SW-846 8270	51-28-5	2,4-Dinitrophenol	53	53	1	1
SW-846 8270	121-14-2	2,4-Dinitrotoluene	72	72	1	1
SW-846 8270	606-20-2	2,6-Dinitrotoluene	72	72	1	1
SW-846 8260	78-93-3	2-Butanone	110.75	111	2	2
SW-846 8270	91-58-7	2-Chloronaphthalene	67	67	1	1
SW-846 8270	95-57-8	2-Chlorophenol	68	68	1	1
SW-846 8270	91-57-6	2-Methylnaphthalene	68	68	1	1
SW-846 8270	95-48-7	2-Methylphenol	67	67	1	1
SW-846 8270	88-74-4	2-Nitroaniline	70	70	1	1

Test Method Name	CAS	Analyte	Minimum (%REC)	Maximum (%REC)	Number of Laboratory Samples	Number of Laboratory Batches
SW-846 8270	91-94-1	3,3'-Dichlorobenzidine	61	61	1	1
SW-846 8270	534-52-1	4,6-Dinitro-2-methylphenol	54	54	1	1
SW-846 8270	106-47-8	4-Chloroaniline	58	58	1	1
SW-846 8260	108-10-1	4-Methyl-2-pentanone	117	118.1	2	2
SW-846 8270	106-44-5	4-Methylphenol	70	70	1	1
SW-846 8270	100-02-7	4-Nitrophenol	74	74	1	1
SW-846 8270	83-32-9	Acenaphthene	65	65	1	1
SW-846 8260	67-64-1	Acetone	100.2	131.7	2	2
SW-846 6010/6010B	7429-90-5	Aluminum	102	102	1	1
SW-846 8270	120-12-7	Anthracene	60	60	1	1
SW-846 6010/6010B	7440-36-0	Antimony	41.7	41.7	1	1
SW-846 6010/6010B	7440-38-2	Arsenic	89.9	89.9	1	1
SW-846 6010/6010B	7440-39-3	Barium	115	115	1	1
SW-846 8260	71-43-2	Benzene	87.21	89.54	2	2
SW-846 8270	56-55-3	Benzo(a)anthracene	63	63	1	1
SW-846 8270	50-32-8	Benzo(a)pyrene	61	61	1	1
SW-846 8270	205-99-2	Benzo(b)fluoranthene	58	58	1	1
SW-846 8270	207-08-9	Benzo(k)fluoranthene	61	61	1	1
SW-846 8270	65-85-0	Benzoic Acid	47	47	1	1
SW-846 8270	100-51-6	Benzyl Alcohol	71	71	1	1
SW-846 6010/6010B	7440-41-7	Beryllium	75.3	75.3	1	1
SW-846 8270	111-44-4	bis(2-Chloroethyl)ether	68	68	1	1
SW-846 8270	39638-32-9	bis(2-Chloroisopropyl)ether	64	64	1	1
SW-846 8270	117-81-7	bis(2-Ethylhexyl)phthalate	65	65	1	1
SW-846 8260	75-27-4	Bromodichloromethane	85.29	100.6	2	2
SW-846 8260	75-25-2	Bromoform	85.79	106.4	2	2
SW-846 8260	74-83-9	Bromomethane	70.4	76.12	2	2
SW-846 8270	85-68-7	Butylbenzylphthalate	57	57	1	1
SW-846 6010/6010B	7440-43-9	Cadmium	92.6	92.6	1	1
SW-846 8260	75-15-0	Carbon Disulfide	71.23	80.5	2	2
SW-846 8260	56-23-5	Carbon Tetrachloride	88.69	88.86	2	2
SW-846 8260	108-90-7	Chlorobenzene	77.4	91.98	2	2
SW-846 8260	75-00-3	Chloroethane	74.05	88.31	2	2
SW-846 8260	67-66-3	Chloroform	87.4	94.16	2	2
SW-846 8260	74-87-3	Chloromethane	57.01	90.1	2	2
SW-846 6010/6010B	7440-47-3	Chromium	257	257	1	1
SW-846 8270	218-01-9	Chrysene	61	61	1	1
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	82.54	95.36	2	2
SW-846 6010/6010B	7440-48-4	Cobalt	96.6	96.6	1	1
SW-846 6010/6010B	7440-50-8	Copper	34.1	34.1	1	1
SW-846 8270	84-74-2	Di-n-butylphthalate	67	67	1	1

Test Method Name	CAS	Analyte	Minimum (%REC)	Maximum (%REC)	Number of Laboratory Samples	Number of Laboratory Batches
SW-846 8270	117-84-0	Di-n-octylphthalate	64	64	1	1
SW-846 8270	53-70-3	Dibenz(a,h)anthracene	62	62	1	1
SW-846 8270	132-64-9	Dibenzofuran	69	69	1	1
SW-846 8260	124-48-1	Dibromochloromethane	87.4	95.91	2	2
SW-846 8270	84-66-2	Diethylphthalate	68	68	1	1
SW-846 8270	131-11-3	Dimethylphthalate	71	71	1	1
SW-846 8260	100-41-4	Ethylbenzene	77.77	86.73	2	2
SW-846 8270	206-44-0	Fluoranthene	69	69	1	1
SW-846 8270	86-73-7	Fluorene	65	65	1	1
SW-846 8270	118-74-1	Hexachlorobenzene	62	62	1	1
SW-846 8260	87-68-3	Hexachlorobutadiene	47.02	67.82	2	2
SW-846 8270	87-68-3	Hexachlorobutadiene	68	68	1	1
SW-846 8270	77-47-4	Hexachlorocyclopentadiene	36	36	1	1
SW-846 8270	67-72-1	Hexachloroethane	66	66	1	1
SW-846 8270	193-39-5	Indeno(1,2,3-cd)pyrene	61	61	1	1
SW-846 6010/6010B	7439-89-6	Iron	26.6	26.6	1	1
SW-846 8270	78-59-1	Isophorone	68	68	1	1
SW-846 6010/6010B	7439-92-1	Lead	75.9	75.9	1	1
SW-846 6010/6010B	7439-93-2	Lithium	96.6	96.6	1	1
SW-846 6010/6010B	7439-96-5	Manganese	178	178	1	1
SW-846 6010/6010B	7439-97-6	Mercury	101	101	1	1
SW-846 8260	75-09-2	Methylene chloride	87.82	91.04	2	2
SW-846 6010/6010B	7439-98-7	Molybdenum	144	144	1	1
SW-846 8270	86-30-6	n-Nitrosodiphenylamine	74	74	1	1
SW-846 8270	621-64-7	n-Nitrosodipropylamine	66	66	1	1
SW-846 8260	91-20-3	Naphthalene	68.37	83.82	2	2
SW-846 8270	91-20-3	Naphthalene	67	67	1	1
SW-846 6010/6010B	7440-02-0	Nickel	170	170	1	1
SW-846 8270	98-95-3	Nitrobenzene	70	70	1	1
SW-846 8270	87-86-5	Pentachlorophenol	37	37	1	1
SW-846 8270	108-95-2	Phenol	70	70	1	1
SW-846 8270	129-00-0	Pyrene	56	56	1	1
SW-846 6010/6010B	7782-49-2	Selenium	75.8	75.8	1	1
SW-846 6010/6010B	7440-22-4	Silver	92.9	92.9	1	1
SW-846 6010/6010B	7440-24-6	Strontium	67.8	67.8	1	1
SW-846 8260	100-42-5	Styrene	71.71	88.58	2	2
SW-846 8260	127-18-4	Tetrachloroethene	80.94	87.37	2	2
SW-846 6010/6010B	7440-31-5	Tin	88.3	88.3	1	1
SW-846 8260	108-88-3	Toluene	75.87	82.58	2	2
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	83.52	91.81	2	2
SW-846 8260	79-01-6	Trichloroethene	82.71	89.62	2	2

Test Method Name	CAS	Analyte	Minimum (%REC)	Maximum (%REC)	Number of Laboratory Samples	Number of Laboratory Batches
SW-846 6010/6010B	11-09-6	Uranium, Total	76.4	76.4	1	1
SW-846 6010/6010B	7440-62-2	Vanadium	68.8	68.8	1	1
SW-846 8260	75-01-4	Vinyl chloride	60.58	86.54	2	2
SW-846 8260	1330-20-7	Xylene	80.1625	87.07	2	2
SW-846 6010/6010B	7440-66-6	Zinc	48.8	48.8	1	1

5.2.2 Precision

Matrix Spike Duplicate Evaluation

Laboratory precision is measured through use of MSDs which are summarized in Table 15. The analytes with the highest relative percent differences (RPDs) were reviewed by comparing the highest sample result to the AL. If the highest sample results were sufficiently below the AL, no further action is needed. For this project, the reviews indicated decisions were not impacted. While a number of the RPDs are high (aluminum, barium, chromium, cobalt, copper, iron, manganese, molybdenum, pyrene, vanadium, and zinc), they would not result in rejection of data that affects project decisions.

Table 15
Sample MSD Evaluation Summary

Test Method	CAS No.	Analyte	Max RPD (%)
SW-846 6010/6010B	7429-90-5	Aluminum	1.980
SW-846 6010/6010B	7440-36-0	Antimony	17.471
SW-846 6010/6010B	7440-38-2	Arsenic	21.892
SW-846 6010/6010B	7440-39-3	Barium	126.045
SW-846 6010/6010B	7440-41-7	Beryllium	3.906
SW-846 6010/6010B	7440-43-9	Cadmium	2.769
SW-846 6010/6010B	7440-47-3	Chromium	64.948
SW-846 6010/6010B	7440-48-4	Cobalt	43.309
SW-846 6010/6010B	7440-50-8	Copper	101.941
SW-846 6010/6010B	7439-89-6	Iron	164.838
SW-846 6010/6010B	7439-92-1	Lead	34.910
SW-846 6010/6010B	7439-93-2	Lithium	14.765
SW-846 6010/6010B	7439-96-5	Manganese	189.859
SW-846 6010/6010B	7439-97-6	Mercury	1.961
SW-846 6010/6010B	7439-98-7	Molybdenum	40.903
SW-846 6010/6010B	7440-02-0	Nickel	14.714
SW-846 6010/6010B	7782-49-2	Selenium	2.733
SW-846 6010/6010B	7440-22-4	Silver	1.283
SW-846 6010/6010B	7440-24-6	Strontium	120.887
SW-846 6010/6010B	7440-31-5	Tin	0.677

Test Method	CAS No.	Analyte	Max RPD (%)
SW-846 6010/6010B	11-09-6	Uranium, Total	1.716
SW-846 6010/6010B	7440-62-2	Vanadium	128.109
SW-846 6010/6010B	7440-66-6	Zinc	133.786
SW-846 8260	71-55-6	1,1,1-Trichloroethane	0.996
SW-846 8260	79-34-5	1,1,2,2-Tetrachloroethane	4.008
SW-846 8260	79-00-5	1,1,2-Trichloroethane	2.904
SW-846 8260	75-34-3	1,1-Dichloroethane	1.749
SW-846 8260	75-35-4	1,1-Dichloroethene	0.955
SW-846 8260	120-82-1	1,2,4-Trichlorobenzene	21.586
SW-846 8260	95-50-1	1,2-Dichlorobenzene	13.721
SW-846 8260	107-06-2	1,2-Dichloroethane	2.203
SW-846 8260	78-87-5	1,2-Dichloropropane	3.942
SW-846 8260	106-46-7	1,4-Dichlorobenzene	13.866
SW-846 8260	78-93-3	2-Butanone	3.453
SW-846 8260	108-10-1	4-Methyl-2-pentanone	2.573
SW-846 8260	67-64-1	Acetone	2.269
SW-846 8260	71-43-2	Benzene	2.465
SW-846 8260	75-27-4	Bromodichloromethane	2.394
SW-846 8260	75-25-2	Bromoform	4.921
SW-846 8260	74-83-9	Bromomethane	0.228
SW-846 8260	75-15-0	Carbon Disulfide	2.862
SW-846 8260	56-23-5	Carbon Tetrachloride	2.697
SW-846 8260	108-90-7	Chlorobenzene	3.483
SW-846 8260	75-00-3	Chloroethane	3.812
SW-846 8260	67-66-3	Chloroform	1.876
SW-846 8260	74-87-3	Chloromethane	1.734
SW-846 8260	10061-01-5	cis-1,3-Dichloropropene	1.991
SW-846 8260	124-48-1	Dibromochloromethane	0.260
SW-846 8260	100-41-4	Ethylbenzene	7.497
SW-846 8260	87-68-3	Hexachlorobutadiene	17.635
SW-846 8260	75-09-2	Methylene chloride	1.284
SW-846 8260	91-20-3	Naphthalene	12.313
SW-846 8260	100-42-5	Styrene	6.612
SW-846 8260	127-18-4	Tetrachloroethene	3.456
SW-846 8260	108-88-3	Toluene	1.795
SW-846 8260	10061-02-6	trans-1,3-Dichloropropene	0.710
SW-846 8260	79-01-6	Trichloroethene	2.023
SW-846 8260	75-01-4	Vinyl chloride	4.300
SW-846 8260	1330-20-7	Xylene	5.685
SW-846 8270	120-82-1	1,2,4-Trichlorobenzene	7.752
SW-846 8270	95-95-4	2,4,5-Trichlorophenol	12.903
SW-846 8270	88-06-2	2,4,6-Trichlorophenol	14.876

Test Method	CAS No.	Analyte	Max RPD (%)
SW-846 8270	120-83-2	2,4-Dichlorophenol	11.765
SW-846 8270	105-67-9	2,4-Dimethylphenol	16.393
SW-846 8270	51-28-5	2,4-Dinitrophenol	7.843
SW-846 8270	121-14-2	2,4-Dinitrotoluene	19.847
SW-846 8270	606-20-2	2,6-Dinitrotoluene	18.182
SW-846 8270	91-58-7	2-Chloronaphthalene	16.129
SW-846 8270	95-57-8	2-Chlorophenol	9.231
SW-846 8270	91-57-6	2-Methylnaphthalene	12.500
SW-846 8270	95-48-7	2-Methylphenol	11.024
SW-846 8270	88-74-4	2-Nitroaniline	22.222
SW-846 8270	91-94-1	3,3'-Dichlorobenzidine	14.035
SW-846 8270	534-52-1	4,6-Dinitro-2-methylphenol	18.182
SW-846 8270	106-47-8	4-Chloroaniline	16.822
SW-846 8270	106-44-5	4-Methylphenol	13.740
SW-846 8270	100-02-7	4-Nitrophenol	12.950
SW-846 8270	83-32-9	Acenaphthene	18.487
SW-846 8270	120-12-7	Anthracene	6.897
SW-846 8270	56-55-3	Benzo(a)anthracene	17.241
SW-846 8270	50-32-8	Benzo(a)pyrene	15.929
SW-846 8270	205-99-2	Benzo(b)fluoranthene	3.509
SW-846 8270	207-08-9	Benzo(k)fluoranthene	17.857
SW-846 8270	65-85-0	Benzoic Acid	11.236
SW-846 8270	100-51-6	Benzyl Alcohol	7.299
SW-846 8270	111-44-4	bis(2-Chloroethyl)ether	12.500
SW-846 8270	39638-32-9	bis(2-Chloroisopropyl)ether	4.800
SW-846 8270	117-81-7	bis(2-Ethylhexyl)phthalate	16.667
SW-846 8270	85-68-7	Butylbenzylphthalate	11.111
SW-846 8270	218-01-9	Chrysene	17.857
SW-846 8270	53-70-3	Dibenz(a,h)anthracene	8.403
SW-846 8270	132-64-9	Dibenzofuran	19.048
SW-846 8270	84-66-2	Diethylphthalate	10.853
SW-846 8270	131-11-3	Dimethylphthalate	16.794
SW-846 8270	84-74-2	Di-n-butylphthalate	12.698
SW-846 8270	117-84-0	Di-n-octylphthalate	22.609
SW-846 8270	206-44-0	Fluoranthene	13.953
SW-846 8270	86-73-7	Fluorene	16.667
SW-846 8270	118-74-1	Hexachlorobenzene	1.626
SW-846 8270	87-68-3	Hexachlorobutadiene	4.317
SW-846 8270	77-47-4	Hexachlorocyclopentadiene	8.000
SW-846 8270	67-72-1	Hexachloroethane	0.000
SW-846 8270	193-39-5	Indeno(1,2,3-cd)pyrene	10.345
SW-846 8270	78-59-1	Isophorone	14.173

Test Method	CAS No.	Analyte	Max RPD (%)
SW-846 8270	91-20-3	Naphthalene	11.024
SW-846 8270	98-95-3	Nitrobenzene	8.955
SW-846 8270	86-30-6	n-Nitrosodiphenylamine	17.647
SW-846 8270	621-64-7	n-Nitrosodipropylamine	11.200
SW-846 8270	87-86-5	Pentachlorophenol	15.000
SW-846 8270	108-95-2	Phenol	17.054
SW-846 8270	129-00-0	Pyrene	5.505

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 16 indicates that sampling frequencies were adequate except for radionuclides (alpha spectroscopy) and metals (6200).

Table 16
Field Duplicate Sample Frequency Summary

Test Method	Sample Code	Number of Samples	% Duplicate Samples
ALPHA SPEC	REAL	2	0.00
	DUP	0	
GAMMA SPECTROSCOPY	REAL	26	7.69
	DUP	2	
SW-846 6010/6010B	REAL	21	9.52
	DUP	2	
SW-846 6200	REAL	3	0.00
	DUP	0	
SW-846 8260	REAL	12	8.33
	DUP	1	
SW-846 8270/8270B	REAL	24	8.33
	DUP	2	

The RPDs indicate how much variation exists in the field duplicate analyses. The EPA data validation guidelines state that "there are no required review criteria for field duplicate analyses comparability." For the DQA, the highest Max RPDs were reviewed (antimony, arsenic, barium, benzo(a)anthracene, beryllium, chrysene, copper, fluoranthene, iron, lead, manganese, mercury, nickel, silver, strontium, vanadium, and zinc). The highest sample amount for those analytes were corrected for the associated RPD (Table 17), and the resulting number was compared to the AL. For this project, none of the corrected numbers were greater than the AL, therefore project decisions were not impacted.

Table 17
RPD Evaluation Summary

Laboratory	Analyte	Max of RPD (%)
ESTLDEN	1,2,4-Trichlorobenzene	3.73
ESTLDEN	2,4,5-Trichlorophenol	3.73
ESTLDEN	2,4,6-Trichlorophenol	3.73
ESTLDEN	2,4-Dichlorophenol	3.73
ESTLDEN	2,4-Dimethylphenol	3.73
ESTLDEN	2,4-Dinitrophenol	5.00
ESTLDEN	2-Chloronaphthalene	3.73
ESTLDEN	2-Chlorophenol	3.73
ESTLDEN	2-Methylnaphthalene	3.73
ESTLDEN	2-Methylphenol	3.73
ESTLDEN	2-Nitroaniline	5.00
ESTLDEN	3,3'-Dichlorobenzidine	6.90
ESTLDEN	4,6-Dinitro-2-methylphenol	5.00
ESTLDEN	4-Chloroaniline	6.90
ESTLDEN	4-Methylphenol	3.73
ESTLDEN	4-Nitrophenol	5.00
FGL	Aluminum	79.12
ESTLDEN	Anthracene	28.57
FGL	Antimony	173.13
FGL	Arsenic	78.95
FGL	Barium	45.14
ESTLDEN	Benzo(a)anthracene	76.92
ESTLDEN	Benzo(a)pyrene	22.22
ESTLDEN	Benzo(b)fluoranthene	16.67
ESTLDEN	Benzo(k)fluoranthene	29.21
ESTLDEN	Benzoic Acid	5.00
ESTLDEN	Benzyl Alcohol	6.90
FGL	Beryllium	37.17
ESTLDEN	bis(2-Chloroethyl)ether	3.73
ESTLDEN	bis(2-Chloroisopropyl)ether	3.73
ESTLDEN	bis(2-Ethylhexyl)phthalate	2.70
ESTLDEN	Butylbenzylphthalate	3.73
FGL	Cadmium	24.39
FGL	Chromium	31.71
ESTLDEN	Chrysene	85.71
FGL	Cobalt	10.98
FGL	Copper	73.42
ESTLDEN	Di-n-butylphthalate	3.73
ESTLDEN	Di-n-octylphthalate	3.73
ESTLDEN	Dibenz(a,h)anthracene	3.73
ESTLDEN	Diethylphthalate	3.73
ESTLDEN	Dimethylphthalate	3.73

Laboratory	Analyte	Max of RPD (%)
ESTLDEN	Fluoranthene	93.33
ESTLDEN	Hexachlorobenzene	3.73
ESTLDEN	Hexachlorobutadiene	3.73
ESTLDEN	Hexachlorocyclopentadiene	3.73
ESTLDEN	Hexachloroethane	3.73
ESTLDEN	Indeno(1,2,3-cd)pyrene	24.00
FGL	Iron	72.11
ESTLDEN	Isophorone	3.73
FGL	Lead	138.19
FGL	Lithium	18.92
FGL	Manganese	132.84
FGL	Mercury	143.31
FGL	Molybdenum	0.00
ESTLDEN	n-Nitrosodiphenylamine	3.73
ESTLDEN	n-Nitrosodipropylamine	3.73
ESTLDEN	Naphthalene	2.70
FGL	Nickel	42.42
ESTLDEN	Nitrobenzene	3.73
ESTLDEN	Pentachlorophenol	5.00
ESTLDEN	Phenol	3.73
ESTLDEN	Pyrene	25.35
FGL	Selenium	28.57
FGL	Silver	100.00
FGL	Strontium	107.79
FGL	Tin	0.00
FGL	Uranium, Total	26.36
FGL	Vanadium	41.99
FGL	Zinc	66.67

5.2.3 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 18 shows the number and percentage of validated records (codes without "1"), the number and percentage of verified records (codes with "1"), and the percentage of rejected records for each analyte group. Less than 25 percent of IHSS Group 600-5 records were validated, and 33 percent to 100 percent of the records verified. However, association with previous and subsequent validated records indicates that the data is acceptable.

Table 18
Validation and Verification Summary

Validation Qualifier Code	Total of CAS Number	Alpha Spec	Gamma Spectroscopy	SW-846 6010/6010B	SW-846 6200	SW-846 8260	SW-846 8270/8270B
No V&V	9	0	9	0	0	0	0
J	3	0	0	0	2	1	0
J1	391	0	0	390	1	0	0
UJ	12	0	0	0	0	12	0
UJ1	34	0	0	28	0	2	4
V	201	0	0	0	34	59	108
V1	1703	10	69	65	17	394	1148
Total	2353	10	78	483	54	468	1260
Validated	216	0	0	0	36	72	108
% Validated	9.18%	0.00%	0.00%	0.00%	66.67%	15.38%	33.33%
Verified	2128	10	69	483	18	396	1152
% Verified	90.44%	100.00%	88.46%	100.00%	33.33%	84.62%	91.43%

Notes:
Validated - J, V, JB, UJ
Verified - 1, J1, V1, B1, UJ1

5.2.4 Sensitivity

RLs, in units of micrograms per kilogram (ug/kg) for organics, milligrams per kilogram (mg/kg) for metals, and picocuries per gram (pCi/g) for radionuclides, were compared with RFCA WRW ALs. Adequate sensitivities of analytical methods were attained for all COCs that affect project decisions. "Adequate" sensitivity is defined as an RL less than an analyte's associated AL, typically less than one-half the AL.

5.3 Summary of Data Quality

RPDs greater than 35 percent indicate the sampling precision limits of some analytes have been exceeded. No records were rejected. Less than 25 percent of the records for IHSS Group 600-5 were validated. If additional V&V information is received, IHSS Group 600-5 records will be updated in SWD. Data qualified as a result of additional data will be assessed as part of the CRA process. Data collected and used for IHSS Group 600-5 are adequate for decision making based on ER Program Goals.

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Appendix A
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