NOTICE

All drawings located at the end of the document.

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Data Summary Report
IHSS Group 500-7

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ENCLOSURES

Compact Disc - IHSS Group 500-7 Real Data
Compact Disc – IHSS Group 500-7 QA Data

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ACRONYMS

AL	action level
AR	Administrative Record
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of Concern
DOE	U.S. Department of Energy
DQA	Data Quality Assessment
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ER RSOP	Environmental Restoration RFCA Standard Operating Protocol
FY	Fiscal Year
HPGe	high-purity germanium
HRR	Historical Release Report
IA	Industrial Area
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
K-H	Kaiser-Hill Company L.L.C.
LCS	laboratory control sample
mg/kg	milligram per kilogram
MS	matrix spike
MSD	matrix spike duplicate
N/A	not applicable
ND	not detected
NFAA	No Further Accelerated Action
PAC	Potential Area of Concern
PARCCS	precision, accuracy, representativeness, completeness, comparability, and sensitivity
PCB	polychorinated biphynel
pCi/g	picocuries per gram
POC	Point of Compliance
QC	quality control
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RIN	report identification number
RL	reporting limit
RPD	relative percent difference
SAP	Sampling and Analysis Plan
SD	standard deviation
SOR	sum of ratio
SVOC	semivolatile organic compound
ug/kg	micrograms per kilogram
VOC	volatile organic compound
V&V	verification and validation
WRW	Wildlife Refuge Worker

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1.0 INTRODUCTION

This Data Summary Report summarizes characterization activities conducted at Individual Hazardous Substance Site (IHSS) Group 500-7 at the Rocky Flats Environmental Technology Site (RFETS) in Golden, Colorado. Characterization activities were planned and executed in accordance with the Industrial Area (IA) Sampling and Analysis Plan (SAP) (IASAP) (DOE 2001a) and IASAP Addendum #IA-02-01 (DOE 2001b).

The IHSS included in this report is listed in Table 1 and shown on Figure 1.

Table 1
IHSS Group 500-7 Description

IHSS Group	IHSS/PAC/UBC Site
500-7	500-907 – Tanker Truck Release of Hazardous Waste from Tank 231B

2.0 SITE CHARACTERIZATION

IHSS Group 500-7 information consists of historical knowledge (DOE 1992-2002) and data from five sampling locations with specifications as described in IASAP Addendum #IA-02-01 (DOE 2001b). The sampling specifications for the characterization samples collected are listed in Table 2. The locations of these samples and analytical results greater than background means plus two standard deviations or reporting limits (RLs) are presented on Figure 2 and in Table 3. A summary of the analytical results is presented in Table 4. Deviations from planned sampling specifications are presented in Table 5. The raw data, as of June 3, 2003, are enclosed on a compact disc.

Analytical results indicate that No Further Accelerated Action (NFAA) for IHSS Group 500-7 is warranted for the following reasons:

- All contaminant concentrations are less than proposed Rocky Flats Cleanup Agreement (RFCA) Wildlife Refuge Worker (WRW) Action Levels (ALs) (DOE, et al 2002);
- All contaminant concentrations are less than proposed Ecological Receptor ALs (DOE, et al 2002); and
- There is no identified potential to exceed surface water standards at a Point of Compliance (POC) from this IHSS Group.

A subsurface soil risk screen is not required because this Potential Area of Concern (PAC) was the result of an isolated surface soil spill and subsurface soil was not evaluated.

Approval of this Data Summary Report constitutes regulatory agency concurrence of this IHSS Group as an NFAA. This information and NFAA determination will be documented in the Fiscal Year (FY)03 Historical Release Report (HRR).

2.1 Analytical Results

Several analytes including polychlorinated biphyenls (PCBs), metals, and semivolatile organic compounds (SVOCs) were detected above background levels or laboratory RLs at each of the five sampling locations (Figure 2). However, analytical results indicate that all concentrations are less than proposed RFCA WRW and Ecological Receptor ALs (DOE, et al 2002).

2.2 Sum of Ratios

Sum of ratio (SOR) calculations are based on accelerated action analytical data for the radionuclides of concern (americium-241, plutonium-239/240, uranium-234, uranium-235, and uranium-238). None of the radionuclide activities were greater than background means plus two standard deviations. Therefore, the radionuclide SORs are not calculated.

3.0 DEVIATIONS FROM PLANNED SAMPLING SPECIFICATIONS

There were no deviations from the planned sampling specifications described in IASAP Addendum #IA-02-01 (DOE 2001b) as presented in Table 5.

4.0 DATA QUALITY ASSESSMENT

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

- Regulatory agency approved sampling program design (IASAP Addendum 02-01 [DOE 2001b]);
- Collection of samples in accordance with the sampling design (Section 2.0, Table 2);
- Results of the Data Quality Assessment (DQA) as described in the following sections.

4.1 Data Quality Assessment Process

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

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

Table 2
IHSS Group 500-7 Characterization Sampling Specifications

IHSS Group	IHSS/PAC/UBC Site	Location Code	Easting	Northing	Media	Depth Interval	Analyte	Laboratory Method
500-7	500-907	BZ42-001	2082606.49	749926.62	Surface Soil	0-0.5'	Radionuclides	HPGe
							PCBs	8082
							SVOCs	8270
							Metals	6200/6010
							VOCs	8260B
		BZ42-002	2082635.03	749926.81	Surface Soil	0-0.5'	Radionuclides	HPGe
							PCBs	8082
							SVOCs	8270
							Metals	6200/6010
							VOCs	8260B
		BZ42-003	2082635.15	749911.29	Surface Soil	0-0.5'	Radionuclides	HPGe
							PCBs	8082
							SVOCs	8270
							Metals	6200/6010
							VOCs	8260B
		BZ42-004	2082606.29	749911.18	Surface Soil	0-0.5'	Radionuclides	HPGe
							PCBs	8082
							SVOCs	8270
							Metals	6200/6010
							VOCs	8260B
		BZ42-005	2082620.83	749919.02	Surface Soil	0-0.5'	Radionuclides	HPGe
							PCBs	8082
							SVOCs	8270
							Metals	6200/6010
							VOCs	8260B

Table 3
Soil Results Greater Than Background Means Plus Two Standard Deviations or Reporting Limits

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Unit
BZ42-001	2082606.49	749926.62	Aroclor-1260	0	0.5	20	5.3	12400	-	N/A	ug/kg
BZ42-001	2082606.49	749926.62	Arsenic	0	0.5	11.2	25	22.20	-	10.09	mg/kg
BZ42-001	2082606.49	749926.62	Barium	0	0.5	678	150	26400	-	141.26	mg/kg
BZ42-001	2082606.49	749926.62	Benzo(A)Anthracene	0	0.5	48	43	34900	-	N/A	ug/kg
BZ42-001	2082606.49	749926.62	Chromium	0	0.5	43.4	90	268	-	16.99	mg/kg
BZ42-001	2082606.49	749926.62	Chrysene	0	0.5	94	59	3490000	-	N/A	ug/kg
BZ42-001	2082606.49	749926.62	Copper	0	0.5	85	300	40900	-	18.06	mg/kg
BZ42-001	2082606.49	749926.62	Di-N-Octyl Phthalate	0	0.5	430	40	14700000	-	N/A	ug/kg
BZ42-001	2082606.49	749926.62	Fluoranthene	0	0.5	130	94	27200000	-	N/A	ug/kg
BZ42-001	2082606.49	749926.62	Iron	0	0.5	42100	2500	307000	-	18037.00	mg/kg
BZ42-001	2082606.49	749926.62	Lead	0	0.5	67.2	20	1000	97.70	54.62	mg/kg
BZ42-001	2082606.49	749926.62	Manganese	0	0.5	1200	200	3480	-	365.08	mg/kg
BZ42-001	2082606.49	749926.62	Nickel	0	0.5	46.9	60	20400	-	14.91	mg/kg
BZ42-001	2082606.49	749926.62	Pyrene	0	0.5	110	45	22100000	-	N/A	ug/kg
BZ42-001	2082606.49	749926.62	Strontium	0	0.5	216	250	613000	-	48.94	mg/kg
BZ42-001	2082606.49	749926.62	Vanadium	0	0.5	98.5	100	7150	292	45.59	mg/kg
BZ42-002	2082635.03	749926.81	Aroclor-1260	0	0.5	23	5.1	12400	-	N/A	ug/kg
BZ42-002	2082635.03	749926.81	Arsenic	0	0.5	13	25	22.20	-	10.09	mg/kg
BZ42-002	2082635.03	749926.81	Barium	0	0.5	751	150	26400	-	141.26	mg/kg
BZ42-002	2082635.03	749926.81	Benzo(A)Anthracene	0	0.5	91	42	34900	-	N/A	ug/kg
BZ42-002	2082635.03	749926.81	Chromium	0	0.5	39.3	90	268	-	16.99	mg/kg
BZ42-002	2082635.03	749926.81	Chrysene	0	0.5	110	57	3490000	-	N/A	ug/kg
BZ42-002	2082635.03	749926.81	Copper	0	0.5	58.6	300	40900	-	18.06	mg/kg
BZ42-002	2082635.03	749926.81	Fluoranthene	0	0.5	190	89	27200000	-	N/A	ug/kg
BZ42-002	2082635.03	749926.81	Indeno(1,2,3-Cd)Pyrene	0	0.5	72	51	34900	-	N/A	ug/kg
BZ42-002	2082635.03	749926.81	Iron	0	0.5	41800	2500	307000	-	18037.00	mg/kg
BZ42-002	2082635.03	749926.81	Lead	0	0.5	59.8	20	1000	97.70	54.62	mg/kg

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Unit
BZ42-002	2082635.03	749926.81	Manganese	0	0.5	540	200	3480	-	365.08	mg/kg
BZ42-002	2082635.03	749926.81	Nickel	0	0.5	48.6	60	20400	-	14.91	mg/kg
BZ42-002	2082635.03	749926.81	Pyrene	0	0.5	200	43	22100000	-	N/A	ug/kg
BZ42-002	2082635.03	749926.81	Strontium	0	0.5	216	250	613000	-	48.94	mg/kg
BZ42-002	2082635.03	749926.81	Vanadium	0	0.5	90	100	7150	292	45.59	mg/kg
BZ42-002	2082635.03	749926.81	Zinc	0	0.5	141	50	307000	-	73.76	mg/kg
BZ42-003	2082635.15	749911.29	Aroclor-1260	0	0.5	37	5.1	12400	-	N/A	ug/kg
BZ42-003	2082635.15	749911.29	Barium	0	0.5	772	150	26400	-	141.26	mg/kg
BZ42-003	2082635.15	749911.29	Benzo(A)Anthracene	0	0.5	85	41	34900	-	N/A	ug/kg
BZ42-003	2082635.15	749911.29	Chromium	0	0.5	58.2	90	268	-	16.99	mg/kg
BZ42-003	2082635.15	749911.29	Chrysene	0	0.5	120	56	3490000	-	N/A	ug/kg
BZ42-003	2082635.15	749911.29	Copper	0	0.5	69.3	300	40900	-	18.06	mg/kg
BZ42-003	2082635.15	749911.29	Fluoranthene	0	0.5	210	88	27200000	-	N/A	ug/kg
BZ42-003	2082635.15	749911.29	Indeno(1,2,3-Cd)Pyrene	0	0.5	71	51	34900	-	N/A	ug/kg
BZ42-003	2082635.15	749911.29	Iron	0	0.5	32000	2500	307000	-	18037.00	mg/kg
BZ42-003	2082635.15	749911.29	Lead	0	0.5	61.1	20	1000	97.70	54.62	mg/kg
BZ42-003	2082635.15	749911.29	Manganese	0	0.5	640	200	3480	-	365.08	mg/kg
BZ42-003	2082635.15	749911.29	Nickel	0	0.5	33.1	60	20400	-	14.91	mg/kg
BZ42-003	2082635.15	749911.29	Pyrene	0	0.5	190	42	22100000	-	N/A	ug/kg
BZ42-003	2082635.15	749911.29	Strontium	0	0.5	221	250	613000	-	48.94	mg/kg
BZ42-003	2082635.15	749911.29	Vanadium	0	0.5	74.8	100	7150	292	45.59	mg/kg
BZ42-003	2082635.15	749911.29	Zinc	0	0.5	193	50	307000	-	73.76	mg/kg
BZ42-004	2082606.29	749911.18	Aroclor-1260	0	0.5	10	4.9	12400	-	N/A	ug/kg
BZ42-004	2082606.29	749911.18	Arsenic	0	0.5	11.1	25	22.20	-	10.09	mg/kg
BZ42-004	2082606.29	749911.18	Barium	0	0.5	719	150	26400	-	141.26	mg/kg
BZ42-004	2082606.29	749911.18	Benzo(A)Anthracene	0	0.5	48	40	34900	-	N/A	ug/kg
BZ42-004	2082606.29	749911.18	Chromium	0	0.5	43.1	90	268	-	16.99	mg/kg
BZ42-004	2082606.29	749911.18	Chrysene	0	0.5	62	55	3490000	-	N/A	ug/kg
BZ42-004	2082606.29	749911.18	Copper	0	0.5	68.3	300	40900	-	18.06	mg/kg

Location	Easting	Northing	Analyte	Depth Start (feet)	Depth End (feet)	Result	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Unit
BZ42-004	2082606.29	749911.18	Fluoranthene	0	0.5	92	86	27200000	-	N/A	ug/kg
BZ42-004	2082606.29	749911.18	Iron	0	0.5	34200	2500	307000	-	18037.00	mg/kg
BZ42-004	2082606.29	749911.18	Manganese	0	0.5	720	200	3480	-	365.08	mg/kg
BZ42-004	2082606.29	749911.18	Nickel	0	0.5	35.5	60	20400	-	14.91	mg/kg
BZ42-004	2082606.29	749911.18	Pyrene	0	0.5	94	41	22100000	-	N/A	ug/kg
BZ42-004	2082606.29	749911.18	Strontium	0	0.5	241	250	613000	-	48.94	mg/kg
BZ42-004	2082606.29	749911.18	Vanadium	0	0.5	86.3	100	7150	292	45.59	mg/kg
BZ42-004	2082606.29	749911.18	Zinc	0	0.5	230	50	307000	-	73.76	mg/kg
BZ42-005	2082620.83	749919.02	Acetone	0	0.5	6.3	100	102000000	211000	N/A	ug/kg
BZ42-005	2082620.83	749919.02	Aroclor-1260	0	0.5	10	4.9	12400	-	N/A	ug/kg
BZ42-005	2082620.83	749919.02	Barium	0	0.5	762	150	26400	-	141.26	mg/kg
BZ42-005	2082620.83	749919.02	Chromium	0	0.5	36	90	268	-	16.99	mg/kg
BZ42-005	2082620.83	749919.02	Copper	0	0.5	73.4	300	40900	-	18.06	mg/kg
BZ42-005	2082620.83	749919.02	Iron	0	0.5	29100	2500	307000	-	18037.00	mg/kg
BZ42-005	2082620.83	749919.02	Manganese	0	0.5	490	200	3480	-	365.08	mg/kg
BZ42-005	2082620.83	749919.02	Nickel	0	0.5	32.5	60	20400	-	14.91	mg/kg
BZ42-005	2082620.83	749919.02	Strontium	0	0.5	224	250	613000	-	48.94	mg/kg
BZ42-005	2082620.83	749919.02	Vanadium	0	0.5	59.6	100	7150	292	45.59	mg/kg
BZ42-005	2082620.83	749919.02	Zinc	0	0.5	120	50	307000	-	73.76	mg/kg

Table 4
IHSS Group 500-7 Summary of Analytical Results

Media	Analyte	Number of Samples	Detection Frequency	Maximum	Mean	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Unit
Surface Soil	Arsenic	5	100%	13.00	9.98	22.20	-	10.09	mg/kg
Surface Soil	Chromium	5	100%	58.20	44.00	268	-	16.99	mg/kg
Surface Soil	Antimony	5	0%	3.50	3.50	409	-	N/A	mg/kg
Surface Soil	Cadmium	5	0%	1.50	1.50	962	-	1.61	mg/kg
Surface Soil	Lead	5	100%	67.20	53.90	1000	97.70	54.62	mg/kg
Surface Soil	Cobalt	5	0%	45.00	45.00	1550	-	10.91	mg/kg
Surface Soil	Manganese	5	100%	1200.00	718.00	3480	-	365.08	mg/kg
Surface Soil	Molybdenum	5	0%	25.00	25.00	5110	-	N/A	mg/kg
Surface Soil	Selenium	5	0%	0.50	0.50	5110	-	1.22	mg/kg
Surface Soil	Silver	5	0%	2.50	2.50	5110	-	N/A	mg/kg
Surface Soil	Vanadium	5	100%	98.50	81.84	7150	292	45.59	mg/kg
Surface Soil	Nickel	5	100%	48.60	39.32	20400	-	14.91	mg/kg
Surface Soil	Barium	5	100%	772.00	736.40	26400	-	141.26	mg/kg
Surface Soil	Copper	5	100%	85.00	70.92	40900	-	18.06	mg/kg
Surface Soil	Iron	5	100%	42100.00	35840.00	307000	-	18037.00	mg/kg
Surface Soil	Zinc	5	80%	230.00	137.70	307000	-	73.76	mg/kg
Surface Soil	Strontium	5	100%	241.00	223.60	613000	-	48.94	mg/kg
Surface Soil	Tin	5	20%	5.27	2.65	613000	-	N/A	mg/kg
Surface Soil	Uranium-235	5	0%	0.39	0.22	8	-	0.09	pCi/g
Surface Soil	Americium-241	5	0%	2.22	2.22	76	-	0.02	pCi/g
Surface Soil	Uranium-238/-234	5	0%	5.70	4.30	351	-	2.00	pCi/g
Surface Soil	Benzo(A)Pyrene	5	0%	185.00	175.00	3490	-	N/A	ug/kg
Surface Soil	Dibenz(A,H)Anthracene	5	0%	185.00	175.00	3490	-	N/A	ug/kg
Surface Soil	N-Nitroso-Di-N-Propylamine	5	0%	185.00	175.00	5470	-	N/A	ug/kg
Surface Soil	Aroclor-1221	5	0%	18.50	17.50	12400	-	N/A	ug/kg
Surface Soil	Aroclor-1232	5	0%	18.50	17.50	12400	-	N/A	ug/kg
Surface Soil	Aroclor-1242	5	0%	18.50	17.50	12400	-	N/A	ug/kg

Media	Analyte	Number of Samples	Detection Frequency	Maximum	Mean	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Unit
Surface Soil	Aroclor-1248	5	0%	18.50	17.50	12400	-	N/A	ug/kg
Surface Soil	Aroclor-1254	5	0%	18.50	17.50	12400	-	N/A	ug/kg
Surface Soil	Aroclor-1260	5	100%	37.00	20.00	12400	-	N/A	ug/kg
Surface Soil	1,1-Dichloroethene	4	0%	0.96	0.92	17000	-	N/A	ug/kg
Surface Soil	Hexachlorobenzene	5	0%	185.00	175.00	17200	-	N/A	ug/kg
Surface Soil	Chloroform	4	0%	0.33	0.32	19200	-	N/A	ug/kg
Surface Soil	Trichloroethene	4	0%	0.43	0.41	19600	-	N/A	ug/kg
Surface Soil	Bis(2-Chloroethyl) Ether	5	0%	185.00	175.00	34800	-	N/A	ug/kg
Surface Soil	Benzo(A)Anthracene	5	80%	170.00	88.40	34900	-	N/A	ug/kg
Surface Soil	Benzo(B)Fluoranthene	5	0%	185.00	175.00	34900	-	N/A	ug/kg
Surface Soil	Indeno(1,2,3-Cd)Pyrene	5	40%	185.00	133.60	34900	-	N/A	ug/kg
Surface Soil	Vinyl Chloride	4	0%	1.29	1.24	41200	431	N/A	ug/kg
Surface Soil	Aroclor-1016	5	0%	18.50	17.50	46400	-	N/A	ug/kg
Surface Soil	2,4-Dinitrotoluene	5	0%	185.00	175.00	56300	-	N/A	ug/kg
Surface Soil	2,6-Dinitrotoluene	5	0%	185.00	175.00	56300	-	N/A	ug/kg
Surface Soil	3,3'-Dichlorobenzidine	5	0%	700.00	680.00	61300	-	N/A	ug/kg
Surface Soil	Carbon Tetrachloride	4	0%	0.35	0.33	81500	-	N/A	ug/kg
Surface Soil	1,1,2,2-Tetrachloroethane	4	0%	0.37	0.35	100000	-	N/A	ug/kg
Surface Soil	1,2-Dichloroethane	4	0%	0.56	0.54	106000	-	N/A	ug/kg
Surface Soil	Hexachlorobutadiene	9	0%	185.00	97.34	147000	-	N/A	ug/kg
Surface Soil	Pentachlorophenol	5	0%	900.00	840.00	162000	-	N/A	ug/kg
Surface Soil	Bromomethane	4	0%	1.69	1.63	193000	-	N/A	ug/kg
Surface Soil	Benzene	4	0%	0.38	0.37	205000	-	N/A	ug/kg
Surface Soil	1,1,2-Trichloroethane	4	0%	0.45	0.43	236000	-	N/A	ug/kg
Surface Soil	Cis-1,3-Dichloropropene	4	0%	0.32	0.31	250000	-	N/A	ug/kg
Surface Soil	Trans-1,3-Dichloropropene	4	0%	0.45	0.43	250000	-	N/A	ug/kg
Surface Soil	Dibromochloromethane	4	0%	0.47	0.45	329000	-	N/A	ug/kg
Surface Soil	Nitrobenzene	5	0%	185.00	175.00	332000	-	N/A	ug/kg
Surface Soil	1,2-Dichloropropane	4	0%	0.23	0.22	345000	-	N/A	ug/kg

Media	Analyte	Number of Samples	Detection Frequency	Maximum	Mean	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Unit
Surface Soil	Benzo(K)Fluoranthene	5	0%	185.00	175.00	349000	-	N/A	ug/kg
Surface Soil	Chloromethane	4	0%	1.20	1.16	371000	-	N/A	ug/kg
Surface Soil	2,2'-Oxybis(1-Chloropropane)	5	0%	185.00	175.00	547000	-	N/A	ug/kg
Surface Soil	Tetrachloroethene	4	0%	0.64	0.62	615000	-	N/A	ug/kg
Surface Soil	Bromodichloromethane	4	0%	0.33	0.31	617000	-	N/A	ug/kg
Surface Soil	Hexachloroethane	5	0%	185.00	175.00	737000	-	N/A	ug/kg
Surface Soil	1,4-Dichlorobenzene	4	0%	0.36	0.35	840000	-	N/A	ug/kg
Surface Soil	P-Dichlorobenzene	5	0%	185.00	175.00	840000	-	N/A	ug/kg
Surface Soil	4,6-Dinitro-O-Cresol	5	0%	900.00	840.00	1020000	-	N/A	ug/kg
Surface Soil	Bis(2-Ethylhexyl)Phthalate	5	0%	185.00	175.00	1970000	-	N/A	ug/kg
Surface Soil	2,4-Dinitrophenol	5	0%	900.00	840.00	2040000	-	N/A	ug/kg
Surface Soil	Methylene Chloride	4	0%	0.45	0.44	2530000	39500	N/A	ug/kg
Surface Soil	4-Chloroaniline	5	0%	185.00	175.00	2950000	-	N/A	ug/kg
Surface Soil	Dibenzofuran	5	0%	185.00	175.00	2950000	-	N/A	ug/kg
Surface Soil	2,4-Dichlorophenol	5	0%	185.00	175.00	3070000	-	N/A	ug/kg
Surface Soil	Naphthalene	9	0%	185.00	97.47	3090000	-	N/A	ug/kg
Surface Soil	2,4,6-Trichlorophenol	5	0%	185.00	175.00	3470000	-	N/A	ug/kg
Surface Soil	Chrysene	5	80%	170.00	111.20	3490000	-	N/A	ug/kg
Surface Soil	Hexachlorocyclopentadiene	5	0%	370.00	349.00	3500000	-	N/A	ug/kg
Surface Soil	4-Methylphenol	5	0%	185.00	175.00	3690000	-	N/A	ug/kg
Surface Soil	Bromoform	4	0%	0.71	0.68	3730000	-	N/A	ug/kg
Surface Soil	Ethylbenzene	4	0%	0.35	0.33	4250000	-	N/A	ug/kg
Surface Soil	2-Chlorophenol	5	0%	185.00	175.00	5110000	-	N/A	ug/kg
Surface Soil	Chlorobenzene	4	0%	0.27	0.26	6090000	-	N/A	ug/kg
Surface Soil	N-Nitrosodiphenylamine	5	0%	185.00	175.00	7810000	-	N/A	ug/kg
Surface Soil	P-Nitrophenol	5	0%	900.00	840.00	8180000	-	N/A	ug/kg
Surface Soil	1,2,4-Trichlorobenzene	9	0%	185.00	97.37	9230000	-	N/A	ug/kg
Surface Soil	Chloroethane	4	0%	1.05	1.01	13200000	-	N/A	ug/kg
Surface Soil	Di-N-Octyl Phthalate	5	20%	430.00	224.00	14700000	-	N/A	ug/kg

Media	Analyte	Number of Samples	Detection Frequency	Maximum	Mean	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Background	Unit
Surface Soil	Carbon Disulfide	4	0%	0.30	0.29	15100000	-	N/A	ug/kg
Surface Soil	4-Methyl-2-Pentanone	4	0%	3.62	3.48	16400000	-	N/A	ug/kg
Surface Soil	2-Nitroaniline	5	0%	900.00	840.00	16700000	-	N/A	ug/kg
Surface Soil	2,4-Dimethylphenol	5	0%	185.00	175.00	20400000	-	N/A	ug/kg
Surface Soil	2-Methylnaphthalene	5	0%	185.00	175.00	20400000	-	N/A	ug/kg
Surface Soil	Pyrene	5	80%	200.00	152.80	22100000	-	N/A	ug/kg
Surface Soil	1,1-Dichloroethane	4	0%	0.39	0.38	22500000	-	N/A	ug/kg
Surface Soil	Fluoranthene	5	80%	210.00	158.40	27200000	-	N/A	ug/kg
Surface Soil	Isophorone	5	0%	185.00	175.00	29100000	-	N/A	ug/kg
Surface Soil	1,2-Dichlorobenzene	9	0%	185.00	97.36	31200000	-	N/A	ug/kg
Surface Soil	Toluene	4	0%	0.30	0.29	31300000	329000	N/A	ug/kg
Surface Soil	2-Methylphenol	5	0%	185.00	175.00	36900000	-	N/A	ug/kg
Surface Soil	Acenaphthene	5	0%	185.00	175.00	40800000	-	N/A	ug/kg
Surface Soil	Fluorene	5	0%	185.00	175.00	40800000	-	N/A	ug/kg
Surface Soil	Di-N-Butyl Phthalate	5	0%	185.00	175.00	73700000	-	N/A	ug/kg
Surface Soil	1,1,1-Trichloroethane	4	0%	0.41	0.39	79700000	-	N/A	ug/kg
Surface Soil	2-Chloronaphthalene	5	0%	185.00	175.00	81800000	-	N/A	ug/kg
Surface Soil	2,4,5-Trichlorophenol	5	0%	185.00	175.00	102000000	-	N/A	ug/kg
Surface Soil	Acetone	4	25%	6.30	2.80	102000000	211000	N/A	ug/kg
Surface Soil	Styrene	4	0%	0.41	0.39	123000000	-	N/A	ug/kg
Surface Soil	Butylbenzylphthalate	5	0%	185.00	175.00	147000000	-	N/A	ug/kg
Surface Soil	2-Butanone	4	0%	3.29	3.17	192000000	433000	N/A	ug/kg
Surface Soil	Anthracene	5	0%	185.00	175.00	204000000	-	N/A	ug/kg
Surface Soil	Benyzl Alcohol	5	0%	185.00	175.00	307000000	-	N/A	ug/kg
Surface Soil	Diethyl Phthalate	5	0%	370.00	349.00	590000000	-	N/A	ug/kg
Surface Soil	Phenol	5	0%	185.00	175.00	613000000	-	N/A	ug/kg
Surface Soil	Benzoic Acid	5	0%	900.00	840.00	1000000000	-	N/A	ug/kg
Surface Soil	Dimethyl Phthalate	5	0%	185.00	175.00	1000000000	-	N/A	ug/kg
Surface Soil	Xylenes (Total)	4	0%	1.39	1.34	1000000000	-	N/A	ug/kg

Table 5
IHSS Group 500-7 Deviations from Planned Sampling Specifications

Location Code	Planned Easting	Planned Northing	Actual Easting	Actual Northing	Comments
BZ42-001	2082606.49	749926.62	2082606.49	749926.62	No Deviations Between the Planned and Actual Scenarios
BZ42-002	2082635.03	749926.81	2082635.03	749926.81	
BZ42-003	2082635.15	749911.29	2082635.15	749911.29	
BZ42-004	2082606.29	749911.18	2082606.29	749911.18	
BZ42-005	2082620.83	749919.02	2082620.83	749919.02	

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

- EPA 540/R-94/012, 1994b, USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review;
- EPA 540/R-94/013, 1994c, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review; and
- Kaiser-Hill Company, L.L.C.(K-H) V&V Guidelines:
- General Guidelines for Data Verification and Validation, DA-GR01-v1, 1997a.
- V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v1, 1998.
- V&V Guidelines for Volatile Organics, DA-SS01-v1, 1997b.
- V&V Guidelines for Semivolatile Organics, DA-SS02-v1, 1997c.
- V&V Guidelines for Metals, DA-SS05-v1, 1997d.
- 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 the U.S. Environmental Protection Agency (EPA).

4.2 Verification and Validation of Results

Verification ensures that data produced and used by the project are documented and traceable in accordance with quality requirements. Validation consists of a technical

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review of all data that directly support the project decisions so that any limitations of the data relative to project goals are delineated and the associated data are qualified accordingly. The V&V process defines the criteria that constitute data quality, namely PARCCS parameters. Data traceability and archival are also addressed. V&V criteria include the following:

- Chain-of-custody;
- Preservation and hold-times;
- Instrument calibrations;
- Preparation blanks;
- Interference check samples (metals);
- Matrix spikes/matrix spike duplicates (MS/MSD);
- Laboratory control samples (LCS);
- Field duplicate measurements;
- Chemical yield (radiochemistry);
- Required quantitation limits/minimum detectable activities (sensitivity of chemical and radiochemical measurements, respectively); and
- Sample analysis and preparation methods.

Evaluation of V&V criteria ensures that PARCCS parameters are satisfactory (i.e., within tolerances acceptable to the project). Satisfactory V&V of laboratory quality controls are captured through application of validation "flags" or qualifiers to individual records.

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

Both real and quality control (QC) data, as of June 3, 2003 are included on the enclosed compact disc (CD).

4.2.1 Accuracy

The following measures of accuracy were evaluated:

- LCS evaluation;
- Surrogate evaluation;

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- Field blanks; and
- Sample MS evaluation.

Results are compared to method requirements and project goals. The results of these comparisons are summarized for RFCA contaminants of concern (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

LCS frequency was adequate based on at least one LCS per batch. The minimum and maximum LCS results are summarized, by chemical, in Table 6. All tolerances were within tolerance limits based on the lowest recovery of 63%. Tolerance limits are specific to each analyte, matrix, and laboratory and are updated base on laboratory conditions.

Table 6
Laboratory Control Sample Evaluation

CAS No.	Analyte	Result Type	Number of Samples	Number of Laboratory Batches	Minimum	Maximum	Unit	Test Method
71-55-6	1,1,1-TRICHLOROETHANE	LC	1	1	84.63	84.63	%REC	SW-846 8260
79-34-5	1,1,2,2-TETRACHLOROETHANE	LC	1	1	113	113	%REC	SW-846 8260
79-00-5	1,1,2-TRICHLOROETHANE	LC	1	1	104.1	104.1	%REC	SW-846 8260
75[illegible]	1,1-DICHLOROETHANE	LC	1	1	100.3	100.3	%REC	SW-846 8260
75-35-4	1,1-DICHLOROETHENE	LC	1	1	98.91	98.91	%REC	SW-846 8260
120-82-1	1,2,4-TRICHLOROBENZENE	LC	1	1	68	68	%REC	SW-846 8270B
120-82-1	1,2,4-TRICHLOROBENZENE	LC	1	1	96.15	96.15	%REC	SW-846 8260
107-06-2	1,2-DICHLOROETHANE	LC	1	1	96.43	96.43	%REC	SW-846 8260
78-87-5	1,2-DICHLOROPROPANE	LC	1	1	116.5	116.5	%REC	SW-846 8260
121-14-2	2,4-DINITROTOLUENE	LC	1	1	81	81	%REC	SW-846 8270B
78-93-3	2-BUTANONE	LC	1	1	114.1	114.1	%REC	SW-846 8260
95-57-8	2-CHLOROPHENOL	LC	1	1	67	67	%REC	SW-846 8270B
108-10-1	4-METHYL-2-PENTANONE	LC	1	1	85.24	85.24	%REC	SW-846 8260
83-32-9	ACENAPHTHENE	LC	1	1	66	66	%REC	SW-846 8270B
67-64-1	ACETONE	LC	1	1	98.41	98.41	%REC	SW-846 8260
12674-11-2	AROCLOR-1016	LC	1	1	93	93	%REC	SW-846 8082
11096-82-5	AROCLOR-1260	LC	1	1	90	90	%REC	SW-846 8082
71-43-2	BENZENE	LC	1	1	97.37	97.37	%REC	SW-846 8260
75-27-4	BROMODICHLOROMETHANE	LC	1	1	104.6	104.6	%REC	SW-846 8260
75-25-2	BROMOFORM	LC	1	1	95.82	95.82	%REC	SW-846 8260
74-83-9	BROMOMETHANE	LC	1	1	98.48	98.48	%REC	SW-846 8260
75-15-0	CARBON DISULFIDE	LC	1	1	117.5	117.5	%REC	SW-846 8260
56-23-5	CARBON TETRACHLORIDE	LC	1	1	77.3	77.3	%REC	SW-846 8260
108-90-7	CHLOROBENZENE	LC	1	1	98.64	98.64	%REC	SW-846 8260
75-00-3	CHLOROETHANE	LC	1	1	104.6	104.6	%REC	SW-846 8260
67-66-3	CHLOROFORM	LC	1	1	90.14	90.14	%REC	SW-846 8260
74[illegible]	CHLOROMETHANE	LC	1	1	146	146	%REC	SW-846 8260
100[illegible]1-5	CIS-1,3-DICHLOROPROPENE	LC	1	1	115.6	115.6	%REC	SW-846 8260

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CAS No.	Analyte	Result Type	Number of Samples	Number of Laboratory Batches	Minimum	Maximum	Unit	Test Method
124-48-1	DIBROMOCHLOROMETHANE	LC	1	1	83.19	83.19	%REC	SW-846 8260
100-41-4	ETHYLBENZENE	LC	1	1	105.9	105.9	%REC	SW-846 8260
87-68-3	HEXACHLOROBUTADIENE	LC	1	1	110.3	110.3	%REC	SW-846 8260
75-09-2	METHYLENE CHLORIDE	LC	1	1	94.91	94.91	%REC	SW-846 8260
91-20-3	NAPHTHALENE	LC	1	1	87.18	87.18	%REC	SW-846 8260
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	LC	1	1	70	70	%REC	SW-846 8270B
95-50-1	O-DICHLOROBENZENE	LC	1	1	91.93	91.93	%REC	SW-846 8260
106-46-7	P-DICHLOROBENZENE	LC	1	1	65	65	%REC	SW-846 8270B
106-46-7	P-DICHLOROBENZENE	LC	1	1	95.77	95.77	%REC	SW-846 8260
87-86-5	PENTACHLOROPHENOL	LC	1	1	63	63	%REC	SW-846 8270B
108-95-2	PHENOL	LC	1	1	64	64	%REC	SW-846 8270B
100-02-7	P-NITROPHENOL	LC	1	1	89	89	%REC	SW-846 8270B
129-00-0	PYRENE	LC	1	1	68	68	%REC	SW-846 8270B
100-42-5	STYRENE	LC	1	1	104.2	104.2	%REC	SW-846 8260
127-18-4	TETRACHLOROETHENE	LC	1	1	90.16	90.16	%REC	SW-846 8260
108-88-3	TOLUENE	LC	1	1	102	102	%REC	SW-846 8260
10061-02-6	TRANS-1,3-DICHLOROPROPENE	LC	1	1	114.6	114.6	%REC	SW-846 8260
79-01-6	TRICHLOROETHENE	LC	1	1	100.7	100.7	%REC	SW-846 8260
75-01-4	VINYL CHLORIDE	LC	1	1	118.3	118.3	%REC	SW-846 8260
1330-20-7	XYLENES (TOTAL)	LC	1	1	96.29	96.29	%REC	SW-846 8260

Surrogate Evaluation

Surrogate frequency was adequate based on at least one set per sample. The minimum and maximum surrogate results are summarized, by chemical, in Table 7. All surrogate recoveries are within Environmental Restoration (ER) Program limits.

Table 7
Surrogate Recovery Summary

VOC Surrogate Recoveries				
Number of Samples	**Analyte**	**Minimum**	**Maximum**	**Unit Code**
16	1,2-DICHLOROETHANE-D4	100	117.3	%REC
16	4-BROMOFLUOROBENZENE	80	98.25	%REC
16	TOLUENE-D8	87.27	100	%REC
SVOC Surrogate Recoveries				
Number of Samples	**Analyte**	**Minimum**	**Maximum**	**Unit Code**
6	2-FLUOROBIPHENYL	53	66	%REC
6	2-FLUOROPHENOL	50	61	%REC
6	NITROBENZENE-D5	52	65	%REC
6	TERPHENYL-D14	43	59	%REC

Field Blank Evaluation

The frequency of field blank collection is given in Table 8 and the results of the field blank analysis are given in Table 9. Adequate frequency of field blank evaluation is

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given by five percent or greater ratio of blank samples to real samples for the overall ER Program. 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 ten times the blank result for laboratory contaminants and less than five times the result for non-laboratory contaminants, the real result is eliminated. Uranium-235 and uranium-238 were found in the blanks. However, these analytes were not detected at activities greater than background means plus two standard deviations in the real samples. The detections in the blank samples do not affect project decisions.

Table 8
Field Duplicate Sample Frequency

Test Method Name	Analyte Suite	Sample Code	Number of Samples	% Duplicate Samples
GAMMA SPECTROSCOPY	Radionuclides	REAL	5	20
GAMMA SPECTROSCOPY	Radionuclides	DUP	1	
SW-846 6200	Metals	REAL	5	20
SW-846 6200	Metals	DUP	1	
SW-846 8082	PCBs	REAL	5	20
SW-846 8082	PCBs	DUP	1	
SW-846 8260	VOCs	REAL	4	0
SW-846 8270B	SVOCs	REAL	5	20
SW-846 8270B	SVOCs	DUP	1	

Table 9
Field Blank Summary

Sample QC Code	Test Method Name	Analyte	Maximum Detected Value	Unit
RB	Gamma	Potassium-40	2	pCi/g
RB	Gamma	Radium-226	3.6	pCi/g
RB	Gamma	Uranium-235	0.2	pCi/g
RB	Gamma	Uranium-238	3	pCi/g
Field Blanks (Trip, Rinse, Field) results greater than detection limits (not *U* Qualified)				

Sample Matrix Spike Evaluation

The frequency of MS measurements, relative to each laboratory batch, was adequate based on at least one MS per batch. The minimum and maximum of MS results are summarized by chemical, for the entire project in Table 10. While some of the recoveries appear to be low, they would not result in rejection of the data.

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Table 10
Sample Matrix Spike Evaluation

CAS No.	Analyte	Result Type	Minimum	Maximum	Number of Sample Pairs	Number of Laboratory Batches	Unit	Test Method
120-82-1	1,2,4-TRICHLOROBENZENE	MS	62	62	1	1	%REC	SW-846 8270B
121-14-2	2,4-DINITROTOLUENE	MS	64	64	1	1	%REC	SW-846 8270B
95-57-8	2-CHLOROPHENOL	MS	59	59	1	1	%REC	SW-846 8270B
83-32-9	ACENAPHTHENE	MS	57	57	1	1	%REC	SW-846 8270B
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	MS	62	62	1	1	%REC	SW-846 8270B
106-46-7	P-DICHLOROBENZENE	MS	58	58	1	1	%REC	SW-846 8270B
87-86-5	PENTACHLOROPHENOL	MS	56	56	1	1	%REC	SW-846 8270B
108-95-2	PHENOL	MS	57	57	1	1	%REC	SW-846 8270B
100-02-7	P-NITROPHENOL	MS	81	81	1	1	%REC	SW-846 8270B
129-00-0	PYRENE	MS	50	50	1	1	%REC	SW-846 8270B

4.2.2 Precision

Matrix Spike Duplicate Evaluation

Laboratory precision is measured through use of MSD. Adequate frequency of MSD measurements is indicated by at least one MSD in each laboratory batch. Table 11 indicates that MSD frequencies and relative percent difference (RPD) values were within the ER Program limit of 35%.

Table 11
Sample Matrix Spike Duplicate Evaluation

Analyte Name	Number of Sample Pairs	Number of Laboratory Batches	Max RPD (%)
1,2,4-TRICHLOROBENZENE	1	1	6.7
2,4-DINITROTOLUENE	1	1	8.1
2-CHLOROPHENOL	1	1	1.7
ACENAPHTHENE	1	1	7.3
N-NITROSO-DI-N-PROPYLAMINE	1	1	1.6
P-DICHLOROBENZENE	1	1	7.1
PENTACHLOROPHENOL	1	1	1.8
PHENOL	1	1	0.0
P-NITROPHENOL	1	1	6.4
PYRENE	1	1	2.0

Field Duplicate Evaluation

Field duplicate results reflect sampling precision, or overall repeatability of the sampling process. The frequency of field duplicate collection should exceed one field duplicate per 20 real samples, or five percent. Table 8 indicates that sampling frequencies were adequate for all analytical suites. A common metric for evaluating precision is the RPD value; RPD values are given in Table 12. Ideally, RPDs of less than 35 percent (in soil) indicate satisfactory precision. Values exceeding 35 percent only affect project decisions

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if the imprecision is great enough to cause contradictory decisions relative to the COC (i.e., one sample indicates clean soil whereas the QC partner does not). As indicated by the data in Table 12, a number of analytes have RPD values greater than 35 percent. The RPD percentages greater than 35 percent indicate that the sampling precision for these analytes was exceeded. Project decisions were based on analytes that exceeded ALs and no analytes were detected at values greater than proposed WRW and ecological ALs. Therefore the imprecision does not affect project decisions.

Table 12
RPD Evaluation

Analyte	Max of RPD %
1,2,4-TRICHLOROBENZENE	197.9
1,2-DICHLOROBENZENE	5.3
2,2'-OXYBIS(1-CHLOROPROPANE)	5.3
2,4,5-TRICHLOROPHENOL	5.3
2,4,6-TRICHLOROPHENOL	5.3
2,4-DICHLOROPHENOL	5.3
2,4-DIMETHYLPHENOL	5.3
2,4-DINITROPHENOL	5.4
2,4-DINITROTOLUENE	5.3
2,6-DINITROTOLUENE	5.3
2-CHLORONAPHTHALENE	5.3
2-CHLOROPHENOL	5.3
2-METHYLNAPHTHALENE	5.3
2-METHYLPHENOL	5.3
2-NITROANILINE	5.4
3,3'-DICHLOROBENZIDINE	6.9
4,6-DINITRO-O-CRESOL	5.4
4-CHLOROANILINE	5.3
4-METHYLPHENOL	5.3
ACENAPHTHENE	5.3
AM-241	19.7
ANTHRACENE	5.3
ANTIMONY	0.0
AROCLOR-1016	5.3
AROCLOR-1221	5.3
AROCLOR-1232	5.3
AROCLOR-1242	5.3
AROCLOR-1248	5.3
AROCLOR-1254	5.3
AROCLOR-1260	22.2
ARSENIC	15.0
BARIUM	11.5
BENYZL ALCOHOL	5.3
BENZO(A)ANTHRACENE	156.2
BENZO(A)PYRENE	5.3
BENZO(B)FLUORANTHENE	5.3
BENZO(K)FLUORANTHENE	5.3

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Analyte	Max of RPD %
BENZOIC ACID	5.4
BIS(2-CHLOROETHYL) ETHER	5.3
BIS(2-ETHYLHEXYL)PHTHALATE	5.3
BUTYLBENZYLPHTHALATE	5.3
CADMIUM	0.0
CHRYSENE	24.3
COBALT	0.0
COPPER	25.9
DIBENZ(A,H)ANTHRACENE	5.3
DIBENZOFURAN	5.3
DIETHYL PHTHALATE	5.3
DIMETHYL PHTHALATE	5.3
DI-N-BUTYL PHTHALATE	5.3
DI-N-OCTYL PHTHALATE	60.6
FLUORANTHENE	0.0
FLUORENE	5.3
HEXACHLOROBENZENE	5.3
HEXACHLOROBUTADIENE	197.8
HEXACHLOROCYCLOPENTADIENE	5.3
HEXACHLOROETHANE	5.3
INDENO(1,2,3-CD)PYRENE	5.3
IRON	13.7
ISOPHORONE	5.3
LEAD	12.2
MANGANESE	9.6
MOLYBDENUM	0.0
NAPHTHALENE	198.0
NICKEL	21.2
NITROBENZENE	5.3
N-NITROSO-DI-N-PROPYLAMINE	5.3
N-NITROSODIPHENYLAMINE	5.3
P-DICHLOROBENZENE	198.1
PENTACHLOROPHENOL	5.4
PHENOL	5.3
P-NITROPHENOL	5.4
PYRENE	9.5
SELENIUM	0.0
SILVER	0.0
STRONTIUM	0.0
TIN	0.0
URANIUM-235	29.2
URANIUM-238	52.4
VANADIUM	32.4
ZINC	193.4

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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 13 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. These data indicate the frequency of validation and rejection rates are within ER Program quality requirements.

Table 13
Validation and Verification Summary

Validation Code	Number of Records	Radionuclides	Metals	PBCs	SVOCs	VOCs
No V&V	336	80	0	0	0	256
J1	4	0	4	0	0	0
R1	0	0	0	0	0	0
V1	452	0	96	35	321	0
UJ1	10	0	0	0	10	0
Total	802	80	100	35	331	256
Total Validated	0	0	0	0	0	0
%Validated	0%	0%	0%	0%	0%	0%
Total Verified	462	0	96	35	321	0
%Verified	56%	0.00%	96%	100%	97%	0%
%Rejected	1%	0.00%	0%	0%	0%	0%

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

4.2.3 Sensitivity

Reporting limits, in units of ug/kg for organics, mg/kg for metals, and pCi/g for radionuclides, were compared with proposed RFCA WRW and Ecological Receptor ALs (DOE, et al 2002). Adequate sensitivities of analytical methods were attained for all COCs that affect project decisions. "Adequate" sensitivity is defined as a reporting limit less than an analyte's associated AL, typically less than one-half the AL.

4.3 Summary of Data Quality

The RPDs greater than 35 percent indicate that the sampling precision limits for some analytes were exceeded. However, the imprecision does not affect project decisions because real results for these analytes were less than ALs. No records were rejected. No records were validated, however, compliance with the RFETS Site validation goal of 25% of all analytical records indicates that these data are adequate. If additional V&V information is received, IHSS Groups 500-7 records will be updated in the Soil Water Database. Data qualified as a result of additional data will be assessed as part of the

Comprehensive Risk Assessment process. Data collected and used for IHSS Group 500-7 is adequate for decision-making.

5.0 REFERENCES

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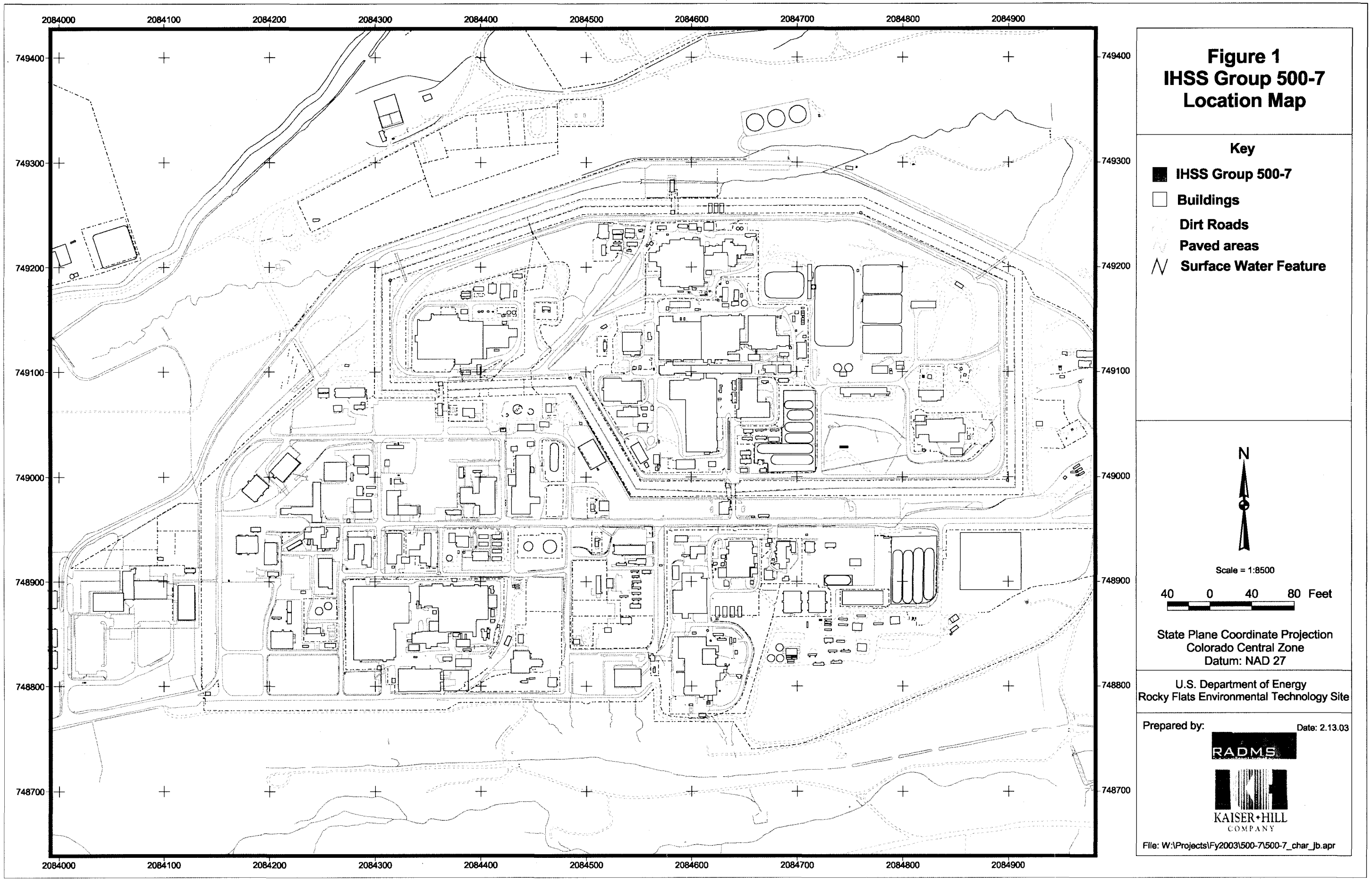
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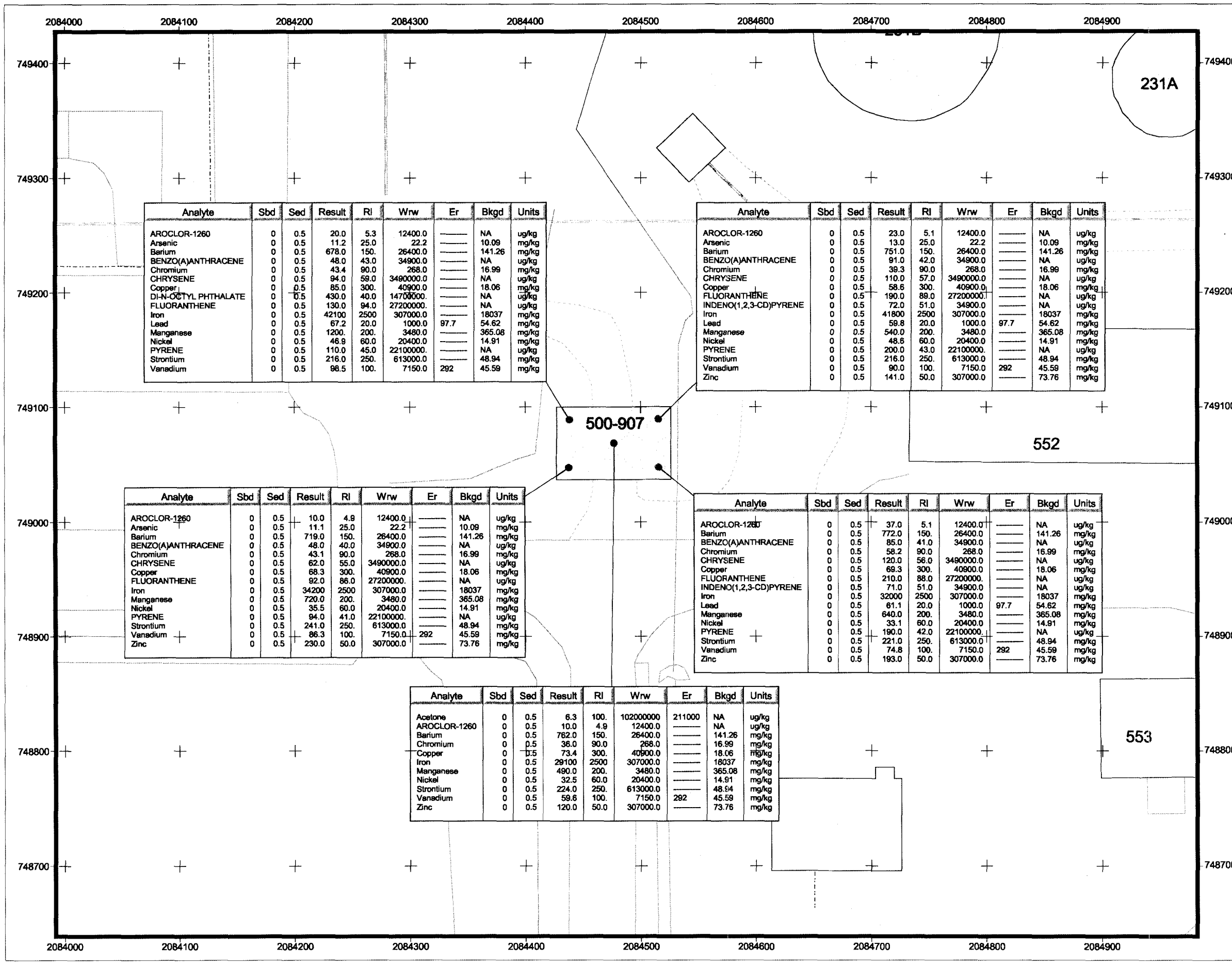
749100
749000
748900
748800
748700
Figure 1
IHSS Group 500-7
Location Map
Key
IHSS Group 500-7
Buildings
Dirt Roads
Paved areas
Surface Water Feature
N
Scale = 1:8500
40 0 40 80 Feet
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27
U.S. Department of Energy
Rocky Flats Environmental Technology Site
Prepared by:
Date: 2.13.03
RADMS
KAISER+HILL
COMPANY
File: W:\Projects\Fy2003\500-7\500-7_char_jb.apr



Analyte	Sbd	Sed	Result	Rl	Wrw	Er	Bkgd	Units
AROCLOR-1260	0	0.5	20.0	5.3	12400.0	———	NA	ug/kg
Arsenic	0	0.5	11.2	25.0	22.2	———	10.09	mg/kg
Barium	0	0.5	678.0	150.	26400.0	———	141.26	mg/kg
BENZO(A)ANTHRACENE	0	0.5	48.0	43.0	34900.0	———	NA	ug/kg
Chromium	0	0.5	43.4	90.0	268.0	———	16.99	mg/kg
CHRYSENE	0	0.5	94.0	59.0	3490000.0	———	NA	ug/kg
Copper	0	0.5	85.0	300.	40900.0	———	18.06	mg/kg
DI-N-OCTYL PHTHALATE	0	0.5	430.0	40.0	14700000.	———	NA	ug/kg
FLUORANTHENE	0	0.5	130.0	94.0	27200000.	———	NA	ug/kg
Iron	0	0.5	42100	2500	307000.0	———	18037	mg/kg
Lead	0	0.5	67.2	20.0	1000.0	97.7	54.62	mg/kg
Manganese	0	0.5	1200.	200.	3480.0	———	365.08	mg/kg
Nickel	0	0.5	46.9	60.0	20400.0	———	14.91	mg/kg
PYRENE	0	0.5	110.0	45.0	22100000.	———	NA	ug/kg
Strontium	0	0.5	216.0	250.	613000.0	———	48.94	mg/kg
Vanadium	0	0.5	98.5	100.	7150.0	292	45.59	mg/kg

Analyte	Sbd	Sed	Result	Rl	Wrw	Er	Bkgd	Units
AROCLOR-1260	0	0.5	23.0	5.1	12400.0	———	NA	ug/kg
Arsenic	0	0.5	13.0	25.0	22.2	———	10.09	mg/kg
Barium	0	0.5	751.0	150.	26400.0	———	141.26	mg/kg
BENZO(A)ANTHRACENE	0	0.5	91.0	42.0	34900.0	———	NA	ug/kg
Chromium	0	0.5	39.3	90.0	268.0	———	16.99	mg/kg
CHRYSENE	0	0.5	110.0	57.0	3490000.0	———	NA	ug/kg
Copper	0	0.5	58.6	300.	40900.0	———	18.06	mg/kg
FLUORANTHENE	0	0.5	190.0	89.0	27200000.	———	NA	ug/kg
INDENO(1,2,3-CD)PYRENE	0	0.5	72.0	51.0	34900.0	———	NA	ug/kg
Iron	0	0.5	41800	2500	307000.0	———	18037	mg/kg
Lead	0	0.5	59.8	20.0	1000.0	97.7	54.62	mg/kg
Manganese	0	0.5	540.0	200.	3480.0	———	365.08	mg/kg
Nickel	0	0.5	48.6	60.0	20400.0	———	14.91	mg/kg
PYRENE	0	0.5	200.0	43.0	22100000.	———	NA	ug/kg
Strontium	0	0.5	216.0	250.	613000.0	———	48.94	mg/kg
Vanadium	0	0.5	90.0	100.	7150.0	292	45.59	mg/kg
Zinc	0	0.5	141.0	50.0	307000.0	———	73.76	mg/kg

Analyte	Sbd	Sed	Result	Rl	Wrw	Er	Bkgd	Units
AROCLOR-1260	0	0.5	10.0	4.9	12400.0	———	NA	ug/kg
Arsenic	0	0.5	11.1	25.0	22.2	———	10.09	mg/kg
Barium	0	0.5	719.0	150.	26400.0	———	141.26	mg/kg
BENZO(A)ANTHRACENE	0	0.5	48.0	40.0	34900.0	———	NA	ug/kg
Chromium	0	0.5	43.1	90.0	268.0	———	16.99	mg/kg
CHRYSENE	0	0.5	62.0	55.0	3490000.0	———	NA	ug/kg
Copper	0	0.5	68.3	300.	40900.0	———	18.06	mg/kg
FLUORANTHENE	0	0.5	92.0	86.0	27200000.	———	NA	ug/kg
Iron	0	0.5	34200	2500	307000.0	———	18037	mg/kg
Manganese	0	0.5	720.0	200.	3480.0	———	365.08	mg/kg
Nickel	0	0.5	35.5	60.0	20400.0	———	14.91	mg/kg
PYRENE	0	0.5	94.0	41.0	22100000.	———	NA	ug/kg
Strontium	0	0.5	241.0	250.	613000.0	———	48.94	mg/kg
Vanadium	0	0.5	86.3	100.	7150.0	292	45.59	mg/kg
Zinc	0	0.5	230.0	50.0	307000.0	———	73.76	mg/kg

Analyte	Sbd	Sed	Result	Rl	Wrw	Er	Bkgd	Units
AROCLOR-1260	0	0.5	37.0	5.1	12400.0	———	NA	ug/kg
Barium	0	0.5	772.0	150.	26400.0	———	141.26	mg/kg
BENZO(A)ANTHRACENE	0	0.5	85.0	41.0	34900.0	———	NA	ug/kg
Chromium	0	0.5	58.2	90.0	268.0	———	16.99	mg/kg
CHRYSENE	0	0.5	120.0	56.0	3490000.0	———	NA	ug/kg
Copper	0	0.5	69.3	300.	40900.0	———	18.06	mg/kg
FLUORANTHENE	0	0.5	210.0	88.0	27200000.	———	NA	ug/kg
INDENO(1,2,3-CD)PYRENE	0	0.5	71.0	51.0	34900.0	———	NA	ug/kg
Iron	0	0.5	32000	2500	307000.0	———	18037	mg/kg
Lead	0	0.5	61.1	20.0	1000.0	97.7	54.62	mg/kg
Manganese	0	0.5	640.0	200.	3480.0	———	365.08	mg/kg
Nickel	0	0.5	33.1	60.0	20400.0	———	14.91	mg/kg
PYRENE	0	0.5	190.0	42.0	22100000.	———	NA	ug/kg
Strontium	0	0.5	221.0	250.	613000.0	———	48.94	mg/kg
Vanadium	0	0.5	74.8	100.	7150.0	292	45.59	mg/kg
Zinc	0	0.5	193.0	50.0	307000.0	———	73.76	mg/kg

Analyte	Sbd	Sed	Result	Rl	Wrw	Er	Bkgd	Units
Acetone	0	0.5	6.3	100.	102000000	211000	NA	ug/kg
AROCLOR-1260	0	0.5	10.0	4.9	12400.0	———	NA	ug/kg
Barium	0	0.5	762.0	150.	26400.0	———	141.26	mg/kg
Chromium	0	0.5	36.0	90.0	268.0	———	16.99	mg/kg
Copper	0	0.5	73.4	300.	40900.0	———	18.06	mg/kg
Iron	0	0.5	29100	2500	307000.0	———	18037	mg/kg
Manganese	0	0.5	490.0	200.	3480.0	———	365.08	mg/kg
Nickel	0	0.5	32.5	60.0	20400.0	———	14.91	mg/kg
Strontium	0	0.5	224.0	250.	613000.0	———	48.94	mg/kg
Vanadium	0	0.5	59.6	100.	7150.0	292	45.59	mg/kg
Zinc	0	0.5	120.0	50.0	307000.0	———	73.76	mg/kg

Figure 2
Surface Soil Sample Results Above Background Levels or MDLs at IHSS Group 500-7

Key

- Samples Less Than WRW AL
- IHSS
- PAC
- Buildings
- Dirt Roads
- Paved areas
- Surface Water Feature
- Process Waste Lines
- Old Process Waste Lines

RL Detection Limit
BKGD Background
WRW Wildlife Refuge Worker Action Level
ER Ecological Receptor Action Level

N

Scale = 1:500

20 0 20 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Prepared by: Date: March 2003

RADMS

KAISER+HILL COMPANY

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