# Draft Closeout Report for IHSS Group 000-4

## New Process Waste Lines (NPWL)

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# Draft Closeout Report for IHSS 000-4

# New Process Waste Lines (NPWL)

Approval received from the Colorado Department of Public Health and Environment

(_____).

Approval letter contained in the Administrative Record.

**August 2005**

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## ENCLOSURE

CD Containing Standardized Real and QC Accelerated Action Data

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## ACRONYMS

| | |
|---|---|
| AL | action level |
| AOC | area of concern |
| AR | Administrative Record |
| ASD | Analytical Services Division |
| AST | aboveground storage tank |
| bgs | below ground surface |
| BMP | Best Management Practice |
| BZ | Buffer Zone |
| CAD/ROD | Corrective Action Decision/Record of Decision |
| CAS | Chemical Abstracts Service |
| CDD | closure description document |
| CD | compact disc |
| CDPHE | Colorado Department of Public Health and Environment |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CHWA | Colorado Hazardous Waste Act |
| $cm^2$ | square centimeters |
| COC | contaminant of concern |
| CPIR | Contingency Plan Implementation Report |
| cpm | counts per minute |
| CRA | Comprehensive Risk Assessment |
| cy | cubic yard |
| D&D | Decontamination and Decommissioning |
| DOE | U.S. Department of Energy |
| DOP | Decommissioning Operations Plan |
| dpm | disintegrations per minute |
| DQA | Data Quality Assessment |
| DQO | data quality objective |
| EPA | U.S. Environmental Protection Agency |
| ER | Environmental Restoration |
| ERA | Ecological Risk Assessment |
| ER RSOP | Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation |
| EU | Exposure Unit |
| ft | foot |
| $ft^2$ | square foot |
| FY | Fiscal Year |
| GC/MS | gas chromatography/mass spectrometry |
| HCl | hydrochloric acid |
| HDPE | high-density polyethylene |
| $HNO_3$ | nitric acid |
| HPGe | high-purity germanium |
| HRC® | hydrogen release compound |
| HRR | Historical Release Report |

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| | |
|---|---|
| IA | Industrial Area |
| IABZSAP | Industrial Area and Buffer Zone Sampling and Analysis Plan |
| IAG | interagency agreement |
| IASAP | Industrial Area Sampling and Analysis Plan |
| IHSS | Individual Hazardous Substance Site |
| IIR | Internal Investigation Report |
| ITS | Interceptor Trench System |
| ISOCS | In-Situ Counting System |
| K-H | Kaiser-Hill Company, L.L.C. |
| LCS | laboratory control sample |
| LLW | low-level radioactive waste |
| LLMW | low-level mixed waste |
| ug/kg | micrograms per kilogram |
| ug/L | micrograms per liter |
| MDL | method detection limit |
| mg/kg | milligrams per kilogram |
| mg/L | milligrams per liter |
| MS | matrix spike |
| MSD | matrix spike duplicate |
| MST | modular storage tanks |
| NaI | sodium iodide |
| N/A | not applicable |
| nCi/g | nanocuries per gram |
| NFAA | No Further Accelerated Action |
| NLR | No Longer Representative |
| NPWL | New Process Waste Lines |
| OPWL | Original Process Waste Line |
| OU | operable unit |
| PA | Protected Area |
| PAC | Potential Area of Concern |
| PAH | polycyclic aromatic hydrocarbon |
| PARCCS | precision, accuracy, representativeness, completeness, comparability, and sensitivity |
| PCB | polychlorinated biphenyl |
| PCE | tetrachloroethene |
| pCi/g | picocuries per gram |
| pCi/L | picocuries per liter |
| PCOC | potential contaminant of concern |
| POE | Point of Evaluation |
| ppb | parts per billion |
| ppm | parts per million |
| PVC | polyvinyl chloride |
| QC | quality control |
| RAO | remedial action objective |
| RCRA | Resource Conservation and Recovery Act |
| RFCA | Rocky Flats Cleanup Agreement |

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| | |
|---|---|
| RFETS or Site | Rocky Flats Environmental Technology Site |
| RFI/RI | RCRA Facility Investigation/Remedial Investigation |
| RI/FS | Remedial Investigation/Feasibility Study |
| RIN | report identification number |
| RL | reporting limit |
| RLCR | Reconnaissance Level Characterization Report |
| RPD | relative percent difference |
| RSOP | RFCA Standard Operating Protocol for Routine Soil Remediation |
| SAP | Sampling and Analysis Plan |
| Sbd | sample beginning depth |
| SD | standard deviation |
| Sed | sample ending depth |
| SEP | Solar Evaporation Ponds |
| SOR | sum of ratios |
| SSRS | Subsurface Soil Risk Screen |
| SVOC | semivolatile organic compound |
| SWD | Soil Water Database |
| S&W | Swinerton and Walberg |
| TCE | Trichloroethene |
| UBC | under building contamination |
| UCL | upper confidence limit |
| V&V | verification and validation |
| VOC | volatile organic compound |
| WRW | wildlife refuge worker |

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## EXECUTIVE SUMMARY

Individual Hazardous Substance Site (IHSS) Group 000-4 at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado consists of the New Process Waste Lines (NPWL).

NPWL was a permitted Resource Conservation and Recovery Act (RCRA) Unit and was closed in accordance with approved RCRA closure description documents (CDDs) (DOE 2002e and 2003i). Portions of the NPWL were cleaned and closed in place in accordance with the RCRA Part B Permit.

The NPWL was a network of double-contained underground and aboveground pipelines and used to transport liquid waste streams to Building 374, Waste Treatment Operations. The NPWL transported a variety of waste streams and included the following:

- Laundry water,
- Nonradioactive and chemical laboratory waste,
- Uranium and beryllium waste,
- Polychlorinated biphenyls (PCBs),
- Solar Evaporation Pond (SEP) water,
- Incidental water,
- High nitrate waste from Building 774, and
- Utilities waste.

This closeout report includes information and data on NPWL from all applicable IHSS Groups so that it is a comprehensive summary of NPWL data and actions. For this report, the NPWL was divided into four primary areas (100/400 Area, 500 Area, 700 Area, and 800 Area).

Accelerated actions conducted at IHSS Group 000-4 consisted of characterization sampling of soil, excavation of radionuclide contaminated soil, and confirmation sampling of soil. Based upon the accelerated actions performed and analytical results of sampling, conditions at IHSS Group 000-4 include the following:

- 249 soil samples were obtained from 151 sampling locations (141 characterization locations and 10 confirmation locations).

- Approximately 15,300 ft of NPWL were excavated and disposed of from the Site.

- Approximately 6,200 ft of NPWL were clean closed and left in place.

- Twenty valve vaults were part of the NPWL network. Six valve vaults were completely removed, three valve vaults were partially excavated and flow filled, and eleven valve vaults were partially excavated and backfilled with soil.

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- The potential sources of contamination related to NPWL that existed at activities or concentrations greater than RFCA WRW soil ALs were removed unless remediation was not required based on RFCA (DOE et al. 2003).

- Arsenic was the only residual contaminants remaining at a concentration greater than the RFCA WRW soil AL; however, remediation was not required according to RFCA (DOE et al. 2003)

- Backfilling of excavations and regrading has been completed.

- Final grading of areas containing NPWL will be conducted as part of other projects.

All accelerated action objectives related to NPWL were achieved. Confirmation sampling results indicate activities and concentrations are less than RFCA WRW soil ALs. Results of the accelerated action justify No Further Accelerated Action (NFAA) for IHSS Group 000-4 and this justification is based on the following:

- The potential sources of contamination existing in soil at concentrations greater than RFCA WRW soil ALs were removed except arsenic, which did not require remediation based on RFCA.

- All valve vaults associated with NPWL were either partially excavated and backfilled or flow filled, or were completely removed, thereby eliminating these areas as potential sources of future contaminant releases.

- Remaining NPWL has been rinsed, sampled for RCRA constituents, and shown to be RCRA-clean, further eliminating potential future releases of contamination.

- In accordance with the SSRS, subsurface soil in the area is not subject to significant erosion.

Currently, no Group-specific engineering controls or environmental monitoring are recommended as a result of the conditions remaining at IHSS Group 000-4. Likewise, no specific institutional or physical controls are recommended as a result of the conditions remaining at IHSS Group 000-4.

IHSS Group 000-4 will be evaluated as part of the Sitewide CRA. The CRA is part of the Remedial Investigation/Feasibility Study (RI/FS) that will be conducted for the Site.

The need for and extent of any more general, long-term stewardship activities will also be analyzed in the RI/FS and proposed as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for the Site will ultimately be contained in the Corrective Action Decision/Record of Decision (CAD/ROD). This Closeout Report and associated documentation will be retained as part of the Rocky Flats Administrative Record (AR) file.

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## 1.0 INTRODUCTION

This Closeout Report summarizes accelerated action activities conducted at Individual Hazardous Substance Site (IHSS) Group 000-4 at the Rocky Flats Environmental Technology Site (RFETS or Site) in Golden, Colorado. IHSS Group 000-4 consists of the New Process Waste Lines (NPWL).

In addition, NPWL was addressed in other IHSS Group investigations. Accelerated actions related to NPWL in other IHSS Groups are also presented in this NPWL Closeout Report. Other IHSS Groups that involved NPWL actions are listed in Table 1.

**Table 1**
**Other IHSS Groups Addressing Accelerated Actions**

| IHSS Group | IABZSAP Addendum | ER RSOP Notification | Data Summary/ Closeout Report |
|---|---|---|---|
| 000-1 | #IA-02-07 (DOE 2002a) | #02-08 (DOE 2002b) | Closeout Report (DOE 2003a) |
| 000-2 | #IA-03-11 (DOE 2003b) | #03-14 (DOE 2003c) | Closeout Report (DOE 2005a) |
| 100-4 | #IA-02-01 (DOE 2001b) | #02-01 (DOE 2002c) | Closeout Report(DOE 2003d) |
| 500-3 | #IA-03-12 (DOE 2003e) | #05-02 (DOE 2005b) | Closeout Report (DOE 2005c) |
| 800-1 | #IA-03-01 (DOE 2003f) | #03-12 (DOE 2003g) | Closeout Report (DOE 2004a) |
| 800-3 | #IA-04-06 (DOE 2004b) | #05-04(DOE 2005d) | Closeout Report (DOE 2005e) |
| 800-6 | #IA-02-01 (DOE 2001a) | #02-02 (DOE 2002d) | Closeout Report (DOE 2003h) |

NPWL was a permitted Resource Conservation and Recovery Act (RCRA) Unit and was closed in accordance with approved RCRA closure description documents (CDDs) (DOE 2002e and 2003i). Portions of the NPWL were cleaned and closed in place in accordance with the RCRA Part B Permit.

Approximately 21,500 feet (ft) of NPWL existed at the Site. Approximately 15,300 ft of NPWL were removed and 6,200 ft of NPWL were clean closed and left in place. During accelerated action activities, soil was collected from 151 locations along the NPWL. Twenty valve vaults were part of the NPWL network and six valve vaults were completely removed, three valve vaults were partially excavated and flow filled, and eleven valve vaults were partially excavated and backfilled with soil.

The NPWL was a network of double-contained underground and aboveground pipelines and used to transport liquid waste streams to Building 374, Waste Treatment Operations. The NPWL transported a variety of waste streams and included the following:

- Laundry water,
- Nonradioactive and chemical laboratory waste,
- Uranium and beryllium waste,
- Polychlorinated biphenyls (PCBs),
- Solar Evaporation Pond (SEP) water,
- Incidental water,

- High nitrate waste from Building 774, and
- Utilities waste.

Accelerated action activities, including NPWL characterization and removal, were planned and executed in accordance with the Industrial Area (IA) Sampling and Analysis Plan (SAP) (IASAP) (DOE 2001a), the Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) (DOE 2003j), and the IHSS Group 000-4 RSOP Notification #05-01 (DOE 2004c). In addition, several other IASAP Addenda and RSOP Notifications addressed NPWL related actions, and are referenced in Table 1.

This Closeout Report contains results from all IHSS 000-4 NPWL investigations. Soil samples from 151 locations are presented in this Closeout Report. In order to present these data in manageable groups, the Site was divided into 4 primary areas for this report. NPWL related accelerated action activities and results are presented for each of the following areas:

- 100/400 Area,
- 300/500 Area,
- 700 Area, and
- 800 Area.

The NPWL and associated valve vaults within these defined areas are shown on Figure 1.

This report contains the information necessary to demonstrate attainment of cleanup objectives and final closure of IHSS Group 000-4, including the following:

- Site characterization information
  - Description of site characterization activities, and
  - Site characterization data, including data tables and maps;
- Site accelerated action information
  - Description of accelerated action, including the rationale for the action,
  - Map of the project area and dates and durations of specific remedial activities, and
  - Photographs documenting site remediation and reclamation activities;
- Confirmation sampling data, including data tables and location maps, as well as a comparison of the confirmation data to applicable cleanup goals;
- Deviations from the ER RSOP (DOE 2003j);

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- The Subsurface Soil Risk Screen (SSRS);
- Near-term stewardship actions and long-term stewardship recommendations;
- Disposition of wastes;
- Site reclamation information;
- Table of No Longer Representative (NLR) locations that have been remediated. These data will be used to mark database records so they are not used in the CRA or other Site analyses; and
- Data Quality Assessment (DQA), including comparisons of confirmation data with project data quality objectives (DQOs).

Approval of this Closeout Report constitutes regulatory agency concurrence that IHSS Group 000-4 is a No Further Accelerated Action (NFAA) Site. This information and NFAA determination will be documented in the Fiscal Year (FY) 2005 (05) Annual Update for the Historical Release Report (HRR).

## 2.0 SITE CHARACTERIZATION

IHSS Group 000-4 characterization information consists of historical process knowledge and analytical data. Historical information for IHSS Group 000-4 was derived from the HRR and annual updates (DOE 1992-2004), the Industrial Area Data Summary Report (DOE 2000), and the IASAP (DOE 2001a) and is summarized in Section 2.1. Summaries of historical information from the other IHSS Groups listed in Table 1 are provided in Section 2.2. Accelerated action analytical data for IHSS Group 000-4 are summarized in Section 2.3.

The enclosed compact disc (CD) contains the complete accelerated action data set for IHSS Group 000-4, including NPWL-related data derived from other IHSS Groups. The CD includes standardized real and quality control (QC) data, including Chemical Abstracts Service (CAS) numbers, analyte names, and units.

### 2.1 Historical Information – IHSS Group 000-4 (NPWL)

As previously mentioned, the NPWL consisted of a network of double-contained underground and aboveground pipelines and tanks that transported liquid waste streams to Building 374, Waste Treatment Operations. The NPWL overlapped the OPWL in many places and, for the most part, replaced the Original Process Waste Line (OPWL) infrastructure. Installation of the NPWL was completed in 1984. Some of the OPWL lines were converted to NPWL.

Potential contaminants of concern (PCOCs) included acids, bases, solvents, radionuclides, PCBs, metals, oils, and photographic laboratory chemicals.



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Releases from NPWL were documented at several PACs and are summarized below:

- Nitric acid ($HNO_3$), hydrofluoric acid, and hydrochloric acid (HCl) from Building 123 scrubber;
- Nitrate, radionuclides, and acids from Valve Vaults 11, 12, and 13; and
- Nitrate and radionuclides from process waste line leaks.

Spilled material from Building 123 was containerized and transferred into the Building 123 process waste system on November 7, 1989. Responses to occurrences at Valve Vaults 11, 12, and 13 have included repairing valve vaults and piping and removing contaminated soil. Contaminated soil from process waste line leaks was excavated and removed (DOE 1999).

These incidents are further described in Section 2.2.

## 2.2 Historical Information – Other IHSS Groups

Historical information on other IHSS Groups where NPWL was addressed is described in Sections 2.2.1 through 2.2.15.

### 2.2.1 IHSS Group 000-1 – Solar Evaporation Ponds (SEP)

***Solar Evaporation Ponds IHSS 000-101***

The SEP (IHSS 101) were located on the northeastern side of the Protected Area (PA) and consisted of five surface impoundments: Ponds 207-A, 207-B North, 207-B Center, 207-B South, and 207-C. The major features in IHSS 101 were the SEP, Original Pond, Effluent Line IHSS 700-149.1 Interceptor Trench System (ITS), and areas in the immediate vicinity including IHSS 176 (Swinerton and Walberg [S&W] Contractor Storage Yard) (DOE 1995).

The SEP were used to store and evaporate low-level radioactive process wastes and neutralized acidic wastes containing high levels of nitrate and aluminum hydroxide. The SEP also received additional wastes, including treated sanitary effluent, aluminum scrap, alcohol wash solutions, drums of radiography solutions, leachate from the RFETS sanitary landfill, ITS groundwater, saltwater, personnel decontamination wash water, HCl, $HNO_3$, hexavalent chromium, and cyanide wastes. The original pond was constructed in 1953 and used until 1956. Pond 207-A was placed in service in 1956. Ponds 207-B North, Center, and South were placed in service in 1960, and Pond 207-C was constructed in 1970 (DOE 1995).

In the 1980s, SEP use was phased out and transfer of process wastewater into the ponds ceased in 1986. Cleanup activities began in 1985 to drain and treat the liquid waste and process the pond sludges (DOE 1995). All SEP were drained and the sludge was removed in 1995. A NFAA was issued on July 25, 2003 by the CDPHE for the SEP (DOE 2003a).

NPWL in the SEP area consisted of an aboveground line, part of the NPWL system and RCRA Unit 374.3 which was used to convey water from the Modular Storage Tanks (MSTs) via Building 910 to Building 374. Typically water transferred from Building 910 to Building 374 did not contain RCRA-contaminated wastewater. However, in 1999, a temporary authorization was received to transfer decant water from the 750 Pad sludge removal project and cooling tower water from Building 779. The wastewater from the 750 Pad project contained concentrations of metals in the parts per billion (ppb) range and concentrations of methyl ethyl ketone in the parts per million (ppm) range. The cooling water from Building 779 was contaminated with arsenic (11 milligrams per liter [mg/L]). Upon completion of the transfer of this waste to Building 374, the transfer line was to be flushed, rinsed, and sampled and analyzed to ensure no residual contamination remained.

### 2.2.2 IHSS Group 000-2 (OPWL)

***Building 123 Process Waste Line Break, PAC 100-602***

On April 13, 1989, Valve Vault 17, located on Cottonwood Avenue between Buildings 443 and 444, was found flooded with approximately 1,200 gallons of aqueous waste. Subsequent investigation showed the source of the waste was a break in the process waste line in Manhole 1, south of Building 123. Leakage from the break had migrated into bedding material surrounding the pipe and ultimately reached Valve Vault 17 through either pipe bedding materials (soil), or a polyvinyl chloride (PVC) electrical conduit. The release also migrated into a section of the abandoned OPWL network (PAC 000-121). Discharge of Building 123 process waste into the broken line was discontinued on April 18, 1989, five days after the release to Valve Vault 17 was first detected. The potentially affected area includes the process waste line between Manhole 2 and Valve Vault 18 (immediately south of Building 123), the process waste line between Valve Vaults 18 and 17, soil around Valve Vaults 18 and 17, and the OPWL between Manholes 2 and 3. In July 1989, groundwater containing blue dye, used several months earlier to trace the release, was observed seeping into excavations around Valve Vault 18. According to one report, the release may also have reached the storm sewer system. Numerous detailed reports address these actions.

The release consisted of Building 123 process waste. Based on typical daily quantities of wastes discharged from Building 123, the following materials were likely released to the environment:

- 25 gallons urine;
- 12.5 gallons $HNO_3$ (unknown concentration);
- 20 gallons HCl (unknown concentration);
- 1.5 pounds ammonium thiocyanate;
- 1.0 pound ammonium iodide; and
- 2.5 gallons ammonium hydroxide (unknown concentration).

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The above materials would have been diluted in approximately 2,000 gallons of tap water.

Minor amounts of naturally occurring uranium were detected in soil and water samples collected after the release. Up to 140 picocuries per liter (pCi/L) alpha activity was recorded in samples of the waste from Valve Vault 17. One water sample from a manhole south of Building 123 also contained 8 percent ethylene glycol.

After process waste discharge to the broken line was discontinued, soil sampling was conducted to determine the source and extent of the release. A temporary aboveground line was installed, and a replacement underground line was planned for completion by June 1, 1989.

The release was documented in Resource Conservation and Recovery Act (RCRA) Contingency Plan Implementation Report (CPIR) No. 89-003 and in Rocky Flats Plant Internal Investigation Report (IIR) No. 89-55. Because the affected area was near existing IHSSs scheduled for investigation and remediation activities, no cleanup was initiated at that time. The area was addressed later as part of the IHSS 000-2 OPWL project (DOE 2005 – in Agency review).

### 2.2.3 IHSS Group 100-4 – Under Building Contamination (UBC) 123 – Health Physics Laboratory

***Waste Leaks IHSS 100-148***

The eastern wing of Building 123 was encompassed by IHSS 148. Building 123 was constructed as a laboratory and was one of the first buildings at RFETS. When constructed, the building consisted of a north wing running east-west and an east wing running north-south. A west wing running north-south was added onto the western end of the north wing in the late 1960s (probably 1968) and an addition to the southern end of the east wing was added in approximately 1972.

Persons interviewed for the CEARP Phase 1 document indicated that several small spills of nitrate-bearing wastes occurred around the outside of Building 123. These wastes may have contained radionuclides. Additionally, interviewees indicated that there were potential releases of nitrate-bearing wastes from the OPWL buried beneath Building 123. This pipeline was in use from the start of operations in Building 123 until the OPWL was replaced by the NPWL. The abandonment of the OPWL beneath Building 123 occurred no later than February 1975 when engineering drawings documented the abandonment of the OPWL system.

Building 123 was serviced by a 4-inch-diameter process waste line buried beneath the north and east wings of the building. The main process waste line drained from west to east in the north wing, and from north to south the east wing. The pipe was sloped at 1 percent. A number of connections were made to the main pipe, some of which consisted of headers servicing a number of process waste drains in the building. The pipe was probably constructed of a type of iron called "Duriron." The OPWL piping from Building 123 led to an underground tank system behind Building 441 that collected

wastes generated by both Buildings 123 and 441. From this tank system, the process waste materials were pumped out for treatment in the process waste system.

The OPWL drain was not double-contained, and varied in depth beneath the floor of Building 123 from approximately 0.5 to 3 ft beneath the bottom of the concrete floor of the building. The line came out from beneath the southern end of the east wing of the building, with an invert elevation of approximately 6032.5 ft. Interviewees have stated that this line, being constructed of a type of iron, probably leaked considerable amounts of waste without personnel aware of the leak. The types of waste consisted of laboratory wastes from analysis of urine, fecal, and other bioassay samples. Nitrates and low levels of radionuclides were associated with the wastes carried in the OPWL. The NPWL that replaced the OPWL consisted of either double-contained or overhead lines (DOE 2003d).

Surface soil samples were collected and analyzed as part of the Operable Unit (OU) 13 RCRA Facility Investigation/Remedial Investigation (RFI/RI). Thirty-four analytes were detected in the surface soil samples, including 26 inorganic compounds and 8 radionuclides. Eleven analytes exceeded background concentrations at a minimum of one sampling location throughout IHSS 148. Constituents that exceeded background concentrations were chromium, cobalt, copper, lead, nickel, strontium, zinc, americium-241, plutonium-239/240, uranium-233/234, and uranium-238. These data are available in the IA Data Summary Report (DOE 2000).

A soil gas survey was conducted on a 25-ft grid and samples were analyzed in the field using gas chromatography/mass spectrometry (GC/MS). Sixty-four soil gas locations were sampled and 13 samples contained volatile organic compound (VOC ) levels in excess of the 1 micrograms per liter (μg/L) method detection limit (MDL). Benzene, toluene, ethylbenzene, xylene, and fuel constituents were detected in samples collected from the perimeter of Building 123 and within the east and west wings of the building. Trichlorofluoromethane was detected in nine samples distributed throughout the IHSS 148 area at levels up to 2.6 μg/L. Tetrachloroethene was detected at 1.5 μg/L in a sample collected east of Building 123.

***Building 123 Scrubber Solution Spill, PAC 100-611***

An inoperative pump in the Building 123 process waste transfer system caused the Building 123 scrubber system to overflow, spilling scrubbing solution into a bermed area outside of the building and into three pits beneath the floor of the building. Also, approximately 5 gallons of liquid were present in and around a nearby storm water drainage ditch which served the Building 123 parking lot. It was speculated that this liquid leaked from the berm wall interface with the underlying asphalt. However, it was later concluded that this liquid was not associated with the incident (that is, it was in the ditch prior to the incident). All of the spilled solution was contained within secondary containment structures, and none of the solution was believed to have impacted the environment.

Under normal operating conditions, the scrubbing solution drained into the process waste system when the scrubbing process was completed. The source of the problem was waste

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pump switches that were in the wrong position, as well as the influent valve that was blocked by glass filtering wool from Building 123.

The scrubbing solution consisted primarily of water, which was used to scrub $HNO_3$, hydrofluoric acid, and HCl used in Building 123. Approximately 50 gallons were released to the bermed area, and several hundred gallons were contained in the three pits beneath the Building 123 floor. Analyses showed the solution in the bermed area had a pH of 1.6, while the solution in the three pits had a pH of 6.0.

The 5 gallons of liquid in the parking lot drainage ditch did not react when sodium bicarbonate was applied, indicating it was not acidic and, therefore, was not the scrubbing solution.

Normal scrubbing solution drainage was restored when the glass wool material was cleared and the inoperative process waste pump was restarted. A submersible pump was used to transfer the scrubbing solution from the bermed area to process waste drains in Building 123. Measures were proposed to prevent subsequent buildup of glass wool in the process waste system. A RCRA CPIR (89-019) was written.

### 2.2.4 IHSS GROUP 500-1

***Valve Vaults 11, 12, and 13 IHSS 300-186***

Valve Vaults 11, 12, and 13 were located inline along the process waste line south of Building 374 and west of Building 552. Several incidents occurred in one or more of the valve vaults resulting in the release of process waste to the environment. Process waste lines connected the valve vaults and containment lines surrounded the pipes. In addition to the double-contained lines, the process waste lines were equipped with leak-detection sensors.

The first incident related to these valve vaults for which documentation was found was on June 12, 1985. Contractors excavating a drainage ditch along the southern side of the PA in the northeastern corner of the Building 371 parking lot broke the outer containment of four lines and the inner line of the low-level transfer line near Valve Vault 13. Soon after it was broken, pumping began from the process waste tanks in Building 460 to Building 374, allowing liquid to be released from the inner pipe. Details of the spill in 1985 indicated a pH of 5 and 6 on litmus paper with a laboratory analysis of 7.2. The process waste consisted of Oakite and distilled water. It was estimated at the time that 1,700 gallons of liquid were pumped, but only approximately 4.4 gallons were spilled onto the ground. The pipe was repaired after the 1985 incident. Investigation at that time revealed no radioactive contamination.

In June 1986, corrosion of a 1-inch-diameter hole in a black iron flange, which was connected to a stainless-steel piping system, caused a release of process waste into Valve Vault 13. The sump pump recirculated the liquid in the vault. The sensor alarm sounded but was not responded to until the next day. In June 1986, the black iron flange was replaced with a stainless-steel flange with no release of contamination. These repairs

were thought to have contributed to the leak found in 1987, because the repairs were not compatible with the original design.

The June 1986 incident involved an acidic liquid waste that corroded the iron flange. In October 1986, the soil surrounding the pipe was saturated with a yellow liquid. Monitoring of the area disclosed alpha, beta, and uranium-238 contamination of up to 1.7 x $10^5$, 5 x $10^4$, and 9 x $10^2$ pCi/L, respectively. Analytical results from water samples indicated the presence of uranium, americium, plutonium, total alpha activity, and total beta activity.

The process line between Valve Vault 12 and Valve Vault 13 was reported leaking on October 24, 1986. The process waste lines were designed to provide a constant slope between adjacent valve vaults to allow any liquid in the containment pipe to flow into a vault and trigger an alarm. No alarm sounded when the release occurred. It was determined at the time the leak occurred that the lines had been previously repaired and reworked in 1981 or 1982 and that they were replaced in a manner that did not allow drainage. Instead, a trap was created, allowing saturation of the bedding material and soil around the pipe.

After the leak had been detected in October 1986, an area 30 ft by 100 ft was excavated to locate the leak in the process waste lines. The repairs were completed on November 13, 1986. A series of small cofferdams was built to contain surface water and groundwater, and the collected fluids were eventually removed by a tank truck and placed in SEP 207-A. Approximately 24 waste boxes of uranium-contaminated sand and gravel were shipped off site for low-level radioactive disposal. Cleanup was completed on December 8, 1986, by reducing the radiation levels to slightly above background. The area was backfilled.

On June 1, 1987, a radioactive leak was discovered near Valve Vault 13 when contamination was found in the culvert drain collection basin. The leak was found to be in the high-level transfer line between Building 374 and Valve Vault 13. A radioactive acidic solution was released in the June 1987 incident. Analytical results from samples collected in the culvert drain collection basin showed 42,000 pCi/L gross alpha activity and 13,000 pCi/L gross beta activity.

In response to the culvert contamination in 1987, dikes were installed in the drain path to prohibit further draining. Liquids were drained from the transfer pipe and pumped to a mobile tanker. The culvert was taken out and soil was removed until both alpha and beta counts were below 250 counts per minute (cpm). A work order was submitted to install a leak-detection device; however, it is not known whether this was complete. The high- and low-level transfer lines were replaced with fibercast piping and repaired to the original design specifications.

On September 13, 1988, Valve Vault 12 was flooded with 1,700 gallons of high nitrate solution during transfer between Building 774 and Building 374. A connection at a tygon tube became separated which allowed the leak to occur.

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In October 1989, a significant amount of liquid was found in Valve Vault 11, Valve Vault 12, and Valve Vault 13. The alarms had sounded in the Building 231 Pump House, Pump Station #1, and Valve Vault 19, but upon inspection no problems were found at these locations. The inspection continued and resulted in the discovery of liquid in Vaults 11, 12, and 13.

The liquid that leaked in 1989 was approximately 10,000 gallons of SEP water with a pH of 7.5 to 8.0. Analytical results of radioactivity levels indicated 3,122 to 7,134 pCi/L gross alpha activity.

A document written in May 1989 indicated that backfilling of an excavation at this valve vault would have to be delayed for over a year because of legalities in dealing with the contaminated waste. This excavation may be due to the flooding incident in 1988.

The supervisor of Building 374 ordered pumping stopped from Building 778 and Building 774 in response to the 1989 incident. The RCRA/Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) office was notified. The appropriate lockout/tagouts were provided on the valves in Valve Vault 12 and in the Building 231 Pump House. The liquid was removed and repairs to the line were completed by October 22, 1989. The line flow-tested successfully. A RCRA CPIR (89-015) was prepared and submitted on this incident.

### 2.2.5 IHSS GROUP 800-3

***Valve Vault 2, PAC 800-1200***

During a routine inspection of Valve Vault 2 on April 25, 1989, liquid was discovered in the leak detection collection bottle. The bottle was also leaking; therefore, the alarm was not sounded. The leak was coming from the south process transfer line that consisted of a 3-inch PVC Schedule 80 pipe inside a 6-inch polyethylene chase pipe (containment pipe). A pH check of the liquid indicated that the inner pipe, which originated from waste tanks in Building 883, was leaking. Three discharges had occurred through this line since the vault was last inspected (March 14, 1989), at which time no leaks were apparent.

Building 883 generated a process waste that was $HNO_3$ and/or rinsate water contaminated with depleted uranium. A pH check of the liquid showed a pH of 1 to 2. The waste was partially neutralized with roughly equal amounts of a KOH solution before it was discharged to Building 374 via Valve Vault 2. Total alpha activity measured 39,000,000 pCi/L.

Upon detection of the leak, discharge valves from the waste tanks in Building 883 were closed and locked out. Plumbing changes took place within 2 days after the leak was detected to ensure that no more transfers were made through the line. Hydrostatic testing of the inner line began on May 8, 1989, and continued through the month. Removal of the inner line began on May 29 and continued through June 2. Salt encrustations were found at the elbow where the process waste line exits the nitrad pickling operation room.

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From June 5 to 9, 1989, the secondary chase pipe was hydrostatically tested. When it was found leaking, the line was inspected by electronic visual imaging on June15, 1989, to locate the leak. Soil sampling had not begun as of July 31, 1989.

Because the release amounts exceeded the reportable quantity, the event was reported to the National Response Center on June 15, 1989. A RCRA CPIR (Implementation Report No. 89-007) was submitted.

## 2.3 Accelerated Action Data

Soil characterization sampling targeting NPWL and locations near NPWL was conducted from January 2002 to July 2005. A total of 151 accelerated action soil characterization and confirmation sampling locations were sampled in IHSS Group 000-4. Soil characterization sampling locations conducted as part of the IHSS Group 000-4 project were selected to target valve vaults as they were removed, breaks in the pipeline containment, stained soil, and pipe joints, and sections of NPWL that could not be clean-closed (DOE 2004_). NPWL that were clean-closed under the RFETS RCRA Part B Permit did not require soil characterization sampling.Only two soil sampling locations contained contaminants at activities or concentrations greater than RFCA soil WRW ALs.

Accelerated action sampling and analyses of soil samples related to NPWL are summarized in Table 2. Accelerated action sampling specifications and deviations, including potential contaminants of concern (PCOCs) and media sampled from IHSS Group 000-4 and other IHSS Groups, are presented in Table 3.

**Table 2**
**IHSS Group 000-4 Accelerated Action**
**Soil Sampling and Analysis Summary**

| Category | Planned Total | Actual Total |
|---|---|---|
| Number of Sampling Locations | N/A – An IHSS Group 000-4 IASAP Addendum does not exist; therefore, a planned total is not available. Samples were collected in accordance with the ER RSOP (DOE 2003j). | 82 (from IHSS Group 000-4)<br>69 (additional locations collected under other IHSS Groups)<br><br>**151 Combined Total** |
| Number of Samples | N/A | 99 (from IHSS Group 000-4)<br><br>150 (additional samples collected under other IHSS Groups)<br><br>**249 Combined Total** |
| Number of Metals Analyses (SW-846 6010/6010B or 6200) | N/A | 142 |
| Number of Radionuclide Analyses (alpha or gamma) | N/A | 246 |
| Number of SVOC Analyses (SW-846 8270B) | N/A | 24 |
| Number of VOC Analyses (SW-846 8260) | N/A | 101 |
| Number of Nitrate-N Analyses (SW9056 or E300.0) | N/A | 20 |
| Number of TRPH Analyses (SW8440) | N/A | 41 |

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## Table 3
## IHSS Group 000-4 Accelerated Action Sampling Specifications and Deviations

| Area | IHSS Group | Location | Planned Northing | Planned Easting | Actual Northing | Actual Easting | Media | Actual Depth Interval (ft) | Actual Analytes | Comments/Deviations |
|---|---|---|---|---|---|---|---|---|---|---|
| 100/400 | 000-4 | BT38-007 | 749007.662 | 2081519.837 | 749147.516 | 2081576.589 | Subsurface Soil | 2.5-3.0 | Radionuclides | Biased characterization sample on NPWL between B122 and VV-18. |
| 100/400 | 000-4 | BT39-011 | 749281.25 | 2081471.452 | 749156.534 | 2081519.041 | Subsurface Soil | 2.0-2.5 | Radionuclides VOCs | Biased characterization sample on NPWL outside south wall of B122. |
| 100/400 | 000-4 | BT39-012 | 749280.814 | 2081471.67 | 749156.042 | 2081519.912 | Subsurface Soil | 2.0-2.5 | Radionuclides | Biased characterization sample on NPWL outside south wall of B122. |
| 100/400 | 000-4 | BU37-000 | 748921.087 | 2081715.799 | 748920.237 | 2081722.336 | Subsurface Soil | 6.0-6.5 | Metals Nitrate/Nitrite Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 100/400 | 100-4 | BU38-002 | 749043.942 | 2081539.886 | 749039.101 | 2081729.023 | Subsurface Soil | 8.0 | Radionuclides | (UBC 123 Radiological Health Physics Laboratory IHSS 100-148 Waste Leaks) Manhole 2 |
| 100/400 | 100-4 | BU38-003 | 749034.393 | 2081540.754 | 749038.606 | 2081656.205 | Subsurface Soil | 7.0 | Radionuclides | (UBC 123 Radiological Health Physics Laboratory IHSS 100-148 Waste Leaks) |
| 100/400 | 100-4 | BU38-004 | 749025.713 | 2081541.622 | 749068.933 | 2081652.691 | Subsurface Soil | 5.0 | Radionuclides | (UBC 123 Radiological Health Physics Laboratory IHSS 100-148 Waste Leaks) |
| 100/400 | 100-4 | BU38-005 | 749017.9 | 2081541.622 | 749089.941 | 2081652.691 | Subsurface Soil | 5.0 | Radionuclides | (UBC 123 Radiological Health Physics Laboratory IHSS 100-148 Waste Leaks) Southwestern Sump |
| 100/400 | 100-4 | BU38-006 | 749011.824 | 2081541.622 | 749103.451 | 2081652.691 | Subsurface Soil | 5.0 | Radionuclides | (UBC 123 Radiological Health Physics Laboratory IHSS 100-148 Waste Leaks) Western Sump |
| 100/400 | 100-4 | BU38-007 | 749004.011 | 2081542.49 | 749145.413 | 2081652.691 | Subsurface Soil | 5.0 | Radionuclides | (UBC 123 Radiological Health Physics Laboratory IHSS 100-148 Waste Leaks) Northern Sump on Western Side |
| 100/400 | 100-4 | BU38-008 | 748998.803 | 2081543.359 | 749124 | 2081652.691 | Subsurface Soil | 5.0 | Radionuclides | (UBC 123 Radiological Health Physics Laboratory IHSS 100-148 Waste Leaks) West Process Line |
| 100/400 | 000-2 | BU38-017 | 748975.277 | 2081732.394 | 749003.637 | 2081729.928 | Subsurface Soil | 4.5-6.5 | Metals Radionuclides VOCs | Biased characterization sample proposed in 000-2 IASAP Addendum. |

| Area | IHSS Group | Location | Planned Northing | Planned Easting | Actual Northing | Actual Easting | Media | Actual Depth Interval (ft) | Actual Analytes | Comments/Deviations |
|---|---|---|---|---|---|---|---|---|---|---|
| 100/400 | 000-4 | BU38-019 | 749135.108 | 2081558.128 | 749135.169 | 2081586.404 | Subsurface Soil | 4.5-5.0 | Metals Nitrate/Nitrite Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 100/400 | 000-4 | BU38-020 | 749065.755 | 2081558.128 | 749065.678 | 2081587.89 | Subsurface Soil | 5.0-5.5 | Metals Nitrate/Nitrite Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 100/400 | 000-4 | BU38-021 | 748994.234 | 2081559.754 | 748997.43 | 2081591.845 | Subsurface Soil | 8.0-8.5 | Metals Nitrate/Nitrite Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 100/400 | 000-4 | BU38-022 | 748991.524 | 2081643.737 | 748997.442 | 2081643.727 | Subsurface Soil | 8.0-8.5 | Metals Nitrate/Nitrite Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 100/400 | 000-4 | BU38-023 | 749031.62 | 2081730.971 | 749031.684 | 2081730.914 | Subsurface Soil | 7.0-7.5 | Metals Nitrate/Nitrite Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 100/400 | 000-4 | BU38-024 | 748988.274 | 2081730.429 | 748992.582 | 2081729.187 | Subsurface Soil | 7.0-7.5 | Metals Nitrate/Nitrite Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 100/400 | 000-4 | BU38-025 | 748989.529 | 2081724.887 | 748999.138 | 2081585.488 | Subsurface Soil | 8.0-8.5 | Radionuclides | Biased characterization sample on NPWL between B122 and VV-18. |
| 100/400 | 000-4 | BV37-000 | 748903.207 | 2081771.607 | 748903.948 | 2081785.943 | Subsurface Soil | 5.0-5.5 | Metals Nitrate/Nitrite Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 100/400 | 000-4 | BV38-015 | 749005.742 | 2081791.011 | 748995.92 | 2081725.553 | Subsurface Soil | 6.0-7.0 | Radionuclides | Biased characterization sample at VV-18. |
| 100/400 | 000-4 | BV38-016 | 749005.863 | 2081791.286 | 749001.65 | 2081732.332 | Subsurface Soil | 7.0-7.5 | Metals Radionuclides | Biased characterization sample at VV-18. |
| 100/400 | 000-4 | BV38-017 | 748998.364 | 2081791.429 | 748997.99 | 2081727.46 | Subsurface Soil | 7.5-8.0 | Radionuclides | Biased characterization sample at VV-18. |
| 100/400 | 400-7 | BW38-009 | 749031.458 | 2082118.675 | 749194.732 | 2082215.962 | Subsurface Soil | 3.0-3.3 | Metals Radionuclides VOCs | Confirmation location, biased location added to target NPWL. |

| Area | IHSS Group | Location | Planned Northing | Planned Easting | Actual Northing | Actual Easting | Media | Actual Depth Interval (ft) | Actual Analytes | Comments/Deviations |
|---|---|---|---|---|---|---|---|---|---|---|
| 100/400 | 400-7 | BX38-019 | 749071.034 | 2082185.886 | 749120.898 | 2082184.921 | Subsurface Soil | 16.5-17.5 | Radionuclides TPH VOCs | Biased location to target IHSS 129 relocated 50 ft N and 6 ft W to avoid steam lines and fence. Collected sample from one interval shallower than planned due to equipment refusal; had only partial recovery. |
| 100/400 | 400-7 | BX38-040 | 749116.875 | 2082209.648 | 749116.885 | 2082209.629 | Surface Soil<br>Subsurface Soil | 0.0-0.5<br>0.5-2.5<br>2.5-4.5<br>4.5-6.5 | Radionuclides (4.5-6.5 only) TPH | Biased location added to target IHSS 129 to delineate TPH contamination. |
| 100/400 | 400-7 | BX38-043 | N/A | N/A | 749115.424 | 2082227.424 | Surface Soil<br>Subsurface Soil | 0.0-0.5<br>0.5-2.5<br>2.5-4.5<br>4.5-6.5<br>6.5-8.5<br>8.5-10.5<br>10.5-12.5<br>14.5-16.5<br>16.5-18.5 | TPH | Biased location added to target IHSS 129 to delineate TPH contamination. Partial Recovery at intervals 10.5-12.5 and 14.5-16.5. |
| 100/400 | 400-7 | BX38-045 | N/A | N/A | 749116.424 | 2082239.069 | Surface Soil<br>Subsurface Soil | 0.0-0.5<br>0.5-2.5<br>2.5-4.5<br>4.5-6.5<br>6.5-8.5<br>8.5-10.5<br>10.5-12.5<br>12.5-14.5 | TPH | Biased location added to target IHSS 129 to delineate TPH contamination. |

| Area | IHSS Group | Location | Planned Northing | Planned Easting | Actual Northing | Actual Easting | Media | Actual Depth Interval (ft) | Actual Analytes | Comments/Deviations |
|---|---|---|---|---|---|---|---|---|---|---|
| 100/400 | 400-7 | BX38-046 | N/A | N/A | 749122.157 | 2082306.395 | Surface Soil Subsurface Soil | 0.0-0.5<br>0.5-2.5<br>2.5-4.5<br>4.5-6.5<br>6.5-8.5<br>8.5-10.5<br>10.5-12.5<br>12.5-14.5<br>14.5-16.5<br>16.5-18.5<br>18.5-20.5<br>20.5-22.5 | TPH | Biased location added to target IHSS 129 to delineate TPH contamination. |
| 100/400 | 400-7 | BX38-055 | N/A | N/A | 749121.465 | 2082167.028 | Subsurface Soil | 12.0-12.5 | TPH | In-process sampling location for southern side of tank excavation. |
| 100/400 | 000-4 | BX38-057 | 749130.498 | 2082269.164 | 749131.037 | 2082262.706 | Subsurface Soil | 8.0-8.5 | Metals Radionuclides TRPH VOCs | Biased characterization sample at end of removed NPWL east of VV-16. |
| 100/400 | 400-6 | BY37-019 | 748912.56 | 2082372.01 | 748912.542 | 2082372.031 | Surface Soil Subsurface Soil | 0.0-0.5<br>0.5-2.5 | Metals Radionuclides VOCs (0.5-2.5 only) | No significant change in location. |
| 100/400 | 400-7 | BY38-011 | 749130.987 | 2082410.712 | 749131.623 | 2082416.427 | Surface Soil Subsurface Soil | 0.0-0.5<br>0.5-2.5<br>4.5-6.5 | Metals Radionuclides SVOCs VOCs (except 0.0-0.5) | Biased location to target Valve Vault 20 relocated 1 ft N and 6 ft E to get adjacent to target. No change in depth intervals or analytes. |
| 100/400 | 000-2 | BY38-013 | 749011.899 | 2082413.46 | 749011.8503 | 2082413.426 | Subsurface Soil | 2.5-4.5 | Metals Radionuclides VOCs | Biased characterization sample proposed in 000-2 IASAP Addendum. |
| 100/400 | 000-2 | BY38-016 | 749024.733 | 2082498.011 | 749034.65 | 2082417.63 | Subsurface Soil | 4.0-4.5 | Metals Radionuclides VOCs | Biased characterization sample. Proposed sampling at approximately 100 ft intervals along OPWL. |
| 100/400 | 400-7 | BY38-042 | N/A | N/A | 749120.192 | 2082207.938 | Subsurface Soil | 18.0-18.2 | TPH | Confirmation sampling location in the East Plume, center of western trench. |

| Area | IHSS Group | Location | Planned Northing | Planned Easting | Actual Northing | Actual Easting | Media | Actual Depth Interval (ft) | Actual Analytes | Comments/Deviations |
|---|---|---|---|---|---|---|---|---|---|---|
| 100/400 | 400-7 | BY38-046 | N/A | N/A | 749116.218 | 2082214.558 | Subsurface Soil | 16.0-16.2 | TPH | Confirmation sampling location in the East Plume, Valve Vault 16. |
| 100/400 | 400-7 | BY39-011 | N/A | N/A | 749154.698 | 2082216.745 | Subsurface Soil | 8.0-8.2 | TPH | Confirmation sampling location in the East Plume, northern side of western trench. |
| 100/400 | 400-7 | BY39-012 | N/A | N/A | 749123.69 | 2082285.659 | Subsurface Soil | 8.0-8.2 | TPH | Confirmation sampling location in the East Plume, northern side of central trench. |
| 100/400 | 400-7 | BY39-013 | N/A | N/A | 749117.172 | 2082344.544 | Subsurface Soil | 5.0-5.2 | TPH | Confirmation sampling location in the East Plume, northern side of eastern trench. |
| 300/500 | 000-4 | BX44-001 | 750311.094 | 2082316.857 | 749990.711 | 2082622.966 | Subsurface Soil | 7.0-7.5 | Metals<br>Radionuclides<br>SVOCs<br>VOCs | Biased characterization sample targeting repaired NPWL location. |
| 300/500 | 500-1 | BY43-000 | 749997.97 | 2082512.209 | 749998.061 | 2082512.216 | Subsurface Soil | 2.5-4.5<br>4.5-6.5 | Metals<br>Radionuclides | Statistical location; no significant change in location. |
| 300/500 | 500-1 | BY44-001 | 750196.913 | 2082536.659 | 750196.943 | 2082539.829 | Surface Soil<br>Subsurface Soil | 0.0-0.5<br>2.5-4.5<br>4.5-6.5 | Metals<br>Radionuclides<br>VOCs (except 0.0-0.5) | Statistical location; moved 3 ft east to be within 1 ft of NPWL. |
| 300/500 | 000-4 | BZ42-014 | 749948.579 | 2082543.239 | 750010.396 | 2082529.351 | Subsurface Soil | 3.0-3.3 | Radionuclides | Biased characterization sample at VV-13. |
| 300/500 | 000-4 | BZ42-015 | 749939.17 | 2082584.014 | 750012.432 | 2082546.466 | Subsurface Soil | 3.0-3.3 | Radionuclides | Biased characterization sample at VV-13. |
| 300/500 | 000-4 | BZ42-016 | 749920.35 | 2082554.217 | 750016.407 | 2082566.185 | Subsurface Soil | 3.0-3.3 | Radionuclides | Biased characterization sample at VV-13. |
| 300/500 | 500-1 | BZ43-000 | 750001.545 | 2082550.257 | 750003.701 | 2082555.204 | Subsurface Soil | 14.5-16.5 | Metals<br>Radionuclides | Biased location targeted at NPWL and valve vault; moved 6 ft northeast to be within 1 ft of NPWL and valve vault. |
| 300/500 | 500-1 | BZ43-001 | 749988.175 | 2082553.796 | 749984.487 | 2082552.194 | Subsurface Soil | 14.5-16.5 | Metals<br>Radionuclides | Biased location targeted at NPWL and valve vault; moved 4 ft SW to be within 1 ft of NPWL and valve vault. |
| 300/500 | 500-1 | BZ43-002 | 749990.927 | 2082541.999 | 749984.512 | 2082542.177 | Subsurface Soil | 14.5-16.5 | Metals<br>Radionuclides | Biased location targeted at NPWL and valve vault; moved 6 ft south to be within 1 ft of NPWL. |

| Area | IHSS Group | Location | Planned Northing | Planned Easting | Actual Northing | Actual Easting | Media | Actual Depth Interval (ft) | Actual Analytes | Comments/Deviations |
|---|---|---|---|---|---|---|---|---|---|---|
| 300/500 | 000-4 | BZ43-003 | 749992.5 | 2082661.149 | 749998.611 | 2082658.815 | Subsurface Soil | 12.5-14.5 | Metals Nitrate/Nitrite Radionuclides | Biased characterization sample at VV-12. |
| 300/500 | 000-4 | BZ43-004 | 749988.961 | 2082674.518 | 749980.463 | 2082674.206 | Subsurface Soil | 12.5-14.5 | Metals Radionuclides | Biased characterization sample at VV-12. |
| 300/500 | 500-1 | BZ43-005 | 749991.714 | 2082604.916 | 749991.706 | 2082612.92 | Subsurface Soil | 6.5-8.5 8.5-10.5 10.5-11.0 | Metals Radionuclides | Biased location targeted at NPWL and valve vault; moved 8 ft east to be within 1 ft of NPWL;10.5-11.0 interval shortened because of expanding clay. |
| 300/500 | 500-1 | BZ43-006 | 749991.714 | 2082577.39 | 749996.299 | 2082577.613 | Subsurface Soil | 6.5-8.5 8.5-10.5 10.5-12.5 | Metals Radionuclides | Biased location targeted at NPWL; moved 4.6 ft north to be within 1 ft of NPWL. |
| 300/500 | 500-1 | BZ43-007 | 750017.016 | 2082542.758 | 750016.615 | 2082551.858 | Subsurface Soil | 2.5-4.5 4.5-6.5 | Metals Radionuclides | Statistical location moved 9.1 ft east to be within 1 ft of NPWL. |
| 300/500 | 500-1 | BZ43-008 | 750052.995 | 2082541.538 | 750052.834 | 2082543.591 | Subsurface Soil | 2.5-4.5 4.5-6.5 | Metals Radionuclides | Statistical location moved 2 ft east to be within 1 ft of NPWL. |
| 300/500 | 500-1 | BZ43-009 | 750088.975 | 2082540.318 | 750089.068 | 2082543.206 | Subsurface Soil | 2.5-4.5 4.5-6.5 | Metals Radionuclides | Statistical location moved 3 ft east to be within 1 ft of NPWL. |
| 300/500 | 500-1 | BZ43-010 | 750124.954 | 2082539.099 | 750124.546 | 2082537.064 | Subsurface Soil | 3.0-4.5 5.5-6.5 | Metals Radionuclides | Statistical location moved 2.1 ft west to be within 1 ft of NPWL; partial recovery from both intervals. |
| 300/500 | 500-1 | BZ43-011 | 750160.933 | 2082537.879 | 750160.767 | 2082541.063 | Surface Soil Subsurface Soil | 0.0-0.5 2.5-4.5 4.5-6.5 | Metals Radionuclides VOCs (except 0.0-0.5) | Statistical location moved 3 ft east to be within 1 ft of NPWL. |
| 300/500 | 000-4 | BZ43-028 | 749998.075 | 2082547.714 | 749993.69 | 2082550.805 | Subsurface Soil | 10.0-12.0 | Metals Radionuclides | Biased characterization sample at VV-13. |
| 300/500 | 000-4 | BZ43-029 | 750091.096 | 2082546.551 | 750091.64 | 2082545.318 | Surface Soil Subsurface Soil | 0.0-0.3 7.0-7.3 | Metals (only 7.0-7.3) Radionuclides | Biased characterization sample on NPWL between B374 and VV-13. |
| 300/500 | 000-4 | BZ43-030 | 750117.909 | 2082727.203 | 749965.925 | 2082958.28 | Surface Soil | 0.0-0.5 | Radionuclides | Biased characterization sample on NPWL between VV-11 and VV-12. |
| 300/500 | 000-4 | BZ43-031 | 749977.483 | 2082611.542 | 749993.612 | 2082623.816 | Subsurface Soil | 7.5-8.0 | Radionuclides VOCs | Confirmation to BX44-001 hotspot excavation. |

| Area | IHSS Group | Location | Planned Northing | Planned Easting | Actual Northing | Actual Easting | Media | Actual Depth Interval (ft) | Actual Analytes | Comments/Deviations |
|---|---|---|---|---|---|---|---|---|---|---|
| 300/500 | 000-4 | BZ43-032 | 749973.638 | 2082611.457 | 749989.828 | 2082620.197 | Subsurface Soil | 7.5-8.0 | Radionuclides VOCs | Confirmation to BX44-001 hotspot excavation. |
| 300/500 | 000-4 | BZ43-033 | 749977.569 | 2082616.242 | 749991.319 | 2082627.596 | Subsurface Soil | 7.5-8.0 | Radionuclides VOCs | Confirmation to BX44-001 hotspot excavation. |
| 300/500 | 000-4 | BZ43-034 | 749973.381 | 2082616.499 | 749988.668 | 2082624.879 | Subsurface Soil | 7.5-8.0 | Radionuclides VOCs | Confirmation to BX44-001 hotspot excavation. |
| 300/500 | 000-4 | BZ43-035 | 749975.518 | 2082613.935 | 749991.322 | 2082625.491 | Subsurface Soil | 8.0-8.3 | Radionuclides VOCs | Confirmation to BX44-001 hotspot excavation. |
| 300/500 | 000-4 | BZ43-036 | 749975.421 | 2082611.361 | 749983.211 | 2082653.539 | Subsurface Soil | 9.0-10.0 | Metals Radionuclides VOCs | Biased characterization sample at VV-12. |
| 300/500 | 000-4 | BZ43-037 | 749975.685 | 2082616.28 | 749978.049 | 2082584.689 | Subsurface Soil | 17.0-18.0 | Metals Radionuclides VOCs | Biased characterization sample on NPWL between VV-12 and VV-13. |
| 300/500 | 000-4 | BZ43-038 | 749977.345 | 2082613.887 | 749935.063 | 2082618.401 | Surface Soil | 0.0-0.5 | Radionuclides | Biased characterization sample added south of NPWL between VV-12 and VV-13. |
| 300/500 | 000-4 | BZ43-039 | 749974.969 | 2082611.333 | 749947.136 | 2082619.394 | Surface Soil | 0.0-0.5 | Radionuclides | Biased characterization sample added south of NPWL between VV-12 and VV-13. |
| 300/500 | 000-4 | BZ43-040 | 749974.79 | 2082616.501 | 749957.983 | 2082621.421 | Surface Soil | 0.0-0.5 | Radionuclides | Biased characterization sample added south of NPWL between VV-12 and VV-13. |
| 300/500 | 000-4 | BZ44-004 | 750180.628 | 2082546.551 | 750180.625 | 2082546.579 | Subsurface Soil | 8.0-9.0 | Metals Radionuclides | Biased characterization sample on NPWL between B374 and VV-13. |
| 300/500 | 000-4 | BZ44-005 | 750268.998 | 2082545.389 | 750268.998 | 2082545.389 | Subsurface Soil | 8.0-9.0 | Metals Radionuclides | Biased characterization sample on NPWL between B374 and VV-13. |
| 300/500 | 000-4 | BZ44-006 | 750346.903 | 2082545.389 | 750346.903 | 2082545.389 | Subsurface Soil | 9.0-10.0 | Metals Radionuclides | Biased characterization sample on NPWL between B374 and VV-13. |
| 300/500 | 300-4 | BZ45-005 | 750448.241 | 2082550.26 | 750395.702 | 2082554.764 | Subsurface Soil | 6.5-8.0 | Metals Radionuclides | No significant change. (Text to right from Data Summary, deviation calc shows 50 ft N-S difference??) |
| 300/500 | 000-4 | CA43-004 | 749983.849 | 2082925.197 | 749986.475 | 2082922.564 | Subsurface Soil | 0.5-2.5<br>2.5-4.5<br>4.5-6.5 | VOCs | Biased characterization sample on NPWL between VV-11 and VV-12. |

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| Area | IHSS Group | Location | Planned Northing | Planned Easting | Actual Northing | Actual Easting | Media | Actual Depth Interval (ft) | Actual Analytes | Comments/Deviations |
|---|---|---|---|---|---|---|---|---|---|---|
| 300/500 | 000-4 | CA43-016 | 749991.954 | 2082751.233 | 749987 | 2082750.904 | Subsurface Soil | 6.5-8.5<br>8.5-10.5<br>10.5-12.5 | Metals<br>Radionuclides | Biased characterization sample on NPWL between VV-11 and VV-12. |
| 300/500 | 000-4 | CA43-017 | 749990.165 | 2082858.01 | 749994.256 | 2082858.148 | Subsurface Soil | 7.0-8.5<br>8.5-10.5<br>10.5-12.5 | Metals<br>Radionuclides | Biased characterization sample on NPWL between VV-11 and VV-12. |
| 300/500 | 000-4 | CA43-022 | 749993.278 | 2082932.607 | 749991.994 | 2082932.164 | Subsurface Soil | 11.0-11.5 | Metals<br>Radionuclides<br>SVOCs<br>VOCs | Biased characterization sample on NPWL between VV-11 and VV-12. |
| 300/500 | 000-4 | CB42-024 | 749954.664 | 2083020.581 | 750004.392 | 2083035.033 | Subsurface Soil | 1.0-1.3 | Radionuclides | Biased characterization sample on NPWL between VV-11 and VV-12. |
| 300/500 | 000-4 | CB43-000 | 749990.095 | 2083101.733 | 749977.418 | 2083102.468 | Subsurface Soil | 12.5-14.5 | Metals<br>Radionuclides | Biased characterization sample on NPWL between VV-11 and VV-12. |
| 300/500 | 000-4 | CB43-001 | 749993.016 | 2083113.661 | 749982.101 | 2083116.535 | Subsurface Soil | 12.5-14.5 | Metals<br>Radionuclides | Biased characterization sample on NPWL between VV-11 and VV-12. |
| 300/500 | 000-4 | CB43-008 | 749991.427 | 2083081.934 | 749999.464 | 2083081.648 | Subsurface Soil | 0.5-2.5<br>2.5-4.5<br>4.5-6.5 | VOCs | Biased characterization sample on NPWL between VV-11 and VV-12. |
| 300/500 | 000-4 | CB43-019 | 749995.58 | 2083019.719 | 750001.842 | 2083034.524 | Subsurface Soil | 0.5-2.5<br>2.5-4.5<br>4.5-6.5 | VOCs | Biased characterization sample on NPWL between VV-11 and VV-12. |
| 300/500 | 000-4 | CB43-024 | 749979.697 | 2082987.412 | 749968.219 | 2082987.888 | Subsurface Soil | 0.5-2.5<br>2.5-4.5<br>4.5-6.5 | VOCs | Biased characterization sample on NPWL between VV-11 and VV-12. |
| 300/500 | 000-4 | CB43-029 | 749999.733 | 2082957.504 | 749999.691 | 2082957.557 | Subsurface Soil | 0.5-2.5<br>2.5-4.5<br>4.5-6.5 | VOCs | Biased characterization sample on NPWL between VV-11 and VV-12. |
| 300/500 | 000-4 | CB43-047 | 749992.693 | 2083033.243 | 749994.87 | 2083032.476 | Subsurface Soil | 7.0-8.0 | Metals<br>Radionuclides | Biased characterization sample on NPWL between VV-11 and VV-12. |
| 300/500 | 000-4 | CB43-048 | 749992.438 | 2083033.579 | 749991.824 | 2082678.35 | Subsurface Soil | 9.0-11.0 | Metals<br>Radionuclides | Biased characterization sample at VV-12. |
| 300/500 | 500-1 | CC43-002 | 749987.275 | 2083144.15 | 749979.134 | 2083145.824 | Subsurface Soil | 0.5-2.5<br>2.5-4.5<br>4.5-6.5 | VOCs | Statistical location; moved 8.3 ft south to avoid process waste line. |

| Area | IHSS Group | Location | Planned Northing | Planned Easting | Actual Northing | Actual Easting | Media | Actual Depth Interval (ft) | Actual Analytes | Comments/Deviations |
|---|---|---|---|---|---|---|---|---|---|---|
| 300/500 | 500-1 | CC43-004 | 749989.604 | 2083289.024 | 749993.004 | 2083295.733 | Surface Soil<br>Subsurface Soil | 0.0-0.5<br>0.5-2.5<br>2.5-4.5<br>4.5-6.5 | Metals<br>Radionuclides<br>VOCs (except 0.0-0.5) | Statistical location; moved 7.5 ft northeast to avoid manhole. |
| 300/500 | 500-1 | CC43-007 | 750002.522 | 2083255.422 | 750000.085 | 2083257.191 | Subsurface Soil | 4.5-6.5 | Metals<br>PCBs<br>Radionuclides<br>VOCs | Statistical location; moved 3.0 ft southeast to avoid underground line. |
| 300/500 | 500-1 | CC43-008 | 749979.881 | 2083227.433 | 749996.579 | 2083217.175 | Subsurface Soil | 4.5-6.5 | Metals<br>PCBs<br>Radionuclides<br>VOCs | Statistical location; moved 19.6 ft northwest to avoid underground utilities. |
| 300/500 | 500-1 | CC43-012 | 749992.798 | 2083193.831 | 750000.989 | 2083194.522 | Subsurface Soil | 4.5-6.5 | Metals<br>PCBs<br>Radionuclides<br>VOCs | Statistical location; moved 8.2 ft north to avoid underground (electrical?) line. |
| 300/500 | 500-1 | CC43-017 | 750005.716 | 2083160.228 | 750005.732 | 2083160.322 | Subsurface Soil | 4.5-6.5 | Metals<br>PCBs<br>Radionuclides<br>VOCs | Statistical location; no significant change in location. |
| 300/500 | 000-4 | CC43-037 | 749990.651 | 2083213.405 | 749993.099 | 2083213.455 | Surface Soil | 0.0-0.5 | Metals<br>Radionuclides<br>VOCs | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 300/500 | 000-4 | CD43-019 | 749989.567 | 2083348.32 | 749986.48 | 2083345.368 | Subsurface Soil | 6.0-6.3 | Metals<br>Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 300/500 | 000-4 | CD43-020 | 749988.483 | 2083450.725 | 749982.466 | 2083450.059 | Subsurface Soil | 6.0-6.3 | Metals<br>Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 300/500 | 500-3 | CD43-022 | 750026.257 | 2083533.487 | 750034.7971 | 2083549.844 | Subsurface Soil | 17.0-18.0 | Radionuclides | Southern sidewall of Building 528 excavation. Sampled from excavator bucket. |
| 300/500 | 500-3 | CD43-024 | 750032.211 | 2083533.216 | 750059.3052 | 2083539.531 | Subsurface Soil | 20.0-21.0 | Radionuclides | Center of Building 528 excavation. Sampled from excavator bucket. |

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| Area | IHSS Group | Location | Planned Northing | Planned Easting | Actual Northing | Actual Easting | Media | Actual Depth Interval (ft) | Actual Analytes | Comments/Deviations |
|---|---|---|---|---|---|---|---|---|---|---|
| 300/500 | 500-3 | CD43-029 | 750032.799 | 2083434.543 | 750060.129 | 2083480.533 | Subsurface Soil | 20.0-22.0 | Radionuclides | Characterization sample collected beneath Building 561 tank. |
| 300/500 | 500-3 | CE43-000 | 750051.504 | 2083563.59 | 750054.497 | 2083555.328 | Subsurface Soil | 6.5-7.1<br>8.5-10.1<br>10.5-11.5<br>12.5-14.0<br>14.7-15.8<br>16.5-18.5<br>18.5-20.5<br>20.5-22.4 | Metals<br>Radionuclides<br>VOCs | Relocated (8.8 NW) to target OPWL and Building 528 basement. |
| 300/500 | 000-4 | CE43-016 | 749987.4 | 2083549.879 | 749980.507 | 2083532.481 | Subsurface Soil | 10.0-10.3 | Metals<br>Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 300/500 | 000-4 | CE43-017 | 749987.4 | 2083613.272 | 749982.981 | 2083613.917 | Subsurface Soil | 8.0-8.3 | Metals<br>Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 300/500 | 000-4 | CK44-024 | 750305.679 | 2084842.195 | 750012.106 | 2082774.164 | Subsurface Soil | 7.5-8.0<br>9.0-10.5 | Radionuclides | Biased location added under NPWL between Tanks 231A and 231B. |
| 700 | 000-4 | CE40-002 | 749485.669 | 2083688.044 | 749485.694 | 2083693.185 | Subsurface Soil | 10.0-10.5 | Metals<br>Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 700 | 000-4 | CE40-003 | 749381.639 | 2083689.128 | 749386.308 | 2083693.923 | Subsurface Soil | 10.0-10.5 | Metals<br>Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 700 | 000-4 | CE41-000 | 749687.77 | 2083686.961 | 749687.785 | 2083686.902 | Surface Soil | 0.0-0.3 | Metals<br>Radionuclides<br>VOCs | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 700 | 000-4 | CE41-001 | 749590.784 | 2083688.044 | 749591.811 | 2083688.335 | Subsurface Soil | 15.0-15.5 | Metals<br>Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 700 | 000-4 | CE41-002 | 749641.072 | 2083695.278 | 749685.18 | 2083698.246 | Subsurface Soil | 4.5-5.0 | Radionuclides | Biased characterization sample north of VV-7. |

| Area | IHSS Group | Location | Planned Northing | Planned Easting | Actual Northing | Actual Easting | Media | Actual Depth Interval (ft) | Actual Analytes | Comments/Deviations |
|---|---|---|---|---|---|---|---|---|---|---|
| 700 | 700-2 | CE42-001 | 749916.847 | 2083689.502 | 749916.871 | 2083700.012 | Subsurface Soil | 2.5-4.5<br>4.5-6.5 | Metals<br>Radionuclides<br>SVOCs<br>VOCs | Biased sample. Location moved approximately 4 ft northwest to target OPWL. |
| 700 | 000-4 | CE42-007 | 749886.62 | 2083686.961 | 749886.632 | 2083686.922 | Subsurface Soil | 8.0-8.5 | Metals<br>Radionuclides<br>VOCs | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 700 | 000-4 | CE42-008 | 749788.008 | 2083687.503 | 749787.975 | 2083687.49 | Surface Soil | 0.0-0.3 | Metals<br>Radionuclides<br>VOCs | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 700 | 000-4 | CE43-018 | 750117.438 | 2083686.961 | 750117.343 | 2083686.975 | Subsurface Soil | 10.0-10.5 | Metals<br>Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 700 | 000-4 | CE43-019 | 749986.858 | 2083685.877 | 749993.668 | 2083687.287 | Subsurface Soil | 8.5-8.8 | Metals<br>Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 700 | 700-10 | CE44-027 | 750315.44 | 2083613.736 | 750315.278 | 2083616.844 | Subsurface Soil | 12.5-14.5<br>14.5-16.5<br>16.5-18.5<br>18.5-20.5<br>20.5-22.0 | Radionuclides<br>VOCs | Biased; targeted on down gradient side of building opposite tank; both alpha and gamma spectrometry samples collected in all intervals; radionuclide samples in lower three intervals not in SAP Addendum; moved 3.1 ft east to avoid building footer; 20. |
| 700 | 700-10 | CE44-028 | 750306.196 | 2083613.823 | 750305.834 | 2083616.561 | Subsurface Soil | 12.5-14.5<br>14.5-16.5<br>16.5-18.5<br>18.5-20.5<br>20.5-22.5 | Radionuclides<br>VOCs | Biased; targeted on down gradient side of building opposite pumps; both alpha and gamma spectrometry samples collected; radionuclide samples in lower three intervals not in SAP Addendum; moved 2.7 ft east to avoid building footer; no change in inter. |
| 700 | 000-4 | CE44-033 | 750246.392 | 2083686.419 | 750237.774 | 2083682.974 | Subsurface Soil | 8.0-8.5 | Metals<br>Radionuclides | Biased characterization sample at VV-9. |

| Area | IHSS Group | Location | Planned Northing | Planned Easting | Actual Northing | Actual Easting | Media | Actual Depth Interval (ft) | Actual Analytes | Comments/Deviations |
|---|---|---|---|---|---|---|---|---|---|---|
| 700 | 700-3 | CE46-013 | 750672.884 | 2083730.704 | 750672.685 | 2083745.663 | Surface Soil<br>Subsurface Soil | 0.0-0.5<br>0.5-2.5<br>2.5-4.5<br>4.5-6.5 | Metals<br>Radionuclides<br>SVOCs<br>VOCs (except 0.0-0.5) | Statistical characterization location; no significant change in location; 1.0 ft of asphalt fill. No change in depth intervals and analytes. |
| 700 | 000-4 | CE48-041 | 751156.214 | 2083709.23 | 751187.058 | 2083621.714 | Subsurface Soil | 10.0-10.5 | Radionuclides | Biased characterization sample north of Building 771 added to NPWL project. |
| 700 | 000-4 | CF48-026 | 751153.145 | 2083857.157 | 751174.361 | 2083719.133 | Subsurface Soil | 10.0-10.3 | Radionuclides | Biased characterization sample north of Building 771 added to NPWL project. |
| 700 | 000-4 | CF48-027 | 751156.266 | 2083857.645 | 751273.146 | 2083543.925 | Subsurface Soil | 9.0-8.5 | Radionuclides | Biased characterization sample north of Building 771 added to NPWL project. |
| 700 | 000-4 | CF49-025 | 751169.718 | 2083857.157 | 751185.198 | 2083851.294 | Subsurface Soil | 10.0-10.3 | Radionuclides | Biased characterization sample north of Building 771 added to NPWL project. |
| 700 | 000-4 | CG39-005 | 749344.013 | 2084108.792 | 749365.098 | 2083668.014 | Subsurface Soil | 6.5-7.0 | Radionuclides | Biased characterization sample south of VV-7. |
| 700 | 000-1 | CH46-049 | 750750.091 | 2084173.197 | 750821.314 | 2084185.802 | Surface Soil | 0.0-0.2 | Radionuclides | Biased characterization on NPWL near SEP. |
| 700 | 000-1 | CH46-050 | 750750.036 | 2084190.488 | 750865.242 | 2084180.461 | Surface Soil | 0.0-0.2 | Radionuclides | Biased characterization on NPWL near SEP. |
| 700 | 700-7 | CI46-010 | 750707.283 | 2084388.558 | 750714.914 | 2084387.386 | Surface Soil | 0.0-0.5 | Metals<br>Radionuclides | Statistical location; relocated 7.6 ft N and 1.2 ft W to stay clear of water line. |
| 700 | 700-7 | CI46-014 | 750721.54 | 2084421.614 | 750721.531 | 2084421.63 | Surface Soil<br>Subsurface Soil | 0.0-0.5<br>0.5-2.5<br>2.5-4.5<br>4.5-6.5<br>6.5-8.5<br>8.5-10.5 | Metals<br>Radionuclides<br>VOCs (except 0.0-0.5) | Statistical location; no significant change in location. |
| 700 | 700-7 | CJ46-021 | 750721.313 | 2084578.534 | 750721.296 | 2084578.532 | Surface Soil<br>Subsurface Soil | 0.0-0.5<br>0.5-2.5<br>2.5-4.5<br>4.5-6.5<br>6.5-8.5<br>8.5-10.5 | Metals<br>Radionuclides<br>VOCs (except 0.0-0.5) | Statistical location; no significant change in location. |

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| Area | IHSS Group | Location | Planned Northing | Planned Easting | Actual Northing | Actual Easting | Media | Actual Depth Interval (ft) | Actual Analytes | Comments/Deviations |
|---|---|---|---|---|---|---|---|---|---|---|
| 800 | 000-2 | BY38-039 | N/A | N/A | 749176.584 | 2083685.205 | Subsurface Soil | 4.5-5.5 | Metals Radionuclides VOCs | Additional biased characterization sample. |
| 800 | 000-4 | CE35-001 | 748508.758 | 2083698.339 | 748509.64 | 2083699.103 | Subsurface Soil | 7.0-8.0 | Metals Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 800 | 000-4 | CE35-002 | 748413.397 | 2083698.339 | 748415.116 | 2083698.702 | Subsurface Soil | 7.0-7.5 | Metals Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 800 | 000-4 | CE36-000 | 748703.273 | 2083698.339 | 748706.828 | 2083696.691 | Subsurface Soil | 6.0-6.5 | Metals Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 800 | 000-4 | CE36-001 | 748605.745 | 2083698.339 | 748599.467 | 2083698.729 | Subsurface Soil | 7.0-7.5 | Metals Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 800 | 800-3 | CE37-003 | 748896.018 | 2083698.033 | 748883.176 | 2083699.002 | Subsurface Soil | 20.0-22.0 | Metals Radionuclides SVOCs VOCs | Biased location to target first native soil interval beneath valve vault; moved several times due to sampling refusal; final location was 13 ft south of planned location. Estimated depth to vault is 15 ft bgs; there is a 2-3 ft sump present and appr |
| 800 | 000-4 | CE37-009 | 748890.745 | 2083698.881 | 748883.468 | 2083698.825 | Subsurface Soil | 8.0-9.5 | Metals Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 800 | 000-4 | CE37-010 | 748793.758 | 2083698.339 | 748792.913 | 2083695.364 | Subsurface Soil | 6.0-7.0 | Metals Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 800 | 000-4 | CE37-011 | 748841.106 | 2083698.106 | 748854.008 | 2083702.66 | Surface Soil | 0.0-0.1 | Radionuclides | Biased characterization sample south of VV-2. |
| 800 | 000-4 | CE39-004 | 749275.983 | 2083690.212 | 749212.43 | 2083734 | Surface Soil Subsurface Soil | 0.0-0.5 0.5-2.5 | Metals Radionuclides SVOCs VOCs (0.5-2.5) | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |

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| Area | IHSS Group | Location | Planned Northing | Planned Easting | Actual Northing | Actual Easting | Media | Actual Depth Interval (ft) | Actual Analytes | Comments/Deviations |
|---|---|---|---|---|---|---|---|---|---|---|
| 800 | 000-4 | CE39-005 | 749171.952 | 2083690.754 | 749168.87 | 2083694.922 | Subsurface Soil | 12.0-12.5 | Metals Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |
| 800 | 800-5 | CF33-000 | 748124.84 | 2083824.359 | 748123.827 | 2083816.862 | Subsurface Soil | 16.5-18.5 | Metals Radionuclides SVOCs VOCs | Moved outside of building because of concerns with groundwater beneath the building. |
| 800 | 800-5 | CF33-004 | 748101.172 | 2083838.062 | 748098.54 | 2083832.87 | Subsurface Soil | 16.9-17.4 | Metals Radionuclides SVOCs VOCs | Location and depth interval were changed due to actual location of the OPWL. |
| 800 | 800-5 | CF33-010 | 748131.956 | 2083867.655 | 748131.956 | 2083867.655 | Subsurface Soil | 5.0-5.01 | Metals Radionuclides SVOCs VOCs | Sample collected at "D" (4.5-6.5) interval instead of "E" (6.5-8.5) interval to target actual depth of OPWL. Depth interval represents a grab sample. |
| 800 | 800-5 | CF33-011 | 748148.962 | 2083801.486 | 748143.538 | 2083807.896 | Subsurface Soil | 5.0-5.5 | Metals Radionuclides SVOCs VOCs | Additional sampling location targeting OPWL. |
| 800 | 800-5 | CF34-022 | 748184.54 | 2083801.565 | 748188.61 | 2083796.23 | Subsurface Soil | 25.0-25.5 | Metals Radionuclides SVOCs VOCs | Additional sampling location targeting OPWL. |
| 800 | 000-2 | CF35-040 | 748420.186 | 2083742.608 | 748428.797 | 2083736.401 | Subsurface Soil | 2.5-3.0 | Radionuclides Metals VOCs | Additional biased characterization sample. |
| 800 | 800-3 | CF37-009 | 748892.487 | 2083738.648 | 748896.138 | 2083738.837 | Subsurface Soil | 4.5-6.5 | Metals Radionuclides SVOCs VOCs | Biased location to target NPWL; moved 4 ft N to get closer to target. Planned depth was 14.5-16.5 |
| 800 | 000-4 | CF37-030 | 748892.912 | 2083777.446 | 748906.485 | 2083792.508 | Subsurface Soil | 12.0-12.5 | Metals Radionuclides | Biased characterization location along approximately 100' spacing intervals on NPWL to be removed |

| Area | IHSS Group | Location | Planned Northing | Planned Easting | Actual Northing | Actual Easting | Media | Actual Depth Interval (ft) | Actual Analytes | Comments/Deviations |
|---|---|---|---|---|---|---|---|---|---|---|
| 800 | 800-1 | CF38-009 | 749093.76 | 2083883.326 | 749098.928 | 2083885.089 | Subsurface Soil | 4.5-4.8 | Metals Radionuclides SVOCs VOCs | Biased location added under NPWL. |
| 800 | 800-1 | CF38-010 | 749093.444 | 2083935.543 | 749095.829 | 2083949.459 | Subsurface Soil | 4.5-4.8 | Metals Radionuclides SVOCs VOCs | Biased location added under NPWL. |
| 800 | 000-2 | CF39-000 | 749171.374 | 2083881.998 | 749172.472 | 2083848.635 | Subsurface Soil | 6.0-6.1 | Radionuclides Metals VOCs | Additional biased characterization sample. |
| 800 | 800-1 | CG38-033 | 749092.811 | 2084015.609 | 749095.774 | 2084017.949 | Subsurface Soil | 4.5-4.8 | Metals Radionuclides SVOCs VOCs | Biased location added under NPWL. |

Results of accelerated action characterization and confirmation sampling are discussed by area in Sections 2.3.1 through 2.3.4. Analytical results for all accelerated action characterization, in-process, and confirmation samples are presented in Table 4. In addition, analytical results with activities or concentrations greater than RFCA WRW soil AL exceedances are identified with bold text in Table 4.

### 2.3.1 100/400 Area

The 100/400 Area includes samples collected as part of IHSS Groups 000-2, 000-4, 100-4, 400-3, and 400-7 investigations. During sampling activities, 35 characterization and 5 confirmation locations were sampled. None of the soil samples collected from the 100/400 Area contained contaminants at activities or concentrations greater than RFCA WRW soil ALs. Analytical results of soil characterization sampling with concentrations greater than background means plus two standard deviations or reporting limits (RLs) are shown on Figure 2.

Confirmation samples were collected as part of the IHSS Group 400-7 project near Valve Vault 16 during soil excavation activities. None of the samples contained contaminants at activities or concentrations greater than RFCA WRW soil ALs.

### 2.3.2 300/500 Area

The 300/500 Area includes samples collected as part of IHSS Group 000-4, 300-4, 500-1, and 500-3 projects. Sixty-four locations were sampled in the 300/500 Area including 59 characterization locations and 5 confirmation locations.

Radionuclides were detected at one location at activities greater than there respective RFCA WRW soil ALs. Sample location BX44-001 contained americium-241 (566.5 pCi/g), plutonium-239/240 (3,290.1 pCi/g), uranium-234 (2,056 pCi/g), uranium-235 (27.41 pCi/g), and uranium-238 (2,056 pCi/g).

Remediation of radionuclide-contaminated soil was required at sample location BX44-001. Removal activities conducted as part of the IHSS Group 000-4 project are described in Section 4.1. Analytical results of soil characterization sampling with concentrations greater than background means plus two standard deviations or RLs are shown on Figure 3.

### 2.3.3 700 Area

The 700 Area contains NPWL-related soil samples collected under IHSS Group 000-1, 000-4, 700-2, 700-3, 700-7, and 700-10 ER projects. Soil samples were collected at 24 locations related to NPWL in the 700 Area. No contaminants were reported with activities or concentrations greater than RFCA WRW soil ALs as shown on Figure 4.

**Table 4**
**IHSS Group 000-4 Accelerated Action Soil Characterization Sampling Results Greater Than Background Means Plus Two Standard Deviations or RLs**

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100/400 | 000-4 | BT38-007 | 749147.516 | 2081576.589 | 2.50 | 3.00 | Uranium-235 | 0.189 | 8 | 0.120 | - | pCi/g |
| 100/400 | 000-4 | BT38-007 | 749147.516 | 2081576.589 | 2.50 | 3.00 | Uranium-238 | 2.619 | 351 | 1.490 | - | pCi/g |
| 100/400 | 100-4 | BU38-002 | 749039.101 | 2081729.023 | 8.00 | 8.01 | Americium-241 | 0.035 | 76 | 0.020 | - | pCi/g |
| 100/400 | 100-4 | BU38-004 | 749068.933 | 2081652.691 | 0.00 | 0.17 | Americium-241 | 0.046 | 76 | 0.023 | - | pCi/g |
| 100/400 | 100-4 | BU38-004 | 749068.933 | 2081652.691 | 0.00 | 0.17 | Uranium-235 | 0.128 | 8 | 0.094 | - | pCi/g |
| 100/400 | 100-4 | BU38-005 | 749089.941 | 2081652.691 | 5.00 | 5.01 | Americium-241 | 0.050 | 76 | 0.020 | - | pCi/g |
| 100/400 | 000-2 | BU38-017 | 749003.637 | 2081729.928 | 4.50 | 6.50 | Aluminum | 40000.000 | 228000 | 35373.170 | - | mg/kg |
| 100/400 | 000-4 | BU38-020 | 749065.678 | 2081587.89 | 5.00 | 5.50 | Zinc | 190.000 | 307000 | 73.760 | - | mg/kg |
| 100/400 | 000-4 | BU38-023 | 749031.684 | 2081730.914 | 7.00 | 7.50 | Aluminum | 19000.000 | 228000 | 16902.000 | - | mg/kg |
| 100/400 | 000-4 | BU38-023 | 749031.684 | 2081730.914 | 7.00 | 7.50 | Chromium | 19.000 | 268 | 16.990 | - | mg/kg |
| 100/400 | 000-4 | BU38-023 | 749031.684 | 2081730.914 | 7.00 | 7.50 | Lithium | 13.000 | 20400 | 11.550 | - | mg/kg |
| 100/400 | 000-4 | BU38-023 | 749031.684 | 2081730.914 | 7.00 | 7.50 | Nickel | 16.000 | 20400 | 14.910 | - | mg/kg |
| 100/400 | 000-4 | BU38-025 | 748999.138 | 2081585.488 | 8.00 | 8.50 | Uranium-235 | 0.168 | 8 | 0.094 | - | pCi/g |
| 100/400 | 000-4 | BV38-016 | 749001.65 | 2081732.332 | 7.00 | 7.50 | Barium | 1230.000 | 26400 | 289.380 | - | mg/kg |
| 100/400 | 400-7 | BW38-009 | 749194.732 | 2082215.962 | 3.00 | 3.30 | Acetone | 6.800 | 102000000 | - | 4.600 | ug/kg |
| 100/400 | 000-4 | BX44-001 | 749990.711 | 2082622.966 | 7.00 | 7.50 | 2-Methylnaphthalene | 1100.000 | 20400000 | - | 22.000 | ug/kg |
| **100/400** | **000-4** | **BX44-001** | **749990.711** | **2082622.966** | **7.00** | **7.50** | **Americium-241** | **566.500** | **76** | **0.020** | **-** | **pCi/g** |
| 100/400 | 000-4 | BX44-001 | 749990.711 | 2082622.966 | 7.00 | 7.50 | Barium | 954.000 | 26400 | 289.380 | - | mg/kg |
| 100/400 | 000-4 | BX44-001 | 749990.711 | 2082622.966 | 7.00 | 7.50 | bis(2-Ethylhexyl)phthalate | 140.000 | 1970000 | - | 35.000 | ug/kg |
| 100/400 | 000-4 | BX44-001 | 749990.711 | 2082622.966 | 7.00 | 7.50 | Fluorene | 57.000 | 40800000 | - | 21.000 | ug/kg |
| 100/400 | 000-4 | BX44-001 | 749990.711 | 2082622.966 | 7.00 | 7.50 | Mercury | 13.800 | 25200 | 1.520 | - | mg/kg |
| 100/400 | 000-4 | BX44-001 | 749990.711 | 2082622.966 | 7.00 | 7.50 | Naphthalene | 1400.000 | 3090000 | - | 535.000 | ug/kg |
| ***100/400*** | ***000-4*** | ***BX44-001*** | ***749990.711*** | ***2082622.966*** | ***7.00*** | ***7.50*** | ***Plutonium-239/240*** | ***3229.050*** | ***50*** | ***0.020*** | - | ***pCi/g*** |
| ***100/400*** | ***000-4*** | ***BX44-001*** | ***749990.711*** | ***2082622.966*** | ***7.00*** | ***7.50*** | ***Uranium-234*** | ***2056.000*** | ***300*** | ***2.640*** | - | ***pCi/g*** |
| **100/400** | **000-4** | **BX44-001** | **749990.711** | **2082622.966** | **7.00** | **7.50** | **Uranium-235** | **27.410** | **8** | **0.120** | **-** | **pCi/g** |
| **100/400** | **000-4** | **BX44-001** | **749990.711** | **2082622.966** | **7.00** | **7.50** | **Uranium-238** | **2056.000** | **351** | **1.490** | **-** | **pCi/g** |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *100/400* | *400-6* | *BY37-019* | *748912.542* | *2082372.031* | *0.00* | *0.50* | *Uranium-234* | *2.802* | *300* | *2.253* | - | *pCi/g* |
| 100/400 | 400-6 | BY37-019 | 748912.542 | 2082372.031 | 0.00 | 0.50 | Uranium-235 | 0.169 | 8 | 0.094 | - | pCi/g |
| 100/400 | 400-6 | BY37-019 | 748912.542 | 2082372.031 | 0.00 | 0.50 | Uranium-238 | 2.802 | 351 | 2.000 | - | pCi/g |
| *100/400* | *400-6* | *BY37-019* | *748912.542* | *2082372.031* | *0.50* | *2.50* | *Uranium-234* | *2.717* | *300* | *2.640* | - | *pCi/g* |
| 100/400 | 400-6 | BY37-019 | 748912.542 | 2082372.031 | 0.50 | 2.50 | Uranium-235 | 0.248 | 8 | 0.120 | - | pCi/g |
| 100/400 | 400-6 | BY37-019 | 748912.542 | 2082372.031 | 0.50 | 2.50 | Uranium-238 | 2.717 | 351 | 1.490 | - | pCi/g |
| 100/400 | 400-7 | BY38-011 | 749131.623 | 2082416.427 | 0.50 | 2.50 | Fluoranthene | 53.000 | 27200000 | - | 43.000 | ug/kg |
| 100/400 | 400-7 | BY38-011 | 749131.623 | 2082416.427 | 0.50 | 2.50 | Uranium-235 | 0.175 | 8 | 0.120 | - | pCi/g |
| 100/400 | 400-7 | BY38-011 | 749131.623 | 2082416.427 | 4.50 | 6.50 | Benzo(a)anthracene | 44.000 | 34900 | - | 42.000 | ug/kg |
| 100/400 | 400-7 | BY38-011 | 749131.623 | 2082416.427 | 4.50 | 6.50 | Chrysene | 51.000 | 3490000 | - | 37.000 | ug/kg |
| 100/400 | 400-7 | BY38-011 | 749131.623 | 2082416.427 | 4.50 | 6.50 | Fluoranthene | 100.000 | 27200000 | - | 42.000 | ug/kg |
| 100/400 | 400-7 | BY38-011 | 749131.623 | 2082416.427 | 4.50 | 6.50 | Pyrene | 110.000 | 22100000 | - | 60.000 | ug/kg |
| 100/400 | 400-7 | BY38-011 | 749131.623 | 2082416.427 | 4.50 | 6.50 | Uranium-235 | 0.173 | 8 | 0.120 | - | pCi/g |
| 100/400 | 000-2 | BY38-013 | 749011.8503 | 2082413.426 | 2.50 | 4.50 | Aluminum | 80000.000 | 228000 | 35373.170 | - | mg/kg |
| 100/400 | 000-2 | BY38-013 | 749011.8503 | 2082413.426 | 2.50 | 4.50 | Arsenic | 21.000 | 22.2 | 13.140 | - | mg/kg |
| 100/400 | 000-2 | BY38-013 | 749011.8503 | 2082413.426 | 2.50 | 4.50 | Lithium | 50.000 | 20400 | 34.660 | - | mg/kg |
| 100/400 | 000-2 | BY38-013 | 749011.8503 | 2082413.426 | 2.50 | 4.50 | Toluene | 12.600 | 31300000 | - | 5.480 | ug/kg |
| *100/400* | *000-2* | *BY38-013* | *749011.8503* | *2082413.426* | *2.50* | *4.50* | *Uranium-234* | *3.990* | *300* | *2.640* | - | *pCi/g* |
| 100/400 | 000-2 | BY38-013 | 749011.8503 | 2082413.426 | 2.50 | 4.50 | Uranium-235 | 0.242 | 8 | 0.120 | - | pCi/g |
| 100/400 | 000-2 | BY38-013 | 749011.8503 | 2082413.426 | 2.50 | 4.50 | Uranium-238 | 3.990 | 351 | 1.490 | - | pCi/g |
| 100/400 | 000-2 | BY38-013 | 749011.8503 | 2082413.426 | 2.50 | 4.50 | Vanadium | 120.000 | 7150 | 88.490 | - | mg/kg |
| 100/400 | 000-2 | BY38-016 | 749034.65 | 2082417.63 | 4.00 | 4.50 | Acetone | 9.600 | 102000000 | - | 5.600 | ug/kg |
| 300/500 | 500-1 | BY44-001 | 750196.943 | 2082539.829 | 0.00 | 0.50 | Copper | 24.000 | 40900 | 18.060 | - | mg/kg |
| 300/500 | 500-1 | BY44-001 | 750196.943 | 2082539.829 | 0.00 | 0.50 | Manganese | 460.000 | 3480 | 365.080 | - | mg/kg |
| *300/500* | *500-1* | *BY44-001* | *750196.943* | *2082539.829* | *0.00* | *0.50* | *Uranium-234* | *2.587* | *300* | *2.253* | - | *pCi/g* |
| 300/500 | 500-1 | BY44-001 | 750196.943 | 2082539.829 | 0.00 | 0.50 | Uranium-235 | 0.227 | 8 | 0.094 | - | pCi/g |
| 300/500 | 500-1 | BY44-001 | 750196.943 | 2082539.829 | 0.00 | 0.50 | Uranium-238 | 2.587 | 351 | 2.000 | - | pCi/g |
| 300/500 | 500-1 | BY44-001 | 750196.943 | 2082539.829 | 2.50 | 4.50 | Uranium-235 | 0.197 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BY44-001 | 750196.943 | 2082539.829 | 4.50 | 6.50 | Uranium-235 | 0.154 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BY44-001 | 750196.943 | 2082539.829 | 4.50 | 6.50 | Uranium-238 | 1.929 | 351 | 1.490 | - | pCi/g |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 300/500 | 000-4 | BZ42-014 | 750010.396 | 2082529.351 | 3.00 | 3.30 | Uranium-234 | 3.214 | 300 | 2.640 | - | pCi/g |
| 300/500 | 000-4 | BZ42-014 | 750010.396 | 2082529.351 | 3.00 | 3.30 | Uranium-235 | 0.183 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | BZ42-014 | 750010.396 | 2082529.351 | 3.00 | 3.30 | Uranium-238 | 3.214 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | BZ42-015 | 750012.432 | 2082546.466 | 3.00 | 3.30 | Uranium-234 | 2.902 | 300 | 2.640 | - | pCi/g |
| 300/500 | 000-4 | BZ42-015 | 750012.432 | 2082546.466 | 3.00 | 3.30 | Uranium-238 | 2.902 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | BZ42-016 | 750016.407 | 2082566.185 | 3.00 | 3.30 | Uranium-234 | 3.504 | 300 | 2.640 | - | pCi/g |
| 300/500 | 000-4 | BZ42-016 | 750016.407 | 2082566.185 | 3.00 | 3.30 | Uranium-235 | 0.191 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | BZ42-016 | 750016.407 | 2082566.185 | 3.00 | 3.30 | Uranium-238 | 3.504 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-1 | BZ43-000 | 750003.701 | 2082555.204 | 14.50 | 16.50 | Uranium-234 | 5.553 | 300 | 2.640 | - | pCi/g |
| 300/500 | 500-1 | BZ43-000 | 750003.701 | 2082555.204 | 14.50 | 16.50 | Uranium-235 | 0.361 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-000 | 750003.701 | 2082555.204 | 14.50 | 16.50 | Uranium-238 | 5.553 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-1 | BZ43-001 | 749984.487 | 2082552.194 | 14.50 | 16.50 | Uranium-234 | 5.132 | 300 | 2.640 | - | pCi/g |
| 300/500 | 500-1 | BZ43-001 | 749984.487 | 2082552.194 | 14.50 | 16.50 | Uranium-235 | 0.244 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-001 | 749984.487 | 2082552.194 | 14.50 | 16.50 | Uranium-238 | 5.132 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-1 | BZ43-002 | 749984.512 | 2082542.177 | 14.50 | 16.50 | Uranium-234 | 5.616 | 300 | 2.640 | - | pCi/g |
| 300/500 | 500-1 | BZ43-002 | 749984.512 | 2082542.177 | 14.50 | 16.50 | Uranium-235 | 0.307 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-002 | 749984.512 | 2082542.177 | 14.50 | 16.50 | Uranium-238 | 5.616 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | BZ43-003 | 749998.611 | 2082658.815 | 12.50 | 14.50 | Uranium, Total | 9.900 | 2750 | 3.040 | - | mg/kg |
| 300/500 | 000-4 | BZ43-003 | 749998.611 | 2082658.815 | 12.50 | 14.50 | Uranium-238 | 2.950 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | BZ43-004 | 749980.463 | 2082674.206 | 12.50 | 14.50 | Uranium-234 | 4.093 | 300 | 2.640 | - | pCi/g |
| 300/500 | 000-4 | BZ43-004 | 749980.463 | 2082674.206 | 12.50 | 14.50 | Uranium-235 | 0.229 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | BZ43-004 | 749980.463 | 2082674.206 | 12.50 | 14.50 | Uranium-238 | 4.093 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-1 | BZ43-005 | 749991.706 | 2082612.92 | 6.50 | 8.50 | Uranium-234 | 3.076 | 300 | 2.640 | - | pCi/g |
| 300/500 | 500-1 | BZ43-005 | 749991.706 | 2082612.92 | 6.50 | 8.50 | Uranium-235 | 0.170 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-005 | 749991.706 | 2082612.92 | 6.50 | 8.50 | Uranium-238 | 3.076 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-1 | BZ43-005 | 749991.706 | 2082612.92 | 8.50 | 10.50 | Uranium-234 | 3.914 | 300 | 2.640 | - | pCi/g |
| 300/500 | 500-1 | BZ43-005 | 749991.706 | 2082612.92 | 8.50 | 10.50 | Uranium-235 | 0.190 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-005 | 749991.706 | 2082612.92 | 8.50 | 10.50 | Uranium-238 | 3.914 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-1 | BZ43-005 | 749991.706 | 2082612.92 | 10.50 | 11.00 | Uranium-234 | 4.672 | 300 | 2.640 | - | pCi/g |
| 300/500 | 500-1 | BZ43-005 | 749991.706 | 2082612.92 | 10.50 | 11.00 | Uranium-235 | 0.283 | 8 | 0.120 | - | pCi/g |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 300/500 | 500-1 | BZ43-005 | 749991.706 | 2082612.92 | 10.50 | 11.00 | Uranium-238 | 4.672 | 351 | 1.490 | - | pCi/g |
| *300/500* | *500-1* | *BZ43-006* | *749996.299* | *2082577.613* | *6.50* | *8.50* | *Uranium-234* | *4.604* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-1 | BZ43-006 | 749996.299 | 2082577.613 | 6.50 | 8.50 | Uranium-235 | 0.212 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-006 | 749996.299 | 2082577.613 | 6.50 | 8.50 | Uranium-238 | 4.604 | 351 | 1.490 | - | pCi/g |
| *300/500* | *500-1* | *BZ43-006* | *749996.299* | *2082577.613* | *8.50* | *10.50* | *Uranium-234* | *5.199* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-1 | BZ43-006 | 749996.299 | 2082577.613 | 8.50 | 10.50 | Uranium-238 | 5.199 | 351 | 1.490 | - | pCi/g |
| *300/500* | *500-1* | *BZ43-006* | *749996.299* | *2082577.613* | *10.50* | *12.50* | *Uranium-234* | *4.462* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-1 | BZ43-006 | 749996.299 | 2082577.613 | 10.50 | 12.50 | Uranium-235 | 0.201 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-006 | 749996.299 | 2082577.613 | 10.50 | 12.50 | Uranium-238 | 4.462 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-1 | BZ43-007 | 750016.615 | 2082551.858 | 2.50 | 4.50 | Arsenic | 13.300 | 22.2 | 13.140 | - | mg/kg |
| 300/500 | 500-1 | BZ43-007 | 750016.615 | 2082551.858 | 2.50 | 4.50 | Barium | 1300.000 | 26400 | 289.380 | - | mg/kg |
| 300/500 | 500-1 | BZ43-007 | 750016.615 | 2082551.858 | 2.50 | 4.50 | Uranium-235 | 0.127 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-007 | 750016.615 | 2082551.858 | 4.50 | 6.50 | Barium | 1110.000 | 26400 | 289.380 | - | mg/kg |
| 300/500 | 500-1 | BZ43-008 | 750052.834 | 2082543.591 | 2.50 | 4.50 | Uranium-235 | 0.145 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-008 | 750052.834 | 2082543.591 | 4.50 | 6.50 | Uranium-238 | 1.990 | 351 | 1.490 | - | pCi/g |
| *300/500* | *500-1* | *BZ43-009* | *750089.068* | *2082543.206* | *2.50* | *4.50* | *Uranium-234* | *4.872* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-1 | BZ43-009 | 750089.068 | 2082543.206 | 2.50 | 4.50 | Uranium-235 | 0.190 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-009 | 750089.068 | 2082543.206 | 2.50 | 4.50 | Uranium-238 | 4.872 | 351 | 1.490 | - | pCi/g |
| *300/500* | *500-1* | *BZ43-009* | *750089.068* | *2082543.206* | *4.50* | *6.50* | *Uranium-234* | *3.456* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-1 | BZ43-009 | 750089.068 | 2082543.206 | 4.50 | 6.50 | Uranium-235 | 0.248 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-009 | 750089.068 | 2082543.206 | 4.50 | 6.50 | Uranium-238 | 3.456 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-1 | BZ43-010 | 750124.546 | 2082537.064 | 3.00 | 4.50 | Uranium-235 | 0.217 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-010 | 750124.546 | 2082537.064 | 3.00 | 4.50 | Uranium-238 | 1.638 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-1 | BZ43-011 | 750160.767 | 2082541.063 | 2.50 | 4.50 | Acetone | 6.500 | 102000000 | - | 5.200 | ug/kg |
| 300/500 | 000-4 | BZ43-028 | 749993.69 | 2082550.805 | 10.00 | 12.00 | Americium-241 | 0.206 | 76 | 0.020 | - | pCi/g |
| 300/500 | 000-4 | BZ43-028 | 749993.69 | 2082550.805 | 10.00 | 12.00 | Plutonium-239/240 | 0.446 | 50 | 0.020 | - | pCi/g |
| 300/500 | 000-4 | BZ43-029 | 750091.64 | 2082545.318 | 0.00 | 0.30 | Americium-241 | 1.140 | 76 | 0.023 | - | pCi/g |
| 300/500 | 000-4 | BZ43-029 | 750091.64 | 2082545.318 | 0.00 | 0.30 | Plutonium-239/240 | 0.489 | 50 | 0.066 | - | pCi/g |
| 300/500 | 000-4 | BZ43-029 | 750091.64 | 2082545.318 | 0.00 | 0.30 | Uranium-235 | 0.445 | 8 | 0.094 | - | pCi/g |
| 300/500 | 000-4 | BZ43-029 | 750091.64 | 2082545.318 | 0.00 | 0.30 | Uranium-238 | 2.720 | 351 | 2.000 | - | pCi/g |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 300/500 | 000-4 | BZ43-029 | 750091.64 | 2082545.318 | 7.00 | 7.30 | Americium-241 | 0.758 | 76 | 0.020 | - | pCi/g |
| *300/500* | *000-4* | *BZ43-029* | *750091.64* | *2082545.318* | *7.00* | *7.30* | *Plutonium-239/240* | *4.318* | *50* | *0.020* | - | *pCi/g* |
| 300/500 | 000-4 | BZ43-029 | 750091.64 | 2082545.318 | 7.00 | 7.30 | Uranium, Total | 8.600 | 2750 | 3.040 | - | mg/kg |
| *300/500* | *000-4* | *BZ43-029* | *750091.64* | *2082545.318* | *7.00* | *7.30* | *Uranium-234* | *5.115* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | BZ43-029 | 750091.64 | 2082545.318 | 7.00 | 7.30 | Uranium-235 | 0.201 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | BZ43-029 | 750091.64 | 2082545.318 | 7.00 | 7.30 | Uranium-238 | 5.115 | 351 | 1.490 | - | pCi/g |
| *300/500* | *000-4* | *BZ43-030* | *749965.925* | *2082958.28* | *0.00* | *0.50* | *Uranium-234* | *3.939* | *300* | *2.253* | - | *pCi/g* |
| 300/500 | 000-4 | BZ43-030 | 749965.925 | 2082958.28 | 0.00 | 0.50 | Uranium-235 | 0.188 | 8 | 0.094 | - | pCi/g |
| 300/500 | 000-4 | BZ43-030 | 749965.925 | 2082958.28 | 0.00 | 0.50 | Uranium-238 | 3.939 | 351 | 2.000 | - | pCi/g |
| *300/500* | *000-4* | *BZ43-036* | *749983.211* | *2082653.539* | *9.00* | *10.00* | *Uranium-234* | *3.925* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | BZ43-036 | 749983.211 | 2082653.539 | 9.00 | 10.00 | Uranium-235 | 0.214 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | BZ43-036 | 749983.211 | 2082653.539 | 9.00 | 10.00 | Uranium-238 | 3.925 | 351 | 1.490 | - | pCi/g |
| *300/500* | *000-4* | *BZ43-037* | *749978.049* | *2082584.689* | *17.00* | *18.00* | *Uranium-234* | *3.468* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | BZ43-037 | 749978.049 | 2082584.689 | 17.00 | 18.00 | Uranium-238 | 3.468 | 351 | 1.490 | - | pCi/g |
| *300/500* | *000-4* | *BZ43-038* | *749935.063* | *2082618.401* | *0.00* | *0.50* | *Uranium-234* | *3.545* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | BZ43-038 | 749935.063 | 2082618.401 | 0.00 | 0.50 | Uranium-235 | 0.167 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | BZ43-038 | 749935.063 | 2082618.401 | 0.00 | 0.50 | Uranium-238 | 3.545 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | BZ43-039 | 749947.136 | 2082619.394 | 0.00 | 0.50 | Americium-241 | 0.218 | 76 | 0.020 | - | pCi/g |
| *300/500* | *000-4* | *BZ43-039* | *749947.136* | *2082619.394* | *0.00* | *0.50* | *Plutonium-239/240* | *1.240* | *50* | *0.020* | - | *pCi/g* |
| 300/500 | 000-4 | BZ43-040 | 749957.983 | 2082621.421 | 0.00 | 0.50 | Uranium-235 | 0.213 | 8 | 0.120 | - | pCi/g |
| 300/500 | 300-4 | BZ45-005 | 750395.702 | 2082554.764 | 6.50 | 8.50 | Barium | 822.000 | 26400 | 289.380 | - | mg/kg |
| *300/500* | *300-4* | *BZ45-005* | *750395.702* | *2082554.764* | *6.50* | *8.50* | *Uranium-234* | *5.315* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 300-4 | BZ45-005 | 750395.702 | 2082554.764 | 6.50 | 8.50 | Uranium-235 | 0.312 | 8 | 0.120 | - | pCi/g |
| 300/500 | 300-4 | BZ45-005 | 750395.702 | 2082554.764 | 6.50 | 8.50 | Uranium-238 | 5.315 | 351 | 1.490 | - | pCi/g |
| 300/500 | 300-4 | BZ45-005 | 750395.702 | 2082554.764 | 6.50 | 8.50 | Vanadium | 137.000 | 7150 | 88.490 | - | mg/kg |
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 6.50 | 8.50 | Barium | 769.000 | 26400 | 289.380 | - | mg/kg |
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 8.50 | 10.50 | Barium | 1000.000 | 26400 | 289.380 | - | mg/kg |
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 8.50 | 10.50 | Uranium-235 | 0.135 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 8.50 | 10.50 | Vanadium | 89.600 | 7150 | 88.490 | - | mg/kg |
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 10.50 | 12.50 | Barium | 1110.000 | 26400 | 289.380 | - | mg/kg |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 10.50 | 12.50 | Iron | 41200.000 | 307000 | 41046.520 | - | mg/kg |
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 10.50 | 12.50 | Strontium | 216.000 | 613000 | 211.380 | - | mg/kg |
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 10.50 | 12.50 | Uranium-238 | 1.723 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 10.50 | 12.50 | Vanadium | 98.500 | 7150 | 88.490 | - | mg/kg |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 7.00 | 8.50 | Barium | 945.000 | 26400 | 289.380 | - | mg/kg |
| *300/500* | *000-4* | *CA43-017* | *749994.256* | *2082858.148* | *7.00* | *8.50* | *Uranium-234* | *2.826* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 7.00 | 8.50 | Uranium-235 | 0.192 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 7.00 | 8.50 | Uranium-238 | 2.826 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 8.50 | 10.50 | Barium | 1210.000 | 26400 | 289.380 | - | mg/kg |
| *300/500* | *000-4* | *CA43-017* | *749994.256* | *2082858.148* | *8.50* | *10.50* | *Uranium-234* | *3.097* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 8.50 | 10.50 | Uranium-238 | 3.097 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 10.50 | 12.50 | Barium | 863.000 | 26400 | 289.380 | - | mg/kg |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 10.50 | 12.50 | Iron | 41100.000 | 307000 | 41046.520 | - | mg/kg |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 10.50 | 12.50 | Uranium-235 | 0.145 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 10.50 | 12.50 | Vanadium | 89.300 | 7150 | 88.490 | - | mg/kg |
| 300/500 | 000-4 | CA43-022 | 749991.994 | 2082932.164 | 11.00 | 11.50 | 1,2,4-Trichlorobenzene | 0.880 | 9230000 | - | 0.790 | ug/kg |
| 300/500 | 000-4 | CA43-022 | 749991.994 | 2082932.164 | 11.00 | 11.50 | Methylene chloride | 3.300 | 2530000 | - | 0.890 | ug/kg |
| 300/500 | 000-4 | CA43-022 | 749991.994 | 2082932.164 | 11.00 | 11.50 | Naphthalene | 1.400 | 3090000 | - | 0.960 | ug/kg |
| *300/500* | *000-4* | *CB42-024* | *750004.392* | *2083035.033* | *1.00* | *1.30* | *Uranium-234* | *39.070* | *300* | *2.253* | - | *pCi/g* |
| 300/500 | 000-4 | CB42-024 | 750004.392 | 2083035.033 | 1.00 | 1.30 | Uranium-235 | 0.370 | 8 | 0.094 | - | pCi/g |
| 300/500 | 000-4 | CB42-024 | 750004.392 | 2083035.033 | 1.00 | 1.30 | Uranium-238 | 39.070 | 351 | 2.000 | - | pCi/g |
| 300/500 | 000-4 | CB43-000 | 749977.418 | 2083102.468 | 12.50 | 14.50 | Barium | 847.000 | 26400 | 289.380 | - | mg/kg |
| 300/500 | 000-4 | CB43-000 | 749977.418 | 2083102.468 | 12.50 | 14.50 | Strontium | 217.000 | 613000 | 211.380 | - | mg/kg |
| 300/500 | 000-4 | CB43-001 | 749982.101 | 2083116.535 | 12.50 | 14.50 | Barium | 1200.000 | 26400 | 289.380 | - | mg/kg |
| 300/500 | 000-4 | CB43-001 | 749982.101 | 2083116.535 | 12.50 | 14.50 | Vanadium | 96.200 | 7150 | 88.490 | - | mg/kg |
| 300/500 | 000-4 | CB43-048 | 749991.824 | 2082678.35 | 9.00 | 11.00 | Antimony | 0.720 | 409 | 0.470 | - | mg/kg |
| 300/500 | 500-1 | CC43-004 | 749993.004 | 2083295.733 | 0.50 | 2.50 | Acetone | 15.000 | 102000000 | - | 5.000 | ug/kg |
| 300/500 | 500-1 | CC43-004 | 749993.004 | 2083295.733 | 2.50 | 4.50 | 1,2,4-Trichlorobenzene | 0.760 | 9230000 | - | 0.740 | ug/kg |
| 300/500 | 500-1 | CC43-004 | 749993.004 | 2083295.733 | 2.50 | 4.50 | Naphthalene | 2.400 | 3090000 | - | 0.890 | ug/kg |
| 300/500 | 500-1 | CC43-004 | 749993.004 | 2083295.733 | 2.50 | 4.50 | Tetrachloroethene | 1.700 | 615000 | - | 1.000 | ug/kg |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 300/500 | 500-1 | CC43-004 | 749993.004 | 2083295.733 | 2.50 | 4.50 | Toluene | 1.200 | 31300000 | - | 0.810 | ug/kg |
| 300/500 | 500-1 | CC43-004 | 749993.004 | 2083295.733 | 4.50 | 6.50 | Naphthalene | 1.000 | 3090000 | - | 0.890 | ug/kg |
| *300/500* | *500-1* | *CC43-007* | *750000.085* | *2083257.191* | *4.50* | *6.50* | *Uranium-234* | *5.981* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-1 | CC43-007 | 750000.085 | 2083257.191 | 4.50 | 6.50 | Uranium-238 | 5.981 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-1 | CC43-008 | 749996.579 | 2083217.175 | 4.50 | 6.50 | Uranium-235 | 0.140 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | CC43-012 | 750000.989 | 2083194.522 | 4.50 | 6.50 | Uranium-235 | 0.134 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | CC43-017 | 750005.732 | 2083160.322 | 4.50 | 6.50 | Naphthalene | 0.970 | 3090000 | - | 0.890 | ug/kg |
| 300/500 | 500-1 | CC43-017 | 750005.732 | 2083160.322 | 4.50 | 6.50 | Plutonium-239/240 | 0.446 | 50 | 0.020 | - | pCi/g |
| 300/500 | 000-4 | CC43-037 | 749993.099 | 2083213.455 | 0.00 | 0.50 | Acetone | 5.000 | 102000000 | - | 1.600 | ug/kg |
| 300/500 | 000-4 | CC43-037 | 749993.099 | 2083213.455 | 0.00 | 0.50 | Carbon Tetrachloride | 0.340 | 81500 | - | 0.190 | ug/kg |
| 300/500 | 000-4 | CC43-037 | 749993.099 | 2083213.455 | 0.00 | 0.50 | Methylene chloride | 1.600 | 2530000 | - | 0.360 | ug/kg |
| 300/500 | 000-4 | CC43-037 | 749993.099 | 2083213.455 | 0.00 | 0.50 | Tetrachloroethene | 0.790 | 615000 | - | 0.200 | ug/kg |
| 300/500 | 000-4 | CC43-037 | 749993.099 | 2083213.455 | 0.00 | 0.50 | Toluene | 0.099 | 31300000 | - | 0.094 | ug/kg |
| 300/500 | 000-4 | CC43-037 | 749993.099 | 2083213.455 | 0.00 | 0.50 | Trichloroethene | 0.170 | 19600 | - | 0.150 | ug/kg |
| 300/500 | 500-3 | CD43-022 | 750034.7971 | 2083549.844 | 17.00 | 18.00 | Americium-241 | 1.363 | 76 | 0.020 | - | pCi/g |
| *300/500* | *500-3* | *CD43-022* | *750034.7971* | *2083549.844* | *17.00* | *18.00* | *Plutonium-239/240* | *7.769* | *50* | *0.020* | - | *pCi/g* |
| 300/500 | 500-3 | CD43-022 | 750034.7971 | 2083549.844 | 17.00 | 18.00 | Uranium-235 | 0.173 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-3 | CD43-024 | 750059.3052 | 2083539.531 | 20.00 | 21.00 | Americium-241 | 1.002 | 76 | 0.020 | - | pCi/g |
| *300/500* | *500-3* | *CD43-024* | *750059.3052* | *2083539.531* | *20.00* | *21.00* | *Plutonium-239/240* | *5.711* | *50* | *0.020* | - | *pCi/g* |
| 300/500 | 500-3 | CD43-024 | 750059.3052 | 2083539.531 | 20.00 | 21.00 | Uranium-238 | 1.675 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-3 | CD43-029 | 750060.129 | 2083480.533 | 20.00 | 22.00 | Uranium-238 | 1.624 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 6.50 | 7.10 | Uranium-235 | 0.141 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 6.50 | 7.10 | Uranium-238 | 1.817 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 8.50 | 10.10 | Ethylbenzene | 6.460 | 4250000 | - | 5.830 | ug/kg |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 8.50 | 10.10 | Toluene | 6.910 | 31300000 | - | 5.830 | ug/kg |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 8.50 | 10.10 | Uranium-235 | 0.185 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 8.50 | 10.10 | Xylene | 41.700 | 2040000 | - | 11.700 | ug/kg |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 10.50 | 11.50 | Uranium-235 | 0.159 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 14.70 | 15.80 | Uranium-235 | 0.175 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 16.50 | 18.50 | Uranium-235 | 0.152 | 8 | 0.120 | - | pCi/g |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *300/500* | *500-3* | *CE43-000* | *750054.497* | *2083555.328* | *18.50* | *20.50* | *Uranium-234* | *4.585* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 18.50 | 20.50 | Uranium-235 | 0.240 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 18.50 | 20.50 | Uranium-238 | 4.585 | 351 | 1.490 | - | pCi/g |
| *300/500* | *500-3* | *CE43-000* | *750054.497* | *2083555.328* | *20.50* | *22.40* | *Uranium-234* | *4.066* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 20.50 | 22.40 | Uranium-235 | 0.175 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 20.50 | 22.40 | Uranium-238 | 4.066 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | CF48-026 | 751174.361 | 2083719.133 | 10.00 | 10.30 | Uranium-235 | 0.249 | 8 | 0.120 | - | pCi/g |
| *300/500* | *000-4* | *CF49-025* | *751185.198* | *2083851.294* | *10.00* | *10.30* | *Uranium-234* | *4.522* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | CF49-025 | 751185.198 | 2083851.294 | 10.00 | 10.30 | Uranium-235 | 0.323 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | CF49-025 | 751185.198 | 2083851.294 | 10.00 | 10.30 | Uranium-238 | 4.522 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | CK44-024 | 750012.106 | 2082774.164 | 9.00 | 10.50 | Uranium-235 | 0.134 | 8 | 0.120 | - | pCi/g |
| 700 | 000-4 | CE40-003 | 749386.308 | 2083693.923 | 10.00 | 10.50 | Plutonium-239/240 | 3.370 | 50 | 0.020 | - | pCi/g |
| 700 | 000-4 | CE41-000 | 749687.785 | 2083686.902 | 0.00 | 0.30 | Acetone | 8.300 | 102000000 | - | 1.500 | ug/kg |
| 700 | 000-4 | CE41-001 | 749591.811 | 2083688.335 | 15.00 | 15.50 | Lead | 37.000 | 1000 | 24.970 | - | mg/kg |
| 700 | 000-4 | CE41-001 | 749591.811 | 2083688.335 | 15.00 | 15.50 | Zinc | 160.000 | 307000 | 139.100 | - | mg/kg |
| 700 | 000-4 | CE41-002 | 749685.18 | 2083698.246 | 4.50 | 5.00 | Uranium-238 | 1.535 | 351 | 1.490 | - | pCi/g |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 2.50 | 4.50 | Barium | 1210.000 | 26400 | 289.380 | - | mg/kg |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 2.50 | 4.50 | bis(2-Ethylhexyl)phthalate | 96.000 | 1970000 | - | 74.000 | ug/kg |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 2.50 | 4.50 | Uranium-238 | 1.631 | 351 | 1.490 | - | pCi/g |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 4.50 | 6.50 | Barium | 989.000 | 26400 | 289.380 | - | mg/kg |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 4.50 | 6.50 | bis(2-Ethylhexyl)phthalate | 96.000 | 1970000 | - | 81.000 | ug/kg |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 4.50 | 6.50 | Di-n-butylphthalate | 130.000 | 73700000 | - | 23.000 | ug/kg |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 4.50 | 6.50 | Strontium | 217.000 | 613000 | 211.380 | - | mg/kg |
| *700* | *700-2* | *CE42-001* | *749916.871* | *2083700.012* | *4.50* | *6.50* | *Uranium-234* | *3.284* | *300* | *2.640* | - | *pCi/g* |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 4.50 | 6.50 | Uranium-235 | 0.240 | 8 | 0.120 | - | pCi/g |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 4.50 | 6.50 | Uranium-238 | 3.284 | 351 | 1.490 | - | pCi/g |
| 700 | 000-4 | CE42-007 | 749886.632 | 2083686.922 | 8.00 | 8.50 | Acetone | 15.000 | 102000000 | - | 1.600 | ug/kg |
| 700 | 000-4 | CE42-007 | 749886.632 | 2083686.922 | 8.00 | 8.50 | Naphthalene | 0.570 | 3090000 | - | 0.410 | ug/kg |
| 700 | 000-4 | CE42-007 | 749886.632 | 2083686.922 | 8.00 | 8.50 | Trichloroethene | 1.600 | 19600 | - | 0.150 | ug/kg |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 700 | 000-4 | CE42-008 | 749787.975 | 2083687.49 | 0.00 | 0.30 | Acetone | 4.600 | 102000000 | - | 1.800 | ug/kg |
| 700 | 000-4 | CE43-019 | 749993.668 | 2083687.287 | 8.50 | 8.80 | Lithium | 47.000 | 20400 | 34.660 | - | mg/kg |
| 700 | 000-4 | CE43-019 | 749993.668 | 2083687.287 | 8.50 | 8.80 | Uranium, Total | 9.700 | 2750 | 3.040 | - | mg/kg |
| 700 | 000-4 | CE43-019 | 749993.668 | 2083687.287 | 8.50 | 8.80 | Uranium-238 | 3.150 | 351 | 1.490 | - | pCi/g |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 12.50 | 14.50 | Trichloroethene | 3.300 | 19600 | - | 1.100 | ug/kg |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 14.50 | 16.50 | 1,2,4-Trichlorobenzene | 0.850 | 9230000 | - | 0.810 | ug/kg |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 14.50 | 16.50 | Naphthalene | 1.600 | 3090000 | - | 0.980 | ug/kg |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 14.50 | 16.50 | Trichloroethene | 1.300 | 19600 | - | 0.990 | ug/kg |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 16.50 | 18.50 | Trichloroethene | 1.700 | 19600 | - | 1.100 | ug/kg |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 18.50 | 20.50 | Trichloroethene | 1.200 | 19600 | - | 1.100 | ug/kg |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 18.50 | 20.50 | Uranium-238 | 1.790 | 351 | 1.490 | - | pCi/g |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 20.50 | 22.00 | Acetone | 6.000 | 102000000 | - | 5.700 | ug/kg |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 20.50 | 22.00 | Naphthalene | 1.300 | 3090000 | - | 1.100 | ug/kg |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 20.50 | 22.00 | Trichloroethene | 3.900 | 19600 | - | 1.100 | ug/kg |
| 700 | 700-10 | CE44-028 | 750305.834 | 2083616.561 | 12.50 | 14.50 | Acetone | 16.000 | 102000000 | - | 5.700 | ug/kg |
| 700 | 700-10 | CE44-028 | 750305.834 | 2083616.561 | 12.50 | 14.50 | Ethylbenzene | 4.500 | 4250000 | - | 1.500 | ug/kg |
| 700 | 700-10 | CE44-028 | 750305.834 | 2083616.561 | 12.50 | 14.50 | Toluene | 36.000 | 31300000 | - | 0.960 | ug/kg |
| 700 | 700-10 | CE44-028 | 750305.834 | 2083616.561 | 12.50 | 14.50 | Trichloroethene | 1.900 | 19600 | - | 1.100 | ug/kg |
| 700 | 700-10 | CE44-028 | 750305.834 | 2083616.561 | 12.50 | 14.50 | Xylene | 16.000 | 2040000 | - | 3.400 | ug/kg |
| 700 | 700-10 | CE44-028 | 750305.834 | 2083616.561 | 14.50 | 16.50 | Acetone | 6.800 | 102000000 | - | 5.500 | ug/kg |
| 700 | 700-10 | CE44-028 | 750305.834 | 2083616.561 | 20.50 | 22.50 | Uranium-238 | 1.800 | 351 | 1.490 | - | pCi/g |
| 700 | 000-4 | CE44-033 | 750237.774 | 2083682.974 | 8.00 | 8.50 | Americium-241 | 0.693 | 76 | 0.020 | - | pCi/g |
| 700 | 000-4 | CE44-033 | 750237.774 | 2083682.974 | 8.00 | 8.50 | Uranium-235 | 0.258 | 8 | 0.120 | - | pCi/g |
| 700 | 700-3 | CE46-013 | 750672.685 | 2083745.663 | 0.00 | 0.50 | Benzo(a)pyrene | 52.000 | 3490 | - | 41.000 | ug/kg |
| 700 | 700-3 | CE46-013 | 750672.685 | 2083745.663 | 0.00 | 0.50 | Benzo(b)fluoranthene | 49.000 | 34900 | - | 30.000 | ug/kg |
| 700 | 700-3 | CE46-013 | 750672.685 | 2083745.663 | 0.00 | 0.50 | Chrysene | 44.000 | 3490000 | - | 29.000 | ug/kg |
| 700 | 700-3 | CE46-013 | 750672.685 | 2083745.663 | 0.00 | 0.50 | Fluoranthene | 69.000 | 27200000 | - | 23.000 | ug/kg |
| *700* | *700-3* | *CE46-013* | *750672.685* | *2083745.663* | *0.00* | *0.50* | *Uranium-234* | *3.952* | *300* | *2.253* | - | *pCi/g* |
| 700 | 700-3 | CE46-013 | 750672.685 | 2083745.663 | 0.00 | 0.50 | Uranium-235 | 0.197 | 8 | 0.094 | - | pCi/g |
| 700 | 700-3 | CE46-013 | 750672.685 | 2083745.663 | 0.00 | 0.50 | Uranium-238 | 3.952 | 351 | 2.000 | - | pCi/g |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 700 | 000-4 | CG39-005 | 749365.098 | 2083668.014 | 6.50 | 7.00 | Uranium-235 | 0.190 | 8 | 0.120 | - | pCi/g |
| 700 | 000-4 | CG39-005 | 749365.098 | 2083668.014 | 6.50 | 7.00 | Uranium-238 | 1.966 | 351 | 1.490 | - | pCi/g |
| 700 | 700-7 | CI46-010 | 750714.914 | 2084387.386 | 0.00 | 0.50 | Americium-241 | 0.424 | 76 | 0.023 | - | pCi/g |
| *700* | *700-7* | *CI46-010* | *750714.914* | *2084387.386* | *0.00* | *0.50* | *Plutonium-239/240* | *2.415* | *50* | *0.066* | - | *pCi/g* |
| 700 | 700-7 | CI46-010 | 750714.914 | 2084387.386 | 0.00 | 0.50 | Uranium-235 | 0.163 | 8 | 0.094 | - | pCi/g |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Aluminum | 25000.000 | 228000 | 16902.000 | - | mg/kg |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Americium-241 | 3.705 | 76 | 0.023 | - | pCi/g |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Barium | 210.000 | 26400 | 141.260 | - | mg/kg |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Chromium | 30.000 | 268 | 16.990 | - | mg/kg |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Lithium | 16.000 | 20400 | 11.550 | - | mg/kg |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Mercury | 0.590 | 25200 | 0.134 | - | mg/kg |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Nickel | 16.000 | 20400 | 14.910 | - | mg/kg |
| *700* | *700-7* | *CI46-014* | *750721.531* | *2084421.63* | *0.00* | *0.50* | *Plutonium-239/240* | *21.119* | *50* | *0.066* | - | *pCi/g* |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Strontium | 77.000 | 613000 | 48.940 | - | mg/kg |
| *700* | *700-7* | *CI46-014* | *750721.531* | *2084421.63* | *0.00* | *0.50* | *Uranium-234* | *4.303* | *300* | *2.253* | - | *pCi/g* |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Uranium-235 | 0.254 | 8 | 0.094 | - | pCi/g |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Uranium-238 | 4.303 | 351 | 2.000 | - | pCi/g |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Vanadium | 54.000 | 7150 | 45.590 | - | mg/kg |
| 700 | 700-7 | CJ46-021 | 750721.296 | 2084578.532 | 0.00 | 0.50 | Americium-241 | 0.601 | 76 | 0.023 | - | pCi/g |
| 700 | 700-7 | CJ46-021 | 750721.296 | 2084578.532 | 0.00 | 0.50 | Chromium | 17.000 | 268 | 16.990 | - | mg/kg |
| *700* | *700-7* | *CJ46-021* | *750721.296* | *2084578.532* | *0.00* | *0.50* | *Plutonium-239/240* | *3.427* | *50* | *0.066* | - | *pCi/g* |
| *700* | *700-7* | *CJ46-021* | *750721.296* | *2084578.532* | *0.00* | *0.50* | *Uranium-234* | *4.706* | *300* | *2.253* | - | *pCi/g* |
| 700 | 700-7 | CJ46-021 | 750721.296 | 2084578.532 | 0.00 | 0.50 | Uranium-235 | 0.168 | 8 | 0.094 | - | pCi/g |
| 700 | 700-7 | CJ46-021 | 750721.296 | 2084578.532 | 0.00 | 0.50 | Uranium-238 | 4.706 | 351 | 2.000 | - | pCi/g |
| 800 | 000-4 | CE35-002 | 748415.116 | 2083698.702 | 7.00 | 7.50 | Aluminum | 20000.000 | 228000 | 16902.000 | - | mg/kg |
| 800 | 000-4 | CE35-002 | 748415.116 | 2083698.702 | 7.00 | 7.50 | Americium-241 | 0.132 | 76 | 0.023 | - | pCi/g |
| 800 | 000-4 | CE35-002 | 748415.116 | 2083698.702 | 7.00 | 7.50 | Beryllium | 1.000 | 921 | 0.966 | - | mg/kg |
| 800 | 000-4 | CE35-002 | 748415.116 | 2083698.702 | 7.00 | 7.50 | Lithium | 15.000 | 20400 | 11.550 | - | mg/kg |
| 800 | 000-4 | CE35-002 | 748415.116 | 2083698.702 | 7.00 | 7.50 | Plutonium-239/240 | 0.145 | 50 | 0.066 | - | pCi/g |
| 800 | 000-4 | CE35-002 | 748415.116 | 2083698.702 | 7.00 | 7.50 | Strontium | 93.000 | 613000 | 48.940 | - | mg/kg |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 800 | 000-4 | CE36-000 | 748706.828 | 2083696.691 | 6.00 | 6.50 | Plutonium-239/240 | 0.130 | 50 | 0.020 | - | pCi/g |
| 800 | 000-4 | CE36-001 | 748599.467 | 2083698.729 | 7.00 | 7.50 | Aluminum | 21000.000 | 228000 | 16902.000 | - | mg/kg |
| 800 | 000-4 | CE36-001 | 748599.467 | 2083698.729 | 7.00 | 7.50 | Beryllium | 1.100 | 921 | 0.966 | - | mg/kg |
| 800 | 000-4 | CE36-001 | 748599.467 | 2083698.729 | 7.00 | 7.50 | Lithium | 16.000 | 20400 | 11.550 | - | mg/kg |
| 800 | 000-4 | CE36-001 | 748599.467 | 2083698.729 | 7.00 | 7.50 | Plutonium-239/240 | 0.103 | 50 | 0.066 | - | pCi/g |
| 800 | 000-4 | CE36-001 | 748599.467 | 2083698.729 | 7.00 | 7.50 | Strontium | 93.000 | 613000 | 48.940 | - | mg/kg |
| 800 | 800-3 | CE37-003 | 748883.176 | 2083699.002 | 20.00 | 22.00 | Acetone | 10.000 | 102000000 | - | 5.900 | ug/kg |
| 800 | 800-3 | CE37-003 | 748883.176 | 2083699.002 | 20.00 | 22.00 | Benzo(a)anthracene | 48.000 | 34900 | - | 31.000 | ug/kg |
| 800 | 800-3 | CE37-003 | 748883.176 | 2083699.002 | 20.00 | 22.00 | bis(2-Ethylhexyl)phthalate | 99.000 | 1970000 | - | 89.000 | ug/kg |
| 800 | 800-3 | CE37-003 | 748883.176 | 2083699.002 | 20.00 | 22.00 | Chrysene | 47.000 | 3490000 | - | 34.000 | ug/kg |
| 800 | 800-3 | CE37-003 | 748883.176 | 2083699.002 | 20.00 | 22.00 | Methylene chloride | 4.000 | 2530000 | - | 1.000 | ug/kg |
| 800 | 800-3 | CE37-003 | 748883.176 | 2083699.002 | 20.00 | 22.00 | Naphthalene | 10.000 | 3090000 | - | 1.100 | ug/kg |
| 800 | 000-4 | CE37-011 | 748854.008 | 2083702.66 | 0.00 | 0.10 | Uranium-235 | 0.142 | 8 | 0.094 | - | pCi/g |
| 800 | 000-4 | CE39-004 | 749212.43 | 2083734 | 0.00 | 0.50 | Lithium | 14.000 | 20400 | 11.550 | - | mg/kg |
| 800 | 000-4 | CE39-004 | 749212.43 | 2083734 | 0.00 | 0.50 | Strontium | 140.000 | 613000 | 48.940 | - | mg/kg |
| *800* | *000-4* | *CE39-004* | *749212.43* | *2083734* | *0.50* | *2.50* | *Uranium-234* | *4.200* | *300* | *2.640* | - | *pCi/g* |
| 800 | 000-4 | CE39-004 | 749212.43 | 2083734 | 0.50 | 2.50 | Uranium-235 | 0.350 | 8 | 0.120 | - | pCi/g |
| 800 | 000-4 | CE39-004 | 749212.43 | 2083734 | 0.50 | 2.50 | Uranium-238 | 4.200 | 351 | 1.490 | - | pCi/g |
| 800 | 000-4 | CE39-005 | 749168.87 | 2083694.922 | 12.00 | 12.50 | Americium-241 | 0.092 | 76 | 0.020 | - | pCi/g |
| 800 | 000-4 | CE39-005 | 749168.87 | 2083694.922 | 12.00 | 12.50 | Plutonium-239/240 | 0.342 | 50 | 0.020 | - | pCi/g |
| 800 | 800-5 | CF33-000 | 748123.827 | 2083816.862 | 16.50 | 18.50 | Uranium-235 | 0.140 | 8 | 0.120 | - | pCi/g |
| 800 | 800-5 | CF33-000 | 748123.827 | 2083816.862 | 16.50 | 18.50 | Uranium-238 | 2.562 | 351 | 1.490 | - | pCi/g |
| 800 | 800-5 | CF33-004 | 748098.54 | 2083832.87 | 16.90 | 17.40 | Barium | 700.000 | 26400 | 289.380 | - | mg/kg |
| 800 | 800-5 | CF33-004 | 748098.54 | 2083832.87 | 16.90 | 17.40 | Naphthalene | 6.160 | 3090000 | - | 6.000 | ug/kg |
| 800 | 800-5 | CF33-004 | 748098.54 | 2083832.87 | 16.90 | 17.40 | Uranium-238 | 2.117 | 351 | 1.490 | - | pCi/g |
| 800 | 800-5 | CF33-004 | 748098.54 | 2083832.87 | 16.90 | 17.40 | Xylene | 16.900 | 2040000 | - | 12.000 | ug/kg |
| **800** | **800-5** | **CF33-010** | **748131.956** | **2083867.655** | **5.00** | **5.01** | **Arsenic** | **25.500** | **22.2** | **13.140** | **-** | **mg/kg** |
| 800 | 800-5 | CF33-010 | 748131.956 | 2083867.655 | 5.00 | 5.01 | Barium | 753.000 | 26400 | 289.380 | - | mg/kg |
| 800 | 800-5 | CF33-010 | 748131.956 | 2083867.655 | 5.00 | 5.01 | Copper | 93.900 | 40900 | 38.210 | - | mg/kg |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 800 | 800-5 | CF33-010 | 748131.956 | 2083867.655 | 5.00 | 5.01 | Fluoranthene | 64.000 | 27200000 | - | 46.000 | ug/kg |
| 800 | 800-5 | CF33-010 | 748131.956 | 2083867.655 | 5.00 | 5.01 | Lead | 30.900 | 1000 | 24.970 | - | mg/kg |
| *800* | *800-5* | *CF33-010* | *748131.956* | *2083867.655* | *5.00* | *5.01* | *Uranium-234* | *4.224* | *300* | *2.640* | - | *pCi/g* |
| 800 | 800-5 | CF33-010 | 748131.956 | 2083867.655 | 5.00 | 5.01 | Uranium-235 | 0.260 | 8 | 0.120 | - | pCi/g |
| 800 | 800-5 | CF33-010 | 748131.956 | 2083867.655 | 5.00 | 5.01 | Uranium-238 | 4.224 | 351 | 1.490 | - | pCi/g |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Arsenic | 12.500 | 22.2 | 10.090 | - | mg/kg |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Barium | 703.000 | 26400 | 141.260 | - | mg/kg |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Benzo(a)anthracene | 160.000 | 34900 | - | 46.000 | ug/kg |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Benzo(a)pyrene | 150.000 | 3490 | - | 60.000 | ug/kg |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Benzo(b)fluoranthene | 110.000 | 34900 | - | 74.000 | ug/kg |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Benzo(k)fluoranthene | 160.000 | 349000 | - | 80.000 | ug/kg |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Chromium | 55.700 | 268 | 16.990 | - | mg/kg |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Chrysene | 180.000 | 3490000 | - | 40.000 | ug/kg |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Copper | 178.000 | 40900 | 18.060 | - | mg/kg |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Fluoranthene | 390.000 | 27200000 | - | 46.000 | ug/kg |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Indeno(1,2,3-cd)pyrene | 90.000 | 34900 | - | 51.000 | ug/kg |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Iron | 30000.000 | 307000 | 18037.000 | - | mg/kg |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Nickel | 40.600 | 20400 | 14.910 | - | mg/kg |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Pyrene | 390.000 | 22100000 | - | 65.000 | ug/kg |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Strontium | 139.000 | 613000 | 48.940 | - | mg/kg |
| *800* | *800-5* | *CF33-011* | *748143.538* | *2083807.896* | *5.00* | *5.50* | *Uranium-234* | *4.256* | *300* | *2.253* | - | *pCi/g* |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Uranium-235 | 0.292 | 8 | 0.094 | - | pCi/g |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Uranium-238 | 4.256 | 351 | 2.000 | - | pCi/g |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Vanadium | 166.000 | 7150 | 45.590 | - | mg/kg |
| 800 | 800-5 | CF33-011 | 748143.538 | 2083807.896 | 5.00 | 5.50 | Zinc | 127.000 | 307000 | 73.760 | - | mg/kg |
| 800 | 800-5 | CF34-022 | 748188.61 | 2083796.23 | 25.00 | 25.50 | Antimony | 7.840 | 409 | 0.470 | - | mg/kg |
| 800 | 800-5 | CF34-022 | 748188.61 | 2083796.23 | 25.00 | 25.50 | Barium | 719.000 | 26400 | 141.260 | - | mg/kg |
| 800 | 800-5 | CF34-022 | 748188.61 | 2083796.23 | 25.00 | 25.50 | Chromium | 49.000 | 268 | 16.990 | - | mg/kg |
| 800 | 800-5 | CF34-022 | 748188.61 | 2083796.23 | 25.00 | 25.50 | Copper | 47.400 | 40900 | 18.060 | - | mg/kg |
| 800 | 800-5 | CF34-022 | 748188.61 | 2083796.23 | 25.00 | 25.50 | Iron | 27200.000 | 307000 | 18037.000 | - | mg/kg |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 800 | 800-5 | CF34-022 | 748188.61 | 2083796.23 | 25.00 | 25.50 | Nickel | 34.600 | 20400 | 14.910 | - | mg/kg |
| 800 | 800-5 | CF34-022 | 748188.61 | 2083796.23 | 25.00 | 25.50 | Strontium | 146.000 | 613000 | 48.940 | - | mg/kg |
| *800* | *800-5* | *CF34-022* | *748188.61* | *2083796.23* | *25.00* | *25.50* | *Uranium-234* | *3.824* | *300* | *2.253* | - | *pCi/g* |
| 800 | 800-5 | CF34-022 | 748188.61 | 2083796.23 | 25.00 | 25.50 | Uranium-235 | 0.229 | 8 | 0.094 | - | pCi/g |
| 800 | 800-5 | CF34-022 | 748188.61 | 2083796.23 | 25.00 | 25.50 | Uranium-238 | 3.824 | 351 | 2.000 | - | pCi/g |
| 800 | 800-5 | CF34-022 | 748188.61 | 2083796.23 | 25.00 | 25.50 | Vanadium | 168.000 | 7150 | 45.590 | - | mg/kg |
| 800 | 800-5 | CF34-022 | 748188.61 | 2083796.23 | 25.00 | 25.50 | Zinc | 90.100 | 307000 | 73.760 | - | mg/kg |
| 800 | 000-2 | CF35-040 | 748428.797 | 2083736.401 | 2.50 | 3.00 | Acetone | 14.000 | 102000000 | - | 5.100 | ug/kg |
| 800 | 000-2 | CF35-040 | 748428.797 | 2083736.401 | 2.50 | 3.00 | Methylene chloride | 1.100 | 2530000 | - | 0.890 | ug/kg |
| 800 | 800-3 | CF37-009 | 748896.138 | 2083738.837 | 4.50 | 6.50 | Acenaphthene | 74.000 | 40800000 | - | 31.000 | ug/kg |
| 800 | 800-3 | CF37-009 | 748896.138 | 2083738.837 | 4.50 | 6.50 | Anthracene | 110.000 | 204000000 | - | 24.000 | ug/kg |
| 800 | 800-3 | CF37-009 | 748896.138 | 2083738.837 | 4.50 | 6.50 | Benzo(a)anthracene | 200.000 | 34900 | - | 25.000 | ug/kg |
| 800 | 800-3 | CF37-009 | 748896.138 | 2083738.837 | 4.50 | 6.50 | Benzo(a)pyrene | 180.000 | 3490 | - | 41.000 | ug/kg |
| 800 | 800-3 | CF37-009 | 748896.138 | 2083738.837 | 4.50 | 6.50 | Benzo(b)fluoranthene | 120.000 | 34900 | - | 29.000 | ug/kg |
| 800 | 800-3 | CF37-009 | 748896.138 | 2083738.837 | 4.50 | 6.50 | Benzo(k)fluoranthene | 170.000 | 349000 | - | 32.000 | ug/kg |
| 800 | 800-3 | CF37-009 | 748896.138 | 2083738.837 | 4.50 | 6.50 | Chrysene | 230.000 | 3490000 | - | 28.000 | ug/kg |
| 800 | 800-3 | CF37-009 | 748896.138 | 2083738.837 | 4.50 | 6.50 | Fluoranthene | 500.000 | 27200000 | - | 23.000 | ug/kg |
| 800 | 800-3 | CF37-009 | 748896.138 | 2083738.837 | 4.50 | 6.50 | Indeno(1,2,3-cd)pyrene | 83.000 | 34900 | - | 23.000 | ug/kg |
| 800 | 800-3 | CF37-009 | 748896.138 | 2083738.837 | 4.50 | 6.50 | Pyrene | 470.000 | 22100000 | - | 140.000 | ug/kg |
| 800 | 800-3 | CF37-009 | 748896.138 | 2083738.837 | 4.50 | 6.50 | Uranium-235 | 0.148 | 8 | 0.120 | - | pCi/g |
| 800 | 800-3 | CF37-009 | 748896.138 | 2083738.837 | 4.50 | 6.50 | Uranium-238 | 1.675 | 351 | 1.490 | - | pCi/g |
| 800 | 800-1 | CF38-009 | 749098.928 | 2083885.089 | 4.50 | 4.80 | Uranium-235 | 0.158 | 8 | 0.120 | - | pCi/g |
| 800 | 800-1 | CF38-009 | 749098.928 | 2083885.089 | 4.50 | 4.80 | Uranium-238 | 1.930 | 351 | 1.490 | - | pCi/g |
| 800 | 800-1 | CF38-010 | 749095.829 | 2083949.459 | 5.00 | 5.01 | 2-Butanone | 6.600 | 192000000 | - | 4.800 | ug/kg |
| 800 | 800-1 | CF38-010 | 749095.829 | 2083949.459 | 5.00 | 5.01 | Acetone | 16.000 | 102000000 | - | 4.700 | ug/kg |
| 800 | 800-1 | CF38-010 | 749095.829 | 2083949.459 | 5.00 | 5.01 | Uranium, Total | 3.600 | 2750 | 3.040 | - | mg/kg |
| 800 | 800-1 | CF38-010 | 749095.829 | 2083949.459 | 5.00 | 5.01 | Uranium-235 | 0.157 | 8 | 0.120 | - | pCi/g |
| 800 | 800-1 | CF38-010 | 749095.829 | 2083949.459 | 5.00 | 5.01 | Uranium-238 | 2.220 | 351 | 1.490 | - | pCi/g |
| 800 | 000-2 | CF39-000 | 749172.472 | 2083848.635 | 6.00 | 6.10 | Acetone | 12.000 | 102000000 | - | 5.200 | ug/kg |
| 800 | 000-2 | CF39-000 | 749172.472 | 2083848.635 | 6.00 | 6.10 | Plutonium-239/240 | 0.198 | 50 | 0.020 | - | pCi/g |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100/400 | 000-4 | BT38-007 | 749147.516 | 2081576.589 | 2.50 | 3.00 | Uranium-235 | 0.189 | 8 | 0.120 | - | pCi/g |
| 100/400 | 000-4 | BT38-007 | 749147.516 | 2081576.589 | 2.50 | 3.00 | Uranium-238 | 2.619 | 351 | 1.490 | - | pCi/g |
| 100/400 | 100-4 | BU38-002 | 749039.101 | 2081729.023 | 8.00 | 8.01 | Americium-241 | 0.035 | 76 | 0.020 | - | pCi/g |
| 100/400 | 100-4 | BU38-004 | 749068.933 | 2081652.691 | 0.00 | 0.17 | Americium-241 | 0.046 | 76 | 0.023 | - | pCi/g |
| 100/400 | 100-4 | BU38-004 | 749068.933 | 2081652.691 | 0.00 | 0.17 | Uranium-235 | 0.128 | 8 | 0.094 | - | pCi/g |
| 100/400 | 100-4 | BU38-005 | 749089.941 | 2081652.691 | 5.00 | 5.01 | Americium-241 | 0.050 | 76 | 0.020 | - | pCi/g |
| 100/400 | 000-2 | BU38-017 | 749003.637 | 2081729.928 | 4.50 | 6.50 | Aluminum | 40000.000 | 228000 | 35373.170 | - | mg/kg |
| 100/400 | 000-4 | BU38-020 | 749065.678 | 2081587.89 | 5.00 | 5.50 | Zinc | 190.000 | 307000 | 73.760 | - | mg/kg |
| 100/400 | 000-4 | BU38-023 | 749031.684 | 2081730.914 | 7.00 | 7.50 | Aluminum | 19000.000 | 228000 | 16902.000 | - | mg/kg |
| 100/400 | 000-4 | BU38-023 | 749031.684 | 2081730.914 | 7.00 | 7.50 | Chromium | 19.000 | 268 | 16.990 | - | mg/kg |
| 100/400 | 000-4 | BU38-023 | 749031.684 | 2081730.914 | 7.00 | 7.50 | Lithium | 13.000 | 20400 | 11.550 | - | mg/kg |
| 100/400 | 000-4 | BU38-023 | 749031.684 | 2081730.914 | 7.00 | 7.50 | Nickel | 16.000 | 20400 | 14.910 | - | mg/kg |
| 100/400 | 000-4 | BU38-025 | 748999.138 | 2081585.488 | 8.00 | 8.50 | Uranium-235 | 0.168 | 8 | 0.094 | - | pCi/g |
| 100/400 | 000-4 | BV38-016 | 749001.65 | 2081732.332 | 7.00 | 7.50 | Barium | 1230.000 | 26400 | 289.380 | - | mg/kg |
| 100/400 | 400-7 | BW38-009 | 749194.732 | 2082215.962 | 3.00 | 3.30 | Acetone | 6.800 | 102000000 | - | 4.600 | ug/kg |
| 100/400 | 000-4 | BX44-001 | 749990.711 | 2082622.966 | 7.00 | 7.50 | 2-Methylnaphthalene | 1100.000 | 20400000 | - | 22.000 | ug/kg |
| **100/400** | **000-4** | **BX44-001** | **749990.711** | **2082622.966** | **7.00** | **7.50** | **Americium-241** | **566.500** | **76** | **0.020** | **-** | **pCi/g** |
| 100/400 | 000-4 | BX44-001 | 749990.711 | 2082622.966 | 7.00 | 7.50 | Barium | 954.000 | 26400 | 289.380 | - | mg/kg |
| 100/400 | 000-4 | BX44-001 | 749990.711 | 2082622.966 | 7.00 | 7.50 | bis(2-Ethylhexyl)phthalate | 140.000 | 1970000 | - | 35.000 | ug/kg |
| 100/400 | 000-4 | BX44-001 | 749990.711 | 2082622.966 | 7.00 | 7.50 | Fluorene | 57.000 | 40800000 | - | 21.000 | ug/kg |
| 100/400 | 000-4 | BX44-001 | 749990.711 | 2082622.966 | 7.00 | 7.50 | Mercury | 13.800 | 25200 | 1.520 | - | mg/kg |
| 100/400 | 000-4 | BX44-001 | 749990.711 | 2082622.966 | 7.00 | 7.50 | Naphthalene | 1400.000 | 3090000 | - | 535.000 | ug/kg |
| ***100/400*** | ***000-4*** | ***BX44-001*** | ***749990.711*** | ***2082622.966*** | ***7.00*** | ***7.50*** | ***Plutonium-239/240*** | ***3229.050*** | ***50*** | ***0.020*** | ***-*** | ***pCi/g*** |
| ***100/400*** | ***000-4*** | ***BX44-001*** | ***749990.711*** | ***2082622.966*** | ***7.00*** | ***7.50*** | ***Uranium-234*** | ***2056.000*** | ***300*** | ***2.640*** | ***-*** | ***pCi/g*** |
| **100/400** | **000-4** | **BX44-001** | **749990.711** | **2082622.966** | **7.00** | **7.50** | **Uranium-235** | **27.410** | **8** | **0.120** | **-** | **pCi/g** |
| **100/400** | **000-4** | **BX44-001** | **749990.711** | **2082622.966** | **7.00** | **7.50** | **Uranium-238** | **2056.000** | **351** | **1.490** | **-** | **pCi/g** |
| *100/400* | *400-6* | *BY37-019* | *748912.542* | *2082372.031* | *0.00* | *0.50* | *Uranium-234* | *2.802* | *300* | *2.253* | - | *pCi/g* |
| 100/400 | 400-6 | BY37-019 | 748912.542 | 2082372.031 | 0.00 | 0.50 | Uranium-235 | 0.169 | 8 | 0.094 | - | pCi/g |
| 100/400 | 400-6 | BY37-019 | 748912.542 | 2082372.031 | 0.00 | 0.50 | Uranium-238 | 2.802 | 351 | 2.000 | - | pCi/g |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *100/400* | *400-6* | *BY37-019* | *748912.542* | *2082372.031* | *0.50* | *2.50* | *Uranium-234* | *2.717* | *300* | *2.640* | - | *pCi/g* |
| 100/400 | 400-6 | BY37-019 | 748912.542 | 2082372.031 | 0.50 | 2.50 | Uranium-235 | 0.248 | 8 | 0.120 | - | pCi/g |
| 100/400 | 400-6 | BY37-019 | 748912.542 | 2082372.031 | 0.50 | 2.50 | Uranium-238 | 2.717 | 351 | 1.490 | - | pCi/g |
| 100/400 | 400-7 | BY38-011 | 749131.623 | 2082416.427 | 0.50 | 2.50 | Fluoranthene | 53.000 | 27200000 | - | 43.000 | ug/kg |
| 100/400 | 400-7 | BY38-011 | 749131.623 | 2082416.427 | 0.50 | 2.50 | Uranium-235 | 0.175 | 8 | 0.120 | - | pCi/g |
| 100/400 | 400-7 | BY38-011 | 749131.623 | 2082416.427 | 4.50 | 6.50 | Benzo(a)anthracene | 44.000 | 34900 | - | 42.000 | ug/kg |
| 100/400 | 400-7 | BY38-011 | 749131.623 | 2082416.427 | 4.50 | 6.50 | Chrysene | 51.000 | 3490000 | - | 37.000 | ug/kg |
| 100/400 | 400-7 | BY38-011 | 749131.623 | 2082416.427 | 4.50 | 6.50 | Fluoranthene | 100.000 | 27200000 | - | 42.000 | ug/kg |
| 100/400 | 400-7 | BY38-011 | 749131.623 | 2082416.427 | 4.50 | 6.50 | Pyrene | 110.000 | 22100000 | - | 60.000 | ug/kg |
| 100/400 | 400-7 | BY38-011 | 749131.623 | 2082416.427 | 4.50 | 6.50 | Uranium-235 | 0.173 | 8 | 0.120 | - | pCi/g |
| 100/400 | 000-2 | BY38-013 | 749011.8503 | 2082413.426 | 2.50 | 4.50 | Aluminum | 80000.000 | 228000 | 35373.170 | - | mg/kg |
| 100/400 | 000-2 | BY38-013 | 749011.8503 | 2082413.426 | 2.50 | 4.50 | Arsenic | 21.000 | 22.2 | 13.140 | - | mg/kg |
| 100/400 | 000-2 | BY38-013 | 749011.8503 | 2082413.426 | 2.50 | 4.50 | Lithium | 50.000 | 20400 | 34.660 | - | mg/kg |
| 100/400 | 000-2 | BY38-013 | 749011.8503 | 2082413.426 | 2.50 | 4.50 | Toluene | 12.600 | 31300000 | - | 5.480 | ug/kg |
| *100/400* | *000-2* | *BY38-013* | *749011.8503* | *2082413.426* | *2.50* | *4.50* | *Uranium-234* | *3.990* | *300* | *2.640* | - | *pCi/g* |
| 100/400 | 000-2 | BY38-013 | 749011.8503 | 2082413.426 | 2.50 | 4.50 | Uranium-235 | 0.242 | 8 | 0.120 | - | pCi/g |
| 100/400 | 000-2 | BY38-013 | 749011.8503 | 2082413.426 | 2.50 | 4.50 | Uranium-238 | 3.990 | 351 | 1.490 | - | pCi/g |
| 100/400 | 000-2 | BY38-013 | 749011.8503 | 2082413.426 | 2.50 | 4.50 | Vanadium | 120.000 | 7150 | 88.490 | - | mg/kg |
| 100/400 | 000-2 | BY38-016 | 749034.65 | 2082417.63 | 4.00 | 4.50 | Acetone | 9.600 | 102000000 | - | 5.600 | ug/kg |
| 300/500 | 500-1 | BY44-001 | 750196.943 | 2082539.829 | 0.00 | 0.50 | Copper | 24.000 | 40900 | 18.060 | - | mg/kg |
| 300/500 | 500-1 | BY44-001 | 750196.943 | 2082539.829 | 0.00 | 0.50 | Manganese | 460.000 | 3480 | 365.080 | - | mg/kg |
| *300/500* | *500-1* | *BY44-001* | *750196.943* | *2082539.829* | *0.00* | *0.50* | *Uranium-234* | *2.587* | *300* | *2.253* | - | *pCi/g* |
| 300/500 | 500-1 | BY44-001 | 750196.943 | 2082539.829 | 0.00 | 0.50 | Uranium-235 | 0.227 | 8 | 0.094 | - | pCi/g |
| 300/500 | 500-1 | BY44-001 | 750196.943 | 2082539.829 | 0.00 | 0.50 | Uranium-238 | 2.587 | 351 | 2.000 | - | pCi/g |
| 300/500 | 500-1 | BY44-001 | 750196.943 | 2082539.829 | 2.50 | 4.50 | Uranium-235 | 0.197 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BY44-001 | 750196.943 | 2082539.829 | 4.50 | 6.50 | Uranium-235 | 0.154 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BY44-001 | 750196.943 | 2082539.829 | 4.50 | 6.50 | Uranium-238 | 1.929 | 351 | 1.490 | - | pCi/g |
| *300/500* | *000-4* | *BZ42-014* | *750010.396* | *2082529.351* | *3.00* | *3.30* | *Uranium-234* | *3.214* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | BZ42-014 | 750010.396 | 2082529.351 | 3.00 | 3.30 | Uranium-235 | 0.183 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | BZ42-014 | 750010.396 | 2082529.351 | 3.00 | 3.30 | Uranium-238 | 3.214 | 351 | 1.490 | - | pCi/g |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *300/500* | *000-4* | *BZ42-015* | *750012.432* | *2082546.466* | *3.00* | *3.30* | *Uranium-234* | *2.902* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | BZ42-015 | 750012.432 | 2082546.466 | 3.00 | 3.30 | Uranium-238 | 2.902 | 351 | 1.490 | - | pCi/g |
| *300/500* | *000-4* | *BZ42-016* | *750016.407* | *2082566.185* | *3.00* | *3.30* | *Uranium-234* | *3.504* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | BZ42-016 | 750016.407 | 2082566.185 | 3.00 | 3.30 | Uranium-235 | 0.191 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | BZ42-016 | 750016.407 | 2082566.185 | 3.00 | 3.30 | Uranium-238 | 3.504 | 351 | 1.490 | - | pCi/g |
| *300/500* | *500-1* | *BZ43-000* | *750003.701* | *2082555.204* | *14.50* | *16.50* | *Uranium-234* | *5.553* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-1 | BZ43-000 | 750003.701 | 2082555.204 | 14.50 | 16.50 | Uranium-235 | 0.361 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-000 | 750003.701 | 2082555.204 | 14.50 | 16.50 | Uranium-238 | 5.553 | 351 | 1.490 | - | pCi/g |
| *300/500* | *500-1* | *BZ43-001* | *749984.487* | *2082552.194* | *14.50* | *16.50* | *Uranium-234* | *5.132* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-1 | BZ43-001 | 749984.487 | 2082552.194 | 14.50 | 16.50 | Uranium-235 | 0.244 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-001 | 749984.487 | 2082552.194 | 14.50 | 16.50 | Uranium-238 | 5.132 | 351 | 1.490 | - | pCi/g |
| *300/500* | *500-1* | *BZ43-002* | *749984.512* | *2082542.177* | *14.50* | *16.50* | *Uranium-234* | *5.616* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-1 | BZ43-002 | 749984.512 | 2082542.177 | 14.50 | 16.50 | Uranium-235 | 0.307 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-002 | 749984.512 | 2082542.177 | 14.50 | 16.50 | Uranium-238 | 5.616 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | BZ43-003 | 749998.611 | 2082658.815 | 12.50 | 14.50 | Uranium, Total | 9.900 | 2750 | 3.040 | - | mg/kg |
| 300/500 | 000-4 | BZ43-003 | 749998.611 | 2082658.815 | 12.50 | 14.50 | Uranium-238 | 2.950 | 351 | 1.490 | - | pCi/g |
| *300/500* | *000-4* | *BZ43-004* | *749980.463* | *2082674.206* | *12.50* | *14.50* | *Uranium-234* | *4.093* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | BZ43-004 | 749980.463 | 2082674.206 | 12.50 | 14.50 | Uranium-235 | 0.229 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | BZ43-004 | 749980.463 | 2082674.206 | 12.50 | 14.50 | Uranium-238 | 4.093 | 351 | 1.490 | - | pCi/g |
| *300/500* | *500-1* | *BZ43-005* | *749991.706* | *2082612.92* | *6.50* | *8.50* | *Uranium-234* | *3.076* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-1 | BZ43-005 | 749991.706 | 2082612.92 | 6.50 | 8.50 | Uranium-235 | 0.170 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-005 | 749991.706 | 2082612.92 | 6.50 | 8.50 | Uranium-238 | 3.076 | 351 | 1.490 | - | pCi/g |
| *300/500* | *500-1* | *BZ43-005* | *749991.706* | *2082612.92* | *8.50* | *10.50* | *Uranium-234* | *3.914* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-1 | BZ43-005 | 749991.706 | 2082612.92 | 8.50 | 10.50 | Uranium-235 | 0.190 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-005 | 749991.706 | 2082612.92 | 8.50 | 10.50 | Uranium-238 | 3.914 | 351 | 1.490 | - | pCi/g |
| *300/500* | *500-1* | *BZ43-005* | *749991.706* | *2082612.92* | *10.50* | *11.00* | *Uranium-234* | *4.672* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-1 | BZ43-005 | 749991.706 | 2082612.92 | 10.50 | 11.00 | Uranium-235 | 0.283 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-005 | 749991.706 | 2082612.92 | 10.50 | 11.00 | Uranium-238 | 4.672 | 351 | 1.490 | - | pCi/g |
| *300/500* | *500-1* | *BZ43-006* | *749996.299* | *2082577.613* | *6.50* | *8.50* | *Uranium-234* | *4.604* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-1 | BZ43-006 | 749996.299 | 2082577.613 | 6.50 | 8.50 | Uranium-235 | 0.212 | 8 | 0.120 | - | pCi/g |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 300/500 | 500-1 | BZ43-006 | 749996.299 | 2082577.613 | 6.50 | 8.50 | Uranium-238 | 4.604 | 351 | 1.490 | - | pCi/g |
| *300/500* | *500-1* | *BZ43-006* | *749996.299* | *2082577.613* | *8.50* | *10.50* | *Uranium-234* | *5.199* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-1 | BZ43-006 | 749996.299 | 2082577.613 | 8.50 | 10.50 | Uranium-238 | 5.199 | 351 | 1.490 | - | pCi/g |
| *300/500* | *500-1* | *BZ43-006* | *749996.299* | *2082577.613* | *10.50* | *12.50* | *Uranium-234* | *4.462* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-1 | BZ43-006 | 749996.299 | 2082577.613 | 10.50 | 12.50 | Uranium-235 | 0.201 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-006 | 749996.299 | 2082577.613 | 10.50 | 12.50 | Uranium-238 | 4.462 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-1 | BZ43-007 | 750016.615 | 2082551.858 | 2.50 | 4.50 | Arsenic | 13.300 | 22.2 | 13.140 | - | mg/kg |
| 300/500 | 500-1 | BZ43-007 | 750016.615 | 2082551.858 | 2.50 | 4.50 | Barium | 1300.000 | 26400 | 289.380 | - | mg/kg |
| 300/500 | 500-1 | BZ43-007 | 750016.615 | 2082551.858 | 2.50 | 4.50 | Uranium-235 | 0.127 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-007 | 750016.615 | 2082551.858 | 4.50 | 6.50 | Barium | 1110.000 | 26400 | 289.380 | - | mg/kg |
| 300/500 | 500-1 | BZ43-008 | 750052.834 | 2082543.591 | 2.50 | 4.50 | Uranium-235 | 0.145 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-008 | 750052.834 | 2082543.591 | 4.50 | 6.50 | Uranium-238 | 1.990 | 351 | 1.490 | - | pCi/g |
| *300/500* | *500-1* | *BZ43-009* | *750089.068* | *2082543.206* | *2.50* | *4.50* | *Uranium-234* | *4.872* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-1 | BZ43-009 | 750089.068 | 2082543.206 | 2.50 | 4.50 | Uranium-235 | 0.190 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-009 | 750089.068 | 2082543.206 | 2.50 | 4.50 | Uranium-238 | 4.872 | 351 | 1.490 | - | pCi/g |
| *300/500* | *500-1* | *BZ43-009* | *750089.068* | *2082543.206* | *4.50* | *6.50* | *Uranium-234* | *3.456* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-1 | BZ43-009 | 750089.068 | 2082543.206 | 4.50 | 6.50 | Uranium-235 | 0.248 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-009 | 750089.068 | 2082543.206 | 4.50 | 6.50 | Uranium-238 | 3.456 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-1 | BZ43-010 | 750124.546 | 2082537.064 | 3.00 | 4.50 | Uranium-235 | 0.217 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | BZ43-010 | 750124.546 | 2082537.064 | 3.00 | 4.50 | Uranium-238 | 1.638 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-1 | BZ43-011 | 750160.767 | 2082541.063 | 2.50 | 4.50 | Acetone | 6.500 | 102000000 | - | 5.200 | ug/kg |
| 300/500 | 000-4 | BZ43-028 | 749993.69 | 2082550.805 | 10.00 | 12.00 | Americium-241 | 0.206 | 76 | 0.020 | - | pCi/g |
| 300/500 | 000-4 | BZ43-028 | 749993.69 | 2082550.805 | 10.00 | 12.00 | Plutonium-239/240 | 0.446 | 50 | 0.020 | - | pCi/g |
| 300/500 | 000-4 | BZ43-029 | 750091.64 | 2082545.318 | 0.00 | 0.30 | Americium-241 | 1.140 | 76 | 0.023 | - | pCi/g |
| 300/500 | 000-4 | BZ43-029 | 750091.64 | 2082545.318 | 0.00 | 0.30 | Plutonium-239/240 | 0.489 | 50 | 0.066 | - | pCi/g |
| 300/500 | 000-4 | BZ43-029 | 750091.64 | 2082545.318 | 0.00 | 0.30 | Uranium-235 | 0.445 | 8 | 0.094 | - | pCi/g |
| 300/500 | 000-4 | BZ43-029 | 750091.64 | 2082545.318 | 0.00 | 0.30 | Uranium-238 | 2.720 | 351 | 2.000 | - | pCi/g |
| 300/500 | 000-4 | BZ43-029 | 750091.64 | 2082545.318 | 7.00 | 7.30 | Americium-241 | 0.758 | 76 | 0.020 | - | pCi/g |
| *300/500* | *000-4* | *BZ43-029* | *750091.64* | *2082545.318* | *7.00* | *7.30* | *Plutonium-239/240* | *4.318* | *50* | *0.020* | - | *pCi/g* |
| 300/500 | 000-4 | BZ43-029 | 750091.64 | 2082545.318 | 7.00 | 7.30 | Uranium, Total | 8.600 | 2750 | 3.040 | - | mg/kg |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *300/500* | *000-4* | *BZ43-029* | *750091.64* | *2082545.318* | *7.00* | *7.30* | *Uranium-234* | *5.115* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | BZ43-029 | 750091.64 | 2082545.318 | 7.00 | 7.30 | Uranium-235 | 0.201 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | BZ43-029 | 750091.64 | 2082545.318 | 7.00 | 7.30 | Uranium-238 | 5.115 | 351 | 1.490 | - | pCi/g |
| *300/500* | *000-4* | *BZ43-030* | *749965.925* | *2082958.28* | *0.00* | *0.50* | *Uranium-234* | *3.939* | *300* | *2.253* | - | *pCi/g* |
| 300/500 | 000-4 | BZ43-030 | 749965.925 | 2082958.28 | 0.00 | 0.50 | Uranium-235 | 0.188 | 8 | 0.094 | - | pCi/g |
| 300/500 | 000-4 | BZ43-030 | 749965.925 | 2082958.28 | 0.00 | 0.50 | Uranium-238 | 3.939 | 351 | 2.000 | - | pCi/g |
| *300/500* | *000-4* | *BZ43-036* | *749983.211* | *2082653.539* | *9.00* | *10.00* | *Uranium-234* | *3.925* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | BZ43-036 | 749983.211 | 2082653.539 | 9.00 | 10.00 | Uranium-235 | 0.214 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | BZ43-036 | 749983.211 | 2082653.539 | 9.00 | 10.00 | Uranium-238 | 3.925 | 351 | 1.490 | - | pCi/g |
| *300/500* | *000-4* | *BZ43-037* | *749978.049* | *2082584.689* | *17.00* | *18.00* | *Uranium-234* | *3.468* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | BZ43-037 | 749978.049 | 2082584.689 | 17.00 | 18.00 | Uranium-238 | 3.468 | 351 | 1.490 | - | pCi/g |
| *300/500* | *000-4* | *BZ43-038* | *749935.063* | *2082618.401* | *0.00* | *0.50* | *Uranium-234* | *3.545* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | BZ43-038 | 749935.063 | 2082618.401 | 0.00 | 0.50 | Uranium-235 | 0.167 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | BZ43-038 | 749935.063 | 2082618.401 | 0.00 | 0.50 | Uranium-238 | 3.545 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | BZ43-039 | 749947.136 | 2082619.394 | 0.00 | 0.50 | Americium-241 | 0.218 | 76 | 0.020 | - | pCi/g |
| *300/500* | *000-4* | *BZ43-039* | *749947.136* | *2082619.394* | *0.00* | *0.50* | *Plutonium-239/240* | *1.240* | *50* | *0.020* | - | *pCi/g* |
| 300/500 | 000-4 | BZ43-040 | 749957.983 | 2082621.421 | 0.00 | 0.50 | Uranium-235 | 0.213 | 8 | 0.120 | - | pCi/g |
| 300/500 | 300-4 | BZ45-005 | 750395.702 | 2082554.764 | 6.50 | 8.50 | Barium | 822.000 | 26400 | 289.380 | - | mg/kg |
| *300/500* | *300-4* | *BZ45-005* | *750395.702* | *2082554.764* | *6.50* | *8.50* | *Uranium-234* | *5.315* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 300-4 | BZ45-005 | 750395.702 | 2082554.764 | 6.50 | 8.50 | Uranium-235 | 0.312 | 8 | 0.120 | - | pCi/g |
| 300/500 | 300-4 | BZ45-005 | 750395.702 | 2082554.764 | 6.50 | 8.50 | Uranium-238 | 5.315 | 351 | 1.490 | - | pCi/g |
| 300/500 | 300-4 | BZ45-005 | 750395.702 | 2082554.764 | 6.50 | 8.50 | Vanadium | 137.000 | 7150 | 88.490 | - | mg/kg |
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 6.50 | 8.50 | Barium | 769.000 | 26400 | 289.380 | - | mg/kg |
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 8.50 | 10.50 | Barium | 1000.000 | 26400 | 289.380 | - | mg/kg |
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 8.50 | 10.50 | Uranium-235 | 0.135 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 8.50 | 10.50 | Vanadium | 89.600 | 7150 | 88.490 | - | mg/kg |
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 10.50 | 12.50 | Barium | 1110.000 | 26400 | 289.380 | - | mg/kg |
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 10.50 | 12.50 | Iron | 41200.000 | 307000 | 41046.520 | - | mg/kg |
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 10.50 | 12.50 | Strontium | 216.000 | 613000 | 211.380 | - | mg/kg |
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 10.50 | 12.50 | Uranium-238 | 1.723 | 351 | 1.490 | - | pCi/g |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 300/500 | 000-4 | CA43-016 | 749987 | 2082750.904 | 10.50 | 12.50 | Vanadium | 98.500 | 7150 | 88.490 | - | mg/kg |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 7.00 | 8.50 | Barium | 945.000 | 26400 | 289.380 | - | mg/kg |
| *300/500* | *000-4* | *CA43-017* | *749994.256* | *2082858.148* | *7.00* | *8.50* | *Uranium-234* | *2.826* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 7.00 | 8.50 | Uranium-235 | 0.192 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 7.00 | 8.50 | Uranium-238 | 2.826 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 8.50 | 10.50 | Barium | 1210.000 | 26400 | 289.380 | - | mg/kg |
| *300/500* | *000-4* | *CA43-017* | *749994.256* | *2082858.148* | *8.50* | *10.50* | *Uranium-234* | *3.097* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 8.50 | 10.50 | Uranium-238 | 3.097 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 10.50 | 12.50 | Barium | 863.000 | 26400 | 289.380 | - | mg/kg |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 10.50 | 12.50 | Iron | 41100.000 | 307000 | 41046.520 | - | mg/kg |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 10.50 | 12.50 | Uranium-235 | 0.145 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | CA43-017 | 749994.256 | 2082858.148 | 10.50 | 12.50 | Vanadium | 89.300 | 7150 | 88.490 | - | mg/kg |
| 300/500 | 000-4 | CA43-022 | 749991.994 | 2082932.164 | 11.00 | 11.50 | 1,2,4-Trichlorobenzene | 0.880 | 9230000 | - | 0.790 | ug/kg |
| 300/500 | 000-4 | CA43-022 | 749991.994 | 2082932.164 | 11.00 | 11.50 | Methylene chloride | 3.300 | 2530000 | - | 0.890 | ug/kg |
| 300/500 | 000-4 | CA43-022 | 749991.994 | 2082932.164 | 11.00 | 11.50 | Naphthalene | 1.400 | 3090000 | - | 0.960 | ug/kg |
| *300/500* | *000-4* | *CB42-024* | *750004.392* | *2083035.033* | *1.00* | *1.30* | *Uranium-234* | *39.070* | *300* | *2.253* | - | *pCi/g* |
| 300/500 | 000-4 | CB42-024 | 750004.392 | 2083035.033 | 1.00 | 1.30 | Uranium-235 | 0.370 | 8 | 0.094 | - | pCi/g |
| 300/500 | 000-4 | CB42-024 | 750004.392 | 2083035.033 | 1.00 | 1.30 | Uranium-238 | 39.070 | 351 | 2.000 | - | pCi/g |
| 300/500 | 000-4 | CB43-000 | 749977.418 | 2083102.468 | 12.50 | 14.50 | Barium | 847.000 | 26400 | 289.380 | - | mg/kg |
| 300/500 | 000-4 | CB43-000 | 749977.418 | 2083102.468 | 12.50 | 14.50 | Strontium | 217.000 | 613000 | 211.380 | - | mg/kg |
| 300/500 | 000-4 | CB43-001 | 749982.101 | 2083116.535 | 12.50 | 14.50 | Barium | 1200.000 | 26400 | 289.380 | - | mg/kg |
| 300/500 | 000-4 | CB43-001 | 749982.101 | 2083116.535 | 12.50 | 14.50 | Vanadium | 96.200 | 7150 | 88.490 | - | mg/kg |
| 300/500 | 000-4 | CB43-048 | 749991.824 | 2082678.35 | 9.00 | 11.00 | Antimony | 0.720 | 409 | 0.470 | - | mg/kg |
| 300/500 | 500-1 | CC43-004 | 749993.004 | 2083295.733 | 0.50 | 2.50 | Acetone | 15.000 | 102000000 | - | 5.000 | ug/kg |
| 300/500 | 500-1 | CC43-004 | 749993.004 | 2083295.733 | 2.50 | 4.50 | 1,2,4-Trichlorobenzene | 0.760 | 9230000 | - | 0.740 | ug/kg |
| 300/500 | 500-1 | CC43-004 | 749993.004 | 2083295.733 | 2.50 | 4.50 | Naphthalene | 2.400 | 3090000 | - | 0.890 | ug/kg |
| 300/500 | 500-1 | CC43-004 | 749993.004 | 2083295.733 | 2.50 | 4.50 | Tetrachloroethene | 1.700 | 615000 | - | 1.000 | ug/kg |
| 300/500 | 500-1 | CC43-004 | 749993.004 | 2083295.733 | 2.50 | 4.50 | Toluene | 1.200 | 31300000 | - | 0.810 | ug/kg |
| 300/500 | 500-1 | CC43-004 | 749993.004 | 2083295.733 | 4.50 | 6.50 | Naphthalene | 1.000 | 3090000 | - | 0.890 | ug/kg |
| *300/500* | *500-1* | *CC43-007* | *750000.085* | *2083257.191* | *4.50* | *6.50* | *Uranium-234* | *5.981* | *300* | *2.640* | - | *pCi/g* |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 300/500 | 500-1 | CC43-007 | 750000.085 | 2083257.191 | 4.50 | 6.50 | Uranium-238 | 5.981 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-1 | CC43-008 | 749996.579 | 2083217.175 | 4.50 | 6.50 | Uranium-235 | 0.140 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | CC43-012 | 750000.989 | 2083194.522 | 4.50 | 6.50 | Uranium-235 | 0.134 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-1 | CC43-017 | 750005.732 | 2083160.322 | 4.50 | 6.50 | Naphthalene | 0.970 | 3090000 | - | 0.890 | ug/kg |
| 300/500 | 500-1 | CC43-017 | 750005.732 | 2083160.322 | 4.50 | 6.50 | Plutonium-239/240 | 0.446 | 50 | 0.020 | - | pCi/g |
| 300/500 | 000-4 | CC43-037 | 749993.099 | 2083213.455 | 0.00 | 0.50 | Acetone | 5.000 | 102000000 | - | 1.600 | ug/kg |
| 300/500 | 000-4 | CC43-037 | 749993.099 | 2083213.455 | 0.00 | 0.50 | Carbon Tetrachloride | 0.340 | 81500 | - | 0.190 | ug/kg |
| 300/500 | 000-4 | CC43-037 | 749993.099 | 2083213.455 | 0.00 | 0.50 | Methylene chloride | 1.600 | 2530000 | - | 0.360 | ug/kg |
| 300/500 | 000-4 | CC43-037 | 749993.099 | 2083213.455 | 0.00 | 0.50 | Tetrachloroethene | 0.790 | 615000 | - | 0.200 | ug/kg |
| 300/500 | 000-4 | CC43-037 | 749993.099 | 2083213.455 | 0.00 | 0.50 | Toluene | 0.099 | 31300000 | - | 0.094 | ug/kg |
| 300/500 | 000-4 | CC43-037 | 749993.099 | 2083213.455 | 0.00 | 0.50 | Trichloroethene | 0.170 | 19600 | - | 0.150 | ug/kg |
| 300/500 | 500-3 | CD43-022 | 750034.7971 | 2083549.844 | 17.00 | 18.00 | Americium-241 | 1.363 | 76 | 0.020 | - | pCi/g |
| *300/500* | *500-3* | *CD43-022* | *750034.7971* | *2083549.844* | *17.00* | *18.00* | *Plutonium-239/240* | *7.769* | *50* | *0.020* | - | *pCi/g* |
| 300/500 | 500-3 | CD43-022 | 750034.7971 | 2083549.844 | 17.00 | 18.00 | Uranium-235 | 0.173 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-3 | CD43-024 | 750059.3052 | 2083539.531 | 20.00 | 21.00 | Americium-241 | 1.002 | 76 | 0.020 | - | pCi/g |
| *300/500* | *500-3* | *CD43-024* | *750059.3052* | *2083539.531* | *20.00* | *21.00* | *Plutonium-239/240* | *5.711* | *50* | *0.020* | - | *pCi/g* |
| 300/500 | 500-3 | CD43-024 | 750059.3052 | 2083539.531 | 20.00 | 21.00 | Uranium-238 | 1.675 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-3 | CD43-029 | 750060.129 | 2083480.533 | 20.00 | 22.00 | Uranium-238 | 1.624 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 6.50 | 7.10 | Uranium-235 | 0.141 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 6.50 | 7.10 | Uranium-238 | 1.817 | 351 | 1.490 | - | pCi/g |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 8.50 | 10.10 | Ethylbenzene | 6.460 | 4250000 | - | 5.830 | ug/kg |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 8.50 | 10.10 | Toluene | 6.910 | 31300000 | - | 5.830 | ug/kg |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 8.50 | 10.10 | Uranium-235 | 0.185 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 8.50 | 10.10 | Xylene | 41.700 | 2040000 | - | 11.700 | ug/kg |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 10.50 | 11.50 | Uranium-235 | 0.159 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 14.70 | 15.80 | Uranium-235 | 0.175 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 16.50 | 18.50 | Uranium-235 | 0.152 | 8 | 0.120 | - | pCi/g |
| *300/500* | *500-3* | *CE43-000* | *750054.497* | *2083555.328* | *18.50* | *20.50* | *Uranium-234* | *4.585* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 18.50 | 20.50 | Uranium-235 | 0.240 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 18.50 | 20.50 | Uranium-238 | 4.585 | 351 | 1.490 | - | pCi/g |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *300/500* | *500-3* | *CE43-000* | *750054.497* | *2083555.328* | *20.50* | *22.40* | *Uranium-234* | *4.066* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 20.50 | 22.40 | Uranium-235 | 0.175 | 8 | 0.120 | - | pCi/g |
| 300/500 | 500-3 | CE43-000 | 750054.497 | 2083555.328 | 20.50 | 22.40 | Uranium-238 | 4.066 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | CF48-026 | 751174.361 | 2083719.133 | 10.00 | 10.30 | Uranium-235 | 0.249 | 8 | 0.120 | - | pCi/g |
| *300/500* | *000-4* | *CF49-025* | *751185.198* | *2083851.294* | *10.00* | *10.30* | *Uranium-234* | *4.522* | *300* | *2.640* | - | *pCi/g* |
| 300/500 | 000-4 | CF49-025 | 751185.198 | 2083851.294 | 10.00 | 10.30 | Uranium-235 | 0.323 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | CF49-025 | 751185.198 | 2083851.294 | 10.00 | 10.30 | Uranium-238 | 4.522 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | CK44-024 | 750012.106 | 2082774.164 | 9.00 | 10.50 | Uranium-235 | 0.134 | 8 | 0.120 | - | pCi/g |
| 700 | 000-4 | CE40-003 | 749386.308 | 2083693.923 | 10.00 | 10.50 | Plutonium-239/240 | 3.370 | 50 | 0.020 | - | pCi/g |
| 700 | 000-4 | CE41-000 | 749687.785 | 2083686.902 | 0.00 | 0.30 | Acetone | 8.300 | 102000000 | - | 1.500 | ug/kg |
| 700 | 000-4 | CE41-001 | 749591.811 | 2083688.335 | 15.00 | 15.50 | Lead | 37.000 | 1000 | 24.970 | - | mg/kg |
| 700 | 000-4 | CE41-001 | 749591.811 | 2083688.335 | 15.00 | 15.50 | Zinc | 160.000 | 307000 | 139.100 | - | mg/kg |
| 700 | 000-4 | CE41-002 | 749685.18 | 2083698.246 | 4.50 | 5.00 | Uranium-238 | 1.535 | 351 | 1.490 | - | pCi/g |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 2.50 | 4.50 | Barium | 1210.000 | 26400 | 289.380 | - | mg/kg |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 2.50 | 4.50 | bis(2-Ethylhexyl)phthalate | 96.000 | 1970000 | - | 74.000 | ug/kg |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 2.50 | 4.50 | Uranium-238 | 1.631 | 351 | 1.490 | - | pCi/g |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 4.50 | 6.50 | Barium | 989.000 | 26400 | 289.380 | - | mg/kg |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 4.50 | 6.50 | bis(2-Ethylhexyl)phthalate | 96.000 | 1970000 | - | 81.000 | ug/kg |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 4.50 | 6.50 | Di-n-butylphthalate | 130.000 | 73700000 | - | 23.000 | ug/kg |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 4.50 | 6.50 | Strontium | 217.000 | 613000 | 211.380 | - | mg/kg |
| *700* | *700-2* | *CE42-001* | *749916.871* | *2083700.012* | *4.50* | *6.50* | *Uranium-234* | *3.284* | *300* | *2.640* | - | *pCi/g* |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 4.50 | 6.50 | Uranium-235 | 0.240 | 8 | 0.120 | - | pCi/g |
| 700 | 700-2 | CE42-001 | 749916.871 | 2083700.012 | 4.50 | 6.50 | Uranium-238 | 3.284 | 351 | 1.490 | - | pCi/g |
| 700 | 000-4 | CE42-007 | 749886.632 | 2083686.922 | 8.00 | 8.50 | Acetone | 15.000 | 102000000 | - | 1.600 | ug/kg |
| 700 | 000-4 | CE42-007 | 749886.632 | 2083686.922 | 8.00 | 8.50 | Naphthalene | 0.570 | 3090000 | - | 0.410 | ug/kg |
| 700 | 000-4 | CE42-007 | 749886.632 | 2083686.922 | 8.00 | 8.50 | Trichloroethene | 1.600 | 19600 | - | 0.150 | ug/kg |
| 700 | 000-4 | CE42-008 | 749787.975 | 2083687.49 | 0.00 | 0.30 | Acetone | 4.600 | 102000000 | - | 1.800 | ug/kg |
| 700 | 000-4 | CE43-019 | 749993.668 | 2083687.287 | 8.50 | 8.80 | Lithium | 47.000 | 20400 | 34.660 | - | mg/kg |
| 700 | 000-4 | CE43-019 | 749993.668 | 2083687.287 | 8.50 | 8.80 | Uranium, Total | 9.700 | 2750 | 3.040 | - | mg/kg |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 700 | 000-4 | CE43-019 | 749993.668 | 2083687.287 | 8.50 | 8.80 | Uranium-238 | 3.150 | 351 | 1.490 | - | pCi/g |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 12.50 | 14.50 | Trichloroethene | 3.300 | 19600 | - | 1.100 | ug/kg |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 14.50 | 16.50 | 1,2,4-Trichlorobenzene | 0.850 | 9230000 | - | 0.810 | ug/kg |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 14.50 | 16.50 | Naphthalene | 1.600 | 3090000 | - | 0.980 | ug/kg |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 14.50 | 16.50 | Trichloroethene | 1.300 | 19600 | - | 0.990 | ug/kg |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 16.50 | 18.50 | Trichloroethene | 1.700 | 19600 | - | 1.100 | ug/kg |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 18.50 | 20.50 | Trichloroethene | 1.200 | 19600 | - | 1.100 | ug/kg |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 18.50 | 20.50 | Uranium-238 | 1.790 | 351 | 1.490 | - | pCi/g |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 20.50 | 22.00 | Acetone | 6.000 | 102000000 | - | 5.700 | ug/kg |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 20.50 | 22.00 | Naphthalene | 1.300 | 3090000 | - | 1.100 | ug/kg |
| 700 | 700-10 | CE44-027 | 750315.278 | 2083616.844 | 20.50 | 22.00 | Trichloroethene | 3.900 | 19600 | - | 1.100 | ug/kg |
| 700 | 700-10 | CE44-028 | 750305.834 | 2083616.561 | 12.50 | 14.50 | Acetone | 16.000 | 102000000 | - | 5.700 | ug/kg |
| 700 | 700-10 | CE44-028 | 750305.834 | 2083616.561 | 12.50 | 14.50 | Ethylbenzene | 4.500 | 4250000 | - | 1.500 | ug/kg |
| 700 | 700-10 | CE44-028 | 750305.834 | 2083616.561 | 12.50 | 14.50 | Toluene | 36.000 | 31300000 | - | 0.960 | ug/kg |
| 700 | 700-10 | CE44-028 | 750305.834 | 2083616.561 | 12.50 | 14.50 | Trichloroethene | 1.900 | 19600 | - | 1.100 | ug/kg |
| 700 | 700-10 | CE44-028 | 750305.834 | 2083616.561 | 12.50 | 14.50 | Xylene | 16.000 | 2040000 | - | 3.400 | ug/kg |
| 700 | 700-10 | CE44-028 | 750305.834 | 2083616.561 | 14.50 | 16.50 | Acetone | 6.800 | 102000000 | - | 5.500 | ug/kg |
| 700 | 700-10 | CE44-028 | 750305.834 | 2083616.561 | 20.50 | 22.50 | Uranium-238 | 1.800 | 351 | 1.490 | - | pCi/g |
| 700 | 000-4 | CE44-033 | 750237.774 | 2083682.974 | 8.00 | 8.50 | Americium-241 | 0.693 | 76 | 0.020 | - | pCi/g |
| 700 | 000-4 | CE44-033 | 750237.774 | 2083682.974 | 8.00 | 8.50 | Uranium-235 | 0.258 | 8 | 0.120 | - | pCi/g |
| 700 | 700-3 | CE46-013 | 750672.685 | 2083745.663 | 0.00 | 0.50 | Benzo(a)pyrene | 52.000 | 3490 | - | 41.000 | ug/kg |
| 700 | 700-3 | CE46-013 | 750672.685 | 2083745.663 | 0.00 | 0.50 | Benzo(b)fluoranthene | 49.000 | 34900 | - | 30.000 | ug/kg |
| 700 | 700-3 | CE46-013 | 750672.685 | 2083745.663 | 0.00 | 0.50 | Chrysene | 44.000 | 3490000 | - | 29.000 | ug/kg |
| 700 | 700-3 | CE46-013 | 750672.685 | 2083745.663 | 0.00 | 0.50 | Fluoranthene | 69.000 | 27200000 | - | 23.000 | ug/kg |
| *700* | *700-3* | *CE46-013* | *750672.685* | *2083745.663* | *0.00* | *0.50* | *Uranium-234* | *3.952* | *300* | *2.253* | - | *pCi/g* |
| 700 | 700-3 | CE46-013 | 750672.685 | 2083745.663 | 0.00 | 0.50 | Uranium-235 | 0.197 | 8 | 0.094 | - | pCi/g |
| 700 | 700-3 | CE46-013 | 750672.685 | 2083745.663 | 0.00 | 0.50 | Uranium-238 | 3.952 | 351 | 2.000 | - | pCi/g |
| 700 | 000-4 | CG39-005 | 749365.098 | 2083668.014 | 6.50 | 7.00 | Uranium-235 | 0.190 | 8 | 0.120 | - | pCi/g |
| 700 | 000-4 | CG39-005 | 749365.098 | 2083668.014 | 6.50 | 7.00 | Uranium-238 | 1.966 | 351 | 1.490 | - | pCi/g |
| 700 | 700-7 | CI46-010 | 750714.914 | 2084387.386 | 0.00 | 0.50 | Americium-241 | 0.424 | 76 | 0.023 | - | pCi/g |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *700* | *700-7* | *CI46-010* | *750714.914* | *2084387.386* | *0.00* | *0.50* | *Plutonium-239/240* | *2.415* | *50* | *0.066* | - | *pCi/g* |
| 700 | 700-7 | CI46-010 | 750714.914 | 2084387.386 | 0.00 | 0.50 | Uranium-235 | 0.163 | 8 | 0.094 | - | pCi/g |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Aluminum | 25000.000 | 228000 | 16902.000 | - | mg/kg |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Americium-241 | 3.705 | 76 | 0.023 | - | pCi/g |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Barium | 210.000 | 26400 | 141.260 | - | mg/kg |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Chromium | 30.000 | 268 | 16.990 | - | mg/kg |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Lithium | 16.000 | 20400 | 11.550 | - | mg/kg |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Mercury | 0.590 | 25200 | 0.134 | - | mg/kg |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Nickel | 16.000 | 20400 | 14.910 | - | mg/kg |
| *700* | *700-7* | *CI46-014* | *750721.531* | *2084421.63* | *0.00* | *0.50* | *Plutonium-239/240* | *21.119* | *50* | *0.066* | - | *pCi/g* |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Strontium | 77.000 | 613000 | 48.940 | - | mg/kg |
| *700* | *700-7* | *CI46-014* | *750721.531* | *2084421.63* | *0.00* | *0.50* | *Uranium-234* | *4.303* | *300* | *2.253* | - | *pCi/g* |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Uranium-235 | 0.254 | 8 | 0.094 | - | pCi/g |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Uranium-238 | 4.303 | 351 | 2.000 | - | pCi/g |
| 700 | 700-7 | CI46-014 | 750721.531 | 2084421.63 | 0.00 | 0.50 | Vanadium | 54.000 | 7150 | 45.590 | - | mg/kg |
| 700 | 700-7 | CJ46-021 | 750721.296 | 2084578.532 | 0.00 | 0.50 | Americium-241 | 0.601 | 76 | 0.023 | - | pCi/g |
| 700 | 700-7 | CJ46-021 | 750721.296 | 2084578.532 | 0.00 | 0.50 | Chromium | 17.000 | 268 | 16.990 | - | mg/kg |
| *700* | *700-7* | *CJ46-021* | *750721.296* | *2084578.532* | *0.00* | *0.50* | *Plutonium-239/240* | *3.427* | *50* | *0.066* | - | *pCi/g* |

Bold denotes AL exceedance.
Italic type denotes values derived from HPGe measurement.

### 2.3.4 800 Area

The 800 Area includes samples collected as part of the IHSS Group 000-2, 000-4, 800-1, 800-3, and 800-5 ER projects. Twenty-three characterization sampling locations were sampled in the 800 Area. One location contained arsenic at a concentration of 25.5 mg/kg (RFCA WRW soil AL of 22.2 mg/kg).

Soil remediation was not required in the 800 Area based on RFCA because the nonradionuclide contaminant arsenic was detected in subsurface soil at a depth greater than 6-in below the ground surface. Analytical results of soil characterization sampling with concentrations greater than background means plus two standard deviations or RLs are shown on Figure 5.

## 2.4 SORs

Radionuclide sums of ratios (SORs) for surface soil (0 to 3 ft) were calculated for IHSS Group 000-4 sampling locations based on the accelerated action analytical data for the contaminants of concern (COCs) and RFCA WRW soil ALs. Radionuclide SORs were calculated for all locations with analytical results greater than background means plus two standard deviations for americium-241, plutonium-239/240, uranium-234, uranium-235, and uranium-238. Plutonium-239/240 activities are derived from americium-241 activities (that is, plutonium-239/240 activity = americium-241 gamma spectroscopy activity x 5.7) when americium-241 is measured using high-purity germanium (HPGe) detection analysis. In accordance with RFCA (DOE et al. 2003), the AL of 116 picocuries per gram (pCi/g) plutonium-239/240 is used in the SOR calculation. As shown on Table 5, none of SORs for radionuclides in surface soil in IHSS Group 000-4 were greater than 1 and project decisions were not affected.

**Table 5**
**IHSS Group 000-4 Radionuclide SORs for Surface Soil**

| Location | Starting Depth (ft) | Ending Depth (ft) | Radionuclide SOR |
|---|---|---|---|
| BU38-004 | 0 | 0.17 | 0.017 |
| BY37-019 | 0 | 0.5 | 0.038 |
| BY44-001 | 0 | 0.5 | 0.044 |
| BZ43-029 | 0 | 0.3 | 0.083 |
| BZ43-030 | 0 | 0.5 | 0.048 |
| CE37-011 | 0 | 0.1 | 0.018 |
| CE46-013 | 0 | 0.5 | 0.049 |
| CI46-010 | 0 | 0.5 | 0.047 |
| CI46-014 | 0 | 0.5 | 0.289 |
| CJ46-021 | 0 | 0.5 | 0.088 |

SORs for nonradionuclides were calculated for all surface soil (0 to 0.5 ft) where analyte concentrations were 10 percent or more of a contaminant's RFCA WRW soil AL. Only



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one sample, CI46-014 had reportable nonradionuclide SOR of 0.112 and project decisions were not affected.

## 3.0 SUMMARY STATISTICS

Summary statistics, by analyte, were calculated for IHSS Group 000-4 surface soil and subsurface soil sampling locations (Tables 6 and 7, respectively). These summaries are based on detected concentrations only for organics and above-background means plus two standard deviations for inorganics.

**Table 6**
**Surface Soil Summary Statistics**

| Analyte | Number of Samples | Detection Frequency | Average Concentration | Maximum Concentration | WRW AL | Background Mean Plus 2SD | Unit |
|---|---|---|---|---|---|---|---|
| 1,2,4-Trichlorobenzene | 5 | 20.00% | 0.880 | 0.880 | 9230000 | - | ug/kg |
| Aluminum | 22 | 18.18% | 21250.000 | 25000.000 | 228000 | 16902.000 | mg/kg |
| Americium-241 | 31 | 19.35% | 1.008 | 3.705 | 76 | 0.023 | pCi/g |
| Antimony | 24 | 8.33% | 4.280 | 7.840 | 409 | 0.470 | mg/kg |
| Arsenic | 24 | 4.17% | 12.500 | 12.500 | 22.2 | 10.090 | mg/kg |
| Barium | 24 | 12.50% | 544.000 | 719.000 | 26400 | 141.260 | mg/kg |
| Benzo(a)anthracene | 5 | 20.00% | 160.000 | 160.000 | 34900 | - | ug/kg |
| Benzo(a)pyrene | 5 | 40.00% | 101.000 | 150.000 | 3490 | - | ug/kg |
| Benzo(b)fluoranthene | 5 | 40.00% | 79.500 | 110.000 | 34900 | - | ug/kg |
| Benzo(k)fluoranthene | 5 | 20.00% | 160.000 | 160.000 | 349000 | - | ug/kg |
| Beryllium | 22 | 9.09% | 1.050 | 1.100 | 921 | 0.966 | mg/kg |
| Chromium | 24 | 20.83% | 34.140 | 55.700 | 268 | 16.990 | mg/kg |
| Chrysene | 5 | 40.00% | 112.000 | 180.000 | 3490000 | - | ug/kg |
| Copper | 24 | 12.50% | 83.133 | 178.000 | 40900 | 18.060 | mg/kg |
| Fluoranthene | 5 | 40.00% | 229.500 | 390.000 | 27200000 | - | ug/kg |
| Indeno(1,2,3-cd)pyrene | 5 | 20.00% | 90.000 | 90.000 | 34900 | - | ug/kg |
| Iron | 24 | 8.33% | 28600.000 | 30000.000 | 307000 | 18037.000 | mg/kg |
| Lithium | 22 | 22.73% | 14.800 | 16.000 | 20400 | 11.550 | mg/kg |
| Manganese | 24 | 4.17% | 460.000 | 460.000 | 3480 | 365.080 | mg/kg |
| Mercury | 22 | 4.55% | 0.590 | 0.590 | 25200 | 0.134 | mg/kg |
| Methylene chloride | 3 | 33.33% | 3.300 | 3.300 | 2530000 | - | ug/kg |
| Naphthalene | 5 | 20.00% | 1.400 | 1.400 | 3090000 | - | ug/kg |
| Nickel | 24 | 16.67% | 26.800 | 40.600 | 20400 | 14.910 | mg/kg |
| Plutonium-239/240 | 31 | 19.35% | 4.616 | 21.119 | 50 | 0.066 | pCi/g |
| Pyrene | 5 | 20.00% | 390.000 | 390.000 | 22100000 | - | ug/kg |
| Strontium | 24 | 25.00% | 114.667 | 146.000 | 613000 | 48.940 | mg/kg |
| Uranium-234 | 31 | 29.03% | 7.715 | 39.070 | 300 | 2.253 | pCi/g |
| Uranium-235 | 31 | 45.16% | 0.224 | 0.445 | 8 | 0.094 | pCi/g |
| Uranium-238 | 31 | 32.26% | 7.216 | 39.070 | 351 | 2.000 | pCi/g |
| Vanadium | 24 | 12.50% | 129.333 | 168.000 | 7150 | 45.590 | mg/kg |
| Zinc | 24 | 12.50% | 135.700 | 190.000 | 307000 | 73.760 | mg/kg |



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## Table 7
## Subsurface Soil Summary Statistics

| Analyte | Number of Samples | Detection Frequency | Average Concentration | Maximum Concentration | WRW AL | Background Mean Plus 2SD | Unit |
|---|---|---|---|---|---|---|---|
| 1,2,4-Trichlorobenzene | 96 | 2.08% | 0.805 | 0.850 | 9230000 | - | ug/kg |
| 2-Butanone | 96 | 1.04% | 6.600 | 6.600 | 192000000 | - | ug/kg |
| 2-Methylnaphthalene | 19 | 5.26% | 1100.000 | 1100.000 | 20400000 | - | ug/kg |
| Acenaphthene | 19 | 5.26% | 74.000 | 74.000 | 40800000 | - | ug/kg |
| Acetone | 96 | 20.83% | 8.515 | 16.000 | 102000000 | - | ug/kg |
| Aluminum | 96 | 5.21% | 52000.000 | 80000.000 | 228000 | 35373.170 | mg/kg |
| Americium-241 | 160 | 13.75% | 31.598 | 566.500 | 76 | 0.020 | pCi/g |
| Anthracene | 19 | 5.26% | 110.000 | 110.000 | 204000000 | - | ug/kg |
| Arsenic | 112 | 5.36% | 18.133 | 25.500 | 22.2 | 13.140 | mg/kg |
| Barium | 112 | 15.18% | 1000.706 | 1300.000 | 26400 | 289.380 | mg/kg |
| Benzo(a)anthracene | 19 | 15.79% | 97.333 | 200.000 | 34900 | - | ug/kg |
| Benzo(a)pyrene | 19 | 5.26% | 180.000 | 180.000 | 3490 | - | ug/kg |
| Benzo(b)fluoranthene | 19 | 5.26% | 120.000 | 120.000 | 34900 | - | ug/kg |
| Benzo(k)fluoranthene | 19 | 5.26% | 170.000 | 170.000 | 349000 | - | ug/kg |
| bis(2-Ethylhexyl)phthalate | 19 | 21.05% | 107.750 | 140.000 | 1970000 | - | ug/kg |
| Carbon Tetrachloride | 96 | 2.08% | 7.270 | 14.200 | 81500 | - | ug/kg |
| Chromium | 112 | 0.89% | 77.000 | 77.000 | 268 | 68.270 | mg/kg |
| Chrysene | 19 | 15.79% | 109.333 | 230.000 | 3490000 | - | ug/kg |
| Copper | 112 | 0.89% | 93.900 | 93.900 | 40900 | 38.210 | mg/kg |
| Di-n-butylphthalate | 19 | 5.26% | 130.000 | 130.000 | 73700000 | - | ug/kg |
| Ethylbenzene | 96 | 3.13% | 3.787 | 6.460 | 4250000 | - | ug/kg |
| Fluoranthene | 19 | 21.05% | 179.250 | 500.000 | 27200000 | - | ug/kg |
| Fluorene | 19 | 5.26% | 57.000 | 57.000 | 40800000 | - | ug/kg |
| Indeno(1,2,3-cd)pyrene | 19 | 5.26% | 83.000 | 83.000 | 34900 | - | ug/kg |
| Iron | 112 | 1.79% | 41150.000 | 41200.000 | 307000 | 41046.520 | mg/kg |
| Lead | 112 | 1.79% | 33.950 | 37.000 | 1000 | 24.970 | mg/kg |
| Lithium | 96 | 4.17% | 43.000 | 50.000 | 20400 | 34.660 | mg/kg |
| Manganese | 112 | 0.89% | 950.000 | 950.000 | 3480 | 901.620 | mg/kg |
| Mercury | 108 | 0.93% | 13.800 | 13.800 | 25200 | 1.520 | mg/kg |
| Methylene chloride | 96 | 4.17% | 1.923 | 4.000 | 2530000 | - | ug/kg |
| Naphthalene | 96 | 14.58% | 102.221 | 1400.000 | 3090000 | - | ug/kg |
| Plutonium-239/240 | 161 | 14.29% | 160.894 | 3229.050 | 50 | 0.020 | pCi/g |
| Pyrene | 19 | 10.53% | 290.000 | 470.000 | 22100000 | - | ug/kg |
| Strontium | 112 | 2.68% | 216.667 | 217.000 | 613000 | 211.380 | mg/kg |
| Tetrachloroethene | 96 | 3.13% | 0.913 | 1.700 | 615000 | - | ug/kg |
| Toluene | 96 | 9.38% | 6.378 | 36.000 | 31300000 | - | ug/kg |
| Trichloroethene | 96 | 13.54% | 1.500 | 3.900 | 19600 | - | ug/kg |
| Uranium, Total | 91 | 4.40% | 7.950 | 9.900 | 2750 | 3.040 | mg/kg |
| Uranium-234 | 161 | 27.33% | 51.047 | 2056.000 | 300 | 2.640 | pCi/g |
| Uranium-235 | 161 | 40.99% | 0.635 | 27.410 | 8 | 0.120 | pCi/g |
| Uranium-238 | 161 | 42.24% | 35.726 | 2056.000 | 351 | 1.490 | pCi/g |
| Vanadium | 112 | 5.36% | 105.100 | 137.000 | 7150 | 88.490 | mg/kg |
| Xylene | 96 | 6.25% | 12.773 | 41.700 | 2040000 | - | ug/kg |
| Zinc | 112 | 0.89% | 160.000 | 160.000 | 307000 | 139.100 | mg/kg |

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## 4.0 ACCELERATED ACTION

Accelerated action objectives were developed for IHSS Group 000-4 and are described in ER RSOP Notification #05-01 (DOE 2004c) and RSOP Notifications for other IHSS Groups listed in Table 1. Based on historical information, potential contaminants of concern (PCOCs) include acids, bases, solvents, radionuclides, metals, nitrate/nitrite, oils, and photographic chemicals (DOE 1999). Depending on the requirements of IA SAP Addenda listed on Table 1, samples were analyzed for metals, nitrate, PCBs, radionuclides, semivolatile compounds (SVOCs), and volatile organic compounds (VOCs). The ER RSOP remedial action objectives (RAOs) included the following:

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

The accelerated action remediation goals for IHSS Group 000-4 included the following:

- Conduct soil sampling at valve vaults and pipelines that were not clean-closed. Soil samples will be collected at valve vaults as they are removed. It is anticipated that valve vaults 8, 9, 10, 11, 12, and 13 will be removed. Confirmation samples will be collected along pipelines at the following locations:
  - Breaks in the pipeline containment,
  - Stained soil, and
  - Pipe joints.

It is anticipated that the pipelines between valve vaults 1 and 2, valve vault 2 and Building 883, valve vaults 3 and 7, valve vaults 7 and 8, and valve vaults 8 and 13 will be removed.

- Remove soil with plutonium-239/240 or americium-241 activities greater than the RFCA WRW ALs to a depth of 3 feet, or to less than the applicable AL, which ever comes first. If concentrations are greater than 3 nanocuries per gram (nCi/g) between 3 and 6 feet, characterize and remediate in accordance with RFCA Attachment 5 (DOE et al 2003). Conduct the SSRS to evaluate the need for additional action.
- If contaminated soil is removed, collect confirmation soil samples in accordance with the IABZSAP (DOE 2004d).
- Remediation targets will be identified based on ER characterization sampling conducted as part of other IHSS Group characterization or on Decommissioning information. It is anticipated that after remediation there may be areas with concentrations of metals, radionuclides, and organics greater than background means

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plus two standard deviations or detection limits, but below RFCA ALs between 0 and 3 feet in depth.

ER accelerated action activities were conducted at IHSS Group 000-4 between January 2002 and July 2005. Starting and ending dates of significant activities are listed in Table 8. Photographs of site activities are presented in Appendix B. All accelerated action objectives were achieved. Removal activities are described below.

**Table 8**
**IHSS Group 000-4 and Other IHSS Groups**
**Approximate Dates of Accelerated Action Activities**

| Activity | Starting Date | Ending Date | Duration |
|---|---|---|---|
| Accelerated action characterization sampling | January 2002 | July 2005 | 3 years 6 months (not continuous) |
| Accelerated action soil removal activities in conjunction with characterization, in-process, and confirmation sampling | January 2002 | July 2005 | 3 years 6 months (not continuous) |
| Excavation backfilling and regrading activities | January 2002 | July 2005 | 3 years 6 months (not continuous) |

## 4.1 NPWL Disposition

The disposition of NPWL and associated valve vaults conducted as part of IHSS Group 000-4 and other IHSS Group accelerated actions is described in the following sections. Some NPWL, while not associated with a specific IHSS Group, were removed as part of nearby accelerated actions.

### 4.1.1 IHSS Group 000-1 – Solar Evaporation Ponds

The above ground NPWL that were present south of the SEP and transferred waste from the modular storage tanks (MST) to the ponds were removed in 2003 (DOE 2003a).

### 4.1.2 IHSS Group 800-1 – UBC 865 – Materials Process Building

Two NPWL sections located west of Building 865 were tapped and drained, filled with epoxy, and removed. These sections were packaged and sent off site for disposal as low-level mixed waste. The northernmost line was removed up to Valve Vault 6, and all of the line to the Building 889 area was removed (there was no remaining end to grout) (DOE 2004a).

### 4.1.3 IHSS Group 800-3

NPWL from Valve Vault 2 to Building 883 and from Valve Vault 2 to Valve Vault 1 were removed. NPWL from Valve Vault 2 to Valve Vault 3 were not removed, but were clean-closed in accordance with the RCRA Part B permit (DOE 2005d). Valve Vault 2 was removed to greater than 4 feet (ft) below ground surface and grouted.

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### 4.1.4 IHSS Group 800-6

An 8-foot section of metal housing around the NPWL (RCRA Unit 40) adjacent to Building 889 was removed. The housing was disposed of as low level radioactive waste. The remaining line consists of a high-density polyethylene (HDPE) line in which the actual waste line resides. The waste line is PVC pipe. The waste line was capped, and the space between the waste line and the HDPE line was filled with grout (DOE 2003h). The line was removed as part of the Building 865 Decontamination & Decommissioning (D&D) Project.

## 4.2 Soil Removal Activities

Only one soil removal action was taken to remediate contaminated soil as part of the IHSS Group 000-4 project. A repaired section of NPWL located between Valve Vaults 12 and 13 contained radionuclide contamination which required remediation. The area approximately 5 ft by 7 ft and 8 ft deep was excavated to remove contaminated soil (Figure 6). Following the removal of contaminated soil, confirmation sampling indicated radionuclide activities in the remaining soil were below RFCA WRW soil ALs.

## 4.3 Site Reclamation

Excavations described in Section 4.1 were backfilled with clean onsite soil. The excavation areas were regraded and revegetated.

# 5.0 CONFIRMATION SAMPLING

Confirmation samples were collected from 10 locations in areas associated with NPWL. Confirmation sampling locations and analytical results with activities or concentrations greater than background means plus two standard deviations or RLs are shown on Figure 7 and analytical results are listed in Table 9.

Confirmation samples were obtained from 5 locations in the 100/400 Area and 5 locations in the 300/500 Area. Confirmation sampling in the 100/400 Area was conducted as part of the IHSS Group 400-7 project (DOE 2004e). Confirmation samples collected in the 300/500 Area were collected after radionuclide contaminated soil detected below a repaired section of NPWL was excavated. Results of all confirmation sampling indicate all activities and concentrations are less than RFCA WRW soil ALs as shown on Figure 7.

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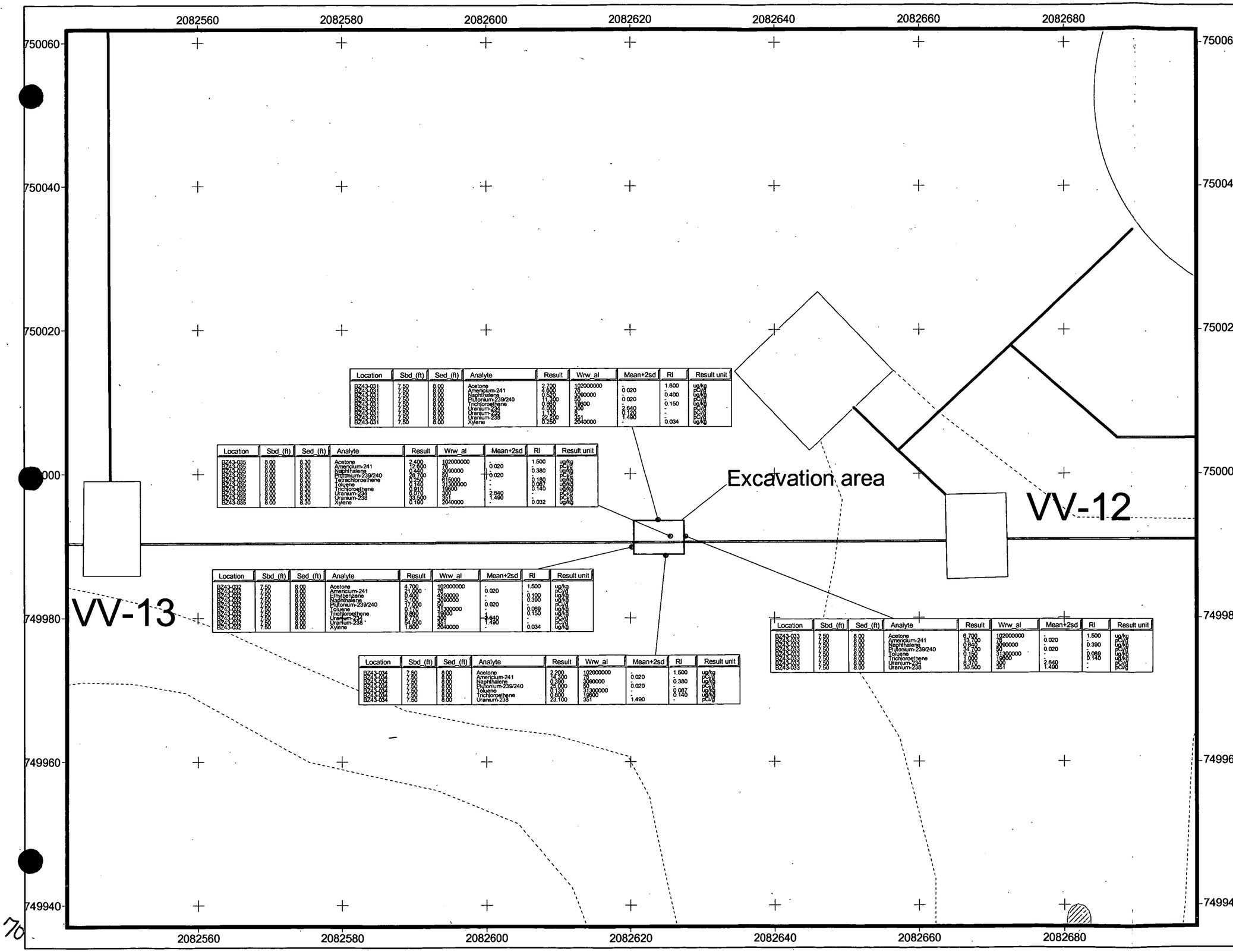


| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-031 | 7.50 | 8.00 | Acetone | 2.700 | 102000000 | - | 1.600 | ug/kg |
| BZ43-031 | 7.50 | 8.00 | Americium-241 | 4.600 | 70 | 0.020 | - | pCi/g |
| BZ43-031 | 7.50 | 8.00 | Naphthalene | 0.520 | 7960000 | - | 0.400 | ug/kg |
| BZ43-031 | 7.50 | 8.00 | Plutonium-239/240 | 11.300 | 50 | 0.020 | - | pCi/g |
| BZ43-031 | 7.50 | 8.00 | Trichloroethene | 0.980 | 19600 | - | 0.150 | ug/kg |
| BZ43-031 | 7.50 | 8.00 | Uranium-234 | 4.100 | 300 | 2.640 | - | pCi/g |
| BZ43-031 | 7.50 | 8.00 | Uranium-235 | 1.190 | 8 | 0.153 | - | pCi/g |
| BZ43-031 | 7.50 | 8.00 | Uranium-238 | 22.500 | 351 | 1.490 | - | pCi/g |
| BZ43-031 | 7.50 | 8.00 | Xylene | 0.250 | 2040000 | - | 0.034 | ug/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-035 | 8.00 | 8.30 | Acetone | 2.400 | 102000000 | - | 1.500 | ug/kg |
| BZ43-035 | 8.00 | 8.30 | Americium-241 | 7.600 | 70 | 0.020 | - | pCi/g |
| BZ43-035 | 8.00 | 8.30 | Naphthalene | 0.440 | 7960000 | - | 0.380 | ug/kg |
| BZ43-035 | 8.00 | 8.30 | Plutonium-239/240 | 28.700 | 50 | 0.020 | - | pCi/g |
| BZ43-035 | 8.00 | 8.30 | Tetrachloroethene | 0.250 | 615000 | - | 0.180 | ug/kg |
| BZ43-035 | 8.00 | 8.30 | Toluene | 0.140 | 31300000 | - | 0.097 | ug/kg |
| BZ43-035 | 8.00 | 8.30 | Trichloroethene | 0.910 | 19600 | - | 0.140 | ug/kg |
| BZ43-035 | 8.00 | 8.30 | Uranium-234 | 6.010 | 300 | 2.640 | - | pCi/g |
| BZ43-035 | 8.00 | 8.30 | Uranium-238 | 33.600 | 351 | 1.490 | - | pCi/g |
| BZ43-035 | 8.00 | 8.30 | Xylene | 0.190 | 2040000 | - | 0.032 | ug/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-032 | 7.50 | 8.00 | Acetone | 4.700 | 102000000 | - | 1.500 | ug/kg |
| BZ43-032 | 7.50 | 8.00 | Americium-241 | 21.000 | 70 | 0.020 | - | pCi/g |
| BZ43-032 | 7.50 | 8.00 | Ethylbenzene | 0.440 | 4300000 | - | 0.100 | ug/kg |
| BZ43-032 | 7.50 | 8.00 | Naphthalene | 5.100 | 7960000 | - | 0.390 | ug/kg |
| BZ43-032 | 7.50 | 8.00 | Plutonium-239/240 | 17.000 | 50 | 0.020 | - | pCi/g |
| BZ43-032 | 7.50 | 8.00 | Toluene | 0.170 | 31300000 | - | 0.088 | ug/kg |
| BZ43-032 | 7.50 | 8.00 | Trichloroethene | 0.860 | 19600 | - | 0.150 | ug/kg |
| BZ43-032 | 7.50 | 8.00 | Uranium-234 | 8.770 | 300 | 2.640 | - | pCi/g |
| BZ43-032 | 7.50 | 8.00 | Uranium-238 | 54.500 | 351 | 1.490 | - | pCi/g |
| BZ43-032 | 7.50 | 8.00 | Xylene | 1.600 | 2040000 | - | 0.034 | ug/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-034 | 7.50 | 8.00 | Acetone | 2.200 | 102000000 | - | 1.500 | ug/kg |
| BZ43-034 | 7.50 | 8.00 | Americium-241 | 14.300 | 70 | 0.020 | - | pCi/g |
| BZ43-034 | 7.50 | 8.00 | Naphthalene | 0.390 | 7960000 | - | 0.380 | ug/kg |
| BZ43-034 | 7.50 | 8.00 | Plutonium-239/240 | 45.600 | 50 | 0.020 | - | pCi/g |
| BZ43-034 | 7.50 | 8.00 | Toluene | 0.100 | 31300000 | - | 0.097 | ug/kg |
| BZ43-034 | 7.50 | 8.00 | Trichloroethene | 0.900 | 19600 | - | 0.140 | ug/kg |
| BZ43-034 | 7.50 | 8.00 | Uranium-238 | 23.100 | 351 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-033 | 7.50 | 8.00 | Acetone | 6.700 | 102000000 | - | 1.500 | ug/kg |
| BZ43-033 | 7.50 | 8.00 | Americium-241 | 13.700 | 70 | 0.020 | - | pCi/g |
| BZ43-033 | 7.50 | 8.00 | Naphthalene | 0.540 | 7960000 | - | 0.390 | ug/kg |
| BZ43-033 | 7.50 | 8.00 | Plutonium-239/240 | 34.700 | 50 | 0.020 | - | pCi/g |
| BZ43-033 | 7.50 | 8.00 | Toluene | 0.150 | 31300000 | - | 0.088 | ug/kg |
| BZ43-033 | 7.50 | 8.00 | Trichloroethene | 1.000 | 19600 | - | 0.140 | ug/kg |
| BZ43-033 | 7.50 | 8.00 | Uranium-234 | 9.370 | 300 | 2.640 | - | pCi/g |
| BZ43-033 | 7.50 | 8.00 | Uranium-238 | 30.500 | 351 | 1.490 | - | pCi/g |

# Figure 6

## 300/500 Area Excavation and Confirmation Soil Sampling Results

### KEY

- Detection less than WRW AL
- Building/structure
- Demolished structure
- Paved area
- Dirt road
- Stream, ditch, or other drainage feature
- NPWL - removed (below ground)
- NPWL - removed (above ground)
- NPWL - left in place (clean closed)
- NPWL - left in place (not part of RCRA Unit 374.3)
- Valve Vault - removed
- Valve Vault - partially removed and flow filled
- Valve Vault - partially removed and backfilled

DRAFT

N W E S

10 0 10 Feet

Scale = 1:150

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Prepared by: Date: August 2005

RADMS

Prepared for:

KAISER•HILL COMPANY

File:W:\Projects\Fy2005\000-4\NPWL cor gpp.apr

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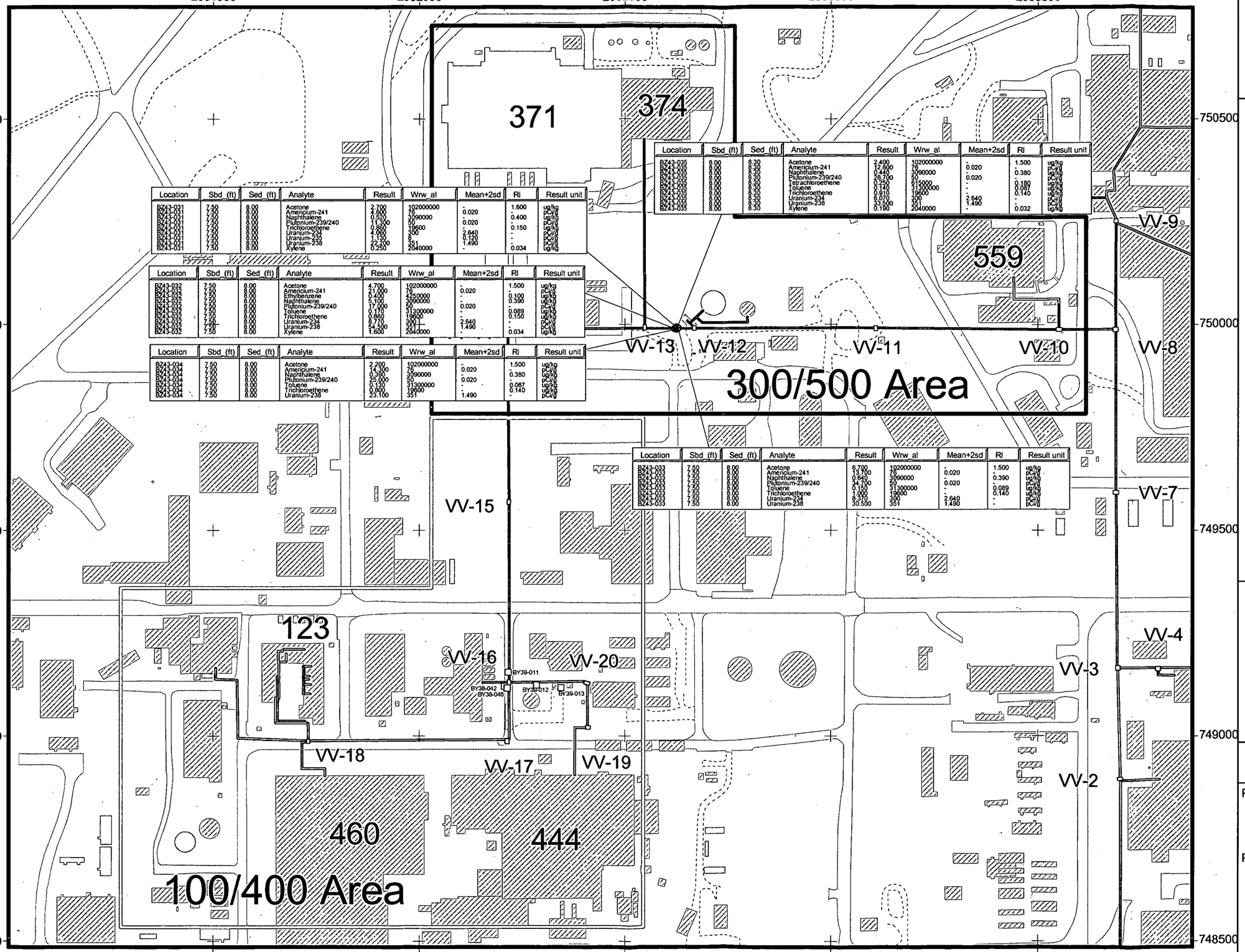
## Table 9
## IHSS Group 000-4 Soil Confirmation Results
## Greater Than Background Means Plus Two Standard Deviations or RLs

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 300/500 | 000-4 | BZ43-031 | 749993.612 | 2082623.816 | 7.50 | 8.00 | Acetone | 2.700 | 102000000 | - | 1.600 | ug/kg |
| 300/500 | 000-4 | BZ43-031 | 749993.612 | 2082623.816 | 7.50 | 8.00 | Americium-241 | 4.600 | 76 | 0.020 | - | pCi/g |
| 300/500 | 000-4 | BZ43-031 | 749993.612 | 2082623.816 | 7.50 | 8.00 | Naphthalene | 0.520 | 3090000 | - | 0.400 | ug/kg |
| 300/500 | 000-4 | BZ43-031 | 749993.612 | 2082623.816 | 7.50 | 8.00 | Plutonium-239/240 | 11.300 | 50 | 0.020 | - | pCi/g |
| 300/500 | 000-4 | BZ43-031 | 749993.612 | 2082623.816 | 7.50 | 8.00 | Trichloroethene | 0.860 | 19600 | - | 0.150 | ug/kg |
| 300/500 | 000-4 | BZ43-031 | 749993.612 | 2082623.816 | 7.50 | 8.00 | Uranium-234 | 4.060 | 300 | 2.640 | - | pCi/g |
| 300/500 | 000-4 | BZ43-031 | 749993.612 | 2082623.816 | 7.50 | 8.00 | Uranium-235 | 1.130 | 8 | 0.120 | - | pCi/g |
| 300/500 | 000-4 | BZ43-031 | 749993.612 | 2082623.816 | 7.50 | 8.00 | Uranium-238 | 22.200 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | BZ43-031 | 749993.612 | 2082623.816 | 7.50 | 8.00 | Xylene | 0.250 | 2040000 | - | 0.034 | ug/kg |
| 300/500 | 000-4 | BZ43-032 | 749989.828 | 2082620.197 | 7.50 | 8.00 | Acetone | 4.700 | 102000000 | - | 1.500 | ug/kg |
| 300/500 | 000-4 | BZ43-032 | 749989.828 | 2082620.197 | 7.50 | 8.00 | Americium-241 | 21.000 | 76 | 0.020 | - | pCi/g |
| 300/500 | 000-4 | BZ43-032 | 749989.828 | 2082620.197 | 7.50 | 8.00 | Ethylbenzene | 0.400 | 4250000 | - | 0.100 | ug/kg |
| 300/500 | 000-4 | BZ43-032 | 749989.828 | 2082620.197 | 7.50 | 8.00 | Naphthalene | 5.100 | 3090000 | - | 0.390 | ug/kg |
| 300/500 | 000-4 | BZ43-032 | 749989.828 | 2082620.197 | 7.50 | 8.00 | Plutonium-239/240 | 17.000 | 50 | 0.020 | - | pCi/g |
| 300/500 | 000-4 | BZ43-032 | 749989.828 | 2082620.197 | 7.50 | 8.00 | Toluene | 0.170 | 31300000 | - | 0.089 | ug/kg |
| 300/500 | 000-4 | BZ43-032 | 749989.828 | 2082620.197 | 7.50 | 8.00 | Trichloroethene | 0.860 | 19600 | - | 0.150 | ug/kg |
| 300/500 | 000-4 | BZ43-032 | 749989.828 | 2082620.197 | 7.50 | 8.00 | Uranium-234 | 8.770 | 300 | 2.640 | - | pCi/g |
| 300/500 | 000-4 | BZ43-032 | 749989.828 | 2082620.197 | 7.50 | 8.00 | Uranium-238 | 54.500 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | BZ43-032 | 749989.828 | 2082620.197 | 7.50 | 8.00 | Xylene | 1.600 | 2040000 | - | 0.034 | ug/kg |
| 300/500 | 000-4 | BZ43-033 | 749991.319 | 2082627.596 | 7.50 | 8.00 | Acetone | 6.700 | 102000000 | - | 1.500 | ug/kg |
| 300/500 | 000-4 | BZ43-033 | 749991.319 | 2082627.596 | 7.50 | 8.00 | Americium-241 | 13.700 | 76 | 0.020 | - | pCi/g |
| 300/500 | 000-4 | BZ43-033 | 749991.319 | 2082627.596 | 7.50 | 8.00 | Naphthalene | 0.640 | 3090000 | - | 0.390 | ug/kg |
| 300/500 | 000-4 | BZ43-033 | 749991.319 | 2082627.596 | 7.50 | 8.00 | Plutonium-239/240 | 34.700 | 50 | 0.020 | - | pCi/g |
| 300/500 | 000-4 | BZ43-033 | 749991.319 | 2082627.596 | 7.50 | 8.00 | Toluene | 0.150 | 31300000 | - | 0.089 | ug/kg |
| 300/500 | 000-4 | BZ43-033 | 749991.319 | 2082627.596 | 7.50 | 8.00 | Trichloroethene | 1.000 | 19600 | - | 0.140 | ug/kg |
| 300/500 | 000-4 | BZ43-033 | 749991.319 | 2082627.596 | 7.50 | 8.00 | Uranium-234 | 8.370 | 300 | 2.640 | - | pCi/g |
| 300/500 | 000-4 | BZ43-033 | 749991.319 | 2082627.596 | 7.50 | 8.00 | Uranium-238 | 30.500 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | BZ43-034 | 749988.668 | 2082624.879 | 7.50 | 8.00 | Acetone | 2.200 | 102000000 | - | 1.500 | ug/kg |

| Area | IHSS Group | Location | Actual Northing | Actual Easting | Starting Depth (ft) | Ending Depth (ft) | Analyte | Result | WRW AL | Background Mean Plus 2 SD | RL | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 300/500 | 000-4 | BZ43-034 | 749988.668 | 2082624.879 | 7.50 | 8.00 | Americium-241 | 14.300 | 76 | 0.020 | - | pCi/g |
| 300/500 | 000-4 | BZ43-034 | 749988.668 | 2082624.879 | 7.50 | 8.00 | Naphthalene | 0.390 | 3090000 | - | 0.380 | ug/kg |
| 300/500 | 000-4 | BZ43-034 | 749988.668 | 2082624.879 | 7.50 | 8.00 | Plutonium-239/240 | 25.000 | 50 | 0.020 | - | pCi/g |
| 300/500 | 000-4 | BZ43-034 | 749988.668 | 2082624.879 | 7.50 | 8.00 | Toluene | 0.130 | 31300000 | - | 0.087 | ug/kg |
| 300/500 | 000-4 | BZ43-034 | 749988.668 | 2082624.879 | 7.50 | 8.00 | Trichloroethene | 0.800 | 19600 | - | 0.140 | ug/kg |
| 300/500 | 000-4 | BZ43-034 | 749988.668 | 2082624.879 | 7.50 | 8.00 | Uranium-238 | 23.100 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | BZ43-035 | 749991.322 | 2082625.491 | 8.00 | 8.30 | Acetone | 2.400 | 102000000 | - | 1.500 | ug/kg |
| 300/500 | 000-4 | BZ43-035 | 749991.322 | 2082625.491 | 8.00 | 8.30 | Americium-241 | 12.600 | 76 | 0.020 | - | pCi/g |
| 300/500 | 000-4 | BZ43-035 | 749991.322 | 2082625.491 | 8.00 | 8.30 | Naphthalene | 0.440 | 3090000 | - | 0.380 | ug/kg |
| 300/500 | 000-4 | BZ43-035 | 749991.322 | 2082625.491 | 8.00 | 8.30 | Plutonium-239/240 | 28.700 | 50 | 0.020 | - | pCi/g |
| 300/500 | 000-4 | BZ43-035 | 749991.322 | 2082625.491 | 8.00 | 8.30 | Tetrachloroethene | 0.250 | 615000 | - | 0.180 | ug/kg |
| 300/500 | 000-4 | BZ43-035 | 749991.322 | 2082625.491 | 8.00 | 8.30 | Toluene | 0.140 | 31300000 | - | 0.087 | ug/kg |
| 300/500 | 000-4 | BZ43-035 | 749991.322 | 2082625.491 | 8.00 | 8.30 | Trichloroethene | 0.910 | 19600 | - | 0.140 | ug/kg |
| 300/500 | 000-4 | BZ43-035 | 749991.322 | 2082625.491 | 8.00 | 8.30 | Uranium-234 | 6.070 | 300 | 2.640 | - | pCi/g |
| 300/500 | 000-4 | BZ43-035 | 749991.322 | 2082625.491 | 8.00 | 8.30 | Uranium-238 | 33.500 | 351 | 1.490 | - | pCi/g |
| 300/500 | 000-4 | BZ43-035 | 749991.322 | 2082625.491 | 8.00 | 8.30 | Xylene | 0.190 | 2040000 | - | 0.032 | ug/kg |




| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-031 | 7.50 | 8.00 | Acetone | 2.700 | 102000000 | - | 1.600 | ug/kg |
| BZ43-031 | 7.50 | 8.00 | Americium-241 | 4.600 | 76 | 0.020 | - | pCi/g |
| BZ43-031 | 7.50 | 8.00 | Naphthalene | 0.520 | 3090000 | - | 0.400 | ug/kg |
| BZ43-031 | 7.50 | 8.00 | Plutonium-239/240 | 11.300 | 50 | 0.020 | - | pCi/g |
| BZ43-031 | 7.50 | 8.00 | Trichloroethene | 0.860 | 19600 | - | 0.150 | ug/kg |
| BZ43-031 | 7.50 | 8.00 | Uranium-234 | 4.060 | 300 | 2.640 | - | pCi/g |
| BZ43-031 | 7.50 | 8.00 | Uranium-235 | 1.130 | 8 | 0.120 | - | pCi/g |
| BZ43-031 | 7.50 | 8.00 | Uranium-238 | 22.200 | 351 | 1.490 | - | pCi/g |
| BZ43-031 | 7.50 | 8.00 | Xylene | 0.250 | 2040000 | - | 0.034 | ug/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-032 | 7.50 | 8.00 | Acetone | 4.700 | 102000000 | - | 1.500 | ug/kg |
| BZ43-032 | 7.50 | 8.00 | Americium-241 | 21.000 | 76 | 0.020 | - | pCi/g |
| BZ43-032 | 7.50 | 8.00 | Ethylbenzene | 0.400 | 4250000 | - | 0.100 | ug/kg |
| BZ43-032 | 7.50 | 8.00 | Naphthalene | 5.100 | 3090000 | - | 0.390 | ug/kg |
| BZ43-032 | 7.50 | 8.00 | Plutonium-239/240 | 17.000 | 50 | 0.020 | - | pCi/g |
| BZ43-032 | 7.50 | 8.00 | Toluene | 0.170 | 31300000 | - | 0.089 | ug/kg |
| BZ43-032 | 7.50 | 8.00 | Trichloroethene | 0.860 | 19600 | - | 0.150 | ug/kg |
| BZ43-032 | 7.50 | 8.00 | Uranium-234 | 8.770 | 300 | 2.640 | - | pCi/g |
| BZ43-032 | 7.50 | 8.00 | Uranium-238 | 54.500 | 351 | 1.490 | - | pCi/g |
| BZ43-032 | 7.50 | 8.00 | Xylene | 1.600 | 2040000 | - | 0.034 | ug/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-034 | 7.50 | 8.00 | Acetone | 2.200 | 102000000 | - | 1.500 | ug/kg |
| BZ43-034 | 7.50 | 8.00 | Americium-241 | 14.300 | 76 | 0.020 | - | pCi/g |
| BZ43-034 | 7.50 | 8.00 | Naphthalene | 0.330 | 3090000 | - | 0.380 | ug/kg |
| BZ43-034 | 7.50 | 8.00 | Plutonium-239/240 | 25.000 | 50 | 0.020 | - | pCi/g |
| BZ43-034 | 7.50 | 8.00 | Toluene | 0.130 | 31300000 | - | 0.087 | ug/kg |
| BZ43-034 | 7.50 | 8.00 | Trichloroethene | 0.800 | 19600 | - | 0.140 | ug/kg |
| BZ43-034 | 7.50 | 8.00 | Uranium-238 | 23.100 | 351 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-035 | 8.00 | 8.30 | Acetone | 2.400 | 102000000 | - | 1.500 | ug/kg |
| BZ43-035 | 8.00 | 8.30 | Americium-241 | 12.600 | 76 | 0.020 | - | pCi/g |
| BZ43-035 | 8.00 | 8.30 | Naphthalene | 0.440 | 3090000 | - | 0.380 | ug/kg |
| BZ43-035 | 8.00 | 8.30 | Plutonium-239/240 | 28.700 | 50 | 0.020 | - | pCi/g |
| BZ43-035 | 8.00 | 8.30 | Tetrachloroethene | 0.250 | 615000 | - | 0.180 | ug/kg |
| BZ43-035 | 8.00 | 8.30 | Toluene | 0.140 | 31300000 | - | 0.087 | ug/kg |
| BZ43-035 | 8.00 | 8.30 | Trichloroethene | 0.910 | 19600 | - | 0.140 | ug/kg |
| BZ43-035 | 8.00 | 8.30 | Uranium-234 | 6.070 | 300 | 2.640 | - | pCi/g |
| BZ43-035 | 8.00 | 8.30 | Uranium-238 | 33.500 | 351 | 1.490 | - | pCi/g |
| BZ43-035 | 8.00 | 8.30 | Xylene | 0.180 | 2040000 | - | 0.032 | ug/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-033 | 7.50 | 8.00 | Acetone | 6.700 | 102000000 | - | 1.500 | ug/kg |
| BZ43-033 | 7.50 | 8.00 | Americium-241 | 13.700 | 76 | 0.020 | - | pCi/g |
| BZ43-033 | 7.50 | 8.00 | Naphthalene | 0.840 | 3090000 | - | 0.390 | ug/kg |
| BZ43-033 | 7.50 | 8.00 | Plutonium-239/240 | 34.700 | 50 | 0.020 | - | pCi/g |
| BZ43-033 | 7.50 | 8.00 | Toluene | 0.150 | 31300000 | - | 0.089 | ug/kg |
| BZ43-033 | 7.50 | 8.00 | Trichloroethene | 1.000 | 19600 | - | 0.140 | ug/kg |
| BZ43-033 | 7.50 | 8.00 | Uranium-234 | 8.370 | 300 | 2.640 | - | pCi/g |
| BZ43-033 | 7.50 | 8.00 | Uranium-238 | 30.500 | 351 | 1.490 | - | pCi/g |

# Figure 7

## 100/400 and 300/500 Area Confirmation Soil Sampling Results

### KEY

- Detection less than WRW AL
- Below background or MDL/RL
- Building/structure
- Demolished structure
- Paved area
- Dirt road
- Stream, ditch, or other drainage feature
- NPWL - removed (below ground)
- NPWL - removed (above ground)
- NPWL - left in place (clean closed)
- NPWL - left in place (not part of RCRA Unit 374.3)
- Valve Vault - removed
- Valve Vault - partially removed and flow filled
- Valve Vault - partially removed and backfilled

DRAFT

N W E S

200 0 200 Feet

Scale = 1:2,750

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Prepared by: RADMS

Date: August 2005

Prepared for: KAISER•HILL COMPANY

File:W:\Projects\Fy2005\000-4\NPWL cor gpp.apr

## 6.0 RCRA UNIT CLOSURE

NPWL is RCRA Unit 374.3 and was closed in accordance with approved RCRA closure description documents (CDDs) (DOE 2002e and 2003i) and the RFETS RCRA Part B Permit (CO-097-05-03-01), Part X, Closure (CDPHE 1997). Closure of the unit is described in the Closure Summary Report for the 700/800 Process Waste Transfer System, RCRA Unit 374.3 (DOE 2005f in preparation).

## 7.0 SUBSURFACE SOIL RISK SCREEN

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

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

No. One sampling location contains arsenic at a concentration greater than the RFCA WRW soil AL. This location (CF33-010) did not require remediation because the nonradionuclide contaminant was detected at a depth greater than 6 in below the surface (5 ft bgs).

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

No. While some sampling locations are in an area mapped as prone to landslides, backfill and regrading of the area has buried residual contamination to depths greater than 3 ft bgs. Additionally, regrading, compacting, and revegetating this area will further reduce the likelihood of erosion in this area. Other areas of the Site containing NPWL are not considered to pose a significant landslide risk.

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

No. No radionuclide contamination greater than 1 nCi/g exists at depths between 3 and 6 ft bgs and activities of residual radionuclides do not exceed RFCA WRW soil ALs..

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

No. Contaminant migration via groundwater is the primary pathway whereby surface water could be impacted by residual contamination from IHSS Group 000-4. As described in Screen 2, most locations containing NPWL are stable areas that are not prone to landslides or high erosion.

The potential for exceedances of surface water standards via the groundwater pathway should be minimal for the following reasons:

- Major portions of NPWL has been removed, eliminating these areas as potential sources;



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- Remaining NPWL has been rinsed, sampled for RCRA constituents, and shown to be RCRA-clean, further eliminating potential future releases of contamination.
- Contaminated soil has been excavated from areas associated with NPWL, with exception to the areas described in Section 2.2, thereby removing potential continuing sources to groundwater contamination;
- Radionuclides and metals are relatively immobile;
- Results for organics were below RFCA WRW soil ALs; and
- Erosion controls will be incorporated as part of the final ground surface reconfiguration in this area, and ongoing surface water quality monitoring will continue to ensure the long-term effectiveness of the accelerated action for protecting surface water.

## 8.0 STEWARDSHIP ANALYSIS

The IHSS Group 000-4 stewardship evaluation was conducted through ongoing consultation with the regulatory agencies. Throughout the project, informal project updates from the Field Project Manager were provided through e-mails, telephone conversations, and personal contacts. Copies of Regulatory Contact Records are provided in Appendix A.

### 8.1 Current Site Conditions

As discussed in Section 2.3, accelerated actions at IHSS Group 000-4 consisted of characterization sampling of soil, excavation radionuclide contaminated soil, and in-process and confirmation sampling of soil. Based upon the accelerated actions performed and analytical results of sampling, conditions at IHSS Group 000-4 include the following:

- Approximately 15,300 ft of NPWL were removed and disposed of from the Site.
- Approximately 6,200 ft of NPWL was grouted and left in place.
- All valve vaults (total of 20) associated with NPWL were removed as part of the IHSS Group 000-4 project.
- The potential sources of contamination related to NPWL that existed at concentrations greater than RFCA WRW soil ALs were removed unless remediation was not required based on RFCA (DOE et al. 2003).
- Arsenic is the residual contaminant remaining at a concentration greater than the RFCA WRW soil AL; however, remediation was not required according to RFCA (DOE et al. 2003)



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- Backfilling of excavations and regrading has been completed. Final grading of areas containing NPWL will be conducted as part of other projects.

## 8.2 Near-Term Management Recommendations

Because residual contaminant concentrations are low and potential contaminant sources have been identified or removed according to accelerated action objectives, no specific near-term management actions are required. Contaminant concentrations in soil remaining at IHSS Group 000-4 do not trigger any further accelerated action.

- Near-term recommendations include the following:

- Excavation at the site will continue to be controlled through the Site Soil Disturbance Permit process;

- Access will be restricted; and

- Site access and the Soil Disturbance Permit process will remain in place pending implementation of long-term controls.

## 8.3 Long-Term Stewardship Recommendations

Based on remaining environmental conditions at IHSS Group 000-4, no IHSS Group-specific long-term stewardship activities are recommended beyond the generally applicable Site requirements. Institutional controls that may be used as appropriate for this area include the following:

- Prohibitions on construction of buildings;

- Restrictions on excavation or other soil disturbance; and

- Prohibition on groundwater pumping in the area of IHSS Group 000-4 and other IHSS Groups.

Currently, no Group-specific engineering controls or environmental monitoring are recommended as a result of the conditions remaining at IHSS Group 000-4. Likewise, no specific institutional or physical controls are recommended as a result of the conditions remaining at IHSS Group 000-4.

IHSS Group 000-4 will be evaluated as part of the Sitewide Comprehensive Risk Assessment (CRA). The CRA is part of the RI/FS that will be conducted for the Site.

The need for and extent of any more general, long-term stewardship activities will also be analyzed in the RI/FS and proposed as part of the preferred alternative in the Proposed Plan for the Site. Institutional controls and other long-term stewardship requirements for the Site will ultimately be contained in the Corrective Action Decision/Record of Decision (CAD/ROD). This Closeout Report and associated documentation will be retained as part of the Rocky Flats Administrative Record (AR) file.



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## 9.0 DEVIATIONS FROM THE ER RSOP

There were no deviations from ER RSOP Notification #05-01 (DOE 2004c) or other ER RSOP Notifications listed in Table 1.

## 10.0 POST-ACCELERATED ACTION CONDITIONS

Residual contaminant concentrations are below RFCA WRW soil ALs at IHSS Group 000-2, with the exception of arsenic at one location. This location did not require remediation based on RFCA (DOE et al. 2003).

## 11.0 WASTE MANAGEMENT

NPWL derived waste was classified as LLW and LLMW. Waste consisted of soil, pipe, concrete, and debris generated during NPWL excavations and removal operations. Waste from both the NPWL and OPWL projects were occasionally combined in the same waste containers. NPWL lines and valve vaults that did not meet RCRA clean closure and were removed, are covered under the RCRA Closure Summary Report (DOE 2005 in progress).

## 12.0 SITE RECLAMATION

Final regrading and revegetation of the area is being conducted as part of other projects.

## 13.0 NLR SAMPLING LOCATIONS

The sampling location designated NLR for IHSS Group 000-4 is listed in Table 10. NLR locations are flagged in the RFETS Soil Water Database (SWD) to ensure they will not be incorporated into the Sitewide CRA or other Site analyses.

**Table 10**
**IHSS Group 000-4 and Other IHSS Groups NLR Sampling Locations**

| Area | Location | Northing | Easting | Media | Starting Depth (ft) | Ending Depth (ft) |
|---|---|---|---|---|---|---|
| 300/500 | BX44-001 | 749990.711 | 2082622.966 | Soil | 7.0 | 7.5 |



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## 14.0 DATA QUALITY ASSESSMENT

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

- Regulatory agency-approved sampling program design in accordance with the IASAP (DOE 2001a) and IABZSAP(DOE 2004d);
- Collection of samples in accordance with the sampling design;
- Implementation of remediation activities in accordance with ER RSOP Notification #05-01 (DOE 2004c); and
- Results of the DQA, as described in the following sections.

### 14.1 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), 1994a, Guidance for the Data Quality Objective Process, QA/G-4;
- EPA, 1998, Guidance for the Data Quality Assessment Process, Practical Methods for Data Analysis, QA/G-9; and
- U.S. Department of Energy (DOE), 1999, Quality Assurance, Order 414.1A.

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

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- K-H, 2002c, V&V Guidelines for Volatile Organics, DA-SS01-v3, October;
- K-H, 2002d, V&V Guidelines for Semivolatile Organics, DA-SS02-v3, October;
- K-H, 2002e, V&V Guidelines for Metals, DA-SS05-v3, October; 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) AR for permanent storage 30 days after being provided to CDPHE and/or EPA.

## 14.2 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 (that is, 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. Standardized real and QC data are included on the enclosed CD.

### 14.2.1 Accuracy

The following measures of accuracy were evaluated:

- LCSs;
- Surrogates;
- Field blanks; and
- Sample MSs.

Results are compared to method requirements and project goals. The results of these comparisons are summarized for RFCA COCs where the results 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***

As indicated in Table 11, LCS analyses were run for all methods except gamma spectroscopy. When the In-Situ Counting System (ISOCS) technique is used for gamma spectroscopy, an internal standard approach is used instead of LCSs. The onsite laboratory that performs gamma spectroscopy is therefore not required to provide LCS data.

**Table 11**
**LCS Summary**

| Test Method | Laboratory Batch | LCS Run? |
|---|---|---|
| Alpha spectroscopy | 134601 | Yes |
| Alpha spectroscopy | 134603 | Yes |
| Alpha spectroscopy | 134604 | Yes |
| Alpha spectroscopy | 150814 | Yes |
| Alpha spectroscopy | 150816 | Yes |
| Alpha spectroscopy | 150818 | Yes |
| Alpha spectroscopy | 155458 | Yes |
| Alpha spectroscopy | 155459 | Yes |
| Alpha spectroscopy | 155460 | Yes |
| Alpha spectroscopy | 157408 | Yes |
| Alpha spectroscopy | 157410 | Yes |
| Alpha spectroscopy | 157414 | Yes |
| Alpha spectroscopy | 3351162 | Yes |
| Alpha spectroscopy | 3351171 | Yes |
| Alpha spectroscopy | 3351176 | Yes |

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| Test Method | Laboratory Batch | LCS Run? |
|---|---|---|
| Alpha spectroscopy | 353989 | Yes |
| Alpha spectroscopy | 353991 | Yes |
| Alpha spectroscopy | 358819 | Yes |
| Alpha spectroscopy | 358841 | Yes |
| Alpha spectroscopy | 358844 | Yes |
| Alpha spectroscopy | 361428 | Yes |
| Alpha spectroscopy | 4092576 | Yes |
| Alpha spectroscopy | 4092577 | Yes |
| Alpha spectroscopy | 4092580 | Yes |
| Alpha spectroscopy | 4111247 | Yes |
| Alpha spectroscopy | 4111253 | Yes |
| Alpha spectroscopy | 4111262 | Yes |
| Alpha spectroscopy | 4121231 | Yes |
| Alpha spectroscopy | 4121241 | Yes |
| Alpha spectroscopy | 4121245 | Yes |
| Alpha spectroscopy | 4160453 | Yes |
| Alpha spectroscopy | 4160456 | Yes |
| Alpha spectroscopy | 4160458 | Yes |
| Alpha spectroscopy | 4167250 | Yes |
| Alpha spectroscopy | 4167252 | Yes |
| Alpha spectroscopy | 4167258 | Yes |
| Alpha spectroscopy | 4183145 | Yes |
| Alpha spectroscopy | 4183146 | Yes |
| Alpha spectroscopy | 4183147 | Yes |
| Alpha spectroscopy | 4211368 | Yes |
| Alpha spectroscopy | 4211370 | Yes |
| Alpha spectroscopy | 4211371 | Yes |
| Alpha spectroscopy | 4216498 | Yes |
| Alpha spectroscopy | 4216499 | Yes |
| Alpha spectroscopy | 4216500 | Yes |
| Alpha spectroscopy | 4219331 | Yes |
| Alpha spectroscopy | 4219344 | Yes |
| Alpha spectroscopy | 4219356 | Yes |
| Alpha spectroscopy | 4289356 | Yes |
| Alpha spectroscopy | 4289359 | Yes |
| Alpha spectroscopy | 4289363 | Yes |
| Alpha spectroscopy | 4296316 | Yes |
| Alpha spectroscopy | 4296320 | Yes |
| Alpha spectroscopy | 4296321 | Yes |
| Alpha spectroscopy | 4317491 | Yes |
| Alpha spectroscopy | 4317528 | Yes |
| Alpha spectroscopy | 4317532 | Yes |
| Alpha spectroscopy | 4328194 | Yes |
| Alpha spectroscopy | 4328196 | Yes |

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| Test Method | Laboratory Batch | LCS Run? |
|---|---|---|
| Alpha spectroscopy | 4328197 | Yes |
| Alpha spectroscopy | 4334398 | Yes |
| Alpha spectroscopy | 4334400 | Yes |
| Alpha spectroscopy | 4334403 | Yes |
| Alpha spectroscopy | 4336464 | Yes |
| Alpha spectroscopy | 4336467 | Yes |
| Alpha spectroscopy | 4336470 | Yes |
| Alpha spectroscopy | 4342446 | Yes |
| Alpha spectroscopy | 4342448 | Yes |
| Alpha spectroscopy | 4342450 | Yes |
| Alpha spectroscopy | 4345481 | Yes |
| Alpha spectroscopy | 4345482 | Yes |
| Alpha spectroscopy | 4345483 | Yes |
| Alpha spectroscopy | 4352580 | Yes |
| Alpha spectroscopy | 4352586 | Yes |
| Alpha spectroscopy | 4352588 | Yes |
| Alpha spectroscopy | 5054408 | Yes |
| Alpha spectroscopy | 5054413 | Yes |
| Alpha spectroscopy | 5054416 | Yes |
| Alpha spectroscopy | 5055549 | Yes |
| Alpha spectroscopy | 5055551 | Yes |
| Alpha spectroscopy | 5055553 | Yes |
| Alpha spectroscopy | 5069439 | Yes |
| Alpha spectroscopy | 5069442 | Yes |
| Alpha spectroscopy | 5069446 | Yes |
| Alpha spectroscopy | 5081546 | Yes |
| Alpha spectroscopy | 5081548 | Yes |
| Alpha spectroscopy | 5081549 | Yes |
| Alpha spectroscopy | 5082474 | Yes |
| Alpha spectroscopy | 5082477 | Yes |
| Alpha spectroscopy | 5082480 | Yes |
| Alpha spectroscopy | 5084143 | Yes |
| Alpha spectroscopy | 5084146 | Yes |
| Alpha spectroscopy | 5084148 | Yes |
| Alpha spectroscopy | 5099077 | Yes |
| Alpha spectroscopy | 5099078 | Yes |
| Alpha spectroscopy | 5099079 | Yes |
| Alpha spectroscopy | 5113101 | Yes |
| Alpha spectroscopy | 5116456 | Yes |
| Alpha spectroscopy | 5116459 | Yes |
| Alpha spectroscopy | 5117611 | Yes |
| Alpha spectroscopy | 5117612 | Yes |
| Alpha spectroscopy | 5117614 | Yes |
| Alpha spectroscopy | 5125579 | Yes |

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| Test Method | Laboratory Batch | LCS Run? |
|---|---|---|
| Alpha spectroscopy | 5125580 | Yes |
| Alpha spectroscopy | 5125582 | Yes |
| Alpha spectroscopy | 5146298 | Yes |
| Alpha spectroscopy | 5146303 | Yes |
| Alpha spectroscopy | 5146306 | Yes |
| Alpha spectroscopy | 5151612 | Yes |
| Alpha spectroscopy | 5151616 | Yes |
| Alpha spectroscopy | 5151618 | Yes |
| Alpha spectroscopy | 5157541 | Yes |
| Alpha spectroscopy | 5157542 | Yes |
| Alpha spectroscopy | 5157543 | Yes |
| Alpha spectroscopy | 5166524 | Yes |
| Alpha spectroscopy | 5166526 | Yes |
| Alpha spectroscopy | 5166528 | Yes |
| Alpha spectroscopy | 5174568 | Yes |
| Alpha spectroscopy | 5174570 | Yes |
| Alpha spectroscopy | 5174573 | Yes |
| Alpha spectroscopy | 5195494 | Yes |
| Alpha spectroscopy | 5195496 | Yes |
| Alpha spectroscopy | 5195498 | Yes |
| SW-846 1311,6010,7470 | 5056523 | Yes |
| SW-846 1311,6010,7470 | 5059173 | Yes |
| SW-846 1311,6010,7470 | 5062313 | Yes |
| SW-846 1311/ 8260 | 5061555 | Yes |
| SW-846 6010 | 2297318 | Yes |
| SW-846 6010 | 2301278 | Yes |
| SW-846 6010 | 3248347 | Yes |
| SW-846 6010 | 3248379 | Yes |
| SW-846 6010 | 3259526 | Yes |
| SW-846 6010 | 3259550 | Yes |
| SW-846 6010 | 3268610 | Yes |
| SW-846 6010 | 3268617 | Yes |
| SW-846 6010 | 3295497 | Yes |
| SW-846 6010 | 3295521 | Yes |
| SW-846 6010 | 3324287 | Yes |
| SW-846 6010 | 3324288 | Yes |
| SW-846 6010 | 3350508 | Yes |
| SW-846 6010 | 3350510 | Yes |
| SW-846 6010 | 3365402 | Yes |
| SW-846 6010 | 3365409 | Yes |
| SW-846 6010 | 4002141 | Yes |
| SW-846 6010 | 4002142 | Yes |
| SW-846 6010 | 4015467 | Yes |
| SW-846 6010 | 4015468 | Yes |

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| Test Method | Laboratory Batch | LCS Run? |
|---|---|---|
| SW-846 6010 | 4016264 | Yes |
| SW-846 6010 | 4091618 | Yes |
| SW-846 6010 | 4092267 | Yes |
| SW-846 6010 | 4104163 | Yes |
| SW-846 6010 | 4104248 | Yes |
| SW-846 6010 | 4105563 | Yes |
| SW-846 6010 | 4107218 | Yes |
| SW-846 6010 | 4114446 | Yes |
| SW-846 6010 | 4118156 | Yes |
| SW-846 6010 | 4119276 | Yes |
| SW-846 6010 | 4119291 | Yes |
| SW-846 6010 | 4119306 | Yes |
| SW-846 6010 | 4119316 | Yes |
| SW-846 6010 | 4120557 | Yes |
| SW-846 6010 | 4121379 | Yes |
| SW-846 6010 | 4153599 | Yes |
| SW-846 6010 | 4155256 | Yes |
| SW-846 6010 | 4156465 | Yes |
| SW-846 6010 | 4157058 | Yes |
| SW-846 6010 | 4169554 | Yes |
| SW-846 6010 | 4170201 | Yes |
| SW-846 6010 | 4176245 | Yes |
| SW-846 6010 | 4176376 | Yes |
| SW-846 6010 | 4189537 | Yes |
| SW-846 6010 | 4194372 | Yes |
| SW-846 6010 | 4210685 | Yes |
| SW-846 6010 | 4210686 | Yes |
| SW-846 6010 | 4213081 | Yes |
| SW-846 6010 | 4215253 | Yes |
| SW-846 6010 | 4217180 | Yes |
| SW-846 6010 | 4217533 | Yes |
| SW-846 6010 | 4220111 | Yes |
| SW-846 6010 | 4220116 | Yes |
| SW-846 6010 | 4232455 | Yes |
| SW-846 6010 | 4232611 | Yes |
| SW-846 6010 | 4288655 | Yes |
| SW-846 6010 | 4289427 | Yes |
| SW-846 6010 | 4294553 | Yes |
| SW-846 6010 | 4299180 | Yes |
| SW-846 6010 | 4321211 | Yes |
| SW-846 6010 | 4321553 | Yes |
| SW-846 6010 | 4328406 | Yes |
| SW-846 6010 | 4329319 | Yes |
| SW-846 6010 | 4329640 | Yes |

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| Test Method | Laboratory Batch | LCS Run? |
|---|---|---|
| SW-846 6010 | 4335511 | Yes |
| SW-846 6010 | 4338277 | Yes |
| SW-846 6010 | 4343666 | Yes |
| SW-846 6010 | 4345160 | Yes |
| SW-846 6010 | 4349535 | Yes |
| SW-846 6010 | 4350224 | Yes |
| SW-846 6010 | 4351669 | Yes |
| SW-846 6010 | 4352502 | Yes |
| SW-846 6010 | 5040298 | Yes |
| SW-846 6010 | 5040335 | Yes |
| SW-846 6010 | 5048463 | Yes |
| SW-846 6010 | 5049282 | Yes |
| SW-846 6010 | 5067499 | Yes |
| SW-846 6010 | 5069192 | Yes |
| SW-846 6010 | 5069615 | Yes |
| SW-846 6010 | 5070396 | Yes |
| SW-846 6010 | 5075592 | Yes |
| SW-846 6010 | 5075658 | Yes |
| SW-846 6010 | 5082546 | Yes |
| SW-846 6010 | 5083361 | Yes |
| SW-846 6010 | 5095549 | Yes |
| SW-846 6010 | 5096167 | Yes |
| SW-846 6010 | 5109586 | Yes |
| SW-846 6010 | 5111217 | Yes |
| SW-846 6010 | 5116122 | Yes |
| SW-846 6010 | 5116290 | Yes |
| SW-846 6010 | 5123534 | Yes |
| SW-846 6010 | 5126214 | Yes |
| SW-846 6010 | 5144484 | Yes |
| SW-846 6010 | 5144522 | Yes |
| SW-846 6010 | 5147523 | Yes |
| SW-846 6010 | 5151263 | Yes |
| SW-846 6010 | 5153595 | Yes |
| SW-846 6010 | 5154247 | Yes |
| SW-846 6010 | 5165200 | Yes |
| SW-846 6010 | 5165583 | Yes |
| SW-846 6010 | 5173538 | Yes |
| SW-846 6010 | 5174214 | Yes |
| SW-846 6010 | 5193524 | Yes |
| SW-846 6010 | 5194457 | Yes |
| SW-846 6010/6010B | 2184209 | Yes |
| SW-846 6010/6010B | 2186325 | Yes |
| SW-846 8082 | 4105525 | Yes |
| SW-846 8082 | 4107424 | Yes |

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| Test Method | Laboratory Batch | LCS Run? |
|---|---|---|
| SW-846 8082 | 4114653 | Yes |
| SW-846 8082 | 4153605 | Yes |
| SW-846 8260 | 2189455 | Yes |
| SW-846 8260 | 3218284 | Yes |
| SW-846 8260 | 4092330 | Yes |
| SW-846 8260 | 4106271 | Yes |
| SW-846 8260 | 4116262 | Yes |
| SW-846 8260 | 4155145 | Yes |
| SW-846 8260 | 4177180 | Yes |
| SW-846 8260 | 4210697 | Yes |
| SW-846 8260 | 4217265 | Yes |
| SW-846 8260 | 4218570 | Yes |
| SW-846 8260 | 4219154 | Yes |
| SW-846 8260 | 4233251 | Yes |
| SW-846 8260 | 4299228 | Yes |
| SW-846 8260 | 4355369 | Yes |
| SW-846 8260 | 5049324 | Yes |
| SW-846 8260 | 5068294 | Yes |
| SW-846 8260 | 5073331 | Yes |
| SW-846 8260 | 5077350 | Yes |
| SW-846 8260 | MS1 VOA_030401B | Yes |
| SW-846 8260 | MS1 VOA_040412A | Yes |
| SW-846 8260 | MS1 VOA_040415A | Yes |
| SW-846 8260 | MS1 VOA_040517A | Yes |
| SW-846 8260 | MS1 VOA_040518A | Yes |
| SW-846 8260 | MS1 VOA_040519A | Yes |
| SW-846 8260 | MS1 VOA_040630A | Yes |
| SW-846 8260 | MS1 VOA_041012A | Yes |
| SW-846 8260 | MS1 VOA_041025A | Yes |
| SW-846 8260 | MS1 VOA_041209A | Yes |
| SW-846 8260 | MS1 VOA_050208A | Yes |
| SW-846 8260 | MS2 VOA_030924A | Yes |
| SW-846 8260 | MS2 VOA_031211A | Yes |
| SW-846 8260 | MS2 VOA_040113A | Yes |
| SW-846 8260 | MS2 VOA_040413A | Yes |
| SW-846 8260 | MS2 VOA_040505A | Yes |
| SW-846 8260 | MS2 VOA_040519A | Yes |
| SW-846 8260 | MS2 VOA_040602A | Yes |
| SW-846 8260 | MS2 VOA_040722A | Yes |
| SW-846 8260 | MS3 VOA_021021A | Yes |
| SW-846 8260 | MS3 VOA_030407B | Yes |
| SW-846 8260 | MS3 VOA_030514B | Yes |
| SW-846 8260 | MS3 VOA_030905A | Yes |
| SW-846 8260 | MS3 VOA_030914B | Yes |

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| Test Method | Laboratory Batch | LCS Run? |
|---|---|---|
| SW-846 8260 | MS3 VOA_031021A | Yes |
| SW-846 8260 | MS3 VOA_031031A | Yes |
| SW-846 8260 | MS3 VOA_031104A | Yes |
| SW-846 8260 | MS3 VOA_031224A | Yes |
| SW-846 8260 | MS3 VOA_040407A | Yes |
| SW-846 8260 | MS3 VOA_040518A | Yes |
| SW-846 8260 | MS3 VOA_040520A | Yes |
| SW-846 8270 | 2300097 | Yes |
| SW-846 8270 | 3096146 | Yes |
| SW-846 8270 | 3136440 | Yes |
| SW-846 8270 | 3248545 | Yes |
| SW-846 8270 | 3350376 | Yes |
| SW-846 8270 | 4103698 | Yes |
| SW-846 8270 | 4105542 | Yes |
| SW-846 8270 | 4131667 | Yes |
| SW-846 8270 | 4189096 | Yes |
| SW-846 8270 | 4299438 | Yes |
| SW-846 8270 | 4350443 | Yes |
| SW-846 8270 | 4352635 | Yes |
| SW-846 8270 | 5046401 | Yes |
| SW-846 8270B | 2185110 | Yes |
| SW9056 OR E300.0 PREP E300.0 | 4219389 | Yes |
| SW9056 OR E300.0 PREP E300.0 | 4219390 | Yes |
| SW9056 OR E300.0 PREP E300.0 | 4349296 | Yes |
| SW9056 OR E300.0 PREP E300.0 | 4349297 | Yes |
| SW9056 OR E300.0 PREP E300.0 | 5152357 | Yes |
| SW9056 OR E300.0 PREP E300.0 | 5158564 | Yes |
| SW9056 OR E300.0 PREP E300.0 | 5166251 | Yes |
| SW9056 OR E300.0 PREP E300.0 | 5174535 | Yes |

The minimum and maximum LCS results are tabulated, by chemical, for the entire project in Table 12. LCS results 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 unacceptably 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 affect project decisions. Based on this analysis, the LCS recoveries for this project did not affect project decisions.

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## Table 12
## LCS Evaluation Summary

| Test Method | CAS No. | Analyte | Minimum Percent Recovery | Maximum Percent Recovery |
|---|---|---|---|---|
| SW-846 8260 | 71-55-6 | 1,1,1-Trichloroethane | 77.46 | 117.80 |
| SW-846 8260 | 79-34-5 | 1,1,2,2-Tetrachloroethane | 74.00 | 119.00 |
| SW-846 8260 | 79-00-5 | 1,1,2-Trichloroethane | 77.08 | 112.00 |
| SW-846 8260 | 75-34-3 | 1,1-Dichloroethane | 82.51 | 116.40 |
| SW-846 8260 | 75-35-4 | 1,1-Dichloroethene | 85.00 | 131.20 |
| SW-846 8270 | 120-82-1 | 1,2,4-Trichlorobenzene | 60.00 | 78.00 |
| SW-846 8270B | 120-82-1 | 1,2,4-Trichlorobenzene | 56.00 | 56.00 |
| SW-846 8260 | 120-82-1 | 1,2,4-Trichlorobenzene | 74.00 | 134.60 |
| SW-846 8260 | 95-50-1 | 1,2-Dichlorobenzene | 75.00 | 124.80 |
| SW-846 8260 | 107-06-2 | 1,2-Dichloroethane | 79.77 | 121.00 |
| SW-846 8260 | 78-87-5 | 1,2-Dichloropropane | 80.27 | 114.40 |
| SW-846 8270B | 106-46-7 | 1,4-Dichlorobenzene | 56.00 | 56.00 |
| SW-846 8260 | 106-46-7 | 1,4-Dichlorobenzene | 78.00 | 129.20 |
| SW-846 8270 | 95-95-4 | 2,4,5-Trichlorophenol | 60.00 | 83.00 |
| SW-846 8270 | 88-06-2 | 2,4,6-Trichlorophenol | 62.00 | 79.00 |
| SW-846 8270 | 120-83-2 | 2,4-Dichlorophenol | 62.00 | 77.00 |
| SW-846 8270 | 105-67-9 | 2,4-Dimethylphenol | 59.00 | 77.00 |
| SW-846 8270 | 51-28-5 | 2,4-Dinitrophenol | 25.00 | 97.00 |
| SW-846 8270B | 121-14-2 | 2,4-Dinitrotoluene | 64.00 | 64.00 |
| SW-846 8270 | 121-14-2 | 2,4-Dinitrotoluene | 65.00 | 88.00 |
| SW-846 8270 | 606-20-2 | 2,6-Dinitrotoluene | 63.00 | 87.00 |
| SW-846 8260 | 78-93-3 | 2-Butanone | 51.54 | 121.00 |
| SW-846 8270 | 91-58-7 | 2-Chloronaphthalene | 61.00 | 80.00 |
| SW-846 8270 | 95-57-8 | 2-Chlorophenol | 63.00 | 77.00 |
| SW-846 8270B | 95-57-8 | 2-Chlorophenol | 63.00 | 63.00 |
| SW-846 8270 | 91-57-6 | 2-Methylnaphthalene | 62.00 | 78.00 |
| SW-846 8270 | 95-48-7 | 2-Methylphenol | 64.00 | 77.00 |
| SW-846 8270 | 88-74-4 | 2-Nitroaniline | 64.00 | 86.00 |
| SW-846 8270 | 91-94-1 | 3,3'-Dichlorobenzidine | 45.00 | 68.00 |
| SW-846 8270 | 534-52-1 | 4,6-Dinitro-2-methylphenol | 35.00 | 100.00 |
| SW-846 8270 | 106-47-8 | 4-Chloroaniline | 30.00 | 63.00 |
| SW-846 8260 | 108-10-1 | 4-Methyl-2-pentanone | 64.74 | 121.00 |
| SW-846 8270 | 106-44-5 | 4-Methylphenol | 64.00 | 79.00 |
| SW-846 8270 | 100-02-7 | 4-Nitrophenol | 59.00 | 93.00 |
| SW-846 8270B | 100-02-7 | 4-Nitrophenol | 59.00 | 59.00 |
| SW-846 8270 | 83-32-9 | Acenaphthene | 60.00 | 80.00 |
| SW-846 8270B | 83-32-9 | Acenaphthene | 58.00 | 58.00 |
| SW-846 8260 | 67-64-1 | Acetone | 30.88 | 131.70 |
| SW-846 6010 | 7429-90-5 | Aluminum | 84.00 | 108.00 |
| SW-846 6010/6010B | 7429-90-5 | Aluminum | 97.00 | 97.00 |
| ALPHA SPEC | 14596-10-2 | Americium-241 | 102.00 | 102.00 |

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| Test Method | CAS No. | Analyte | Minimum Percent Recovery | Maximum Percent Recovery |
|---|---|---|---|---|
| SW-846 8270 | 120-12-7 | Anthracene | 59.00 | 86.00 |
| SW-846 6010/6010B | 7440-36-0 | Antimony | 99.00 | 99.00 |
| SW-846 6010 | 7440-36-0 | Antimony | 80.00 | 102.00 |
| SW-846 8082 | 12674-11-2 | Aroclor-1016 | 72.00 | 87.00 |
| SW-846 8082 | 11096-82-5 | Aroclor-1260 | 72.00 | 105.00 |
| SW-846 6010 | 7440-38-2 | Arsenic | 81.00 | 102.00 |
| SW-846 6010/6010B | 7440-38-2 | Arsenic | 99.00 | 99.00 |
| SW-846 6010/6010B | 7440-39-3 | Barium | 107.00 | 107.00 |
| SW-846 6010 | 7440-39-3 | Barium | 88.00 | 106.00 |
| SW-846 8260 | 71-43-2 | Benzene | 82.96 | 119.70 |
| SW-846 8270 | 56-55-3 | Benzo(a)anthracene | 58.00 | 81.00 |
| SW-846 8270 | 50-32-8 | Benzo(a)pyrene | 59.00 | 83.00 |
| SW-846 8270 | 205-99-2 | Benzo(b)fluoranthene | 58.00 | 86.00 |
| SW-846 8270 | 207-08-9 | Benzo(k)fluoranthene | 57.00 | 87.00 |
| SW-846 8270 | 65-85-0 | Benzoic Acid | 29.00 | 59.00 |
| SW-846 8270 | 100-51-6 | Benzyl Alcohol | 64.00 | 78.00 |
| SW-846 6010 | 7440-41-7 | Beryllium | 89.00 | 106.00 |
| SW-846 6010/6010B | 7440-41-7 | Beryllium | 101.00 | 101.00 |
| SW-846 8270 | 111-44-4 | bis(2-Chloroethyl)ether | 59.00 | 79.00 |
| SW-846 8270 | 39638-32-9 | bis(2-Chloroisopropyl)ether | 60.00 | 76.00 |
| SW-846 8270 | 117-81-7 | bis(2-Ethylhexyl)phthalate | 60.00 | 93.00 |
| SW-846 8260 | 75-27-4 | Bromodichloromethane | 80.62 | 119.40 |
| SW-846 8260 | 75-25-2 | Bromoform | 79.24 | 125.00 |
| SW-846 8260 | 74-83-9 | Bromomethane | 58.06 | 164.30 |
| SW-846 8270 | 85-68-7 | Butylbenzylphthalate | 58.00 | 89.00 |
| SW-846 6010/6010B | 7440-43-9 | Cadmium | 104.00 | 104.00 |
| SW-846 6010 | 7440-43-9 | Cadmium | 84.00 | 104.00 |
| SW-846 8260 | 75-15-0 | Carbon Disulfide | 57.00 | 153.80 |
| SW-846 8260 | 56-23-5 | Carbon Tetrachloride | 74.84 | 122.00 |
| SW-846 8260 | 108-90-7 | Chlorobenzene | 84.47 | 124.60 |
| SW-846 8260 | 75-00-3 | Chloroethane | 75.10 | 155.20 |
| SW-846 8260 | 67-66-3 | Chloroform | 78.43 | 117.20 |
| SW-846 8260 | 74-87-3 | Chloromethane | 45.13 | 239.60 |
| SW-846 6010 | 7440-47-3 | Chromium | 86.00 | 106.00 |
| SW-846 6010/6010B | 7440-47-3 | Chromium | 105.00 | 105.00 |
| SW-846 8270 | 218-01-9 | Chrysene | 57.00 | 84.00 |
| SW-846 8260 | 10061-01-5 | cis-1,3-Dichloropropene | 75.39 | 119.10 |
| SW-846 6010/6010B | 7440-48-4 | Cobalt | 102.00 | 102.00 |
| SW-846 6010 | 7440-48-4 | Cobalt | 83.00 | 104.00 |
| SW-846 6010 | 7440-50-8 | Copper | 86.00 | 105.00 |
| SW-846 6010/6010B | 7440-50-8 | Copper | 105.00 | 105.00 |
| SW-846 8270 | 84-74-2 | Di-n-butylphthalate | 60.00 | 90.00 |
| SW-846 8270 | 117-84-0 | Di-n-octylphthalate | 55.00 | 85.00 |

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| Test Method | CAS No. | Analyte | Minimum Percent Recovery | Maximum Percent Recovery |
|---|---|---|---|---|
| SW-846 8270 | 53-70-3 | Dibenz(a,h)anthracene | 56.00 | 92.00 |
| SW-846 8270 | 132-64-9 | Dibenzofuran | 60.00 | 85.00 |
| SW-846 8260 | 124-48-1 | Dibromochloromethane | 81.82 | 120.00 |
| SW-846 8270 | 84-66-2 | Diethylphthalate | 63.00 | 85.00 |
| SW-846 8270 | 131-11-3 | Dimethylphthalate | 61.00 | 83.00 |
| SW-846 8260 | 100-41-4 | Ethylbenzene | 84.72 | 125.10 |
| SW-846 8270 | 206-44-0 | Fluoranthene | 55.00 | 82.00 |
| SW-846 8270 | 86-73-7 | Fluorene | 60.00 | 81.00 |
| SW-846 8270 | 118-74-1 | Hexachlorobenzene | 62.00 | 87.00 |
| SW-846 8260 | 87-68-3 | Hexachlorobutadiene | 74.00 | 138.40 |
| SW-846 8270 | 87-68-3 | Hexachlorobutadiene | 59.00 | 85.00 |
| SW-846 8270 | 77-47-4 | Hexachlorocyclopentadiene | 41.00 | 100.00 |
| SW-846 8270 | 67-72-1 | Hexachloroethane | 62.00 | 75.00 |
| SW-846 8270 | 193-39-5 | Indeno(1,2,3-cd)pyrene | 58.00 | 84.00 |
| SW-846 6010/6010B | 7439-89-6 | Iron | 100.00 | 100.00 |
| SW-846 6010 | 7439-89-6 | Iron | 90.00 | 112.00 |
| SW-846 8270 | 78-59-1 | Isophorone | 63.00 | 99.00 |
| SW-846 6010 | 7439-92-1 | Lead | 85.00 | 104.00 |
| SW-846 6010/6010B | 7439-92-1 | Lead | 104.00 | 104.00 |
| SW-846 6010/6010B | 7439-93-2 | Lithium | 99.00 | 99.00 |
| SW-846 6010 | 7439-93-2 | Lithium | 89.00 | 107.00 |
| SW-846 6010 | 7439-96-5 | Manganese | 86.00 | 105.00 |
| SW-846 6010/6010B | 7439-96-5 | Manganese | 105.00 | 105.00 |
| SW-846 6010/6010B | 7439-97-6 | Mercury | 98.00 | 98.00 |
| SW-846 6010 | 7439-97-6 | Mercury | 84.00 | 112.00 |
| SW-846 8260 | 75-09-2 | Methylene chloride | 59.00 | 135.90 |
| SW-846 6010 | 7439-98-7 | Molybdenum | 82.00 | 104.00 |
| SW-846 6010/6010B | 7439-98-7 | Molybdenum | 101.00 | 101.00 |
| SW-846 8270 | 86-30-6 | n-Nitrosodiphenylamine | 71.00 | 91.00 |
| SW-846 8270 | 621-64-7 | n-Nitrosodipropylamine | 60.00 | 77.00 |
| SW-846 8270B | 621-64-7 | n-Nitrosodipropylamine | 58.00 | 58.00 |
| SW-846 8270 | 91-20-3 | Naphthalene | 59.00 | 75.00 |
| SW-846 8260 | 91-20-3 | Naphthalene | 70.00 | 118.10 |
| SW-846 6010/6010B | 7440-02-0 | Nickel | 104.00 | 104.00 |
| SW-846 6010 | 7440-02-0 | Nickel | 85.00 | 105.00 |
| SW9056 OR E300.0 PREP E300.0 | 14797-55-8 | Nitrate | 92.00 | 97.00 |
| SW9056 OR E300.0 PREP E300.0 | 14797-65-0 | Nitrite | 95.00 | 97.00 |
| SW-846 8270 | 98-95-3 | Nitrobenzene | 63.00 | 75.00 |
| SW-846 8270 | 87-86-5 | Pentachlorophenol | 33.00 | 78.00 |
| SW-846 8270B | 87-86-5 | Pentachlorophenol | 47.00 | 47.00 |
| SW-846 8270B | 108-95-2 | Phenol | 62.00 | 62.00 |
| SW-846 8270 | 108-95-2 | Phenol | 63.00 | 77.00 |

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| Test Method | CAS No. | Analyte | Minimum Percent Recovery | Maximum Percent Recovery |
|---|---|---|---|---|
| ALPHA SPEC | 10-12-8 | Plutonium-239/240 | 101.00 | 101.00 |
| SW-846 8270 | 129-00-0 | Pyrene | 56.00 | 88.00 |
| SW-846 8270B | 129-00-0 | Pyrene | 68.00 | 68.00 |
| SW-846 6010/6010B | 7782-49-2 | Selenium | 95.00 | 95.00 |
| SW-846 6010 | 7782-49-2 | Selenium | 81.00 | 105.00 |
| SW-846 6010 | 7440-22-4 | Silver | 86.00 | 113.00 |
| SW-846 6010/6010B | 7440-22-4 | Silver | 102.00 | 102.00 |
| SW-846 6010/6010B | 7440-24-6 | Strontium | 107.00 | 107.00 |
| SW-846 6010 | 7440-24-6 | Strontium | 88.00 | 105.00 |
| SW-846 8260 | 100-42-5 | Styrene | 84.23 | 121.90 |
| SW-846 8260 | 127-18-4 | Tetrachloroethene | 80.00 | 127.40 |
| SW-846 6010 | 7440-31-5 | Tin | 81.00 | 104.00 |
| SW-846 6010/6010B | 7440-31-5 | Tin | 101.00 | 101.00 |
| SW-846 8260 | 108-88-3 | Toluene | 79.00 | 134.60 |
| SW-846 8260 | 10061-02-6 | trans-1,3-Dichloropropene | 83.00 | 119.00 |
| SW-846 8260 | 79-01-6 | Trichloroethene | 82.81 | 121.30 |
| SW-846 6010/6010B | 11-09-6 | Uranium, Total | 111.00 | 111.00 |
| SW-846 6010 | 11-09-6 | Uranium, Total | 91.00 | 112.00 |
| ALPHA SPEC | 7440-61-1 | Uranium-238 | 83.00 | 83.00 |
| SW-846 6010/6010B | 7440-62-2 | Vanadium | 106.00 | 106.00 |
| SW-846 6010 | 7440-62-2 | Vanadium | 86.00 | 106.00 |
| SW-846 8260 | 75-01-4 | Vinyl chloride | 55.87 | 194.60 |
| SW-846 8260 | 1330-20-7 | Xylene | 84.27 | 123.80 |
| SW-846 6010 | 7440-66-6 | Zinc | 82.00 | 108.00 |
| SW-846 6010/6010B | 7440-66-6 | Zinc | 100.00 | 100.00 |

### *Surrogate Evaluation*

The frequency of surrogate measurements, relative to each laboratory batch, is given in Table 13. Surrogate frequency was adequate based on at least one set per sample. The minimum and maximum surrogate results are also tabulated, by chemical, for the entire project. Surrogates are added to every sample, and, therefore, surrogate recoveries only impact individual samples. Unacceptable surrogate recoveries can indicate potential matrix effects. The highest and lowest surrogate recoveries for this project were reviewed, and results did not affect project decisions.

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**Table 13**
**Surrogate Recovery Summary**

| VOC Surrogate Recoveries | | | | |
|---|---|---|---|---|
| **Number of Samples** | **Analyte** | **Minimum Recovery** | **Maximum Recovery** | **Unit** |
| 99 | 4-Bromofluorobenzene | 85 | 124 | %REC |
| 99 | Deuterated 1,2-dichloroethane | 81 | 130.4 | %REC |
| 99 | Deuterated Toluene | 85.85 | 114.4 | %REC |
| **SVOC Surrogate Recoveries** | | | | |
| **Number of Samples** | **Analyte** | **Minimum Recovery** | **Maximum Recovery** | **Unit** |
| 23 | 2-Fluorobiphenyl | 47 | 74 | %REC |
| 23 | 2-Fluorophenol | 55 | 81 | %REC |
| 23 | Deuterated Nitrobenzene | 54 | 84 | %REC |
| 23 | p-Terphenyl-d14 | 56 | 98 | %REC |

% REC – percent recovery

### *Field Blank Evaluation*

Results of the field blank analyses are listed in Table 14. 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, blank contamination did not adversely impact project decisions.

**Table 14**
**Field Blank Summary**

| Laboratory | CAS No. | Analyte | Sample QC Code | Detected Result | Unit |
|---|---|---|---|---|---|
| ESTLDEN | 120-82-1 | 1,2,4-Trichlorobenzene | FB | 0.2200 | ug/L |
| STLDEN | 78-93-3 | 2-Butanone | FB | 5.4000 | ug/L |
| ESTLDEN | 78-93-3 | 2-Butanone | RNS | 2.2000 | ug/L |
| STLDEN | 78-93-3 | 2-Butanone | TB | 5.5000 | ug/L |
| ESTLDEN | 78-93-3 | 2-Butanone | TB | 10.0000 | ug/L |
| GEL | 78-93-3 | 2-Butanone | TB | 6.1000 | ug/L |
| ESTLDEN | 78-93-3 | 2-Butanone | FB | 2.4000 | ug/L |
| ESTLDEN | 67-64-1 | Acetone | TB | 120.0000 | ug/L |
| ESTLDEN | 67-64-1 | Acetone | RNS | 3.5000 | ug/L |
| GEL | 67-64-1 | Acetone | TB | 9.1000 | ug/L |
| STLDEN | 67-64-1 | Acetone | FB | 7.8000 | ug/L |
| URS | 67-64-1 | Acetone | TB | 28.0000 | ug/L |
| URS | 67-64-1 | Acetone | FB | 42.0000 | ug/L |
| ESTLDEN | 67-64-1 | Acetone | FB | 32.0000 | ug/L |
| STLDEN | 67-64-1 | Acetone | TB | 8.1000 | ug/L |
| ESTLDEN | 7429-90-5 | Aluminum | FB | 0.1300 | mg/L |
| ESTLDEN | 7429-90-5 | Aluminum | RNS | 0.2000 | mg/L |

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| Laboratory | CAS No. | Analyte | Sample QC Code | Detected Result | Unit |
|---|---|---|---|---|---|
| STLDEN | 7429-90-5 | Aluminum | RNS | 17.2000 | ug/L |
| ESTLDEN | 14596-10-2 | Americium-241 | FB | 0.0444 | pCi/L |
| GEL | 14596-10-2 | Americium-241 | RNS | 0.0576 | pCi/L |
| ESTLDEN | 7440-36-0 | Antimony | FB | 0.0043 | mg/L |
| ESTLDEN | 7440-36-0 | Antimony | RNS | 0.0051 | mg/L |
| ESTLDEN | 7440-39-3 | Barium | FB | 0.0018 | mg/L |
| ESTLDEN | 7440-39-3 | Barium | RNS | 0.0068 | mg/L |
| STLDEN | 7440-39-3 | Barium | RNS | 2.1000 | ug/L |
| URS | 71-43-2 | Benzene | TB | 2.0000 | ug/L |
| ESTLDEN | 7440-41-7 | Beryllium | RNS | 0.0008 | mg/L |
| ESTLDEN | 75-27-4 | Bromodichloromethane | TB | 1.7000 | ug/L |
| URS | 75-27-4 | Bromodichloromethane | FB | 1.4000 | ug/L |
| URS | 75-27-4 | Bromodichloromethane | TB | 1.6000 | ug/L |
| ESTLDEN | 7440-43-9 | Cadmium | RNS | 0.0003 | mg/L |
| ESTLDEN | 75-15-0 | Carbon Disulfide | TB | 0.2800 | ug/L |
| ESTLDEN | 108-90-7 | Chlorobenzene | TB | 0.2400 | ug/L |
| URS | 67-66-3 | Chloroform | FB | 1.7000 | ug/L |
| ESTLDEN | 67-66-3 | Chloroform | TB | 2.1000 | ug/L |
| URS | 67-66-3 | Chloroform | TB | 2.0000 | ug/L |
| ESTLDEN | 7440-47-3 | Chromium | RNS | 0.0021 | mg/L |
| ESTLDEN | 7440-50-8 | Copper | FB | 0.0250 | mg/L |
| ESTLDEN | 7440-50-8 | Copper | RNS | 0.0250 | mg/L |
| ESTLDEN | 124-48-1 | Dibromochloromethane | TB | 0.7600 | ug/L |
| ESTLDEN | 100-41-4 | Ethylbenzene | TB | 0.1800 | ug/L |
| ESTLDEN | 100-41-4 | Ethylbenzene | FB | 0.2000 | ug/L |
| ESTLDEN | 7439-89-6 | Iron | RNS | 0.3400 | mg/L |
| STLDEN | 7439-89-6 | Iron | RNS | 45.8000 | ug/L |
| ESTLDEN | 7439-89-6 | Iron | FB | 0.2400 | mg/L |
| ESTLDEN | 7439-92-1 | Lead | RNS | 0.0730 | mg/L |
| ESTLDEN | 7439-93-2 | Lithium | RNS | 0.0031 | mg/L |
| ESTLDEN | 7439-93-2 | Lithium | FB | 0.0039 | mg/L |
| ESTLDEN | 7439-96-5 | Manganese | FB | 0.0028 | mg/L |
| ESTLDEN | 7439-96-5 | Manganese | RNS | 0.0081 | mg/L |
| STLDEN | 7439-96-5 | Manganese | RNS | 1.5000 | ug/L |
| ESTLDEN | 7439-97-6 | Mercury | RNS | 0.0001 | mg/L |
| ESTLDEN | 7439-97-6 | Mercury | FB | 0.0001 | mg/L |
| ESTLDEN | 75-09-2 | Methylene chloride | FB | 0.3400 | ug/L |
| ESTLDEN | 75-09-2 | Methylene chloride | TB | 0.6500 | ug/L |
| STLDEN | 7439-98-7 | Molybdenum | RNS | 1.7000 | ug/L |
| ESTLDEN | 7439-98-7 | Molybdenum | RNS | 0.0030 | mg/L |
| ESTLDEN | 91-20-3 | Naphthalene | FB | 0.5700 | ug/L |
| URS | 91-20-3 | Naphthalene | FB | 1.7000 | ug/L |
| URS | 91-20-3 | Naphthalene | TB | 2.5000 | ug/L |
| URS | 91-20-3 | Naphthalene | RNS | 2.0000 | ug/L |

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| Laboratory | CAS No. | Analyte | Sample QC Code | Detected Result | Unit |
|---|---|---|---|---|---|
| ESTLDEN | 91-20-3 | Naphthalene | TB | 0.7500 | ug/L |
| ESTLDEN | 10-12-8 | Plutonium-239/240 | FB | 0.0820 | pCi/L |
| GEL | 10-12-8 | Plutonium-239/240 | RNS | 0.0116 | pCi/L |
| ESTLDEN | 7782-49-2 | Selenium | FB | 0.0054 | mg/L |
| ESTLDEN | 7440-22-4 | Silver | FB | 0.0011 | mg/L |
| ESTLDEN | 7440-22-4 | Silver | RNS | 0.0012 | mg/L |
| STLDEN | 7440-24-6 | Strontium | RNS | 2.4000 | ug/L |
| ESTLDEN | 7440-24-6 | Strontium | RNS | 0.0033 | mg/L |
| ESTLDEN | 7440-24-6 | Strontium | FB | 0.0020 | mg/L |
| ESTLDEN | 7440-31-5 | Tin | FB | 0.0075 | mg/L |
| STLDEN | 7440-31-5 | Tin | RNS | 3.8000 | ug/L |
| ESTLDEN | 7440-31-5 | Tin | RNS | 0.0082 | mg/L |
| URS | 108-88-3 | Toluene | FB | 2.2000 | ug/L |
| URS | 108-88-3 | Toluene | TB | 4.5000 | ug/L |
| ESTLDEN | 108-88-3 | Toluene | FB | 3.8000 | ug/L |
| ESTLDEN | 108-88-3 | Toluene | TB | 3.8000 | ug/L |
| URS | 108-88-3 | Toluene | RNS | 1.8000 | ug/L |
| STLDEN | 108-88-3 | Toluene | RNS | 0.4400 | ug/L |
| STLDEN | 108-88-3 | Toluene | FB | 0.5300 | ug/L |
| STLDEN | 108-88-3 | Toluene | TB | 0.5000 | ug/L |
| ESTLDEN | 79-01-6 | Trichloroethene | TB | 0.2500 | ug/L |
| GEL | 11-08-5 | Uranium-234 | RNS | 0.0996 | pCi/L |
| ESTLDEN | 11-08-5 | Uranium-234 | FB | 0.1010 | pCi/L |
| URS | 15117-96-1 | Uranium-235 | FB | 0.2140 | pCi/g |
| ESTLDEN | 15117-96-1 | Uranium-235 | FB | 0.2050 | pCi/L |
| URS | 15117-96-1 | Uranium-235 | RNS | 0.2340 | pCi/g |
| URS | 7440-61-1 | Uranium-238 | FB | 3.3800 | pCi/g |
| URS | 7440-61-1 | Uranium-238 | RNS | 3.8500 | pCi/g |
| ESTLDEN | 7440-61-1 | Uranium-238 | FB | 0.0657 | pCi/L |
| ESTLDEN | 1330-20-7 | Xylene | FB | 0.7200 | ug/L |
| URS | 1330-20-7 | Xylene | TB | 2.6000 | ug/L |
| ESTLDEN | 1330-20-7 | Xylene | TB | 0.6400 | ug/L |
| ESTLDEN | 7440-66-6 | Zinc | RNS | 0.0330 | mg/L |
| ESTLDEN | 7440-66-6 | Zinc | FB | 0.0140 | mg/L |
| STLDEN | 7440-66-6 | Zinc | RNS | 9.6000 | ug/L |

Field blank (EB = equipment, FB = field, RNS = rinse, TB = trip)
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 15. Organic analytes with unacceptably low recoveries resulted in a review of the LCS recoveries. According to the EPA data validation guidelines (EPA 1994b), if organic MS recoveries are low, the data reviewer may use the MS and MSD

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results in conjunction with other QC criteria. For this project, the LCS recoveries were checked, and these checks indicate no decisions were impacted for organic analytes. For inorganics, the associated maximum sample results were divided by the lowest percent recovery for each analyte. If the resulting number was less than the AL, decisions were not impacted, and no action was taken. For this project, all results were acceptable. Low recoveries of barium, iron, manganese, silver, and zinc did not affect project decisions.

**Table 15**
**Sample MS Evaluation Summary**

| Test Method | CAS No. | Analyte | Minimum Percent Recovery | Maximum Percent Recovery | No. of Samples | No. of Lab Batches |
|---|---|---|---|---|---|---|
| SW-846 8260 | 71-55-6 | 1,1,1-Trichloroethane | 78.3 | 118.0 | %REC | 19 |
| SW-846 8260 | 79-34-5 | 1,1,2,2-Tetrachloroethane | 46.2 | 143.4 | %REC | 19 |
| SW-846 8260 | 79-00-5 | 1,1,2-Trichloroethane | 68.7 | 110.0 | %REC | 19 |
| SW-846 8260 | 75-34-3 | 1,1-Dichloroethane | 77.9 | 115.0 | %REC | 19 |
| SW-846 8260 | 75-35-4 | 1,1-Dichloroethene | 62.3 | 106.0 | %REC | 20 |
| SW-846 8270 | 120-82-1 | 1,2,4-Trichlorobenzene | 54.0 | 77.0 | %REC | 9 |
| SW-846 8260 | 120-82-1 | 1,2,4-Trichlorobenzene | 32.0 | 94.0 | %REC | 19 |
| SW-846 8260 | 95-50-1 | 1,2-Dichlorobenzene | 57.2 | 99.3 | %REC | 19 |
| SW-846 8260 | 107-06-2 | 1,2-Dichloroethane | 72.6 | 127.0 | %REC | 19 |
| SW-846 8260 | 78-87-5 | 1,2-Dichloropropane | 70.4 | 111.2 | %REC | 19 |
| SW-846 8260 | 106-46-7 | 1,4-Dichlorobenzene | 57.4 | 101.0 | %REC | 19 |
| SW-846 8270 | 95-95-4 | 2,4,5-Trichlorophenol | 55.0 | 80.0 | %REC | 9 |
| SW-846 8270 | 88-06-2 | 2,4,6-Trichlorophenol | 51.0 | 80.0 | %REC | 9 |
| SW-846 8270 | 120-83-2 | 2,4-Dichlorophenol | 52.0 | 78.0 | %REC | 9 |
| SW-846 8270 | 105-67-9 | 2,4-Dimethylphenol | 55.0 | 77.0 | %REC | 9 |
| SW-846 8270 | 51-28-5 | 2,4-Dinitrophenol | 35.0 | 62.0 | %REC | 9 |
| SW-846 8270 | 121-14-2 | 2,4-Dinitrotoluene | 55.0 | 84.0 | %REC | 9 |
| SW-846 8270 | 606-20-2 | 2,6-Dinitrotoluene | 53.0 | 82.0 | %REC | 9 |
| SW-846 8260 | 78-93-3 | 2-Butanone | 68.7 | 164.2 | %REC | 19 |
| SW-846 8270 | 91-58-7 | 2-Chloronaphthalene | 53.0 | 78.0 | %REC | 9 |
| SW-846 8270 | 95-57-8 | 2-Chlorophenol | 56.0 | 81.0 | %REC | 9 |
| SW-846 8270 | 91-57-6 | 2-Methylnaphthalene | 56.0 | 79.0 | %REC | 9 |
| SW-846 8270 | 95-48-7 | 2-Methylphenol | 56.0 | 81.0 | %REC | 9 |
| SW-846 8270 | 88-74-4 | 2-Nitroaniline | 57.0 | 83.0 | %REC | 9 |
| SW-846 8270 | 91-94-1 | 3,3'-Dichlorobenzidine | 46.0 | 69.0 | %REC | 9 |
| SW-846 8270 | 534-52-1 | 4,6-Dinitro-2-methylphenol | 35.0 | 69.0 | %REC | 9 |
| SW-846 8270 | 106-47-8 | 4-Chloroaniline | 45.0 | 74.0 | %REC | 9 |
| SW-846 8260 | 108-10-1 | 4-Methyl-2-pentanone | 69.3 | 122.0 | %REC | 19 |
| SW-846 8270 | 106-44-5 | 4-Methylphenol | 59.0 | 85.0 | %REC | 9 |
| SW-846 8270 | 100-02-7 | 4-Nitrophenol | 50.0 | 82.0 | %REC | 9 |
| SW-846 8270 | 83-32-9 | Acenaphthene | 54.0 | 77.0 | %REC | 9 |
| SW-846 8260 | 67-64-1 | Acetone | 65.0 | 195.8 | %REC | 19 |
| SW-846 6010 | 7429-90-5 | Aluminum | 208.0 | 10800.0 | %REC | 31 |
| SW-846 8270 | 120-12-7 | Anthracene | 57.0 | 83.0 | %REC | 9 |

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| Test Method | CAS No. | Analyte | Minimum Percent Recovery | Maximum Percent Recovery | No. of Samples | No. of Lab Batches |
|---|---|---|---|---|---|---|
| SW-846 6010 | 7440-36-0 | Antimony | 28.0 | 72.0 | %REC | 31 |
| SW-846 8082 | 12674-11-2 | Aroclor-1016 | 80.0 | 80.0 | %REC | 1 |
| SW-846 8082 | 11096-82-5 | Aroclor-1260 | 79.0 | 79.0 | %REC | 1 |
| SW-846 6010 | 7440-38-2 | Arsenic | 81.0 | 101.0 | %REC | 31 |
| SW-846 6010 | 7440-39-3 | Barium | 0.0 | 141.0 | %REC | 31 |
| SW-846 8260 | 71-43-2 | Benzene | 72.2 | 106.2 | %REC | 20 |
| SW-846 8270 | 56-55-3 | Benzo(a)anthracene | 53.0 | 80.0 | %REC | 9 |
| SW-846 8270 | 50-32-8 | Benzo(a)pyrene | 55.0 | 79.0 | %REC | 9 |
| SW-846 8270 | 205-99-2 | Benzo(b)fluoranthene | 58.0 | 81.0 | %REC | 9 |
| SW-846 8270 | 207-08-9 | Benzo(k)fluoranthene | 50.0 | 91.0 | %REC | 9 |
| SW-846 8270 | 65-85-0 | Benzoic Acid | 0.0 | 62.0 | %REC | 9 |
| SW-846 8270 | 100-51-6 | Benzyl Alcohol | 55.0 | 87.0 | %REC | 9 |
| SW-846 6010 | 7440-41-7 | Beryllium | 84.0 | 106.0 | %REC | 30 |
| SW-846 8270 | 111-44-4 | bis(2-Chloroethyl)ether | 53.0 | 75.0 | %REC | 9 |
| SW-846 8270 | 39638-32-9 | bis(2-Chloroisopropyl)ether | 53.0 | 77.0 | %REC | 9 |
| SW-846 8270 | 117-81-7 | bis(2-Ethylhexyl)phthalate | 57.0 | 87.0 | %REC | 9 |
| SW-846 8260 | 75-27-4 | Bromodichloromethane | 67.7 | 119.0 | %REC | 19 |
| SW-846 8260 | 75-25-2 | Bromoform | 68.0 | 129.0 | %REC | 19 |
| SW-846 8260 | 74-83-9 | Bromomethane | 59.0 | 142.4 | %REC | 19 |
| SW-846 8270 | 85-68-7 | Butylbenzylphthalate | 57.0 | 83.0 | %REC | 9 |
| SW-846 6010 | 7440-43-9 | Cadmium | 58.0 | 102.0 | %REC | 31 |
| SW-846 8260 | 75-15-0 | Carbon Disulfide | 51.0 | 91.0 | %REC | 19 |
| SW-846 8260 | 56-23-5 | Carbon Tetrachloride | 70.1 | 118.0 | %REC | 19 |
| SW-846 8260 | 108-90-7 | Chlorobenzene | 65.7 | 136.2 | %REC | 20 |
| SW-846 8260 | 75-00-3 | Chloroethane | 52.2 | 111.3 | %REC | 19 |
| SW-846 8260 | 67-66-3 | Chloroform | 71.8 | 119.0 | %REC | 19 |
| SW-846 8260 | 74-87-3 | Chloromethane | 40.1 | 159.5 | %REC | 19 |
| SW-846 6010 | 7440-47-3 | Chromium | 77.0 | 169.0 | %REC | 31 |
| SW-846 8270 | 218-01-9 | Chrysene | 52.0 | 78.0 | %REC | 9 |
| SW-846 8260 | 10061-01-5 | cis-1,3-Dichloropropene | 68.7 | 113.0 | %REC | 19 |
| SW-846 6010 | 7440-48-4 | Cobalt | 78.0 | 104.0 | %REC | 31 |
| SW-846 6010 | 7440-50-8 | Copper | 77.0 | 109.0 | %REC | 31 |
| SW-846 8270 | 84-74-2 | Di-n-butylphthalate | 59.0 | 87.0 | %REC | 9 |
| SW-846 8270 | 117-84-0 | Di-n-octylphthalate | 52.0 | 75.0 | %REC | 9 |
| SW-846 8270 | 53-70-3 | Dibenz(a,h)anthracene | 51.0 | 78.0 | %REC | 9 |
| SW-846 8270 | 132-64-9 | Dibenzofuran | 56.0 | 81.0 | %REC | 9 |
| SW-846 8260 | 124-48-1 | Dibromochloromethane | 66.4 | 120.0 | %REC | 19 |
| SW-846 8270 | 84-66-2 | Diethylphthalate | 56.0 | 81.0 | %REC | 9 |
| SW-846 8270 | 131-11-3 | Dimethylphthalate | 57.0 | 81.0 | %REC | 9 |
| SW-846 8260 | 100-41-4 | Ethylbenzene | 68.1 | 125.7 | %REC | 19 |
| SW-846 8270 | 206-44-0 | Fluoranthene | 55.0 | 80.0 | %REC | 9 |
| SW-846 8270 | 86-73-7 | Fluorene | 54.0 | 80.0 | %REC | 9 |
| SW-846 8270 | 118-74-1 | Hexachlorobenzene | 55.0 | 84.0 | %REC | 9 |

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| Test Method | CAS No. | Analyte | Minimum Percent Recovery | Maximum Percent Recovery | No. of Samples | No. of Lab Batches |
|---|---|---|---|---|---|---|
| SW-846 8260 | 87-68-3 | Hexachlorobutadiene | 31.5 | 96.0 | %REC | 19 |
| SW-846 8270 | 87-68-3 | Hexachlorobutadiene | 55.0 | 78.0 | %REC | 9 |
| SW-846 8270 | 77-47-4 | Hexachlorocyclopentadiene | 37.0 | 96.0 | %REC | 9 |
| SW-846 8270 | 67-72-1 | Hexachloroethane | 53.0 | 79.0 | %REC | 9 |
| SW-846 8270 | 193-39-5 | Indeno(1,2,3-cd)pyrene | 52.0 | 80.0 | %REC | 9 |
| SW-846 6010 | 7439-89-6 | Iron | 0.0 | 6370.0 | %REC | 31 |
| SW-846 8270 | 78-59-1 | Isophorone | 57.0 | 93.0 | %REC | 9 |
| SW-846 6010 | 7439-92-1 | Lead | 63.0 | 104.0 | %REC | 31 |
| SW-846 6010 | 7439-93-2 | Lithium | 80.0 | 112.0 | %REC | 30 |
| SW-846 6010 | 7439-96-5 | Manganese | 0.0 | 299.0 | %REC | 31 |
| SW-846 6010 | 7439-97-6 | Mercury | 10.0 | 113.0 | %REC | 31 |
| SW-846 6010/6010B | 7439-97-6 | Mercury | 95.0 | 95.0 | %REC | 1 |
| SW-846 8260 | 75-09-2 | Methylene chloride | 71.5 | 109.0 | %REC | 19 |
| SW-846 6010 | 7439-98-7 | Molybdenum | 75.0 | 98.0 | %REC | 31 |
| SW-846 8270 | 86-30-6 | n-Nitrosodiphenylamine | 62.0 | 86.0 | %REC | 9 |
| SW-846 8270 | 621-64-7 | n-Nitrosodipropylamine | 53.0 | 77.0 | %REC | 9 |
| SW-846 8270 | 91-20-3 | Naphthalene | 55.0 | 73.0 | %REC | 9 |
| SW-846 8260 | 91-20-3 | Naphthalene | 54.5 | 102.0 | %REC | 19 |
| SW-846 6010 | 7440-02-0 | Nickel | 76.0 | 111.0 | %REC | 31 |
| SW9056 OR E300.0 PREP E300.0 | 14797-55-8 | Nitrate | 90.0 | 107.0 | %REC | 6 |
| SW9056 OR E300.0 PREP E300.0 | 14797-65-0 | Nitrite | 90.0 | 95.0 | %REC | 2 |
| SW-846 8270 | 98-95-3 | Nitrobenzene | 58.0 | 82.0 | %REC | 9 |
| SW-846 8270 | 87-86-5 | Pentachlorophenol | 43.0 | 70.0 | %REC | 9 |
| SW-846 8270 | 108-95-2 | Phenol | 58.0 | 83.0 | %REC | 9 |
| SW-846 8270 | 129-00-0 | Pyrene | 54.0 | 83.0 | %REC | 9 |
| SW-846 6010 | 7782-49-2 | Selenium | 80.0 | 101.0 | %REC | 31 |
| SW-846 6010 | 7440-22-4 | Silver | 0.0 | 108.0 | %REC | 31 |
| SW-846 6010 | 7440-24-6 | Strontium | 66.0 | 114.0 | %REC | 31 |
| SW-846 8260 | 100-42-5 | Styrene | 63.2 | 116.3 | %REC | 19 |
| SW-846 8260 | 127-18-4 | Tetrachloroethene | 64.7 | 107.7 | %REC | 19 |
| SW-846 6010 | 7440-31-5 | Tin | 77.0 | 97.0 | %REC | 31 |
| SW-846 8260 | 108-88-3 | Toluene | 70.1 | 109.0 | %REC | 20 |
| SW-846 8260 | 10061-02-6 | trans-1,3-Dichloropropene | 61.5 | 119.0 | %REC | 19 |
| SW-846 8260 | 79-01-6 | Trichloroethene | 73.6 | 136.7 | %REC | 20 |
| SW-846 6010 | 11-09-6 | Uranium, Total | 80.0 | 107.0 | %REC | 30 |
| SW-846 6010 | 7440-62-2 | Vanadium | 75.0 | 151.0 | %REC | 31 |
| SW-846 8260 | 75-01-4 | Vinyl chloride | 45.0 | 124.9 | %REC | 19 |
| SW-846 8260 | 1330-20-7 | Xylene | 64.5 | 115.3 | %REC | 19 |
| SW-846 6010 | 7440-66-6 | Zinc | 0.0 | 386.0 | %REC | 31 |

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### 14.2.2 Precision

Precision is measured by evaluated both MSDs and field duplicates, as described in the following sections.

***Sample Matrix Spike Duplicate Evaluation***

Laboratory precision is measured through use of MSDs, as summarized in Table 16. Analytes with the highest relative percent differences (RPDs) were reviewed by comparing the highest sample result to the RFCA WRW soil AL. For analytes with RPDs greater than 35 percent, if the highest sample concentrations were sufficiently below the AL, no further action is needed. Review of analytes listed on Table 16 with a RPD of greater than 35 percent indicated decisions were not impacted.

**Table 16**
**Sample MSD Evaluation Summary**

| Test Method | CAS No. | Analyte | Max RPD (%) |
|---|---|---|---|
| SW-846 8260 | 71-55-6 | 1,1,1-Trichloroethane | 25.26 |
| SW-846 8260 | 79-34-5 | 1,1,2,2-Tetrachloroethane | 24.15 |
| SW-846 8260 | 79-00-5 | 1,1,2-Trichloroethane | 20.00 |
| SW-846 8260 | 75-34-3 | 1,1-Dichloroethane | 27.32 |
| SW-846 8260 | 75-35-4 | 1,1-Dichloroethene | 37.59 |
| SW-846 8260 | 120-82-1 | 1,2,4-Trichlorobenzene | 32.87 |
| SW-846 8270 | 120-82-1 | 1,2,4-Trichlorobenzene | 24.82 |
| SW-846 8260 | 95-50-1 | 1,2-Dichlorobenzene | 30.59 |
| SW-846 8260 | 107-06-2 | 1,2-Dichloroethane | 29.86 |
| SW-846 8260 | 78-87-5 | 1,2-Dichloropropane | 23.46 |
| SW-846 8260 | 106-46-7 | 1,4-Dichlorobenzene | 28.57 |
| SW-846 8270 | 95-95-4 | 2,4,5-Trichlorophenol | 13.56 |
| SW-846 8270 | 88-06-2 | 2,4,6-Trichlorophenol | 12.84 |
| SW-846 8270 | 120-83-2 | 2,4-Dichlorophenol | 11.11 |
| SW-846 8270 | 105-67-9 | 2,4-Dimethylphenol | 10.96 |
| SW-846 8270 | 51-28-5 | 2,4-Dinitrophenol | 20.51 |
| SW-846 8270 | 121-14-2 | 2,4-Dinitrotoluene | 8.70 |
| SW-846 8270 | 606-20-2 | 2,6-Dinitrotoluene | 11.76 |
| SW-846 8260 | 78-93-3 | 2-Butanone | 34.60 |
| SW-846 8270 | 91-58-7 | 2-Chloronaphthalene | 15.65 |
| SW-846 8270 | 95-57-8 | 2-Chlorophenol | 23.53 |
| SW-846 8270 | 91-57-6 | 2-Methylnaphthalene | 16.67 |
| SW-846 8270 | 95-48-7 | 2-Methylphenol | 16.44 |
| SW-846 8270 | 88-74-4 | 2-Nitroaniline | 13.11 |
| SW-846 8270 | 91-94-1 | 3,3'-Dichlorobenzidine | 24.76 |
| SW-846 8270 | 534-52-1 | 4,6-Dinitro-2-methylphenol | 15.93 |
| SW-846 8270 | 106-47-8 | 4-Chloroaniline | 12.50 |
| SW-846 8260 | 108-10-1 | 4-Methyl-2-pentanone | 32.06 |
| SW-846 8270 | 106-44-5 | 4-Methylphenol | 14.77 |
| SW-846 8270 | 100-02-7 | 4-Nitrophenol | 16.30 |
| SW-846 8270 | 83-32-9 | Acenaphthene | 11.76 |
| SW-846 8260 | 67-64-1 | Acetone | 37.35 |
| SW-846 6010 | 7429-90-5 | Aluminum | 200.00 |

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| Test Method | CAS No. | Analyte | Max RPD (%) |
|---|---|---|---|
| SW-846 8270 | 120-12-7 | Anthracene | 16.13 |
| SW-846 6010 | 7440-36-0 | Antimony | 22.61 |
| SW-846 8082 | 12674-11-2 | Aroclor-1016 | 8.38 |
| SW-846 8082 | 11096-82-5 | Aroclor-1260 | 4.94 |
| SW-846 6010 | 7440-38-2 | Arsenic | 4.60 |
| SW-846 6010 | 7440-39-3 | Barium | 200.00 |
| SW-846 8260 | 71-43-2 | Benzene | 23.46 |
| SW-846 8270 | 56-55-3 | Benzo(a)anthracene | 17.24 |
| SW-846 8270 | 50-32-8 | Benzo(a)pyrene | 11.57 |
| SW-846 8270 | 205-99-2 | Benzo(b)fluoranthene | 11.27 |
| SW-846 8270 | 207-08-9 | Benzo(k)fluoranthene | 21.43 |
| SW-846 8270 | 65-85-0 | Benzoic Acid | 18.18 |
| SW-846 8270 | 100-51-6 | Benzyl Alcohol | 16.06 |
| SW-846 6010 | 7440-41-7 | Beryllium | 27.18 |
| SW-846 8270 | 111-44-4 | bis(2-Chloroethyl)ether | 26.55 |
| SW-846 8270 | 39638-32-9 | bis(2-Chloroisopropyl)ether | 27.20 |
| SW-846 8270 | 117-81-7 | bis(2-Ethylhexyl)phthalate | 11.57 |
| SW-846 8260 | 75-27-4 | Bromodichloromethane | 26.67 |
| SW-846 8260 | 75-25-2 | Bromoform | 43.22 |
| SW-846 8260 | 74-83-9 | Bromomethane | 29.53 |
| SW-846 8270 | 85-68-7 | Butylbenzylphthalate | 10.00 |
| SW-846 6010 | 7440-43-9 | Cadmium | 7.23 |
| SW-846 8260 | 75-15-0 | Carbon Disulfide | 26.21 |
| SW-846 8260 | 56-23-5 | Carbon Tetrachloride | 26.00 |
| SW-846 8260 | 108-90-7 | Chlorobenzene | 28.52 |
| SW-846 8260 | 75-00-3 | Chloroethane | 39.11 |
| SW-846 8260 | 67-66-3 | Chloroform | 27.75 |
| SW-846 8260 | 74-87-3 | Chloromethane | 35.40 |
| SW-846 6010 | 7440-47-3 | Chromium | 33.51 |
| SW-846 8270 | 218-01-9 | Chrysene | 17.54 |
| SW-846 8260 | 10061-01-5 | cis-1,3-Dichloropropene | 28.28 |
| SW-846 6010 | 7440-48-4 | Cobalt | 13.19 |
| SW-846 6010 | 7440-50-8 | Copper | 63.37 |
| SW-846 8270 | 84-74-2 | Di-n-butylphthalate | 11.94 |
| SW-846 8270 | 117-84-0 | Di-n-octylphthalate | 12.61 |
| SW-846 8270 | 53-70-3 | Dibenz(a,h)anthracene | 18.49 |
| SW-846 8270 | 132-64-9 | Dibenzofuran | 11.76 |
| SW-846 8260 | 124-48-1 | Dibromochloromethane | 26.83 |
| SW-846 8270 | 84-66-2 | Diethylphthalate | 16.39 |
| SW-846 8270 | 131-11-3 | Dimethylphthalate | 13.11 |
| SW-846 8260 | 100-41-4 | Ethylbenzene | 26.01 |
| SW-846 8270 | 206-44-0 | Fluoranthene | 13.11 |
| SW-846 8270 | 86-73-7 | Fluorene | 13.56 |
| SW-846 8270 | 118-74-1 | Hexachlorobenzene | 13.11 |
| SW-846 8270 | 87-68-3 | Hexachlorobutadiene | 28.15 |
| SW-846 8260 | 87-68-3 | Hexachlorobutadiene | 45.58 |
| SW-846 8270 | 77-47-4 | Hexachlorocyclopentadiene | 17.78 |
| SW-846 8270 | 67-72-1 | Hexachloroethane | 34.92 |

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| Test Method | CAS No. | Analyte | Max RPD (%) |
|---|---|---|---|
| SW-846 8270 | 193-39-5 | Indeno(1,2,3-cd)pyrene | 14.88 |
| SW-846 6010 | 7439-89-6 | Iron | 200.00 |
| SW-846 8270 | 78-59-1 | Isophorone | 16.54 |
| SW-846 6010 | 7439-92-1 | Lead | 17.58 |
| SW-846 6010 | 7439-93-2 | Lithium | 23.20 |
| SW-846 6010 | 7439-96-5 | Manganese | 200.00 |
| SW-846 6010 | 7439-97-6 | Mercury | 152.38 |
| SW-846 6010/6010B | 7439-97-6 | Mercury | 3.11 |
| SW-846 8260 | 75-09-2 | Methylene chloride | 33.71 |
| SW-846 6010 | 7439-98-7 | Molybdenum | 4.82 |
| SW-846 8270 | 86-30-6 | n-Nitrosodiphenylamine | 13.53 |
| SW-846 8270 | 621-64-7 | n-Nitrosodipropylamine | 18.98 |
| SW-846 8270 | 91-20-3 | Naphthalene | 22.90 |
| SW-846 8260 | 91-20-3 | Naphthalene | 26.72 |
| SW-846 6010 | 7440-02-0 | Nickel | 10.31 |
| SW9056 OR E300.0 PREP E300.0 | 14797-55-8 | Nitrate | 5.71 |
| SW9056 OR E300.0 PREP E300.0 | 14797-65-0 | Nitrite | 2.08 |
| SW-846 8270 | 98-95-3 | Nitrobenzene | 22.22 |
| SW-846 8270 | 87-86-5 | Pentachlorophenol | 16.67 |
| SW-846 8270 | 108-95-2 | Phenol | 18.98 |
| SW-846 8270 | 129-00-0 | Pyrene | 20.00 |
| SW-846 6010 | 7782-49-2 | Selenium | 5.65 |
| SW-846 6010 | 7440-22-4 | Silver | 44.60 |
| SW-846 6010 | 7440-24-6 | Strontium | 27.45 |
| SW-846 8260 | 100-42-5 | Styrene | 23.66 |
| SW-846 8260 | 127-18-4 | Tetrachloroethene | 20.77 |
| SW-846 6010 | 7440-31-5 | Tin | 5.99 |
| SW-846 8260 | 108-88-3 | Toluene | 21.71 |
| SW-846 8260 | 10061-02-6 | trans-1,3-Dichloropropene | 25.90 |
| SW-846 8260 | 79-01-6 | Trichloroethene | 28.89 |
| SW-846 6010 | 11-09-6 | Uranium, Total | 9.52 |
| SW-846 6010 | 7440-62-2 | Vanadium | 68.97 |
| SW-846 8260 | 75-01-4 | Vinyl chloride | 45.30 |
| SW-846 8260 | 1330-20-7 | Xylene | 25.12 |
| SW-846 6010 | 7440-66-6 | Zinc | 99.12 |

### *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 17 indicates field duplicate frequencies were inadequate for radionuclides (GAMMA SPEC), metals (SW846 6010/6010B), and SVOCs (SW-846 8270B). However, project decisions were not impacted.

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**Table 17**
**Field Duplicate Sample Frequency Summary**

| Test Method | No. of Real Samples | No. of Duplicate Samples | % Duplicate Samples |
|---|---|---|---|
| ALPHA SPEC | 81 | 12 | 14.8% |
| GAMMA SPEC | 1 | 0 | 0.0% |
| GAMMA SPECTROSCOPY | 163 | 15 | 9.2% |
| SW-846 6010 | 117 | 9 | 7.7% |
| SW-846 6010/6010B | 1 | 0 | 0.0% |
| SW-846 6200 | 22 | 6 | 27.3% |
| SW-846 8082 | 8 | 4 | 50.0% |
| SW-846 8260 | 99 | 15 | 15.2% |
| SW-846 8270 | 23 | 5 | 21.7% |
| SW-846 8270B | 1 | 0 | 0.0% |
| SW8440 PREP SW3560(9) | 39 | 12 | 30.8% |
| SW9056 OR E300.0 PREP E300.0 | 13 | 1 | 7.7% |

The field duplicate RPD values indicate how much variation exists in the field duplicate analyses. EPA data validation guidelines state "there are no required review criteria for field duplicate analyses comparability" (EPA 1994b). For the DQA, the highest RPD values were reviewed (Table 18). For this project, project decisions were not impacted.

**Table 18**
**RPD Evaluation Summary**

| Lab Code | Test Method | Analyte | Max RPD (%) |
|---|---|---|---|
| ESTLDEN | SW-846 6010 | Aluminum | 66.67 |
| ESTLDEN | SW-846 6010 | Arsenic | 61.39 |
| URS | SW-846 6200 | Arsenic | 0.00 |
| URS | SW-846 6200 | Barium | 30.12 |
| ESTLDEN | SW-846 6010 | Barium | 66.67 |
| ESTLDEN | SW-846 6010 | Beryllium | 37.84 |
| ESTLDEN | SW-846 6010 | Cadmium | 7.14 |
| ESTLDEN | SW-846 6010 | Chromium | 113.51 |
| ESTLDEN | SW-846 6010 | Cobalt | 98.99 |
| URS | SW-846 6200 | Cobalt | 38.81 |
| URS | SW-846 6200 | Copper | 27.46 |
| ESTLDEN | SW-846 6010 | Copper | 56.00 |
| ESTLDEN | SW-846 8270 | Fluoranthene | 131.88 |
| ESTLDEN | SW-846 6010 | Iron | 46.15 |
| URS | SW-846 6200 | Iron | 26.63 |
| ESTLDEN | SW-846 6010 | Lead | 55.81 |
| ESTLDEN | SW-846 6010 | Lithium | 54.78 |
| ESTLDEN | SW-846 6010 | Manganese | 112.73 |

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| Lab Code | Test Method | Analyte | Max RPD (%) |
|---|---|---|---|
| ESTLDEN | SW-846 6010 | Mercury | 37.68 |
| ESTLDEN | SW-846 6010 | Molybdenum | 172.55 |
| ESTLDEN | SW-846 6010 | Nickel | 55.81 |
| URS | SW-846 6200 | Nickel | 20.26 |
| ESTLDEN | SW-846 8270 | Pyrene | 134.73 |
| ESTLDEN | SW-846 6010 | Strontium | 35.56 |
| URS | SW-846 6200 | Strontium | 5.35 |
| ESTLDEN | SW-846 6010 | Uranium, Total | 25.00 |
| ESTLDEN | ALPHA SPEC | Uranium-238 | 28.49 |
| ESTLDEN | SW-846 6010 | Vanadium | 50.00 |
| ESTLDEN | SW-846 6010 | Zinc | 58.82 |
| URS | SW-846 6200 | Zinc | 17.92 |

### 14.2.3 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. 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 for this project are listed in Table 19.

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**Table 19**
**Validation and Verification Summary**

| Validation Qualifier Code | Total No. of Records | No. of Alpha Spectroscopy Records | No. of Gamma Spec | No. of Gamma Spectroscopy Records | No. of SW-846 6010 Records | No. of SW-846 6010/6010B Records | No. of SW-846 6200 Records | No. of SW-846 8082 Records | No. of SW-846 8260 Records | No. of SW-846 8270 Records | No. of SW-846 8270B Records | SW9056 or E300_0 Prep E300_0 Records |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No V&V | 91 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 72 | 3 | 0 | 1 |
| 1 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| J | 185 | 3 | 0 | 0 | 147 | 0 | 32 | 0 | 3 | 0 | 0 | 0 |
| J1 | 432 | 2 | 0 | 0 | 422 | 4 | 3 | 0 | 1 | 0 | 0 | 0 |
| JB | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 3 | 0 | 0 |
| JB1 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 0 |
| R | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| U1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| UJ | 108 | 1 | 0 | 0 | 36 | 0 | 32 | 0 | 34 | 0 | 0 | 5 |
| UJ1 | 197 | 0 | 0 | 0 | 96 | 2 | 5 | 0 | 81 | 10 | 3 | 0 |
| V | 2634 | 105 | 3 | 129 | 457 | 0 | 310 | 56 | 1108 | 466 | 0 | 0 |
| V1 | 5799 | 293 | 0 | 343 | 1526 | 17 | 30 | 0 | 2807 | 718 | 51 | 14 |
| Total | 9487 | 405 | 3 | 489 | 2685 | 23 | 412 | 56 | 4140 | 1200 | 54 | 20 |
| Validated | 2939 | 110 | 3 | 129 | 641 | 0 | 374 | 56 | 1152 | 469 | 0 | 5 |
| % Validated | 30.98% | 27.16% | 100.00% | 26.38% | 23.87% | 0.00% | 90.78% | 100.00% | 27.83% | 39.08% | 0.00% | 25.00% |
| Verified | 6457 | 295 | 0 | 345 | 2044 | 23 | 38 | 0 | 2916 | 728 | 54 | 14 |
| % Verified | 68.06% | 72.84% | 0.00% | 70.55% | 76.13% | 100.00% | 9.22% | 0.00% | 70.43% | 60.67% | 100.00% | 70.00% |
| Rejected | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| % Rejected | 0.02% | 0.25% | 0.00% | 0.00% | 0.04% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |

Validated codes: J, V, JB, UJ
Verified codes: 1, J1, V1, JB1, UJ1

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Two records, one for alpha spectroscopy and one for metals (SW-846 6010), out of 2,939 (0.02 percent) validated records were rejected. None of rejected records affected project decisions. For this project, 30.98 percent of the analyses were validated. This exceeds the overall ER Program V&V goal of 25 percent.

### 14.2.4 Sensitivity

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

## 14.3 Summary of Data Quality

RPDs greater than 35 percent indicate the sampling precision limits of some analytes have been exceeded. Data collected and used for IHSS Group 000-4 are adequate for decision making.

# 15.0 CONCLUSIONS

Results of the accelerated action justify No Further Accelerated Action (NFAA) for IHSS Group 000-4. Justification is based on the following:

- The potential sources of contamination existing in soil at concentrations greater than RFCA WRW soil ALs, with the exception of arsenic at one location were removed, which did not require remediation based on RFCA.
- All valve vaults associated with NPWL were either partially excavated and backfilled or flow filled, or were completely removed, thereby eliminating these areas as potential sources of future contaminant releases.
- Remaining NPWL has been rinsed, sampled for RCRA constituents, and shown to be RCRA-clean, further eliminating potential future releases of contamination.
- In accordance with the SSRS, subsurface soil in the area is not subject to significant erosion.

# 16.0 REFERENCES

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DOE, 1992-2004, Historical Release Reports for the Rocky Flats Plant, Golden, Colorado.

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DOE, 1995, Operable Unit 4 Solar Evaporation Pond Interim Measure/Interim Remedial Action – Environmental Assessment Decision Document, Rocky Flats Environmental Technology Site, Golden, Colorado, February
DOE, 1999, DOE Order 414.1A, Quality Assurance.

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DOE, 2001b, Industrial Area Sampling and Analysis Plan Fiscal Year 2002 Addendum #IA-02-01, Rocky Flats Environmental Technology Site, Golden, Colorado, November.

DOE, 2002a, Industrial Area Sampling and Analysis Plan FY02 Addendum #IA-02-07 Solar Evaporation Ponds Area of Concern, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2002b, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY02 Notification #02-08 IHSS Group 000-1 Solar Evaporation Pond Area of Concern, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

DOE, 2002c, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY2002 Notification #02-01, IHSS Groups 100-4 and 100-5, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2002d, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY2002 Notification #02-02, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

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DOE, 2003b, Industrial Area Sampling and Analysis Plan FY03 Addendum #IA-03-11 IHSS Group 000-2, Original Process Waste Lines, Rocky Flats Environmental Technology Site, Golden, Colorado, August.

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DOE, 2003h, Closeout Report for IHSS Group 800-6, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2003i, Closure Description Document for Partial Closure of Unit 374.3; 700 and 800 Area Process Waste Transfer System, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

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

DOE, 2004a, Closeout Report for IHSS Group 800-1, Rocky Flats Environmental Technology Site, Golden, Colorado, March.

DOE, 2004b, Industrial Area Sampling and Analysis Plan FY04 Addendum #IA-04-06 IHSS Group 800-3, Rocky Flats Environmental Technology Site, Golden, Colorado, January.

DOE, 2004c, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY04 Notification #05-01 IHSS Group 000-4, Rocky Flats Environmental Technology Site, Golden, Colorado, October.

DOE, 2004d, Industrial Area and Buffer Zone Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, May.

DOE, 2004e, Closeout Report for IHSS Group 400-7, Rocky Flats Environmental Technology Site, Golden, Colorado, December.

DOE, 2005a, Closeout Report for IHSS Group 000-2, Original Process Waste Lines (OPWL), Rocky Flats Environmental Technology Site, Golden, Colorado, in process.

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DOE, 2005b, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY05 Notification #05-02 IHSS Group 500-3, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE, 2005c, Closeout Report for IHSS Group 500-3, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2005d, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY05 Notification #05-04 IHSS Group 800-3, Rocky Flats Environmental Technology Site, Golden, Colorado, February.

DOE 2005e, Closeout Report for IHSS Group 800-3, UBC 883,Rocky Flats Environmental Technology Site, Golden, Colorado, June.

DOE, 2005f, Closure Summary Report for the 700/800 Process Waste Transfer System, RCRA Unit 374.3 Rocky Flats Environmental Technology Site, Golden, Colorado, (in preparation)

DOE, CDPHE, and EPA, 2003, RFCA Modification, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

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K-H, 2002b, V&V Guidelines for Isotopic Determinations by Alpha Spectrometry, DA-RC01-v1, October.

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

# Appendix A

# Correspondence

# ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
# REGULATORY CONTACT RECORD

---

**Date/Time:** 08/10/04 – 1315

**Site Contact(s):** C. J. Freiboth (KH) – (CJF-077)
**Phone:** (303) 966-2823

**Regulatory Contact:** David Kruchek, CDPHE
**Phone:** (303) 692-3328

**Agency:** CDPHE

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**Purpose of Contact:** Valve Vault 02 Demolition

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**Meeting Attendance:**

| | |
|---|---|
| C. J. Freiboth, KH PM | David Kruchek, CDPHE |
| M. D. Flannery, KH | H. Linsinbigler, KH |
| S. M. Nesta, KH | A. Cameron, KH |

**Discussion**

On August 10, 2004, at 1315, a walkdown of Valve Vault (VV) 02 was conducted with the State (Kruchek). This vault has been RCRA clean closed, and demolition and removal of the entire vault was required because of residual fixed uranium contamination on the bottom walls of the vault and in the floor sump. The fixed levels on the walls are as high as 19,482 dpm/100 $cm^2$, and the sump has 45,000 dpm /100 $cm^2$ of fixed contamination. There is no removable radiological contamination in the vault.

Demolition activities on the vault were initiated, and included removal of the vault roof and portions of the walls. In order to remove the entire vault, a large excavation around the vault was initiated. The excavation on the outside of the vault continues to fill up with ground water (the water in the excavation has been pumped out three (3) times), due to the proximity of the vault to Building 883, where the footer drain system has been rendered inoperable. In addition, a retaining wall is located above the vault to the east, and in order to excavate around the vault for removal, an even larger excavation would be required. This large of an excavation would take out a significant portion of the retaining wall and could undermine much of the road next to Building 883. A significantly sized excavation creates additional safety concerns due to the sloping requirements. Based on the continued infusion of ground water into the excavation, and because of the size of the vault and required excavation, complete removal of the vault is very difficult.

A proposal was presented to the State (Kruchek), where the debris in the vault would be removed and the bottom portion of the vault would be flow-filled to ensure the fixed contamination is locked in place. Once this has been completed the vault would be removed to the flow-fill, ensuring the two (2) pipe penetrations from the lines from VV-1 are removed, as well as the two (2) lines from Building 883. The excavation around the vault that is filled with water would be pumped one more time and then backfilled.

The State (Kruchek) concurred with the approach that was presented.

**Contact Record Prepared By:** C. J. Freiboth

---

**Required Distribution**:
M. Aguilar, USEPA
S. Bell, DOE
R. Birk, DOE
C. Deck, KH
D. Foss, KH
S. Garcia, EPA
C. Gilbreath, KH
S. Gunderson, CDPHE
D. Kruchek, CDPHE
J. Legare, RFFO
R. Leitner, KH
J. Mead, KH
G. Morgan, DOE
S. Nesta, KH
K. North, KH
R. Schassburger, DOE
D. Shelton, KH
C. Zahm, KH

**Additional Distribution**:
H. Ainscough, CDPHE
A. Cameron, KH
C. J. Freiboth, KH
M. D. Flannery, KH
H. Linsinbigler, KH

# ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
# REGULATORY CONTACT RECORD

---

**Date/Time:** 10/27/04 - 1000

**Site Contact(s):** Karen Wiemelt
**Phone:** (303) 966-9883

**Regulatory Contact:** David Kruchek, CDPHE
**Phone:** (303) 692-3328

**Agency:** CDPHE

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**Purpose of Contact:** Valve Vault 09 Demolition

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**Meeting Attendance:**

| | |
|---|---|
| C. J. Freiboth, KH PM | David Kruchek, CDPHE |
| K. L. Wiemelt, KH | D. Parsons, D&DSC |

**Discussion**

On October 27, 2004, at 1000, a meeting regarding Valve Vault (VV) 09 was conducted with the State (Kruchek). VV 09 is located at the northwest corner of Building 707. The vault's dimensions are 8' by 12' by 11'8" deep. There is also a sump below the bottom of the vault. Additionally, the final grade in this area will be approximately 5 feet higher than current grade.

VV 09 was pressure washed to decontaminate it. Results show that this vault has been RCRA clean closed and has no removable Be contamination. The majority of the valve vault meets radiological unrestricted release criteria for both alpha and beta. However, there are a few elevated levels of alpha activity above the unrestricted release levels for both removable and fixed contamination in the lower 4 feet and sump of the valve vault

Conservative calculations were done to determine the levels of radiological contamination that would be left in the ground if the valve vault were left in place. The estimated levels of remaining radiological material that would be left is as follows:

- 1.47 pCi/g Pu-239
- 0.33 pCi/g Pu-240
- 1.65 pCi/g Am-241
- 0.06 pCi/g U-234
- 0.05 pCi/g U-235
- 1.45 pCi/g U-238

The calculations show that the residual contamination left is well below Wildlife Refuge Worker Action Levels.

A proposal was presented to the State (Kruchek) where the vault would be removed to four feet below final grade and the remainder of the valve vault would be flow-filled to ensure the fixed

contamination is locked in place. Associated NPWL that have not been RCRA clean closed will still be removed. It was also proposed to apply this process to other valve vaults that are RCRA clean-closed but have some contamination above the unrestricted release criteria.

The State (Kruchek) concurred with the approach that was presented and also requested that flow fill be added to a minimum of one foot above the highest (in elevation) level of contamination above the unrestricted release criteria. The State also requested that the removable contamination be fixed prior to flow filling the vault. Site representatives agreed to these items (Freiboth, Parsons, Wiemelt). Results for each valve vault that is a candidate for this approach will be presented and documented in a Contact Record. Additionally, the Closeout Report will also include the estimated amount of transuranic material that is left in place.

**Contact Record Prepared By:** Karen Wiemelt

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**Required Distribution**:
M. Aguilar, USEPA
S. Bell, DOE
R. Birk, DOE
C. Deck, KH
D. Foss, KH
S. Garcia, EPA
C. Gilbreath, KH
S. Gunderson, CDPHE
D. Kruchek, CDPHE
J. Legare, RFFO
R. Leitner, KH
J. Mead, KH
G. Morgan, DOE
S. Nesta, KH
K. North, KH
R. Schassburger, DOE
D. Shelton, KH
C. Zahm, KH

**Additional Distribution**:
H. Ainscough, CDPHE
A. Cameron, KH
C. J. Freiboth, KH
G. Carnival, KH
D. Parsons, KH

# ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
# REGULATORY CONTACT RECORD

---

**Date/Time:** 11/18/04 - 1200

**Site Contact(s):** Karen Wiemelt
**Phone:** (303) 966-9883

**Regulatory Contact:** David Kruchek, CDPHE
**Phone:** (303) 692-3328

**Agency:** CDPHE

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**Purpose of Contact:** Valve Vault 08 Demolition

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**Meeting Attendance:** K. L. Wiemelt, KH David Kruchek, CDPHE

**Discussion**
On November 18, 2004, David Kruchek/CDPHE and Karen Wiemelt/KH discussed the disposition of Valve Vault (VV) 08. VV 08 is located to the west of Building 707. The vault's dimensions are 13' by 12' by 9'6" deep. There is also a sump that extends 4' below the bottom of the vault. Additionally, the final grade in this area will be approximately 3½ feet higher than current grade.

VV 08 was pressure washed to decontaminate it. Results show that this vault has been RCRA clean closed and has no removable Be contamination. The majority of the valve vault meets radiological unrestricted release criteria for both alpha and beta. However, there are a few elevated levels of alpha activity above the unrestricted release levels for fixed contamination in the sump of the valve vault and 2 NPWL stubs located in the lower 4 feet of the valve vault. The sump also has an elevated level of alpha activity slightly above the unrestricted release levels for removable contamination (32 dpm/100 $cm^2$ vs. 20 dpm/100 $cm^2$).

Conservative calculations were done to determine the levels of radiological contamination that would be left in the ground if the valve vault were left in place. The estimated levels of remaining radiological material that would be left are as follows:

- 1.21 pCi/g Pu-239
- 0.27 pCi/g Pu-240
- 1.36 pCi/g Am-241
- 0.05 pCi/g U-234
- 0.05 pCi/g U-235
- 1.43 pCi/g U-238

The calculations show that the residual contamination left is well below Wildlife Refuge Worker Action Levels.

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Based on the approach agreed to for VV 09, VV 08 will be flow-filled to the top of the valve vault. None of the valve vault will be removed since approximately 3½ feet of fill will be added to this area to achieve final configuration. The flow fill will be several feet higher than any level of contamination above the unrestricted release criteria. Associated NPWL outside the valve vault that have not been RCRA clean closed will be removed. However, the NPWL stubs that penetrate the valve vault wall with the elevated readings will remain in place. Additionally, the Closeout Report will include the estimated amount of transuranic material that is left in place.

**Contact Record Prepared By:** Karen Wiemelt

---

**Required Distribution**:
M. Aguilar, USEPA
S. Bell, DOE
R. Birk, DOE
C. Deck, KH
D. Foss, KH
S. Garcia, EPA
C. Gilbreath, KH
S. Gunderson, CDPHE
D. Kruchek, CDPHE
J. Legare, RFFO
R. Leitner, KH
J. Mead, KH
G. Morgan, DOE
S. Nesta, KH
K. North, KH
R. Schassburger, DOE
D. Shelton, KH
C. Zahm, KH

**Additional Distribution**:
H. Ainscough, CDPHE
C. J. Freiboth, KH
G. Carnival, KH
D. Parsons, KH

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# ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
# REGULATORY CONTACT RECORD

---

**Date/Time:** 12/08/04 - 1400

**Site Contact(s):** Karen Wiemelt
**Phone:** (303) 966-9883

**Regulatory Contact:** David Kruchek, CDPHE
**Phone:** (303) 692-3328

**Agency:** CDPHE

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**Purpose of Contact:** Valve Vault 03 Demolition

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**Meeting Attendance:** K. L. Wiemelt, KH David Kruchek, CDPHE

**Discussion**
On December 8, 2004, David Kruchek/CDPHE and Karen Wiemelt/KH discussed the disposition of Valve Vault (VV) 03. VV 03 is located to the northwest of Building 883. The vault's dimensions are 9'9" by 9'9" by 13'6" deep. There is also a sump that extends 4' below the bottom of the vault. Current grade is representative of final grade for this area.

VV 03 was pressure washed to decontaminate it. Results show that this vault has been RCRA clean closed and has no removable Be contamination. The majority of the valve vault meets radiological unrestricted release criteria for both alpha and beta. However, there are a few elevated levels of alpha and beta activity above the unrestricted release levels for fixed contamination in the bottom 6 feet of the valve vault and the sump. All removable levels are below the unrestricted release levels.

Conservative calculations were done to determine the levels of radiological contamination that would be left in the ground if the valve vault were left in place. The estimated levels of remaining radiological material that would be left are as follows:

- 0.71 pCi/g Pu-239
- 0.16 pCi/g Pu-240
- 0.80 pCi/g Am-241
- 0.03 pCi/g U-234
- 0.12 pCi/g U-235
- 3.45 pCi/g U-238

The calculations show that the residual contamination left is well below Wildlife Refuge Worker Action Levels.

Based on the approach agreed to for VV 09, VV 03 will be back-filled to the top of the valve vault. Six feet of the top of the valve vault has already been removed. Debris from this removal

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that is in the bottom of the valve vault will be removed to the extent practicable. Since removable levels meet the unrestricted release levels, the valve vault will be backfilled with dirt. Associated NPWL outside the valve vault that have not been RCRA clean closed will be removed. Additionally, the Closeout Report will include the estimated amount of transuranic material that is left in place.

**Contact Record Prepared By:** Karen Wiemelt

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**Required Distribution**:
M. Aguilar, USEPA
S. Bell, DOE
R. Birk, DOE
C. Deck, KH
D. Foss, KH
S. Garcia, EPA
C. Gilbreath, KH
S. Gunderson, CDPHE
D. Kruchek, CDPHE
J. Legare, RFFO
R. Leitner, KH
J. Mead, KH
G. Morgan, DOE
S. Nesta, KH
K. North, KH
R. Schassburger, DOE
D. Shelton, KH
C. Zahm, KH

**Additional Distribution**:
H. Ainscough, CDPHE
C. J. Freiboth, KH
G. Carnival, KH
D. Parsons, KH

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# ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE
# ER REGULATORY CONTACT RECORD – Rev. 1

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**Date/Time:** June 28, 2005 / 0745 Hrs.

**Site Contact(s):** Gary J. Carnival, Steven Nesta, Chris Gilbreath
**Phone:** 303-994-0734, 303-994-0744, 303-994-2865

**Regulatory Contact:** David Kruchek, Denise Onyskiw
**Phone:** 303-692-3328, 303-994-5673

**Agency:** CDPH&E

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**Purpose of Contact:** To document an agreement reached on the remediation of subsurface, foundation, and abandoned storm drains at Bldg. 371/374

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**Discussion**
An agreement was reached among Bldg 371 project personnel, RISS Environmental Compliance, RISS Environmental Restoration, and the CDPH&E to remediate the subsurface and foundation drains and an abandoned storm drain at Bldg 371/374 as follows:

1. The subsurface drain running down the center of Bldg 371 was exposed, interrupted, and grouted from an excavation inside the east end of the Bldg 371 sub-basement using the Denver Grout grouting protocol established for the OPWL project. A foam plug was injected at approx. 70' to minimize the amount of water flowing through the pipe and then the remainder of the pipe from the foam plug to the pipe opening was grout filled. The 6' x 6' x 4' excavation was flow filled allowing the flow fill to migrate into the drain line running east out of the excavation under the sub-basement wall.
2. The small manway immediately east of the Bldg 371 foundation was completely filled with grout such that the grout penetrated the openings of the subsurface drains entering the manway from the north and south (which includes the subsurface drain discussed in #1 above), and the opening of the discharge pipe exiting to the east to approx. 2' to 3'. This was performed by Denver Grout and accomplished by locating the manway using GPS coordinates, drilling through the soil and top of the manway, installing casing, and filling the manway through the casing from the existing surface.
3. The large manway which was just inside the east foundation wall of Bldg 374 was completely filled with grout such that the grout penetrated the openings of the drain pipe entering the manway from the small manway referenced in #2 above as well as the opening of the discharge pipe exiting the manway to the south to approx. 2' to 3'. This was also be performed by Denver Grout and accomplished by locating the manway using GPS coordinates, drilling through the soil and top of the manway, installing casing, and filling the manway through the casing from the existing surface.

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4. The 8" north and 10" south foundation drains as well as the abandoned 10" corregated metal storm drain and abandoned 10" foundation drain located on the south side of Bldgs 371/374 was remediated by excavating to expose the pipes, a 4' to 6' section of the pipes as well as 4' to 6' of the pipe bedding was removed, the pipe ends were exposed as best as possible since the depth of the excavation was approx. 24' deep, and the excavation was filled to a minimum of 2' above the pipe with Flofill such that the Flofill penetrated and sealed the pipe openings.

5. The three locations where the north and south foundation drains as well as the abandoned storm drain discharged into Interceptor Trench 2 on the east side of Bldg 374 were located, excavated back to a minimum of 4' below final grade, and grouted using the Denver Grout grouting protocol established for the OPWL project. All three of these lines were grouted to a minimum of 65'.

6. The abandoned foundation drain which terminated on the south hillside approx. 150' west of the north/south outfall into Interceptor Trench 2 and approx. 25' north of planned east/west outfall into Interceptor Trench 2 (depth of outfall at this location is approx. 4' to 6') was located using GPS coordinates and excavated to a depth of 24'. A 6' section of pipe was removed, the pipe bedding was disrupted, and the excavation was backfilled per agreement by Denise Onyskiw-CDPH&E and Steve Nesta-KH/RISS.

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**Contact Record Prepared By:** Gary J. Carnival

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Required Distribution:

M. Aguilar, USEPA
H. Ainscough, CDPHE
J. Berardini, K-H
B. Birk, DOE-RFPO
L. Brooks, K-H ESS
G. Carnival, K-H RISS
N. Castaneda, DOE-RFPO
C. Deck, K-H Legal
N. Demos, SSOC
S. Garcia, USEPA
S. Gunderson, CDPHE
S. Johnson, K-H ESS
M. Keating, K-H RISS
L. Kimmel, USEPA
D. Kruchek, CDPHE
D. Mayo, K-H RISS
S. Nesta, K-H RISS
L. Norland, K-H RISS
E. Pottorff, CDPHE
A. Primrose, K-H RISS
M. Roy, DOE-RFPO
R. Schassburger, DOE-RFPO
S. Serreze, K-H RISS
D. Shelton, K-H ESS
C. Spreng, CDPHE
S. Surovchak, DOE-RFPO
J. Walstrom, K-H RISS
K. Wiemelt, K-H RISS
C. Zahm, K-H Legal

Additional Distribution:

D. Onyskiw, CDPH&E
D. Rack, DOE-RFPO
C. Gilbreath, KH-371

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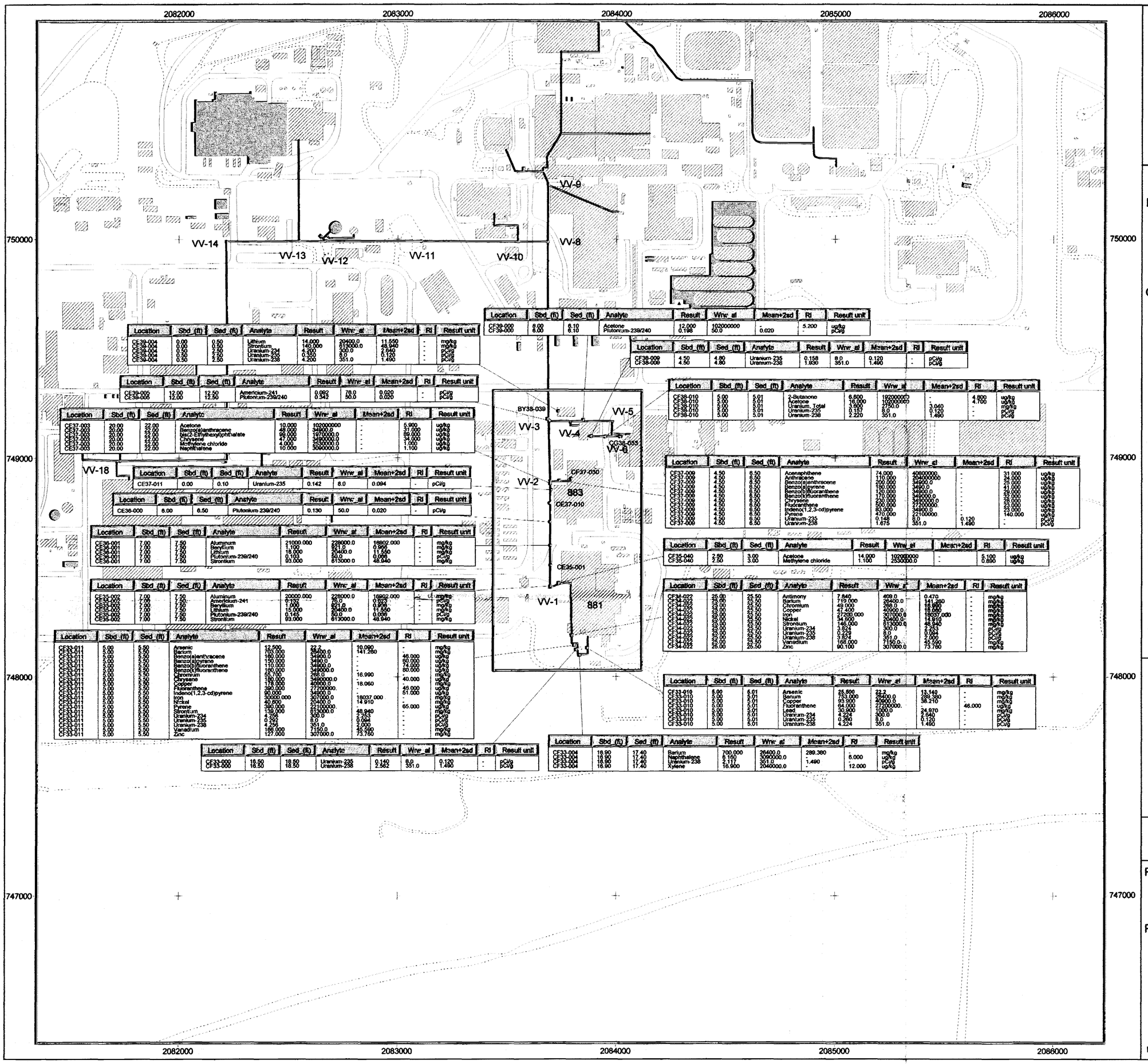
# Appendix B

# Project Photographs

# Enclosure

## CD Containing Standardized Real and QC Accelerated Action Data

64 IA-A-002762




| Location | Sbd (ft) | Sed (ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| CE39-004 | 0.00 | 0.50 | Lithium | 14.000 | 20400.0 | 11.550 | - | mg/kg |
| CE39-004 | 0.00 | 0.50 | Strontium | 140.000 | 613000.0 | 48.940 | - | mg/kg |
| CE39-004 | 0.50 | 2.50 | Uranium-234 | 4.400 | 300.0 | 2.640 | - | pCi/g |
| CE39-004 | 0.50 | 2.50 | Uranium-235 | 0.350 | 8.0 | 0.120 | - | pCi/g |
| CE39-004 | 0.50 | 2.50 | Uranium-238 | 4.200 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd (ft) | Sed (ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| CE39-005 | 12.00 | 12.50 | Americium-241 | 0.092 | 78.0 | 0.020 | - | pCi/g |
| CE39-005 | 12.00 | 12.50 | Plutonium-239/240 | 0.542 | 50.0 | 0.020 | - | pCi/g |

| Location | Sbd (ft) | Sed (ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| CF39-000 | 6.00 | 6.10 | Acetone | 12.000 | 102000000 | | 5.200 | ug/kg |
| CF39-000 | 6.00 | 6.10 | Plutonium-239/240 | 0.198 | 50.0 | 0.020 | - | pCi/g |

| Location | Sbd (ft) | Sed (ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| CF38-009 | 4.50 | 4.80 | Uranium-235 | 0.158 | 8.0 | 0.120 | - | pCi/g |
| CF38-009 | 4.50 | 4.80 | Uranium-238 | 1.930 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd (ft) | Sed (ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| CF38-010 | 5.00 | 5.01 | 2-Butanone | 6.800 | 192000000 | - | 4.800 | ug/kg |
| CF38-010 | 5.00 | 5.01 | Acetone | 16.000 | 102000000 | - | 4.700 | ug/kg |
| CF38-010 | 5.00 | 5.01 | Uranium, Total | 3.600 | 2750.0 | 3.040 | - | mg/kg |
| CF38-010 | 5.00 | 5.01 | Uranium-235 | 0.157 | 8.0 | 0.120 | - | pCi/g |
| CF38-010 | 5.00 | 5.01 | Uranium-238 | 2.220 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd (ft) | Sed (ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| CE37-003 | 20.00 | 22.00 | Acetone | 10.000 | 102000000 | - | 5.900 | ug/kg |
| CE37-003 | 20.00 | 22.00 | Benzo(a)anthracene | 48.000 | 34900.0 | - | 31.000 | ug/kg |
| CE37-003 | 20.00 | 22.00 | bis(2-Ethylhexyl)phthalate | 96.000 | 1970000.0 | - | 88.000 | ug/kg |
| CE37-003 | 20.00 | 22.00 | Chrysene | 47.000 | 3490000.0 | - | 34.000 | ug/kg |
| CE37-003 | 20.00 | 22.00 | Methylene chloride | 4.000 | 2530000.0 | - | 1.000 | ug/kg |
| CE37-003 | 20.00 | 22.00 | Naphthalene | 10.000 | 30600000.0 | - | 1.100 | ug/kg |

| Location | Sbd (ft) | Sed (ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| CE37-011 | 0.00 | 0.10 | Uranium-235 | 0.142 | 8.0 | 0.094 | - | pCi/g |

| Location | Sbd (ft) | Sed (ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| CE36-000 | 6.00 | 6.50 | Plutonium-239/240 | 0.130 | 50.0 | 0.020 | - | pCi/g |

| Location | Sbd (ft) | Sed (ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| CE36-001 | 7.00 | 7.50 | Aluminum | 21000.000 | 228000.0 | 16902.000 | - | mg/kg |
| CE36-001 | 7.00 | 7.50 | Beryllium | 1.100 | 621.0 | 0.966 | - | mg/kg |
| CE36-001 | 7.00 | 7.50 | Lithium | 16.000 | 20400.0 | 11.550 | - | mg/kg |
| CE36-001 | 7.00 | 7.50 | Plutonium-239/240 | 0.103 | 50.0 | 0.066 | - | pCi/g |
| CE36-001 | 7.00 | 7.50 | Strontium | 93.000 | 613000.0 | 48.940 | - | mg/kg |

| Location | Sbd (ft) | Sed (ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| CE35-002 | 7.00 | 7.50 | Aluminum | 20000.000 | 228000.0 | 16902.000 | - | mg/kg |
| CE35-002 | 7.00 | 7.50 | Americium-241 | 0.132 | 78.0 | 0.023 | - | pCi/g |
| CE35-002 | 7.00 | 7.50 | Beryllium | 1.000 | 621.0 | 0.966 | - | mg/kg |
| CE35-002 | 7.00 | 7.50 | Lithium | 15.000 | 20400.0 | 11.550 | - | mg/kg |
| CE35-002 | 7.00 | 7.50 | Plutonium-239/240 | 0.145 | 50.0 | 0.006 | - | pCi/g |
| CE35-002 | 7.00 | 7.50 | Strontium | 93.000 | 613000.0 | 48.940 | - | mg/kg |

| Location | Sbd (ft) | Sed (ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| CE33-011 | 5.00 | 5.50 | Arsenic | 12.500 | 22.2 | 10.090 | - | mg/kg |
| CE33-011 | 5.00 | 5.50 | Barium | 703.000 | 40600.0 | 141.260 | - | mg/kg |
| CE33-011 | 5.00 | 5.50 | Benzo(a)anthracene | 160.000 | 34900.0 | - | 46.000 | ug/kg |
| CE33-011 | 5.00 | 5.50 | Benzo(a)pyrene | 150.000 | 3490.0 | - | 60.000 | ug/kg |
| CE33-011 | 5.00 | 5.50 | Benzo(b)fluoranthene | 110.000 | 34900.0 | - | 74.000 | ug/kg |
| CE33-011 | 5.00 | 5.50 | Benzo(k)fluoranthene | 190.000 | 349000.0 | - | 80.000 | ug/kg |
| CE33-011 | 5.00 | 5.50 | Chromium | 65.700 | 268.0 | 16.990 | - | mg/kg |
| CE33-011 | 5.00 | 5.50 | Chrysene | 180.000 | 3490000.0 | - | 40.000 | ug/kg |
| CE33-011 | 5.00 | 5.50 | Copper | 170.000 | 40600.0 | 18.060 | - | mg/kg |
| CE33-011 | 5.00 | 5.50 | Fluoranthene | 390.000 | 27200000. | - | 49.000 | ug/kg |
| CE33-011 | 5.00 | 5.50 | Indeno(1,2,3-cd)pyrene | 90.000 | 34900.0 | - | 51.000 | ug/kg |
| CE33-011 | 5.00 | 5.50 | Iron | 30600.000 | 307000.0 | 18037.000 | - | mg/kg |
| CE33-011 | 5.00 | 5.50 | Nickel | 40.800 | 20400.0 | 14.910 | - | mg/kg |
| CE33-011 | 5.00 | 5.50 | Pyrene | 390.000 | 22100000. | - | 65.000 | ug/kg |
| CE33-011 | 5.00 | 5.50 | Strontium | 139.000 | 613000.0 | 48.940 | - | mg/kg |
| CE33-011 | 5.00 | 5.50 | Uranium-234 | 4.256 | 300.0 | 2.653 | - | pCi/g |
| CE33-011 | 5.00 | 5.50 | Uranium-235 | 0.292 | 8.0 | 0.094 | - | pCi/g |
| CE33-011 | 5.00 | 5.50 | Uranium-238 | 4.256 | 351.0 | 2.000 | - | pCi/g |
| CE33-011 | 5.00 | 5.50 | Vanadium | 188.000 | 7150.0 | 45.590 | - | mg/kg |
| CE33-011 | 5.00 | 5.50 | Zinc | 127.000 | 307000.0 | 73.760 | - | mg/kg |

| Location | Sbd (ft) | Sed (ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| CF33-000 | 16.50 | 18.50 | Uranium-235 | 0.140 | 8.0 | 0.120 | - | pCi/g |
| CF33-000 | 16.50 | 18.50 | Uranium-238 | 2.562 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd (ft) | Sed (ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| CF33-004 | 16.90 | 17.40 | Barium | 700.000 | 26400.0 | 289.380 | - | mg/kg |
| CF33-004 | 16.90 | 17.40 | Naphthalene | 9.160 | 3090000.0 | - | 6.000 | ug/kg |
| CF33-004 | 16.90 | 17.40 | Uranium-238 | 2.117 | 351.0 | 1.490 | - | pCi/g |
| CF33-004 | 16.90 | 17.40 | Xylene | 16.900 | 2040000.0 | - | 12.000 | ug/kg |

| Location | Sbd (ft) | Sed (ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| CF37-009 | 4.50 | 6.50 | Acenaphthene | 74.000 | 40600000. | - | 31.000 | ug/kg |
| CF37-009 | 4.50 | 6.50 | Anthracene | 110.000 | 204000000 | - | 24.000 | ug/kg |
| CF37-009 | 4.50 | 6.50 | Benzo(a)anthracene | 200.000 | 34900.0 | - | 25.000 | ug/kg |
| CF37-009 | 4.50 | 6.50 | Benzo(a)pyrene | 190.000 | 3490.0 | - | 41.000 | ug/kg |
| CF37-009 | 4.50 | 6.50 | Benzo(b)fluoranthene | 120.000 | 34900.0 | - | 29.000 | ug/kg |
| CF37-009 | 4.50 | 6.50 | Benzo(k)fluoranthene | 170.000 | 349000.0 | - | 32.000 | ug/kg |
| CF37-009 | 4.50 | 6.50 | Chrysene | 230.000 | 3490000.0 | - | 28.000 | ug/kg |
| CF37-009 | 4.50 | 6.50 | Fluoranthene | 500.000 | 27200000. | - | 23.000 | ug/kg |
| CF37-009 | 4.50 | 6.50 | Indeno(1,2,3-cd)pyrene | 83.000 | 34900.0 | - | 23.000 | ug/kg |
| CF37-009 | 4.50 | 6.50 | Pyrene | 470.000 | 22100000. | - | 140.000 | ug/kg |
| CF37-009 | 4.50 | 6.50 | Uranium-235 | 0.148 | 8.0 | 0.120 | - | pCi/g |
| CF37-009 | 4.50 | 6.50 | Uranium-238 | 1.675 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd (ft) | Sed (ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| CE35-040 | 2.50 | 3.00 | Acetone | 14.000 | 102000000 | - | 5.100 | ug/kg |
| CE35-040 | 2.50 | 3.00 | Methylene chloride | 1.100 | 2530000.0 | - | 0.880 | ug/kg |

| Location | Sbd (ft) | Sed (ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| CF34-022 | 25.00 | 25.50 | Antimony | 7.840 | 409.0 | 0.470 | - | mg/kg |
| CF34-022 | 25.00 | 25.50 | Barium | 719.000 | 26400.0 | 141.260 | - | mg/kg |
| CF34-022 | 25.00 | 25.50 | Chromium | 49.000 | 268.0 | 16.990 | - | mg/kg |
| CF34-022 | 25.00 | 25.50 | Copper | 47.400 | 40600.0 | 18.060 | - | mg/kg |
| CF34-022 | 25.00 | 25.50 | Iron | 27200.000 | 307000.0 | 18037.000 | - | mg/kg |
| CF34-022 | 25.00 | 25.50 | Nickel | 34.900 | 20400.0 | 14.910 | - | mg/kg |
| CF34-022 | 25.00 | 25.50 | Strontium | 146.000 | 613000.0 | 48.940 | - | mg/kg |
| CF34-022 | 25.00 | 25.50 | Uranium-234 | 3.924 | 300.0 | 2.653 | - | pCi/g |
| CF34-022 | 25.00 | 25.50 | Uranium-235 | 0.229 | 8.0 | 0.094 | - | pCi/g |
| CF34-022 | 25.00 | 25.50 | Uranium-238 | 3.924 | 351.0 | 2.000 | - | pCi/g |
| CF34-022 | 25.00 | 25.50 | Vanadium | 168.000 | 7150.0 | 45.590 | - | mg/kg |
| CF34-022 | 25.00 | 25.50 | Zinc | 90.100 | 307000.0 | 73.760 | - | mg/kg |

| Location | Sbd (ft) | Sed (ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| CF33-010 | 5.00 | 5.01 | Arsenic | 25.800 | 22.2 | 13.140 | - | mg/kg |
| CF33-010 | 5.00 | 5.01 | Barium | 753.000 | 26400.0 | 289.380 | - | mg/kg |
| CF33-010 | 5.00 | 5.01 | Copper | 93.900 | 40600.0 | 38.210 | - | mg/kg |
| CF33-010 | 5.00 | 5.01 | Fluoranthene | 64.000 | 27200000. | - | 46.000 | ug/kg |
| CF33-010 | 5.00 | 5.01 | Lead | 30.900 | 1000.0 | 24.970 | - | mg/kg |
| CF33-010 | 5.00 | 5.01 | Uranium-234 | 4.224 | 300.0 | 2.640 | - | pCi/g |
| CF33-010 | 5.00 | 5.01 | Uranium-235 | 0.260 | 8.0 | 0.120 | - | pCi/g |
| CF33-010 | 5.00 | 5.01 | Uranium-238 | 4.224 | 351.0 | 1.490 | - | pCi/g |

# Figure 5

## 800 Area Characterization Soil Sampling Results Greater Than Background Means Plus Two Standard Deviations or RLs

### KEY

IHSS Group 000-4

- Detection greater than WRW AL
- Detection less than WRW AL
- Below background or MDL/RL

Other IHSS Group

- Detection greater than WRW AL
- Detection less than WRW AL
- Below background or MDL/RL

- NPWL - removed (below ground)
- NPWL - removed (above ground)
- NPWL - left in place (clean closed)
- NPWL - left in place (not part of RCRA Unit 374.3)
- Valve Vault - removed
- Valve Vault - partially removed and flow filled
- Valve Vault - partially removed and backfilled
- Building/structure
- Demolished structure
- Paved area
- Dirt road

DRAFT

N W E S

400 0 400 Feet

Scale = 1:3,500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Prepared by: RADMS Date: August 2005

Prepared for: KAISER-HILL COMPANY

File:W:\Projects\Fy2005\000-4\NPWL cor gpp.apr

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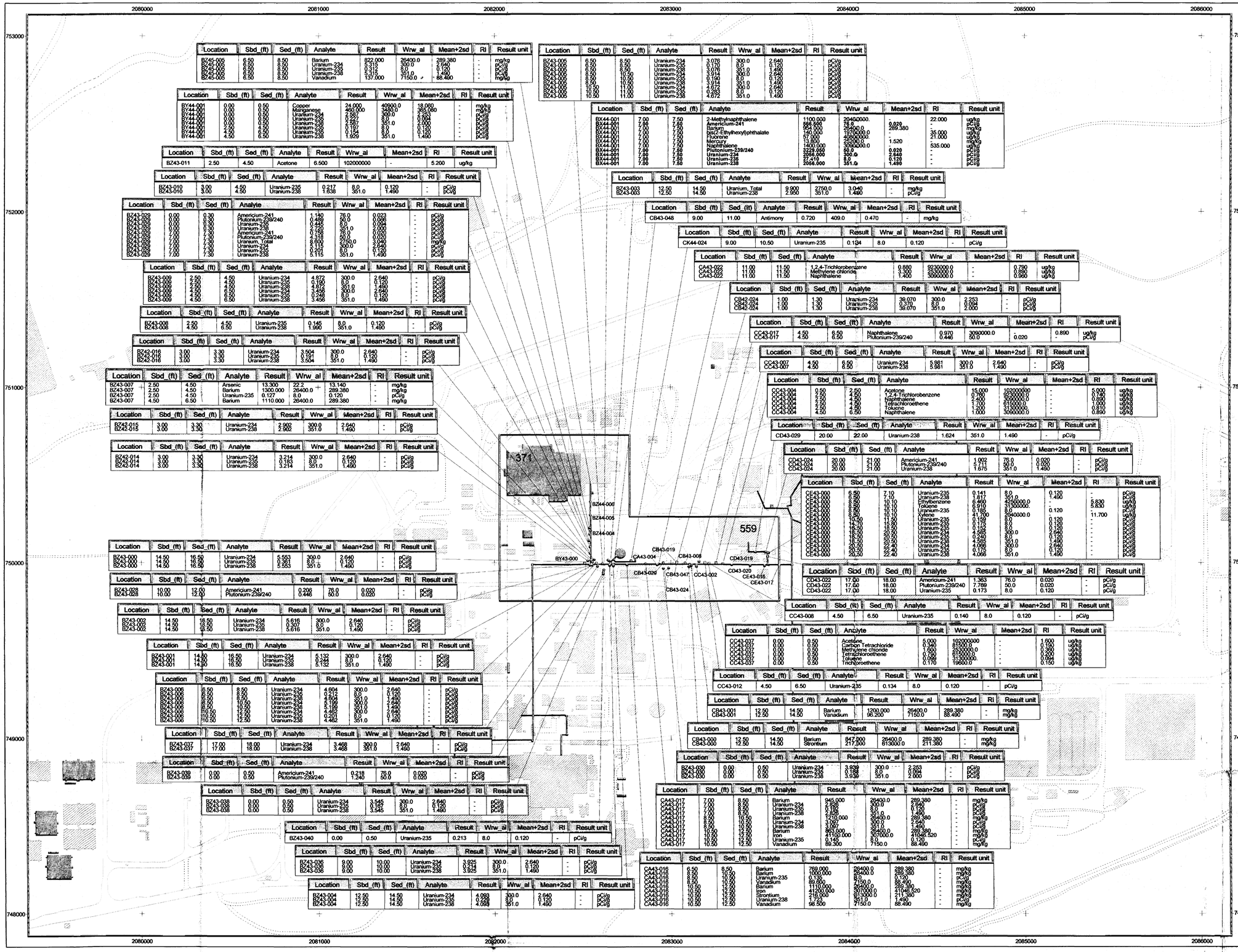


| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ45-005 | 6.50 | 8.50 | Barium | 822.000 | 26400.0 | 289.380 | - | mg/kg |
| BZ45-005 | 6.50 | 8.50 | Uranium-234 | 5.315 | 300.0 | 2.640 | - | pCi/g |
| BZ45-005 | 6.50 | 8.50 | Uranium-235 | 0.312 | 8.0 | 0.120 | - | pCi/g |
| BZ45-005 | 6.50 | 8.50 | Uranium-238 | 5.315 | 351.0 | 1.490 | - | pCi/g |
| BZ45-005 | 6.50 | 8.50 | Vanadium | 137.000 | 7150.0 | 88.490 | - | mg/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BY44-001 | 0.00 | 0.50 | Copper | 24.000 | 40900.0 | 18.060 | - | mg/kg |
| BY44-001 | 0.00 | 0.50 | Manganese | 463.000 | 3480.0 | 363.080 | - | mg/kg |
| BY44-001 | 0.00 | 0.50 | Uranium-234 | 2.387 | 300.0 | 2.623 | - | pCi/g |
| BY44-001 | 0.00 | 0.50 | Uranium-235 | 0.227 | 8.0 | 0.094 | - | pCi/g |
| BY44-001 | 0.00 | 0.50 | Uranium-236 | 2.797 | 351.0 | 2.000 | - | pCi/g |
| BY44-001 | 2.50 | 4.50 | Uranium-235 | 0.197 | 8.0 | 0.120 | - | pCi/g |
| BY44-001 | 4.50 | 6.50 | Uranium-234 | 0.154 | 300.0 | 2.640 | - | pCi/g |
| BY44-001 | 4.50 | 6.50 | Uranium-238 | 1.929 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-011 | 2.50 | 4.50 | Acetone | 6.500 | 102000000 | - | 5.200 | ug/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-010 | 3.00 | 4.50 | Uranium-235 | 0.217 | 8.0 | 0.120 | - | pCi/g |
| BZ43-010 | 3.00 | 4.50 | Uranium-238 | 1.638 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-029 | 0.00 | 0.30 | Americium-241 | 1.130 | 76.0 | 0.023 | - | pCi/g |
| BZ43-029 | 0.00 | 0.30 | Plutonium-239/240 | 0.489 | 50.0 | 0.096 | - | pCi/g |
| BZ43-029 | 0.00 | 0.30 | Uranium-233 | 0.445 | 8.0 | 0.094 | - | pCi/g |
| BZ43-029 | 0.00 | 0.30 | Uranium-238 | 2.720 | 351.0 | 2.000 | - | pCi/g |
| BZ43-029 | 7.00 | 7.30 | Americium-241 | 0.158 | 76.0 | 0.020 | - | pCi/g |
| BZ43-029 | 7.00 | 7.30 | Plutonium-239/240 | 4.318 | 50.0 | 0.020 | - | pCi/g |
| BZ43-029 | 7.00 | 7.30 | Uranium, Total | 8.600 | 2750.0 | 3.040 | - | mg/kg |
| BZ43-029 | 7.00 | 7.30 | Uranium-234 | 5.115 | 300.0 | 2.640 | - | pCi/g |
| BZ43-029 | 7.00 | 7.30 | Uranium-235 | 0.201 | 8.0 | 0.120 | - | pCi/g |
| BZ43-029 | 7.00 | 7.30 | Uranium-238 | 5.115 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-009 | 2.50 | 4.50 | Uranium-234 | 4.672 | 300.0 | 2.640 | - | pCi/g |
| BZ43-009 | 2.50 | 4.50 | Uranium-235 | 0.190 | 8.0 | 0.120 | - | pCi/g |
| BZ43-009 | 2.50 | 4.50 | Uranium-238 | 4.672 | 351.0 | 1.490 | - | pCi/g |
| BZ43-009 | 4.50 | 6.50 | Uranium-234 | 3.456 | 300.0 | 2.640 | - | pCi/g |
| BZ43-009 | 4.50 | 6.50 | Uranium-235 | 0.248 | 8.0 | 0.120 | - | pCi/g |
| BZ43-009 | 4.50 | 6.50 | Uranium-238 | 3.456 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-008 | 2.50 | 4.50 | Uranium-235 | 0.145 | 8.0 | 0.120 | - | pCi/g |
| BZ43-008 | 4.50 | 6.50 | Uranium-238 | 1.990 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ42-016 | 3.00 | 3.30 | Uranium-234 | 3.504 | 300.0 | 2.640 | - | pCi/g |
| BZ42-016 | 3.00 | 3.30 | Uranium-235 | 0.191 | 8.0 | 0.120 | - | pCi/g |
| BZ42-016 | 3.00 | 3.30 | Uranium-238 | 3.504 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-007 | 2.50 | 4.50 | Arsenic | 13.300 | 22.2 | 13.140 | - | mg/kg |
| BZ43-007 | 2.50 | 4.50 | Barium | 1300.000 | 26400.0 | 289.380 | - | mg/kg |
| BZ43-007 | 2.50 | 4.50 | Uranium-235 | 0.127 | 8.0 | 0.120 | - | pCi/g |
| BZ43-007 | 4.50 | 6.50 | Barium | 1110.000 | 26400.0 | 289.380 | - | mg/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ42-015 | 3.00 | 3.30 | Uranium-234 | 2.902 | 300.0 | 2.640 | - | pCi/g |
| BZ42-015 | 3.00 | 3.30 | Uranium-238 | 2.902 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ42-014 | 3.00 | 3.30 | Uranium-234 | 3.214 | 300.0 | 2.640 | - | pCi/g |
| BZ42-014 | 3.00 | 3.30 | Uranium-235 | 0.163 | 8.0 | 0.120 | - | pCi/g |
| BZ42-014 | 3.00 | 3.30 | Uranium-238 | 3.214 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-000 | 14.50 | 16.50 | Uranium-234 | 5.553 | 300.0 | 2.640 | - | pCi/g |
| BZ43-000 | 14.50 | 16.50 | Uranium-235 | 0.261 | 8.0 | 0.120 | - | pCi/g |
| BZ43-000 | 14.50 | 16.50 | Uranium-238 | 5.553 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-028 | 10.00 | 12.00 | Americium-241 | 0.206 | 76.0 | 0.020 | - | pCi/g |
| BZ43-028 | 10.00 | 12.00 | Plutonium-239/240 | 0.446 | 50.0 | 0.020 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-002 | 14.50 | 16.50 | Uranium-234 | 5.616 | 300.0 | 2.640 | - | pCi/g |
| BZ43-002 | 14.50 | 16.50 | Uranium-235 | 0.307 | 8.0 | 0.120 | - | pCi/g |
| BZ43-002 | 14.50 | 16.50 | Uranium-238 | 5.616 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-001 | 14.50 | 16.50 | Uranium-234 | 5.132 | 300.0 | 2.640 | - | pCi/g |
| BZ43-001 | 14.50 | 16.50 | Uranium-235 | 0.242 | 8.0 | 0.120 | - | pCi/g |
| BZ43-001 | 14.50 | 16.50 | Uranium-238 | 5.132 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-006 | 6.50 | 8.50 | Uranium-234 | 4.604 | 300.0 | 2.640 | - | pCi/g |
| BZ43-006 | 6.50 | 8.50 | Uranium-235 | 0.212 | 8.0 | 0.120 | - | pCi/g |
| BZ43-006 | 6.50 | 8.50 | Uranium-238 | 4.604 | 351.0 | 1.490 | - | pCi/g |
| BZ43-006 | 8.50 | 10.50 | Uranium-234 | 5.199 | 300.0 | 2.640 | - | pCi/g |
| BZ43-006 | 8.50 | 10.50 | Uranium-235 | 0.199 | 8.0 | 0.120 | - | pCi/g |
| BZ43-006 | 8.50 | 10.50 | Uranium-238 | 5.199 | 351.0 | 1.490 | - | pCi/g |
| BZ43-006 | 10.50 | 12.50 | Uranium-234 | 4.462 | 300.0 | 2.640 | - | pCi/g |
| BZ43-006 | 10.50 | 12.50 | Uranium-235 | 0.201 | 8.0 | 0.120 | - | pCi/g |
| BZ43-006 | 10.50 | 12.50 | Uranium-238 | 4.462 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-037 | 17.00 | 18.00 | Uranium-234 | 3.468 | 300.0 | 2.640 | - | pCi/g |
| BZ43-037 | 17.00 | 18.00 | Uranium-238 | 3.468 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-038 | 0.00 | 0.50 | Americium-241 | 0.218 | 76.0 | 0.020 | - | pCi/g |
| BZ43-038 | 0.00 | 0.50 | Plutonium-239/240 | 1.240 | 50.0 | 0.020 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-038 | 0.00 | 0.50 | Uranium-234 | 3.545 | 300.0 | 2.640 | - | pCi/g |
| BZ43-038 | 0.00 | 0.50 | Uranium-235 | 0.167 | 8.0 | 0.120 | - | pCi/g |
| BZ43-038 | 0.00 | 0.50 | Uranium-238 | 3.245 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-040 | 0.00 | 0.50 | Uranium-235 | 0.213 | 8.0 | 0.120 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-036 | 9.00 | 10.00 | Uranium-234 | 3.925 | 300.0 | 2.640 | - | pCi/g |
| BZ43-036 | 9.00 | 10.00 | Uranium-235 | 0.214 | 8.0 | 0.120 | - | pCi/g |
| BZ43-036 | 9.00 | 10.00 | Uranium-238 | 3.925 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-004 | 12.50 | 14.50 | Uranium-234 | 4.093 | 300.0 | 2.640 | - | pCi/g |
| BZ43-004 | 12.50 | 14.50 | Uranium-235 | 0.228 | 8.0 | 0.120 | - | pCi/g |
| BZ43-004 | 12.50 | 14.50 | Uranium-238 | 4.093 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-005 | 6.50 | 8.50 | Uranium-234 | 3.076 | 300.0 | 2.640 | - | pCi/g |
| BZ43-005 | 6.50 | 8.50 | Uranium-235 | 0.170 | 8.0 | 0.120 | - | pCi/g |
| BZ43-005 | 6.50 | 8.50 | Uranium-238 | 3.076 | 351.0 | 1.490 | - | pCi/g |
| BZ43-005 | 8.50 | 10.50 | Uranium-234 | 3.914 | 300.0 | 2.640 | - | pCi/g |
| BZ43-005 | 8.50 | 10.50 | Uranium-235 | 0.190 | 8.0 | 0.120 | - | pCi/g |
| BZ43-005 | 8.50 | 10.50 | Uranium-238 | 3.914 | 351.0 | 1.490 | - | pCi/g |
| BZ43-005 | 10.50 | 11.00 | Uranium-234 | 4.672 | 300.0 | 2.640 | - | pCi/g |
| BZ43-005 | 10.50 | 11.00 | Uranium-235 | 0.225 | 8.0 | 0.120 | - | pCi/g |
| BZ43-005 | 10.50 | 11.00 | Uranium-238 | 4.672 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BX44-001 | 7.00 | 7.50 | 2-Methylnaphthalene | 1100.000 | 2040000. | | 22.000 | ug/kg |
| BX44-001 | 7.00 | 7.50 | Americium-241 | 666.000 | 76.0 | 0.020 | - | pCi/g |
| BX44-001 | 7.00 | 7.50 | Barium | 954.000 | 26400.0 | 289.380 | - | mg/kg |
| BX44-001 | 7.00 | 7.50 | bis(2-Ethylhexyl)phthalate | 140.000 | 16700000.0 | - | 35.000 | ug/kg |
| BX44-001 | 7.00 | 7.50 | Fluorene | 57.000 | 408000000. | - | 21.000 | ug/kg |
| BX44-001 | 7.00 | 7.50 | Mercury | 13.800 | 252000.0 | 1.520 | - | mg/kg |
| BX44-001 | 7.00 | 7.50 | Naphthalene | 1400.000 | 3090000.0 | - | 535.000 | ug/kg |
| BX44-001 | 7.00 | 7.50 | Plutonium-239/240 | 2229.000 | 50.0 | 0.020 | - | pCi/g |
| BX44-001 | 7.00 | 7.50 | Uranium-234 | 2056.000 | 300.0 | 2.640 | - | pCi/g |
| BX44-001 | 7.00 | 7.50 | Uranium-235 | 27.410 | 8.0 | 0.120 | - | pCi/g |
| BX44-001 | 7.00 | 7.50 | Uranium-238 | 2056.000 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-003 | 12.50 | 14.50 | Uranium, Total | 9.900 | 2750.0 | 3.040 | - | mg/kg |
| BZ43-003 | 12.50 | 14.50 | Uranium-238 | 2.950 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CB43-048 | 9.00 | 11.00 | Antimony | 0.720 | 409.0 | 0.470 | - | mg/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CK44-024 | 9.00 | 10.50 | Uranium-235 | 0.134 | 8.0 | 0.120 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CA43-022 | 11.00 | 11.50 | 1,2,4-Trichlorobenzene | 0.880 | 9230000.0 | - | 0.790 | ug/kg |
| CA43-022 | 11.00 | 11.50 | Methylene chloride | 3.300 | 2530000.0 | - | 0.880 | ug/kg |
| CA43-022 | 11.00 | 11.50 | Naphthalene | 1.400 | 3090000.0 | - | 0.960 | ug/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CB42-024 | 1.00 | 1.30 | Uranium-234 | 36.070 | 300.0 | 2.263 | - | pCi/g |
| CB42-024 | 1.00 | 1.30 | Uranium-235 | 0.270 | 8.0 | 0.093 | - | pCi/g |
| CB42-024 | 1.00 | 1.30 | Uranium-238 | 39.070 | 351.0 | 2.000 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CC43-017 | 4.50 | 6.50 | Naphthalene | 0.970 | 3090000.0 | - | 0.890 | ug/kg |
| CC43-017 | 4.50 | 6.50 | Plutonium-239/240 | 0.446 | 50.0 | 0.020 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CC43-007 | 4.50 | 6.50 | Uranium-234 | 5.981 | 300.0 | 2.640 | - | pCi/g |
| CC43-007 | 4.50 | 6.50 | Uranium-238 | 5.981 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CC43-004 | 0.50 | 2.50 | Acetone | 15.000 | 102000000 | - | 5.000 | ug/kg |
| CC43-004 | 2.50 | 4.50 | 1,2,4-Trichlorobenzene | 0.760 | 9230000.0 | - | 0.740 | ug/kg |
| CC43-004 | 2.50 | 4.50 | Naphthalene | 2.400 | 3090000.0 | - | 0.890 | ug/kg |
| CC43-004 | 2.50 | 4.50 | Tetrachloroethene | 1.700 | 615000.0 | - | 1.000 | ug/kg |
| CC43-004 | 4.50 | 6.50 | Toluene | 1.200 | 3130000. | - | 0.810 | ug/kg |
| CC43-004 | 4.50 | 6.50 | Naphthalene | 1.000 | 3090000.0 | - | 0.890 | ug/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CD43-029 | 20.00 | 22.00 | Uranium-238 | 1.624 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CD43-024 | 20.00 | 21.00 | Americium-241 | 1.902 | 76.0 | 0.020 | - | pCi/g |
| CD43-024 | 20.00 | 21.00 | Plutonium-239/240 | 5.711 | 50.0 | 0.020 | - | pCi/g |
| CD43-024 | 20.00 | 21.00 | Uranium-238 | 1.675 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CE43-000 | 6.50 | 7.10 | Uranium-235 | 0.141 | 8.0 | 0.120 | - | pCi/g |
| CE43-000 | 6.50 | 7.10 | Uranium-238 | 1.817 | 351.0 | 1.490 | - | pCi/g |
| CE43-000 | 8.50 | 10.10 | Ethylbenzene | 5.400 | 4250000.0 | - | 5.830 | ug/kg |
| CE43-000 | 8.50 | 10.10 | Toluene | 6.910 | 31300000. | - | 5.830 | ug/kg |
| CE43-000 | 8.50 | 10.10 | Uranium-235 | 0.185 | 8.0 | 0.120 | - | pCi/g |
| CE43-000 | 8.50 | 10.10 | Xylene | 41.700 | 2040000.0 | - | 11.700 | ug/kg |
| CE43-000 | 10.50 | 11.50 | Uranium-235 | 0.159 | 8.0 | 0.120 | - | pCi/g |
| CE43-000 | 14.70 | 15.80 | Uranium-235 | 0.175 | 8.0 | 0.120 | - | pCi/g |
| CE43-000 | 16.50 | 18.50 | Uranium-235 | 0.132 | 8.0 | 0.120 | - | pCi/g |
| CE43-000 | 18.50 | 20.50 | Uranium-234 | 2.565 | 300.0 | 2.640 | - | pCi/g |
| CE43-000 | 18.50 | 20.50 | Uranium-235 | 0.230 | 8.0 | 0.120 | - | pCi/g |
| CE43-000 | 18.50 | 20.50 | Uranium-238 | 4.565 | 351.0 | 1.490 | - | pCi/g |
| CE43-000 | 20.50 | 22.40 | Uranium-234 | 4.069 | 300.0 | 2.640 | - | pCi/g |
| CE43-000 | 20.50 | 22.40 | Uranium-235 | 0.175 | 8.0 | 0.120 | - | pCi/g |
| CE43-000 | 20.50 | 22.40 | Uranium-238 | 4.066 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CD43-022 | 17.00 | 18.00 | Americium-241 | 1.363 | 76.0 | 0.020 | - | pCi/g |
| CD43-022 | 17.00 | 18.00 | Plutonium-239/240 | 7.769 | 50.0 | 0.020 | - | pCi/g |
| CD43-022 | 17.00 | 18.00 | Uranium-235 | 0.173 | 8.0 | 0.120 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CC43-008 | 4.50 | 6.50 | Uranium-235 | 0.140 | 8.0 | 0.120 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CC43-037 | 0.00 | 0.50 | Acetone | 5.000 | 102000000 | - | 1.600 | ug/kg |
| CC43-037 | 0.00 | 0.50 | Carbon Tetrachloride | 0.340 | 81500.0 | - | 0.190 | ug/kg |
| CC43-037 | 0.00 | 0.50 | Methylene chloride | 1.600 | 2530000.0 | - | 0.360 | ug/kg |
| CC43-037 | 0.00 | 0.50 | Tetrachloroethene | 0.790 | 615000.0 | - | 0.200 | ug/kg |
| CC43-037 | 0.00 | 0.50 | Toluene | 0.099 | 31300000. | - | 0.094 | ug/kg |
| CC43-037 | 0.00 | 0.50 | Trichloroethene | 0.170 | 19600.0 | - | 0.150 | ug/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CC43-012 | 4.50 | 6.50 | Uranium-235 | 0.134 | 8.0 | 0.120 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CB43-001 | 12.50 | 14.50 | Barium | 1290.000 | 26400.0 | 289.380 | - | mg/kg |
| CB43-001 | 12.50 | 14.50 | Vanadium | 96.200 | 7150.0 | 88.490 | - | mg/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CB43-000 | 12.50 | 14.50 | Barium | 847.000 | 26400.0 | 289.380 | - | mg/kg |
| CB43-000 | 12.50 | 14.50 | Strontium | 217.000 | 613000.0 | 211.380 | - | mg/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| BZ43-030 | 0.00 | 0.50 | Uranium-234 | 3.939 | 300.0 | 2.263 | - | pCi/g |
| BZ43-030 | 0.00 | 0.50 | Uranium-235 | 0.184 | 8.0 | 0.094 | - | pCi/g |
| BZ43-030 | 0.00 | 0.50 | Uranium-238 | 3.939 | 351.0 | 2.000 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CA43-017 | 7.00 | 8.50 | Barium | 945.000 | 26400.0 | 289.380 | - | mg/kg |
| CA43-017 | 7.00 | 8.50 | Uranium-234 | 2.828 | 300.0 | 2.640 | - | pCi/g |
| CA43-017 | 7.00 | 8.50 | Uranium-235 | 0.192 | 8.0 | 0.120 | - | pCi/g |
| CA43-017 | 7.00 | 8.50 | Uranium-238 | 2.828 | 351.0 | 1.490 | - | pCi/g |
| CA43-017 | 8.50 | 10.50 | Barium | 1210.000 | 26400.0 | 289.380 | - | mg/kg |
| CA43-017 | 8.50 | 10.50 | Uranium-234 | 3.097 | 300.0 | 2.640 | - | pCi/g |
| CA43-017 | 8.50 | 10.50 | Uranium-238 | 3.097 | 351.0 | 1.490 | - | pCi/g |
| CA43-017 | 10.50 | 12.50 | Barium | 863.000 | 26400.0 | 289.380 | - | mg/kg |
| CA43-017 | 10.50 | 12.50 | Iron | 41100.000 | 307000.0 | 41046.520 | - | mg/kg |
| CA43-017 | 10.50 | 12.50 | Uranium-235 | 0.145 | 8.0 | 0.120 | - | pCi/g |
| CA43-017 | 10.50 | 12.50 | Vanadium | 89.300 | 7150.0 | 88.490 | - | mg/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | RI | Result unit |
|---|---|---|---|---|---|---|---|---|
| CA43-016 | 6.50 | 8.50 | Barium | 768.000 | 26400.0 | 289.380 | - | mg/kg |
| CA43-016 | 8.50 | 10.50 | Barium | 1000.000 | 26400.0 | 289.380 | - | mg/kg |
| CA43-016 | 8.50 | 10.50 | Uranium-235 | 0.135 | 8.0 | 0.120 | - | pCi/g |
| CA43-016 | 8.50 | 10.50 | Vanadium | 89.600 | 7150.0 | 88.490 | - | mg/kg |
| CA43-016 | 10.50 | 12.50 | Barium | 1110.000 | 26400.0 | 289.380 | - | mg/kg |
| CA43-016 | 10.50 | 12.50 | Iron | 41200.000 | 307000.0 | 41046.520 | - | mg/kg |
| CA43-016 | 10.50 | 12.50 | Strontium | 216.000 | 613000.0 | 211.380 | - | mg/kg |
| CA43-016 | 10.50 | 12.50 | Uranium-235 | 0.123 | 8.0 | 0.120 | - | pCi/g |
| CA43-016 | 10.50 | 12.50 | Vanadium | 98.500 | 7150.0 | 88.490 | - | mg/kg |

# Figure 3

## 300/500 Area Characterization Soil Sampling Results Greater Than Background Means Plus Two Standard Deviations or RLs

## KEY

IHSS Group 000-4

- Detection greater than WRW AL
- Detection less than WRW AL
- Below background or MDL/RL

Other IHSS Group

- Detection greater than WRW AL
- Detection less than WRW AL
- Below background or MDL/RL

Building/structure

Demolished structure

Paved area

Dirt road

Stream, ditch, or other drainage feature

NPWL - removed (below ground)

NPWL - removed (above ground)

NPWL - left in place (clean closed)

NPWL - left in place (not part of RCRA Unit 374.3)

Valve Vault - removed

Valve Vault - partially removed and flow filled

Valve Vault - partially removed and backfilled

Draft

N W E S

300 0 300 Feet

Scale = 1 : 3,000

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Prepared by: RADMS

Date: August 2005

Prepared for: KAISER-HILL COMPANY

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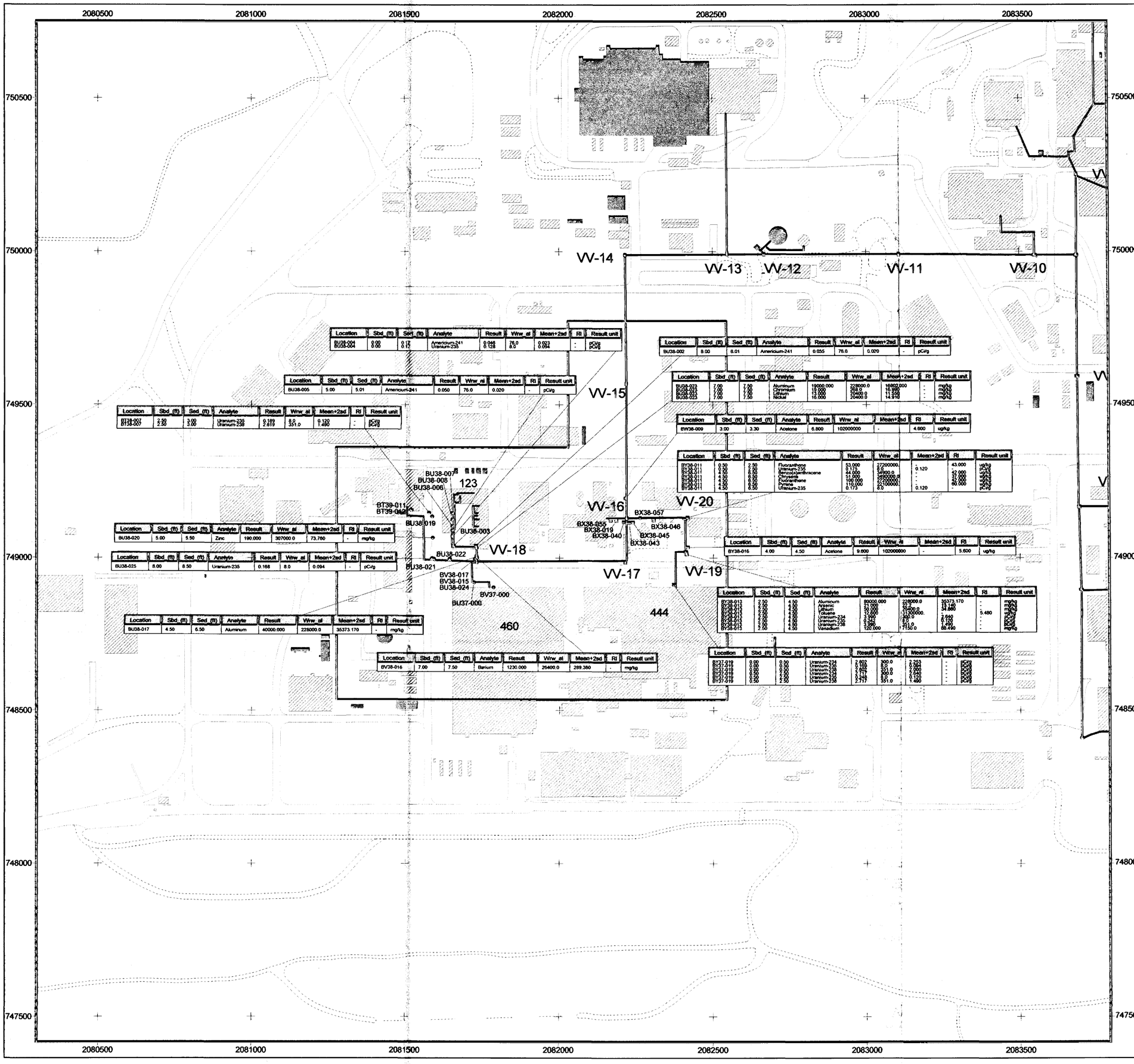
6) IA-A-002762




| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BU38-004 | 0.00 | 0.12 | Americium-241 | 0.046 | 76.0 | 0.063 | - | pCi/g |
| BU38-004 | 0.00 | 0.12 | Uranium-235 | 0.128 | 8.0 | 0.094 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BU38-005 | 5.00 | 5.01 | Americium-241 | 0.050 | 76.0 | 0.020 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BT38-007 | 2.50 | 3.00 | Uranium-235 | 0.189 | 8.0 | 0.130 | - | pCi/g |
| BT38-007 | 2.50 | 3.00 | Uranium-238 | 2.619 | 351.0 | 1.490 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BU38-020 | 5.00 | 5.50 | Zinc | 190.000 | 307000.0 | 73.760 | - | mg/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BU38-025 | 8.00 | 8.50 | Uranium-235 | 0.168 | 8.0 | 0.094 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BU38-017 | 4.50 | 6.50 | Aluminum | 40000.000 | 226000.0 | 35373.170 | - | mg/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BV38-016 | 7.00 | 7.50 | Barium | 1230.000 | 26400.0 | 289.380 | - | mg/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BU38-002 | 8.00 | 8.01 | Americium-241 | 0.035 | 76.0 | 0.020 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BU38-023 | 7.00 | 7.50 | Aluminum | 19000.000 | 226000.0 | 16602.000 | - | mg/kg |
| BU38-023 | 7.00 | 7.50 | Chromium | 13.000 | 268.0 | 10.980 | - | mg/kg |
| BU38-023 | 7.00 | 7.50 | Lithium | 13.000 | 20400.0 | 11.530 | - | mg/kg |
| BU38-023 | 7.00 | 7.50 | Nickel | 16.000 | 20400.0 | 14.910 | - | mg/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BW38-009 | 3.00 | 3.30 | Acetone | 6.800 | 102000000 | - | 4.600 | ug/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BY38-011 | 0.50 | 2.50 | Fluoranthene | 53.000 | 27200000. | - | 43.000 | ug/kg |
| BY38-011 | 0.50 | 2.50 | Uranium-235 | 0.173 | 8.0 | 0.120 | - | pCi/g |
| BY38-011 | 4.50 | 6.50 | Benzo(a)anthracene | 44.000 | 34900.0 | - | 42.000 | ug/kg |
| BY38-011 | 4.50 | 6.50 | Chrysene | 51.000 | 3490000.0 | - | 42.000 | ug/kg |
| BY38-011 | 4.50 | 6.50 | Fluoranthene | 100.000 | 27200000. | - | 43.000 | ug/kg |
| BY38-011 | 4.50 | 6.50 | Pyrene | 110.000 | 21000000. | - | 60.000 | ug/kg |
| BY38-011 | 4.50 | 6.50 | Uranium-235 | 0.173 | 8.0 | 0.120 | - | pCi/g |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BY38-016 | 4.00 | 4.50 | Acetone | 9.600 | 102000000 | - | 5.600 | ug/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BY38-013 | 2.50 | 4.50 | Aluminum | 80000.000 | 226000.0 | 35373.170 | - | mg/kg |
| BY38-013 | 2.50 | 4.50 | Arsenic | 30.000 | 20400.0 | 34.140 | - | mg/kg |
| BY38-013 | 2.50 | 4.50 | Lithium | 31.000 | 31200000. | 34.480 | 5.480 | mg/kg |
| BY38-013 | 2.50 | 4.50 | Uranium-234 | 2.990 | 300.0 | 2.640 | - | pCi/g |
| BY38-013 | 2.50 | 4.50 | Uranium-235 | 0.242 | 8.0 | 0.120 | - | pCi/g |
| BY38-013 | 2.50 | 4.50 | Uranium-238 | 3.390 | 351.0 | 1.490 | - | pCi/g |
| BY38-013 | 2.50 | 4.50 | Vanadium | 120.000 | 7150.0 | 88.490 | - | mg/kg |

| Location | Sbd_(ft) | Sed_(ft) | Analyte | Result | Wrw_al | Mean+2sd | Rl | Result unit |
|---|---|---|---|---|---|---|---|---|
| BY37-019 | 0.00 | 0.50 | Uranium-234 | 2.802 | 300.0 | 2.253 | - | pCi/g |
| BY37-019 | 0.00 | 0.50 | Uranium-235 | 0.109 | 8.0 | 0.064 | - | pCi/g |
| BY37-019 | 0.00 | 0.50 | Uranium-238 | 2.602 | 351.0 | 2.000 | - | pCi/g |
| BY37-019 | 0.50 | 2.50 | Uranium-234 | 2.717 | 300.0 | 2.640 | - | pCi/g |
| BY37-019 | 0.50 | 2.50 | Uranium-235 | 0.248 | 8.0 | 0.120 | - | pCi/g |
| BY37-019 | 0.50 | 2.50 | Uranium-238 | 2.717 | 351.0 | 1.490 | - | pCi/g |

# Figure 2

## 100/400 Area Characterization Soil Sampling Results Greater Than Background Means Plus Two Standard Deviations or RLs

### KEY

IHSS Group 000-4

- Detection greater than WRW AL
- Detection less than WRW AL
- Below background or MDL/RL

Other IHSS Group

- Detection greater than WRW AL
- Detection less than WRW AL
- Below background or MDL/RL

NPWL - removed (below ground)

NPWL - removed (above ground)

NPWL - left in place (clean closed)

NPWL - left in place (not part of RCRA Unit 374.3)

Valve Vault - removed

Valve Vault - partially removed and flow filled

Valve Vault - partially removed and backfilled

Building/structure

Demolished structure

Paved area

Dirt road

DRAFT

N W E S

300 0 300 Feet

Scale = 1:2,500

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD 27

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

Prepared by: RADMS Date: August 2005

Prepared for: KAISER-HILL COMPANY

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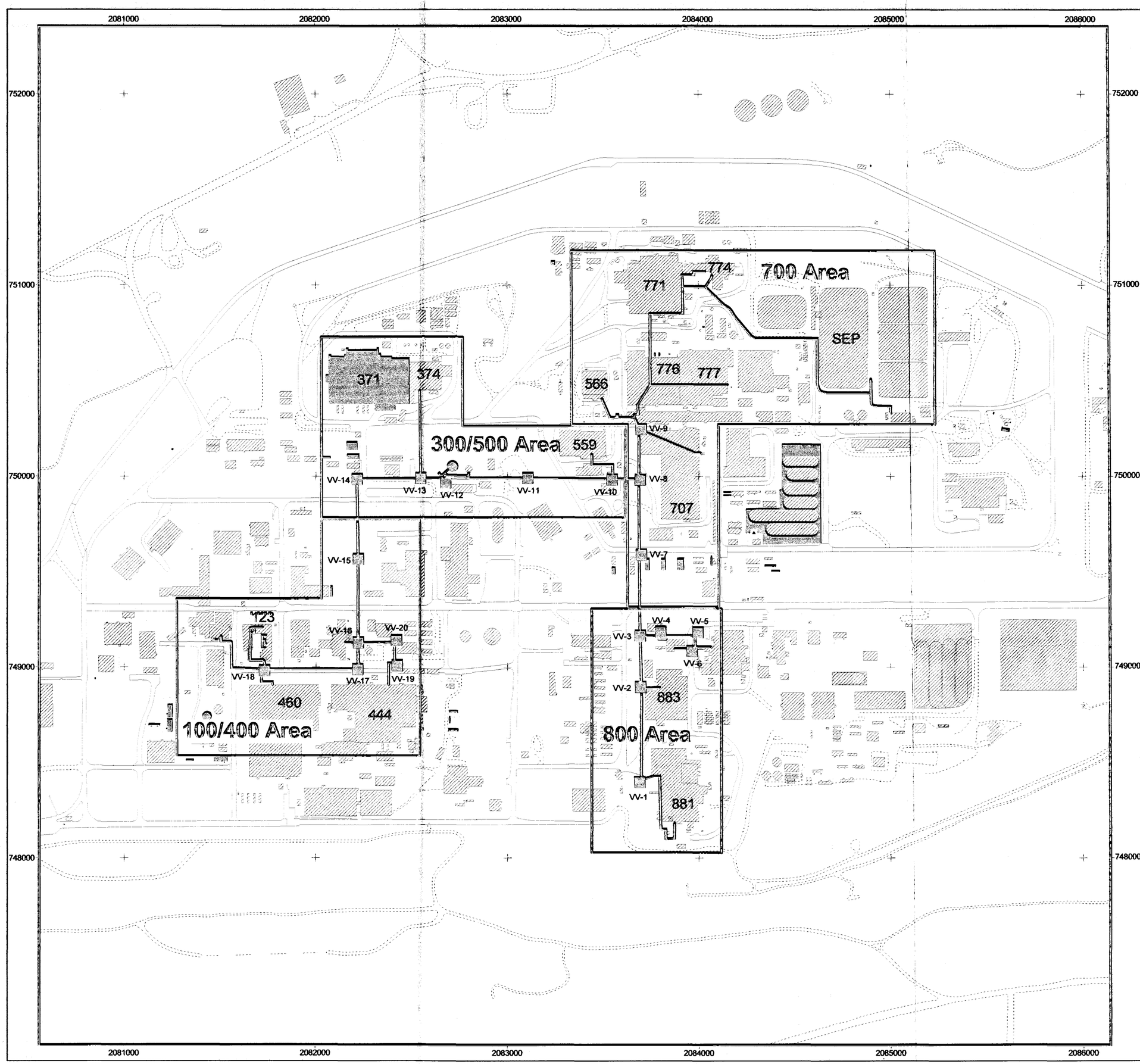


# Figure 1

## IHSS Group 000-4 New Process Waste Lines (NPWL) and Valve Vault Locations

### KEY

- NPWL - removed (below ground)
- NPWL - removed (above ground)
- NPWL - left in place (clean closed)
- NPWL - left in place (not part of RCRA Unit 374.3)
- Valve Vault - removed
- Valve Vault - partially removed and flow filled
- Valve Vault - partially removed and backfilled
- Building/structure
- Demolished structure
- Paved area
- Dirt road

Note: Valve vaults are greatly enlarged from actual scale for readability purposes

DRAFT

N W E S

400 0 400 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: August 2005

Prepared for: KAISER-HILL COMPANY

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