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Subject: Accelerated Residential Sampling - Iron King Mine and Humboldt Smelter Superfund Site Technical Memorandum
Date: Thursday, October 31, 2013 10:41:13 AM
Attachments: SERAS_146_DTM_103013.pdf

An electronic copy of the Accelerated Residential Sampling - Iron King Mine and Humboldt Smelter Superfund Site Technical Memorandum is attached. At the request of Terrance I will be sending two hard copies of the report to ZiZi as soon as possible (today or tomorrow at the latest).

Thanks,

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DATE: October 30, 2013

TO: Terrence Johnson, Ph.D., U.S. EPA/ERT Work Assignment Manager

THROUGH: Rick Leuser, SERAS Deputy Program Manager
David Aloysius, SERAS Task Leader

FROM: Scott Grossman, SERAS Subtask Leader

SUBJECT: **ACCELERATED RESIDENTIAL SAMPLING**
IRON KING MINE AND HUMBOLDT SMELTER SUPERFUND SITE
DEWEY-HUMBOLDT, ARIZONA
WORK ASSIGNMENT SERAS 0-146: TECHNICAL MEMORANDUM

INTRODUCTION

This technical memorandum presents the results of a field portable x-ray fluorescence (XRF) screening assessment for lead and arsenic in soil samples collected at the Site: a cluster of ten residential properties in the vicinity of the Jones Street -Wells Street intersection in the Dewey-Humboldt district. Eight of the properties are single dwelling, however two of the properties have multiple dwellings—13300 Wells Street has four homes and 13330 Wells Street has two homes (Figure 1). The samples were collected between 13 and 15 August, 2013. The Site action levels or removal criteria set by the US EPA Region 9 (Region) were 400 and 150 milligrams per kilogram (mg/kg) for lead and arsenic, respectively. In this report, XRF soil concentrations exceeding the lead and/or arsenic site action levels are referred to as elevated; areas with elevated concentrations are referred to as impacted. The objectives of this assessment were:

(1) Delineate the area with elevated lead and arsenic concentrations.
(2) Estimate the volume of contaminated soil to be removed and replaced with "clean" fill in a follow-up, time-critical removal.

A minimum of 10 percent (%) of the XRF screened soil samples were shipped by SERAS to a Contract Laboratory Program (CLP) laboratory for confirmation analysis (Target Analyte List [TAL] metals). Soil samples from yards exceeding the action limits were composited and submitted for Toxicity Characteristic Leaching Procedure (TCLP) extraction and analysis for Resource Conservation and Recovery Act (RCRA) eight metals (arsenic, barium, cadmium, chromium, lead, selenium, silver, and mercury).

SITE BACKGROUND

The Iron King-Humboldt-Smelter Superfund site is located in Dewey Humboldt, Yavapai County, Arizona. The Iron King-Humboldt-Smelter Superfund site is a combination of sources and releases from two areas: the Iron King Mine and the Humboldt Smelter. A portion of the Town of Dewey-Humboldt is situated between the Mine and the Smelter. Three waterways (Chaparral Gulch, Galena Gulch, and Agua Fria River) also transect the Iron King-Humboldt-Smelter Superfund site. The Iron King Mine occupies approximately 153 acres. The Iron King Mine is bordered by Chaparral Gulch to the north, Galena Gulch to the south, Highway 69 to the east, and undeveloped land to the west. The Main Tailing Pile on the Mine covers over 55 acres, is over 100-feet high and contains over 6,000,000 cubic yards of tailings. The Humboldt Smelter occupies approximately 182 acres. This area is covered in approximately 763,800 square feet of yellow-orange tailings, over 1 million square feet of grey smelter ash, and 456,000 square feet of slag. These mine and smelter wastes are sources of lead and arsenic contamination to neighboring residential soils through air transport, surface deposition, and in some cases was used as yard fill material. The Region has tasked the ERT to conduct a data gap assessment in support of the Site remedial investigation.

In August 2013, the Region requested that ERT/SERAS conduct a removal action assessment of lead and arsenic concentrations in soil in a cluster of residential properties located near the intersection of Wells Street and Jones Street in the district of Dewey Humboldt.

METHODS

Soil Sampling

Soil sample locations provided by the Region were located in the field and a pin flag with a unique identifier was placed at each location. Sample location identifiers consisted of an alphanumeric string, the first part of which was the truncated property address with a trailing sample location number: for example, sample location number 10 at 13330 Wells Street was designated 30W-010. Soil sample identifiers consisted of the location identifier followed by a trailing integer for the sampling depth (1=> 0" to 2", 2 => 10" to 14", 3 = >22" to 26" and 4 => 34" to 38"). For example sample 30W-002-1, was collected at sample location two at 13330 Wells Street at a depth of 0 to 2" (surface).

A surface soil sample was collected at each location using a decontaminated stainless steel trowel. At a subset of locations with elevated lead and arsenic concentrations, follow-up subsurface sampling was done at one-, two- and three-foot depths. These deeper samples were collected with a decontaminated hand-held soil auger, transferred to a dedicated aluminum pan and homogenized. All soil samples were placed in a self-sealing plastic bag and labeled with the sample identifier and date and time of collection.

The position of all sample locations and that of several discrete suspected mine tailings piles were obtained using differentially corrected global positioning system (GPS) (Figure 1).

XRF Field Analysis

A NITON XLt792YW XRF (S/N 8262) analyzer was used to analyze soil samples for lead and arsenic. The NITON XLt792YW XRF measurement times (instrument live-time) were 120 seconds for measurement condition 1 (Filt1 for lead, arsenic) and 30 seconds for measurement condition 2 (Filt2).

Sample preparation, analysis, and quality assurance/quality control (QA/QC) procedures used in this study conform to those described in the SERAS Standard Operating Procedure (SOP) #1720, *Operation of the NITON XLt792YW Field Portable X-ray Fluorescence Unit*.

All samples were brought to a central location for XRF screening. Soil samples were received in labeled plastic bags and were mixed well prior to analysis. Each sample, including the plastic bag, was placed in the NITON portable test stand above the NITON XLt792YW analyzer, the safety shield was closed, and analysis was initiated with the measurement times previously noted. Initially, all sample bags were analyzed twice (front and back of the bag). But later, to expedite the sample analysis and based on the consistency between the two analyses, only samples containing lead concentrations exceeding 200 mg/kg were analyzed twice. For samples where two XRF measurements were collected, the summary data contains the average of both readings. If one measurement was below the reporting limit (RL), the RL was used to calculate the average.

XRF analysis results for each sample were saved in the NITON XLt792YW internal data logger memory and the data were downloaded and archived on a USB drive on a daily basis. Target element (arsenic and lead) results for each analyzed sample and standard were logged into the NITON XLt792YW field logbook. Target element results were qualified using the field method detection limits (MDLs) and RLs; the results are considered preliminary or screening data (SD) data only.

The reliability of the NITON XLt792YW XRF unit and application model was evaluated during the site visit. The Detector Calibration (energy calibration and detector resolution check) was performed at the beginning of the day to ensure that proper instrument calibration was maintained and that the detector resolution was adequate for producing reliable X-ray intensity measurements. The NITON XLt792YW Standard Soil application was verified at the beginning of the day for the target elements. This was accomplished by analyzing Sand and silicon dioxide (SiO_2) blanks, and National Institute of Standards and Technology (NIST) Standard Reference Materials (SRMs) #2709A, #2710A, #2711A, and #2586. Energy calibration checks, detector resolution checks, and application verification results were recorded in the NITON XLt792YW field logbook (SERAS-L-0359). All values were within specification for all target elements.

A low concentration standard, NIST SRM #2709A, was analyzed at the beginning of the day and periodically during sample analysis to establish statistically-derived MDLs for the target elements. The certified concentrations for the target elements in SRM 2709A were: arsenic=10.5, and lead =17.3 mg/kg. The sample standard deviation for these analyses was used to calculate the NITON XLt792YW MDL for each target element. The MDL was calculated as:

$$MDL = t(n-1,99) * \Phi s$$

where:

$t(n-1,99)$ = student's t-value for a 99% confidence level and a standard deviation estimate with n–1 degrees of freedom

Φs = sample standard deviation (n–1 degrees of freedom).

Typically the RL is 2-5 times the statistical MDL. The project specific XRF RLs were 50 mg/kg for lead and 35 mg/kg for arsenic; results below the RL were qualified as non-detect (U). Due to severe spectral overlap between lead and arsenic, the arsenic RL was raised to 1/10 of the lead concentrations in samples where the lead concentration exceeded 350 mg/kg.

Samples for Laboratory Analysis

A minimum of 10% the samples were selected for confirmation of the XRF results at a fixed laboratory. These samples were transferred to 8-ounce glass jars and sent to a CLP laboratory for TAL metals analyses.

Three composite samples for TCLP analysis were made from soil samples collected in the impacted areas: composite B contained all the surface samples from along the fence line at 13330 Wells Street; composite C contained all the subsurface samples along the fence line at 13330 Wells Street; and composite D contained surface samples from the front yard and side of the yard at 13336 Wells Street (Figure 1). Composite samples were homogenized prior to being placed in a 32-ounce glass jar. Samples were submitted to the EPA Region 9 laboratory for TCLP extraction and analysis for eight RCRA metals (arsenic, barium, cadmium, chromium, lead, selenium, silver, and mercury).

RESULTS

Field XRF Soil Concentrations

A total of 254 surface soil samples and 27 subsurface samples were collected between 13 and 15 August 2013 from the ten residential properties (Table 1). Figure 1 shows the sample locations and also outlines five discrete suspected mine tailings piles on 2698 Old Black Canyon Highway.

Table 2 and Figures 2 & 3 summarize the surface XRF soil lead and arsenic concentrations. Overall, approximately 7% of the surface soil samples contained elevated lead and arsenic concentrations. Most of the elevated lead and arsenic samples were clustered at a contiguous area at 13330 and 13336 Wells Street (Figures 2 and 3). The highest XRF soil concentrations were found at 13336 Well Street: 2,095 and 654 mg/kg for lead and arsenic, respectively. With exception of three localized hot spots at 2655 and 2670 Jones Street, all other surface samples were below the action levels for lead and arsenic (Figures 2 and 3).

A subset of the elevated sample locations were resampled for subsurface samples. Subsurface samples were collected at approximately one-, two-, and three-foot depth. A total of nine locations were sampled for subsurface soils: three locations at 13330 Wells Street and six locations at 13336 Wells Street. Note that the isolated sample locations with elevated concentrations were not resampled. Soil XRF results for the nine locations with subsurface sampling are summarized in Table 3 and Figure 4. Two of the three sample locations at 13330 Wells Street had elevated subsurface lead and arsenic concentrations (Figure 4). For the six locations sampled in the subsurface at 13336 Wells Street, all had lead and arsenic concentrations below the MDL.

Laboratory Confirmation of XRF

Table 4 contains TAL metal results for the 30 samples submitted to a CLP laboratory for laboratory confirmation of the XRF data. There was a strong correlation between lead (coefficient of determination of 0.86) and arsenic (coefficient of determination of 0.87) for the XRF and fixed laboratory analytical results. Both coefficients of determination far exceeded the criteria (coefficient of determination greater than 0.70) for XRF confirmation analysis, identified in SERAS SOP #1720, *Operation of the Niton XLt792YW Field Portable X-Ray Fluorescence Unit.* To achieve a coefficient of determination for arsenic greater than 0.7, one outlier data point had to be removed (Appendix A). Table 5 provides a comparison of the laboratory confirmation data with the XRF screening data. Appendix A contains the details of the statistical validation of the XRF lead and arsenic data, Appendix B contains the XRF field data report and Appendix C contains the CLP Analytical Report for TAL metals.

TCLP Analytical Results

Three composite samples collected from 13330 Wells Street and 13336 Wells Street were submitted for TCLP analysis through the EPA Region 9 laboratory. As summarized in Table 6, concentrations for all eight metals were below the RCRA levels for disposal. The TCLP laboratory analytical report is in Appendix D.

REMOVAL ASSESSMENT

Since the XRF soil lead concentrations are higher than those of arsenic--relative to their respective site action levels-- removal areas were delineated using the XRF soil lead concentration data. Removal areas were conservatively defined as XRF soil concentrations above 300 mg/kg lead. Five removal areas were delineated (Figure 5). One primary removal area (P1) was delineated at a relatively large contiguous contaminated area at 13330 and 13336 Wells Street.; four secondary removal areas (P2 to P5) were delineated at the isolated hot spots: three at 2670 Jones Street (P2, P4 and P5) and one at 2655 Jones Street (P3).

For removal volume estimation, area P1 was divided into two areas: P1A and P1B (Figure 5). Elevated lead and arsenic concentrations were found down to the three-foot depth at P1B - 13330 Wells Street, however, elevated concentrations were found in only surface samples at P1A - 13336 Wells St (Figures 4 and 5). During a conversation with occupants at 13330 Wells Street, they told EPA personnel that the original surface fill material in that yard was removed and replaced. The removed fill was subsequently deposited against the western and northern property fence forming an elongated, approximately two-foot high, L-shaped mound (Figure 5). A three-foot depth was used to estimate the removal volume at P1B; a one-foot depth was used everywhere else. Table 7 is a breakdown of the removal volumes by areas; the total removal volume of 341 cubic yards is estimated. Soil should be excavated down to the target depth and replaced with “clean fill”. For Area P1B (the L-shaped mound), the two-foot mound should be removed first, followed by excavating down to one-foot depth. Post excavation confirmation sampling is recommended to support the removal action. To accommodate the removal, the western segments of property fences at 13330 and 13336 Wells Street the dividing fence between the two properties will need to be removed and replaced.

cc: Central Files, Work Assignment No. SERAS-146
Electronic File I:\Archive\SERAS-146\D\TM\103013
Dennis Miller, SERAS Program Manager

TABLES
Iron King Mine Site
Technical Memorandum
October 2013

TABLE 1
Property IDs and Sample Numbers
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

Property ID	Address	Number of Surficial Soil Samples	Number of Subsurface Soil Samples	Number Exceeding Removal Criteria (300 mg/kg for Pb and 150 mg/kg for As)	
				Lead	Arsenic
00W	13300 Wells Street, Dewey, AZ 86327	28	0	1	0
30W	13330 Wells Street, Dewey, AZ 86327	24	9	5	3
36W	13336 Wells Street, Dewey, AZ 86327	27	18	15	11
40W	13340 Wells Street, Dewey, AZ 86327	15	0	0	0
45J	2645 Jones Street, Dewey, AZ 86327	21	0	0	0
55J	2655 Jones Street, Dewey, AZ 86327	18	0	1	0
60J	2660 Jones Street, Dewey, AZ 86327	20	0	0	0
70J	2670 Jones Street, Dewey, AZ 86327	31	0	4	3
80J	2680 Jones Street, Dewey, AZ 86327	33	0	0	0
85J	2685 Jones Street, Dewey, AZ 86327	37	0	0	0
Total Samples		254	27	26	17

Table 2
XRF Lead and Arsenic Surface (0 to 2 inches) Data
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

Sample Number	Sample Location	Lead (mg/kg)		Arsenic (mg/kg)	
		Concentration	RL	Concentration	RL
00W-001-1	00W-001	128	50	42	35
00W-002-1	00W-002	188	50	82	35
00W-003-1	00W-003	138	50	64	35
00W-004-1	00W-004	167	50	41	35
00W-005-1	00W-005	**468**	50	111	46.8
00W-006-1	00W-006	88	50	63	35
00W-007-1	00W-007	88	50	49	35
00W-008-1	00W-008	81	50	40	35
00W-009-1	00W-009	134	50	35 U	35
00W-010-1	00W-010	114	50	38	35
00W-011-1	00W-011	63	50	35 U	35
00W-012-1	00W-012	52	50	35 U	35
00W-013-1	00W-013	79	50	35 U	35
00W-014-1	00W-014	79	50	35 U	35
00W-015-1	00W-015	50 U	50	35	35
00W-016-1	00W-016	70	50	35 U	35
00W-017-1	00W-017	54	50	35 U	35
00W-018-1	00W-018	71	50	35 U	35
00W-019-1	00W-019	80	50	35 U	35
00W-020-1	00W-020	52	50	35 U	35
00W-021-1	00W-021	65	50	35 U	35
00W-022-1	00W-022	272	50	94	35
00W-023-1	00W-023	68	50	35 U	35
00W-024-1	00W-024	88	50	35 U	35
00W-025-1	00W-025	61	50	35 U	35
00W-026-1	00W-026	85	50	35 U	35
00W-027-1	00W-027	56	50	35 U	35
00W-028-1	00W-028	74	50	45	35
30W-001-1	30W-001	279	50	84	35
30W-002-1	30W-002	143	50	35 U	35
30W-003-1	30W-003	146	50	35 U	35
30W-004-1	30W-004	91	50	35 U	35
30W-005-1	30W-005	90	50	35 U	35
30W-006-1	30W-006	137	50	39	35
30W-007-1	30W-007	96	50	35	35

RL = Reporting Limit; U = Not detected above the Reporting Limit
mg/kg = milligram per kilogram

Table 2 (Cont'd)
XRF Lead and Arsenic Surface (0 to 2 inches) Data
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

Sample	Sample	Lead (mg/kg)		Arsenic (mg/kg)	
Number	Location	Concentration	RL	Concentration	RL
30W-008-1	30W-008	123	50	38	35
30W-009-1	30W-009	161	50	35 U	35
30W-010-1	30W-010	69	50	35 U	35
30W-011-1	30W-011	167	50	49	35
30W-012-1	30W-012	197	50	60	35
30W-013-1	30W-013	151	50	44	35
30W-014-1	30W-014	188	50	64	35
30W-015-1	30W-015	175	50	59	35
30W-016-1	30W-016	231	50	66	35
30W-017-1	30W-017	**355**	50	143	35.5
30W-018-1	30W-018	105	50	35 U	35
30W-019-1	30W-019	**523**	50	137	52.3
30W-020-1	30W-020	**540**	50	**210**	54.0
30W-021-1	30W-021	**1,165**	50	**245**	117
30W-022-1	30W-022	173	50	51	35
30W-023-1	30W-023	210	50	78	35
30W-024-1	30W-024	**617**	50	**231**	61.7
36W-001-1	36W-001	148	50	35 U	35
36W-002-1	36W-002	122	50	35 U	35
36W-003-1	36W-003	**312**	50	39	35
36W-004-1	36W-004	75	50	37	35
36W-005-1	36W-005	65	50	35 U	35
36W-006-1	36W-006	114	50	35 U	35
36W-007-1	36W-007	145	50	35 U	35
36W-008-1	36W-008	**333**	50	43	35
36W-009-1	36W-009	**738**	50	**208**	73.8
36W-010-1	36W-010	202	50	35 U	35
36W-011-1	36W-011	109	50	73	35
36W-012-1	36W-012	180	50	35 U	35
36W-013-1	36W-013	**313**	50	111	35
36W-014-1	36W-014	**853**	50	**218**	85.3
36W-015-1	36W-015	**1,180**	50	**259**	118
36W-016-1	36W-016	138	50	35 U	35
36W-017-1	36W-017	**1,505**	50	**396**	151
36W-018-1	36W-018	**820**	50	**475**	82.0

RL = Reporting Limit; U = Not detected above the Reporting Limit
mg/kg = milligram per kilogram

Table 2 (Cont'd)
XRF Lead and Arsenic Surface (0 to 2 inches) Data
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

Sample	Sample	Lead (mg/kg)		Arsenic (mg/kg)	
Number	Location	Concentration	RL	Concentration	RL
36W-019-1	36W-019	**1,226**	50	**362**	123
36W-020-1	36W-020	**2,095**	50	**654**	210
36W-021-1	36W-021	**1,360**	50	**372**	136
36W-022-1	36W-022	**538**	50	**155**	53.8
36W-023-1	36W-023	**938**	50	**279**	93.8
36W-024-1	36W-024	219	50	43	35
36W-025-1	36W-025	**387**	50	122	38.7
36W-026-1	36W-026	**1,135**	50	**366**	114
36W-027-1	36W-027	169	50	35 U	35
40W-001-1	40W-001	50	50	35 U	35
40W-002-1	40W-002	53	50	51	35
40W-003-1	40W-003	55	50	35 U	35
40W-004-1	40W-004	50 U	50	35 U	35
40W-005-1	40W-005	50 U	50	35 U	35
40W-006-1	40W-006	50 U	50	35 U	35
40W-007-1	40W-007	50 U	50	35 U	35
40W-008-1	40W-008	88	50	35 U	35
40W-009-1	40W-009	61	50	35 U	35
40W-010-1	40W-010	84	50	35 U	35
40W-011-1	40W-011	105	50	35 U	35
40W-012-1	40W-012	87	50	38	35
40W-013-1	40W-013	50 U	50	35 U	35
40W-014-1	40W-014	54	50	44	35
40W-015-1	40W-015	75	50	37	35
45J-001-1	45J-001	85	50	35 U	35
45J-002-1	45J-002	65	50	35 U	35
45J-003-1	45J-003	66	50	35 U	35
45J-004-1	45J-004	84	50	35 U	35
45J-005-1	45J-005	56	50	35 U	35
45J-006-1	45J-006	52	50	35 U	35
45J-007-1	45J-007	83	50	35 U	35
45J-008-1	45J-008	67	50	35 U	35
45J-009-1	45J-009	84	50	35 U	35
45J-010-1	45J-010	94	50	35 U	35
45J-011-1	45J-011	65	50	35 U	35

RL = Reporting Limit; U = Not detected above the Reporting Limit
mg/kg = milligram per kilogram

Table 2 (Cont'd)
XRF Lead and Arsenic Surface (0 to 2 inches) Data
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

Sample	Sample	Lead (mg/kg)		Arsenic (mg/kg)	
Number	Location	Concentration	RL	Concentration	RL
45J-012-1	45J-012	68	50	35 U	35
45J-013-1	45J-013	62	50	35 U	35
45J-014-1	45J-014	63	50	35 U	35
45J-015-1	45J-015	94	50	35 U	35
45J-016-1	45J-016	70	50	35 U	35
45J-017-1	45J-017	65	50	35 U	35
45J-018-1	45J-018	104	50	35 U	35
45J-019-1	45J-019	121	50	35 U	35
45J-020-1	45J-020	114	50	35 U	35
45J-021-1	45J-021	98	50	35 U	35
55J-001-1	55J-001	95	50	35 U	35
55J-002-1	55J-002	91	50	35 U	35
55J-003-1	55J-003	84	50	35 U	35
55J-004-1	55J-004	101	50	35 U	35
55J-005-1	55J-005	124	50	35 U	35
55J-006-1	55J-006	97	50	35 U	35
55J-007-1	55J-007	95	50	35 U	35
55J-008-1	55J-008	50 U	50	35 U	35
55J-009-1	55J-009	156	50	35 U	35
55J-010-1	55J-010	68	50	35 U	35
55J-011-1	55J-011	57	50	35 U	35
55J-012-1	55J-012	135	50	43	35
55J-013-1	55J-013	77	50	35 U	35
55J-014-1	55J-014	116	50	35 U	35
55J-015-1	55J-015	91	50	35 U	35
55J-016-1	55J-016	50 U	50	35 U	35
55J-017-1	55J-017	**410**	50	109	41.0
55J-018-1	55J-018	85	50	35 U	35
60J-001-1	60J-001	98	50	35 U	35
60J-002-1	60J-002	74	50	35 U	35
60J-003-1	60J-003	71	50	35 U	35
60J-004-1	60J-004	56	50	35 U	35
60J-005-1	60J-005	100	50	35 U	35
60J-006-1	60J-006	108	50	35 U	35
60J-007-1	60J-007	99	50	35 U	35

RL = Reporting Limit; U = Not detected above the Reporting Limit
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Table 2 (Cont'd)
XRF Lead and Arsenic Surface (0 to 2 inches) Data
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

Sample	Sample	Lead (mg/kg)		Arsenic (mg/kg)	
Number	Location	Concentration	RL	Concentration	RL
60J-008-1	60J-008	50 U	50	35 U	35
60J-009-1	60J-009	62	50	35 U	35
60J-010-1	60J-010	92	50	35 U	35
60J-011-1	60J-011	189	50	41	35
60J-012-1	60J-012	139	50	35 U	35
60J-013-1	60J-013	93	50	35 U	35
60J-014-1	60J-014	164	50	50	35
60J-015-1	60J-015	125	50	35 U	35
60J-016-1	60J-016	112	50	35 U	35
60J-017-1	60J-017	78	50	35 U	35
60J-018-1	60J-018	165	50	67	35
60J-019-1	60J-019	134	50	35 U	35
60J-020-1	60J-020	96	50	35 U	35
70J-001-1	70J-001	149	50	38	35
70J-002-1	70J-002	94	50	45	35
70J-003-1	70J-003	86	50	65	35
70J-004-1	70J-004	126	50	82	35
70J-005-1	70J-005	**369**	50	**440**	36.9
70J-006-1	70J-006	180	50	124	35
70J-007-1	70J-007	126	50	74	35
70J-008-1	70J-008	58	50	35 U	35
70J-009-1	70J-009	67	50	39	35
70J-010-1	70J-010	114	50	50	35
70J-011-1	70J-011	78	50	35 U	35
70J-012-1	70J-012	73	50	41	35
70J-013-1	70J-013	111	50	35 U	35
70J-014-1	70J-014	89	50	35 U	35
70J-015-1	70J-015	**399**	50	**392**	39.9
70J-016-1	70J-016	67	50	49	35
70J-017-1	70J-017	92	50	35 U	35
70J-018-1	70J-018	161	50	45	35
70J-019-1	70J-019	50 U	50	35 U	35
70J-020-1	70J-020	**484**	50	**442**	48.4
70J-021-1	70J-021	78	50	48	35
70J-022-1	70J-022	51	50	35 U	35

RL = Reporting Limit; U = Not detected above the Reporting Limit
mg/kg = milligram per kilogram

Table 2 (Cont'd)
XRF Lead and Arsenic Surface (0 to 2 inches) Data
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

Sample	Sample	Lead (mg/kg)		Arsenic (mg/kg)	
Number	Location	Concentration	RL	Concentration	RL
70J-023-1	70J-023	50 U	50	35 U	35
70J-024-1	70J-024	118	50	52	35
70J-025-1	70J-025	170	50	96	35
70J-026-1	70J-026	70	50	35 U	35
70J-027-1	70J-027	72	50	35 U	35
70J-028-1	70J-028	69	50	35 U	35
70J-029-1	70J-029	**311**	50	41	35
70J-030-1	70J-030	99	50	35 U	35
70J-031-1	70J-031	142	50	36	35
80J-001-1	80J-001	50 U	50	35 U	35
80J-002-1	80J-002	101	50	35 U	35
80J-003-1	80J-003	109	50	35 U	35
80J-004-1	80J-004	93	50	35 U	35
80J-005-1	80J-005	78	50	35 U	35
80J-006-1	80J-006	75	50	35 U	35
80J-007-1	80J-007	83	50	35 U	35
80J-008-1	80J-008	110	50	35 U	35
80J-009-1	80J-009	86	50	35 U	35
80J-010-1	80J-010	58	50	35 U	35
80J-011-1	80J-011	65	50	35 U	35
80J-012-1	80J-012	50 U	50	35 U	35
80J-013-1	80J-013	129	50	42	35
80J-014-1	80J-014	65	50	35 U	35
80J-015-1	80J-015	50 U	50	35 U	35
80J-016-1	80J-016	115	50	35 U	35
80J-017-1	80J-017	52	50	35 U	35
80J-018-1	80J-018	53	50	35 U	35
80J-019-1	80J-019	127	50	36	35
80J-020-1	80J-020	144	50	45	35
80J-021-1	80J-021	92	50	40	35
80J-022-1	80J-022	50 U	50	35 U	35
80J-023-1	80J-023	146	50	46	35
80J-024-1	80J-024	50 U	50	35 U	35
80J-025-1	80J-025	84	50	35 U	35
80J-026-1	80J-026	62	50	35 U	35

RL = Reporting Limit; U = Not detected above the Reporting Limit
mg/kg = milligram per kilogram

Table 2 (Cont'd)
XRF Lead and Arsenic Surface (0 to 2 inches) Data
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

Sample	Sample	Lead (mg/kg)		Arsenic (mg/kg)	
Number	Location	Concentration	RL	Concentration	RL
80J-027-1	80J-027	62	50	35 U	35
80J-028-1	80J-028	50	50	35 U	35
80J-029-1	80J-029	104	50	35 U	35
80J-030-1	80J-030	66	50	35 U	35
80J-031-1	80J-031	56	50	35 U	35
80J-032-1	80J-032	75	50	35 U	35
80J-033-1	80J-033	74	50	35 U	35
85J-001-1	85J-001	50 U	50	35 U	35
85J-002-1	85J-002	87	50	35 U	35
85J-003-1	85J-003	90	50	35 U	35
85J-004-1	85J-004	114	50	35 U	35
85J-005-1	85J-005	114	50	35 U	35
85J-006-1	85J-006	103	50	37	35
85J-007-1	85J-007	94	50	35 U	35
85J-008-1	85J-008	80	50	35 U	35
85J-009-1	85J-009	101	50	35 U	35
85J-010-1	85J-010	92	50	35 U	35
85J-011-1	85J-011	97	50	35 U	35
85J-012-1	85J-012	108	50	35 U	35
85J-013-1	85J-013	97	50	35 U	35
85J-014-1	85J-014	115	50	35 U	35
85J-015-1	85J-015	53	50	35 U	35
85J-016-1	85J-016	55	50	35 U	35
85J-017-1	85J-017	74	50	35 U	35
85J-018-1	85J-018	117	50	35 U	35
85J-019-1	85J-019	108	50	40	35
85J-020-1	85J-020	93	50	35 U	35
85J-021-1	85J-021	117	50	35 U	35
85J-022-1	85J-022	114	50	35 U	35
85J-023-1	85J-023	118	50	35 U	35
85J-024-1	85J-024	97	50	35 U	35
85J-025-1	85J-025	86	50	35 U	35
85J-026-1	85J-026	115	50	35 U	35
85J-027-1	85J-027	125	50	35 U	35
85J-028-1	85J-028	94	50	35 U	35

RL = Reporting Limit; U = Not detected above the Reporting Limit
mg/kg = milligram per kilogram

Table 2 (Cont'd)
XRF Lead and Arsenic Surface (0 to 2 inches) Data
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

Sample	Sample	Lead (mg/kg)		Arsenic (mg/kg)	
Number	Location	Concentration	RL	Concentration	RL
85J-029-1	85J-029	112	50	35 U	35
85J-030-1	85J-030	92	50	35 U	35
85J-031-1	85J-031	106	50	35 U	35
85J-032-1	85J-032	112	50	35 U	35
85J-033-1	85J-033	118	50	35 U	35
85J-034-1	85J-034	154	50	42	35
85J-035-1	85J-035	104	50	37	35
85J-036-1	85J-036	78	50	35 U	35
85J-037-1	85J-037	115	50	35 U	35

RL = Reporting Limit; U = Not detected above the Reporting Limit
mg/kg = milligram per kilogram

TABLE 3
XRF Lead and Arsenic Subsurface Data
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

Sample Number	Sample Location	Depth	Lead (mg/kg)		Arsenic (mg/kg)	
			Concentration	RL	Concentration	RL
30W-020-1	30W-020	0 to 2 inches	**540**	50	**210**	54.0
30W-020-2	30W-020	10 to 14 inches	**435**	50	**171**	43.5
30W-020-3	30W-020	22 to 24 inches	**1,115**	50	**393**	112
30W-020-4	30W-020	34 to 38 inches	225	50	**663**	35
30W-021-1	30W-021	0 to 2 inches	**1,165**	50	**245**	117
30W-021-2	30W-021	10 to 14 inches	84	50	54	35
30W-021-3	30W-021	22 to 24 inches	69	50	35 U	35
30W-021-4	30W-021	34 to 38 inches	50 U	50	35 U	35
30W-024-1	30W-024	0 to 2 inches	**617**	50	**231**	61.7
30W-024-2	30W-024	10 to 14 inches	145	50	**443**	35
30W-024-3	30W-024	22 to 24 inches	51	50	35 U	35
30W-024-4	30W-024	34 to 38 inches	50 U	50	35 U	35
36W-015-1	36W-015	0 to 2 inches	**1,180**	50	**259**	118
36W-015-2	36W-015	10 to 14 inches	51	50	35 U	35
36W-015-3	36W-015	22 to 24 inches	50 U	50	35 U	35
36W-015-4	36W-015	34 to 38 inches	50 U	50	35 U	35
36W-017-1	36W-017	0 to 2 inches	**1,505**	50	**396**	151
36W-017-2	36W-017	10 to 14 inches	50 U	50	35 U	35
36W-017-3	36W-017	22 to 24 inches	50 U	50	35 U	35
36W-017-4	36W-017	34 to 38 inches	50 U	50	35 U	35
36W-020-1	36W-020	0 to 2 inches	**2,095**	50	**654**	210
36W-020-2	36W-020	10 to 14 inches	50 U	50	35 U	35
36W-020-3	36W-020	22 to 24 inches	50 U	50	35 U	35
36W-020-4	36W-020	34 to 38 inches	66	50	45	35
36W-021-1	36W-021	0 to 2 inches	**1,360**	50	**372**	136
36W-021-2	36W-021	10 to 14 inches	50 U	50	35 U	35
36W-021-3	36W-021	22 to 24 inches	50 U	50	35 U	35
36W-021-4	36W-021	34 to 38 inches	50 U	50	35 U	35
36W-023-1	36W-023	0 to 2 inches	**938**	50	**279**	93.8
36W-023-2	36W-023	10 to 14 inches	50 U	50	35 U	35
36W-023-3	36W-023	22 to 24 inches	50 U	50	35 U	35
36W-023-4	36W-023	34 to 38 inches	50 U	50	35 U	35
36W-026-1	36W-026	0 to 2 inches	**1,135**	50	**366**	114
36W-026-2	36W-026	10 to 14 inches	50 U	50	35 U	35
36W-026-3	36W-026	22 to 24 inches	50 U	50	35 U	35
36W-026-4	36W-026	34 to 38 inches	50 U	50	35 U	35

RL = Reporting Limit; U = Not detected above the Reporting Limit
mg/kg = milligrams per kilogram

TABLE 4
TAL Metal Results for Confirmation Samples
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

All Concentrations are in milligram per kilogram (mg/kg)

Location	30W-019-1		30W-020-1		30W-024-1		146-0004		146-0005	
Sample #	146-0001		146-0002		146-0003		36W-002-1		45J-007-1	
ANALYTE	Concentration	RL	Concentration	RL	Concentration	RL	Concentration	RL	Concentration	RL
Aluminum	17600	15.9	11200	15.5	12000	15.1	15700	15.4	10200	14.9
Antimony	16 J-	4.80	11.3 J-	4.60	11.5 J-	4.50	2.1 J-	4.60	2.2 J-	4.50
Arsenic	174	0.790	252	0.770	276	0.760	24.6	0.770	23.5	0.750
Barium	237	15.9	160	15.5	166	15.1	183	15.4	109	14.9
Beryllium	1	0.400	0.75	0.390	0.82	0.380	0.87	0.380	0.65	0.370
Cadmium	3.9	0.400	5	0.390	4.4	0.380	2.6	0.380	1	0.370
Calcium	12500	397	8650	387	9020	378	8390	384	11400	374
Chromium	28.9	0.790	21.7	0.770	25	0.760	26.1	0.770	24	0.750
Cobalt	16.3	4.00	10.1	3.90	11.8	3.80	14.8	3.80	16.3	3.70
Copper	116	2.00	191	1.90	185	1.90	183	1.90	93	1.90
Iron	42900 J	7.90	33200 J	7.70	37200 J	7.60	29100 J	7.70	30200 J	7.50
Lead	955	0.790	761	0.770	737	0.760	139	0.770	73.2	0.750
Magnesium	7660	397	4460	387	4880	378	5920	384	5110	374
Manganese	1120	1.20	501	1.20	511	1.10	872	1.20	607	1.10
Mercury	1.9	0.095	1.8	0.170	1.9	0.190	0.78	0.098	0.058 J	0.086
Nickel	30	3.20	19.8	3.10	22.3	3.00	24	3.10	22.2	3.00
Potassium	3430	397	3650	387	3490	378	5380	384	2530	374
Selenium	0.77 J	2.80	0.9 J	2.70	0.39 J	2.60	2.7 U	2.70	2.6 U	2.60
Silver	9.7	0.790	7.9	0.770	8	0.760	3.4	0.770	3.1	0.750
Sodium	441	397	387 U	387	471	378	393	384	383	374
Thallium	2 U	2.00	1.9 U	1.90	1.9 U	1.90	1.9 U	1.90	1.9 U	1.90
Vanadium	67.1 J	4.00	41.2 J	3.90	47.1 J	3.80	46 J	3.80	60.2 J	3.70
Zinc	778 J	4.80	937 J	4.60	791 J	4.50	396 J	4.60	178 J	4.50

J = The result should be considered an estimated value
J- = Estimated value biased low
U = Analyte was not detected above the Detection Limit
RL = Reporting Limit

TABLE 4 (Cont'd)
TAL Metal Results for Confirmation Samples
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

All Concentrations are in milligram per kilogram (mg/kg)

Location	45J-019-1		55J-010-1		30W-020-2		146-0009		146-0010	
Sample #	146-0006		146-0007		146-0008		30W-020-3		30W-021-1	
ANALYTE	Concentration	RL	Concentration	RL	Concentration	RL	Concentration	RL	Concentration	RL
Aluminum	13200	14.1	13200	15.3	14900	16.6	10100	17.2	11200	14.4
Antimony	2.1 J-	4.20	1.7 J-	4.60	7.7 J-	5.00	46.3 J-	5.20	15.8 J-	4.30
Arsenic	25.4	0.700	23.1	0.770	204	0.830	1630	8.600	283	0.720
Barium	158	14.1	186	15.3	172	16.6	180	17.2	167	14.4
Beryllium	0.83	0.350	0.96	0.380	0.97	0.410	0.85	0.430	0.87	0.360
Cadmium	1.2	0.350	1.4	0.380	4.2	0.410	3.5	0.430	5	0.360
Calcium	6110	352	7870	383	10900	415	4610	430	9140	360
Chromium	25.6	0.700	24.4	0.770	21.2	0.830	16.8	0.860	21.4	0.720
Cobalt	12.8	3.50	15	3.80	12.8	4.10	7.2	4.30	10.7	3.60
Copper	148	1.80	126	1.90	174	2.10	167	2.10	177	1.80
Iron	28300 J	7.00	30900 J	7.70	36700 J	8.30	51600 J	8.60	34100 J	7.20
Lead	122	0.700	59.5	0.770	599	0.830	1470	0.860	1080	0.720
Magnesium	5490	352	5380	383	4980	415	3640	430	4300	360
Manganese	669	1.10	837	1.20	597	1.20	314	1.30	534	1.10
Mercury	0.19	0.098	0.084 J	0.094	1.1	0.110	3.2	0.200	3.1	0.190
Nickel	28.7	2.80	26.6	3.10	17.7	3.30	11.7	3.40	20.3	2.90
Potassium	4030	352	3780	383	4150	415	3420	430	3340	360
Selenium	2.5 U	2.50	2.7 U	2.70	2.9 U	2.90	6.5	3.00	1.1 J	2.50
Silver	3.2	0.700	3.3	0.770	6.5	0.830	15.9	0.860	10.2	0.720
Sodium	411	352	451	383	599	415	602	430	443	360
Thallium	1.8 U	1.80	1.9 U	1.90	2.1 U	2.10	2.1 U	2.10	1.8 U	1.80
Vanadium	46.1 J	3.50	53.7 J	3.80	45.3 J	4.10	47.3 J	4.30	42.3 J	3.60
Zinc	252 J	4.20	157 J	4.60	745 J	5.00	735 J	5.20	957 J	4.30

J = The result should be considered an estimated value

J- = Estimated value biased low

U = Analyte was not detected above the Detection Limit

RL = Reporting Limit

TABLE 4 (Cont'd)
TAL Metal Results for Confirmation Samples
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

All Concentrations are in milligram per kilogram (mg/kg)

Location	30W-024-2		36W-008-1		36W-009-1		146-0014		146-0015	
Sample #	146-0011		146-0012		146-0013		36W-013-1		36W-014-1	
ANALYTE	Concentration	RL	Concentration	RL	Concentration	RL	Concentration	RL	Concentration	RL
Aluminum	11800	17.6	13000	15.7	12000	15.8	11200	15.4	11300	14.4
Antimony	4.6 J-	5.30	3.7 J-	4.70	2.1 J-	4.80	6.9 J-	4.60	10.3 J-	4.30
Arsenic	474	0.880	101	0.780	40.1	0.790	113	0.770	196	0.720
Barium	168	17.6	243	15.7	149	15.8	147	15.4	165	14.4
Beryllium	0.77	0.440	0.83	0.390	0.8	0.400	0.75	0.390	0.86	0.360
Cadmium	2.8	0.440	3.9	0.390	2	0.400	6	0.390	7.2	0.360
Calcium	4430	439	9510	391	9270	396	9580	385	7190	359
Chromium	20.8	0.880	22	0.780	57	0.790	24.6	0.770	22.9	0.720
Cobalt	9.2	4.40	11.8	3.90	12.5	4.00	14.4	3.90	16	3.60
Copper	264	2.20	165	2.00	118	2.00	113	1.90	143	1.80
Iron	36400 J	8.80	28200 J	7.80	25900 J	7.90	34100 J	7.70	40300 J	7.20
Lead	152	0.880	434	0.780	142	0.790	742	0.770	754	0.720
Magnesium	4260	439	5140	391	5040	396	5780	385	5480	359
Manganese	329	1.30	673	1.20	652	1.20	836	1.20	994	1.10
Mercury	0.35	0.098	0.49	0.090	0.29	0.086	0.73	0.091	1.7	0.093
Nickel	16	3.50	20.8	3.10	36.3	3.20	27.2	3.10	26.7	2.90
Potassium	3240	439	4330	391	3530	396	2530	385	3080	359
Selenium	0.47 J	3.10	2.7 U	2.70	2.8 U	2.80	1.7 J	2.70	2.5 U	2.50
Silver	5.1	0.880	5.1	0.780	3.2	0.790	6.4	0.770	7.8	0.720
Sodium	439 U	439	391 U	391	396 U	396	385 U	385	518	359
Thallium	2.2 U	2.20	2 U	2.00	2 U	2.00	1.9 U	1.90	1.8 U	1.80
Vanadium	43.1 J	4.40	39.9 J	3.90	42.8 J	4.00	53 J	3.90	53.3 J	3.60
Zinc	478 J	5.30	700 J	4.70	317 J	4.80	1260 J	4.60	1480 J	4.30

J = The result should be considered an estimated value
J- = Estimated value biased low
U = Analyte was not detected above the Detection Limit
RL = Reporting Limit

TABLE 4 (Cont'd)
TAL Metal Results for Confirmation Samples
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

All Concentrations are in milligram per kilogram (mg/kg)

Location	36W-015-1		36W-017-1		36W-018-1		146-0019		146-0020	
Sample #	146-0016		146-0017		146-0018		36W-019-1		36W-020-1	
ANALYTE	Concentration	RL	Concentration	RL	Concentration	RL	Concentration	RL	Concentration	RL
Aluminum	12700	15.8	9460	14.0	14200	14.9	11900	15.9	7460	15.1
Antimony	13.6 J-	4.70	33.1 J-	4.20	17.2 J-	4.50	13.6 J-	4.80	48.6 J-	4.50
Arsenic	233	0.790	390	0.700	452	0.740	271	0.790	905	7.500
Barium	148	15.8	124	14.0	124	14.9	103	15.9	123	15.1
Beryllium	0.83	0.390	0.68	0.350	1	0.370	0.72	0.400	0.82	0.380
Cadmium	10.1	0.390	10.1	0.350	21.2	0.370	11.9	0.400	18.7 J	0.380
Calcium	11600	394	7320	351	9060	372	5960	397	5800	377
Chromium	19.6	0.790	20.5	0.700	22.8	0.740	25.7	0.790	14.7	0.750
Cobalt	13.5	3.90	9.7	3.50	11	3.70	12.3	4.00	8.4 J	3.80
Copper	162	2.00	222	1.80	270	1.90	142	2.00	296	1.90
Iron	38900 J	7.90	35100 J	7.00	42000 J	7.40	35500 J	7.90	48800	7.50
Lead	1110	0.790	2050	0.700	1120	0.740	1150	0.790	3330	0.750
Magnesium	5870	394	3790	351	5060	372	5100	397	3140	377
Manganese	658	1.20	428	1.10	367	1.10	569	1.20	447	1.10
Mercury	2.5	0.200	4.8	0.490	2.2	0.180	3.8	0.440	9.5	1.000
Nickel	21.3	3.20	17.7	2.80	24.9	3.00	21.9	3.20	12.5	3.00
Potassium	3760	394	3520	351	3840	372	2170	397	3250	377
Selenium	0.6 J	2.80	2.7	2.50	0.96 J	2.60	0.88 J	2.80	6.6	2.60
Silver	11.2	0.790	18.3	0.700	9.4	0.740	10.3	0.790	24.7	0.750
Sodium	405	394	359	351	677	372	397 U	397	502	377
Thallium	2 U	2.00	1.8 U	1.80	1.9 U	1.90	2 U	2.00	1.9 U	1.90
Vanadium	44.8 J	3.90	38.7 J	3.50	50.6 J	3.70	61.5 J	4.00	34.5	3.80
Zinc	2180 J	4.70	1960 J	4.20	6000 J	44.60	2160 J	4.80	4370	45.30

J = The result should be considered an estimated value
J- = Estimated value biased low
U = Analyte was not detected above the Detection Limit
RL = Reporting Limit

TABLE 4 (Cont'd)
TAL Metal Results for Confirmation Samples
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

All Concentrations are in milligram per kilogram (mg/kg)

Location	146-0021		146-0022		146-0023		146-0024		146-0025	
Sample #	36W-020-4		36W-021-1		36W-022-1		36W-023-1		36W-025-1	
ANALYTE	Concentration	RL	Concentration	RL	Concentration	RL	Concentration	RL	Concentration	RL
Aluminum	24500	17.2	8340	15.3	9040	15.2	9640	15.3	9970	15.0
Antimony	1.2 J-	5.20	18.8 J-	4.60	9.5 J-	4.60	12.4 J-	4.60	5.2 J-	4.50
Arsenic	33.4	0.860	468	0.770	337	0.760	249	0.760	106	0.750
Barium	121	17.2	102	15.3	158	15.2	142	15.3	137	15.0
Beryllium	1.2	0.430	0.73	0.380	0.77	0.380	0.78	0.380	0.78	0.380
Cadmium	0.62	0.430	14.5 J	0.380	6.5 J	0.380	11.4 J	0.380	5.6 J	0.380
Calcium	15600	431	5250	384	6340	381	6570	381	7130	376
Chromium	27.7	0.860	18.6	0.770	19.4	0.760	21.3	0.760	20.6	0.750
Cobalt	10.9	4.30	9.8 J	3.80	11.9 J	3.80	12.3 J	3.80	12.4 J	3.80
Copper	28.6	2.20	182	1.90	140	1.90	168	1.90	146	1.90
Iron	31500 J	8.60	37000	7.70	33800	7.60	34600	7.60	32700	7.50
Lead	27.8	0.860	1440	0.770	535	0.760	1020	0.760	351	0.750
Magnesium	5930	431	4050	384	4360	381	5020	381	5110	376
Manganese	538	1.30	492	1.20	1520	1.10	666	1.10	699	1.10
Mercury	0.073 J	0.100	3.7	0.470	1.4	0.091	2.4	0.170	0.68	0.087
Nickel	21.9	3.40	15.9	3.10	18.7	3.00	20.6	3.10	21.8	3.00
Potassium	2120	431	2430	384	2910	381	3260	381	3370	376
Selenium	3 U	3.00	2.8	2.70	0.4 J	2.70	1.7 J	2.70	2.6 U	2.60
Silver	2.9	0.860	12.4	0.770	6.6	0.760	8.7	0.760	4.9	0.750
Sodium	431 U	431	384 U	384	381 U	381	430	381	376 U	376
Thallium	2.2 U	2.20	1.9 U	1.90	1.9 U	1.90	1.9 U	1.90	1.9 U	1.90
Vanadium	64.9 J	4.30	36.9	3.80	48.1	3.80	44.1	3.80	43.5	3.80
Zinc	124 J	5.20	4230	46.00	1480	4.60	2860	45.80	883	4.50

J = The result should be considered an estimated value
J- = Estimated value biased low
U = Analyte was not detected above the Detection Limit
RL = Reporting Limit

TABLE 4 (Cont'd)
TAL Metal Results for Confirmation Samples
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

All Concentrations are in milligram per kilogram (mg/kg)

Location	146-0026		146-0027		146-0028		146-0029		146-0030	
Sample #	36W-026-1		40W-014-1		80J-013-1		80J-113-1		55J-110-1	
ANALYTE	Concentration	RL	Concentration	RL	Concentration	RL	Concentration	RL	Concentration	RL
Aluminum	8490	15.2	11500	16.1	14300	16.1	13500	15.1	10900	16.2
Antimony	25.4 J-	4.50	1.9 J-	4.80	3.1 J-	4.80	2.6 J-	4.50	1.3 J-	4.90
Arsenic	377	0.760	44.5	0.810	46.8	0.800	40.9	0.760	21.3	0.810
Barium	118	15.2	150	16.1	269	16.1	236	15.1	187	16.2
Beryllium	0.83	0.380	0.74	0.400	1	0.400	0.95	0.380	0.77	0.410
Cadmium	17.9 J	0.380	1 J	0.400	2.8 J	0.400	2.6 J	0.380	1.2 J	0.410
Calcium	6060	379	10800	404	7760	402	7850	378	7170	406
Chromium	22.9	0.760	34.8	0.810	33.5	0.800	33.2	0.760	20.6	0.810
Cobalt	12.8 J	3.80	13.9 J	4.00	21.4 J	4.00	20 J	3.80	13.5 J	4.10
Copper	229	1.90	119	2.00	301	2.00	265	1.90	110	2.00
Iron	39700	7.60	25400	8.10	42400	8.00	38600	7.60	26000	8.10
Lead	1240	0.760	39.2	0.810	140	0.800	306	0.760	51.5	0.810
Magnesium	3890	379	6190	404	7480	402	7150	378	4830	406
Manganese	599	1.10	881	1.20	1640	1.20	1250	1.10	907	1.20
Mercury	3	0.180	0.09 J	0.093	0.21	0.094	0.18	0.099	0.083 J	0.089
Nickel	21.8	3.00	32.2	3.20	38.8	3.20	35.9	3.00	21.3	3.20
Potassium	2400	379	3830	404	3320	402	3220	378	3390	406
Selenium	1.1 J	2.70	2.8 U	2.80	2.8 U	2.80	2.6 U	2.60	2.8 U	2.80
Silver	11.7	0.760	2.7	0.810	4.8	0.800	4.4	0.760	2.8	0.810
Sodium	390	379	404 U	404	1060	402	1040	378	406 U	406
Thallium	1.9 U	1.90	2 U	2.00	2 U	2.00	1.9 U	1.90	2 U	2.00
Vanadium	42.6	3.80	42.1	4.00	73.7	4.00	67.4	3.80	46.2	4.10
Zinc	3110	45.50	139	4.80	432	4.80	389	4.50	145	4.90

J = The result should be considered an estimated value
J- = Estimated value biased low
U = Analyte was not detected above the Detection Limit
RL = Reporting Limit

TABLE 5
Comparison of Laboratory ICP Data and Field XRF Data
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

Sample #	Location	Sample Date	Sample Time	Lead (mg/kg)		Arsenic (mg/kg)	
				Lab	XRF	Lab	XRF
146-0001	30W-019-1	8/13/2013	11:32	955	523	174	137
146-0002	30W-020-1	8/13/2013	11:38	761	540	252	210
146-0003	30W-024-1	8/13/2013	13:35	737	617	276	231
146-0004	36W-002-1	8/13/2013	13:51	139	122	24.6	35 U
146-0005	45J-007-1	8/13/2013	10:33	73.2	83	23.5	35 U
146-0006	45J-019-1	8/13/2013	11:15	122	121	25.4	35 U
146-0007	55J-010-1	8/13/2013	9:50	59.5	68	23.1	35 U
146-0030	55J-010-1 (DUP)	8/13/2013	9:50	51.5	68	21.3	35 U
146-0008	30W-020-2	8/14/2013	11:42	599	435	204	171
146-0008 (Dup)	30W-020-2	8/14/2013	11:42	592	435	200	171
146-0009	30W-020-3	8/14/2013	11:52	1470	1,115	1630	393
146-0010	30W-021-1	8/13/2013	11:39	1080	1,165	283	245
146-0011	30W-024-2	8/14/2013	11:46	152	145	474	443
146-0012	36W-008-1	8/13/2013	14:18	434	333	101	43
146-0013	36W-009-1	8/13/2013	14:20	142	738	40.1	208
146-0014	36W-013-1	8/13/2013	14:32	742	313	113	111
146-0015	36W-014-1	8/13/2013	14:36	754	853	196	218
146-0016	36W-015-1	8/13/2013	14:45	1110	1,180	233	259
146-0017	36W-017-1	8/13/2013	14:50	2050	1,505	390	396
146-0018	36W-018-1	8/13/2013	14:53	1120	820	452	475
146-0019	36W-019-1	8/13/2013	14:54	1150	1,226	271	362
146-0020	36W-020-1	8/13/2013	14:56	3330	2,095	905	654
146-0021	36W-020-4	8/14/2013	12:35	27.8	66	33.4	45
146-0022	36W-021-1	8/13/2013	15:02	1440	1,360	468	372
146-0023	36W-022-1	8/13/2013	15:01	535	538	337	155
146-0024	36W-023-1	8/13/2013	15:05	1020	938	249	279
146-0025	36W-025-1	8/13/2013	14:42	351	387	106	122
146-0026	36W-026-1	8/13/2013	14:47	1240	1,135	377	366
146-0027	40W-014-1	8/13/2013	17:34	39.2	54	44.5	44
146-0028	80J-013-1	8/13/2013	16:12	140	129	46.8	42
146-0029	80J-013-1 (DUP)	8/13/2013	16:12	306	129	40.9	42
R^2 Correlation Between XRF and Laboratory Confirmation Data				0.8617		0.8669	

RL = Reporting Limit; U = Not detected above the Reporting Limit
mg/kg = milligram per kilogram
Outlying Data Point; Not Included in Correlation

TABLE 6
TCLP Results for RCRA 8 Metals
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

All Concentrations are in milligram per liter (mg/L)

ANALYTE	**RCRA Limit**	146-0101		146-0102		146-0103	
		Result	RL	Result	RL	Result	RL
Mercury	**0.2**	0.00028 J	0.00030	0.00020 J	0.00030	0.00022 J	0.00030
Chromium	**5.0**	ND	0.10	ND	0.10	ND	0.10
Lead	**5.0**	ND	0.30	ND	0.30	ND	0.30
Selenium	**1.0**	ND	0.20	ND	0.20	ND	0.20
Silver	**5.0**	ND	0.10	ND	0.10	ND	0.10
Arsenic	**5.0**	0.66	0.20	0.43	0.20	0.40	0.20
Barium	**100**	ND	0.50	ND	0.50	0.33 J	0.50
Cadmium	**1.0**	0.026 J	0.050	0.088	0.050	0.033 J	0.050

J = The result should be considered an estimated value.
ND = Analyte was not detected above the Detection Limit

TABLE 7
Removal Volumes by Property and Total Volumes
Iron King Mine Site - Accelerated Residential Sampling
Dewey-Humboldt, Arizona

Property ID	Address	Removal Area (square feet)	Removal Depth (feet)	Removal Volume (cubic feet)	Removal Volume (cubic yards)
Area P1A	13336 Wells Street	3,074	1	3,074	114
Area P1B	13330 Wells Street	1,638	3	4,914	182
Area P2	2660 Jones Street	284	1	284	11
Area P3	2655 Jones Street	411	1	180	7
Area P4	2670 Jones Street	545	1	545	20
Area P5		202	1	202	7
Totals		6,154	-	9,199	341

FIGURES
Iron King Mine Site
Technical Memorandum
October 2013

Base map created using 2010 orthoimagery, sample location from 2013 GPS survey and sample result data from 2013.

Map Creation Date: 01 September 2013

Coordinate system: Arizona State Plane Central
FIPS: 0202
Datum: NAD83
Units: Feet

Data: g:\arcviewprojects\SERAS01\00-146
MXD file: g:\arcinfoprojects\SERAS01\SER00146_IronKingMineSite\ARS_WJ\146_ARS_WJ_Sample_Location_Map_f1

Legend

- Sampling Location
- Tailing Piles
- Property Boundary

0 36 72
Feet

U.S. EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031
W.A.# 0-146

Figure 1
Sample Location Map
Iron King Mine Site
Dewey-Humboldt, Arizona

Base map created using 2010 orthoimagery, sample location from 2013 GPS survey and sample result data from 2013.

Map Creation Date: 02 September 2013

Coordinate system: Arizona State Plane Central
FIPS: 0202
Datum: NAD83
Units: Feet

0 44 88
Feet

U.S. EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031
W.A.# 0-146

Figure 2
Lead Concentration
Iron King Mine Site
Dewey-Humboldt, Arizona

Data: g:\arcviewprojects\SERAS01\00-146
MXD file: g:\arcinfoprojects\SERAS01\SER00146_IronKingMineSite\ARS_WJ\146_ARS_WJ_Lead_Concentration_f2

Base map created using 2010 orthoimagery, sample location from 2013 GPS survey and sample result data from 2013.

Map Creation Date: 02 September 2013

Coordinate system: Arizona State Plane Central
FIPS: 0202
Datum: NAD83
Units: Feet

0 44 88
Feet

U.S. EPA Environmental Response Team
Scientific Engineering Response and Analytical Services
EP-W-09-031
W.A.# 0-146

Figure 3
Arsenic Concentration
Iron King Mine Site
Dewey-Humboldt, Arizona

Data: g:\arcviewprojects\SERAS01\00-146
MXD file: g:\arcinfoprojects\SERAS01\SER00146_IronKingMineSite\ARS_WJ\146_ARS_WJ_Arsenic_Concentration_f3

Sample Number	Depth	Lead (mg/kg) Concentration	Arsenic (mg/kg) Concentration
36W-021-1	0 to 2 inches	1,360	372
36W-021-2	10 to 14 inches	50 U	35 U
36W-021-3	22 to 26 inches	50 U	35 U
36W-021-4	34 to 38 inches	50 U	35 U

Sample Number	Depth	Lead (mg/kg) Concentration	Arsenic (mg/kg) Concentration
36W-020-1	0 to 2 inches	2,095	654
36W-020-2	10 to 14 inches	50 U	35 U
36W-020-3	22 to 26 inches	50 U	35 U
36W-020-4	34 to 38 inches	66	45

Sample Number	Depth	Lead (mg/kg) Concentration	Arsenic (mg/kg) Concentration
30W-021-1	0 to 2 inches	1,165	245
30W-021-2	10 to 14 inches	84	54
30W-021-3	22 to 26 inches	69	35 U
30W-021-4	34 to 38 inches	50 U	35 U

Sample Number	Depth	Lead (mg/kg) Concentration	Arsenic (mg/kg) Concentration
30W-024-1	0 to 2 inches	617	231
30W-024-2	10 to 14 inches	145	443
30W-024-3	22 to 26 inches	51	35 U
30W-024-4	34 to 38 inches	50 U	35 U

Sample Number	Depth	Lead (mg/kg) Concentration	Arsenic (mg/kg) Concentration
30W-020-1	0 to 2 inches	540	210
30W-020-2	10 to 14 inches	435	171
30W-020-3	22 to 26 inches	1,115	393
30W-020-4	34 to 38 inches	225	663

Sample Number	Depth	Lead (mg/kg) Concentration	Arsenic (mg/kg) Concentration
36W-023-1	0 to 2 inches	938	279
36W-023-2	10 to 14 inches	50 U	35 U
36W-023-3	22 to 26 inches	50 U	35 U
36W-023-4	34 to 38 inches	50 U	35 U

Sample Number	Depth	Lead (mg/kg) Concentration	Arsenic (mg/kg) Concentration
36W-015-1	0 to 2 inches	1,180	259
36W-015-2	10 to 14 inches	51	35 U
36W-015-3	22 to 26 inches	50 U	35 U
36W-015-4	34 to 38 inches	50 U	35 U

Sample Number	Depth	Lead (mg/kg) Concentration	Arsenic (mg/kg) Concentration
36W-026-1	0 to 2 inches	1,135	366
36W-026-2	10 to 14 inches	50 U	35 U
36W-026-3	22 to 26 inches	50 U	35 U
36W-026-4	34 to 38 inches	50 U	35 U

Sample Number	Depth	Lead (mg/kg) Concentration	Arsenic (mg/kg) Concentration
36W-017-1	0 to 2 inches	1,505	396
36W-017-2	10 to 14 inches	50 U	35 U
36W-017-3	22 to 26 inches	50 U	35 U
36W-017-4	34 to 38 inches	50 U	35 U

Base map created using 2010 orthoimagery, sample location from 2013 GPS survey and sample result data from 2013.

Map Creation Date: 02 September 2013

Coordinate system: Arizona State Plane Central
FIPS: 0202
Datum: NAD83
Units: Feet

Data: g:\arcviewprojects\SERAS01\00-146
MXD file: g:\arcinfoprojects\SERAS01\SER00146_IronKingMineSite\ARS_WJ\146_ASR_WJ_Subsurface_Concentration_Map_f4

Legend

Lead Concentration (mg/kg)	Arsenic Concentration (mg/kg)
< 300	< 150
>= 300	>= 150

0 48 96
Feet

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Scientific Engineering Response and Analytical Services
EP-W-09-031
W.A.# 0-146

Figure 4
Subsurface Concentration Map
Iron King Mine Site
Dewey-Humboldt, Arizona

Base map created using 2010 orthoimagery, sample location from 2013 GPS survey and sample result data from 2013.

Map Creation Date: 02 September 2013

Coordinate system: Arizona State Plane Central
FIPS: 0202
Datum: NAD83
Units: Feet

0 48 96
Feet

RL = Reporting Limit
mg/kg = micrograms per kilogram
sqft = Square feet

U.S. EPA Environmental Response Team
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EP-W-09-031
W.A.# 0-146

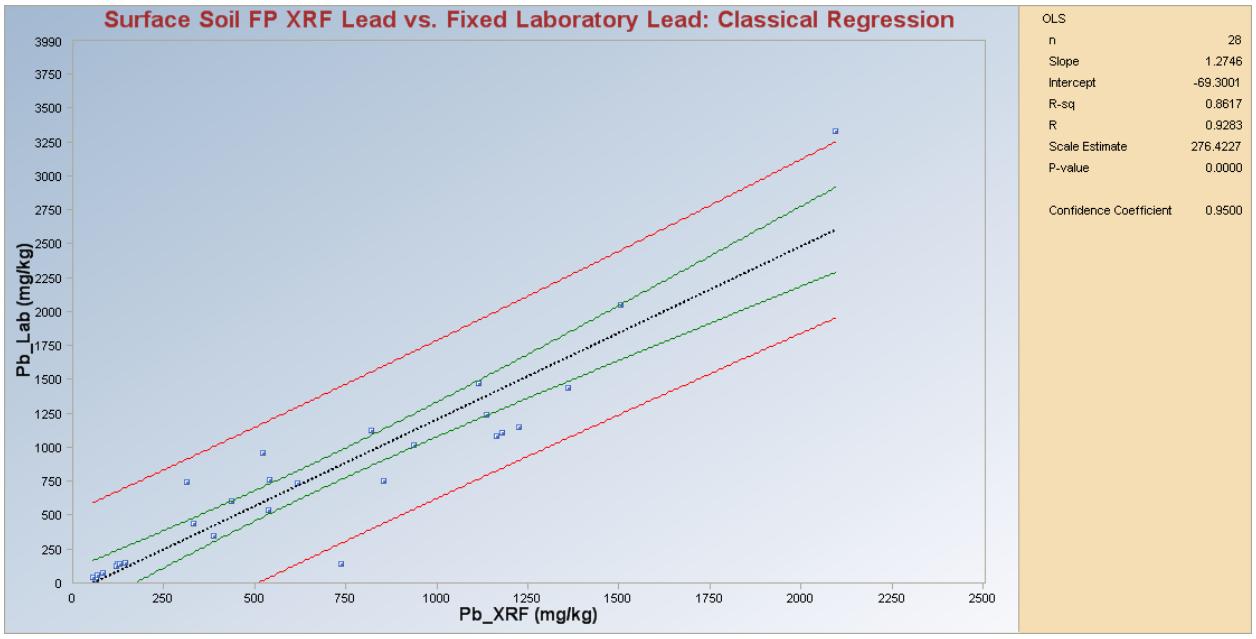
Figure 5
Removal Area
Iron King Mine Site
Dewey-Humboldt, Arizona

Data: g:\arcviewprojects\SERAS01\00-146
MXD file: g:\arcinfoprojects\SERAS01\SER00146_IronKingMineSite\ARS_WJ\146_ARS_WJ_Removal_Area_f5

APPENDIX A
XRF Statistical Summary Report
Iron King Mine Site
Technical Memorandum
October 2013

Statistical confirmation analysis was conducted on 28 samples collected during the August 2013 Accelerated Residential Lead Sampling Event. Data included in the statistical analysis can be found in Table 5. Field Portable X-Ray Fluorescence (XRF) readings for lead and arsenic were compared to the corresponding EPA Region 9 laboratory confirmation results using ordinary least squares (OLS) regression analyses. Analyses were conducted using ProUCL version 4.0 EPA software and Excel.

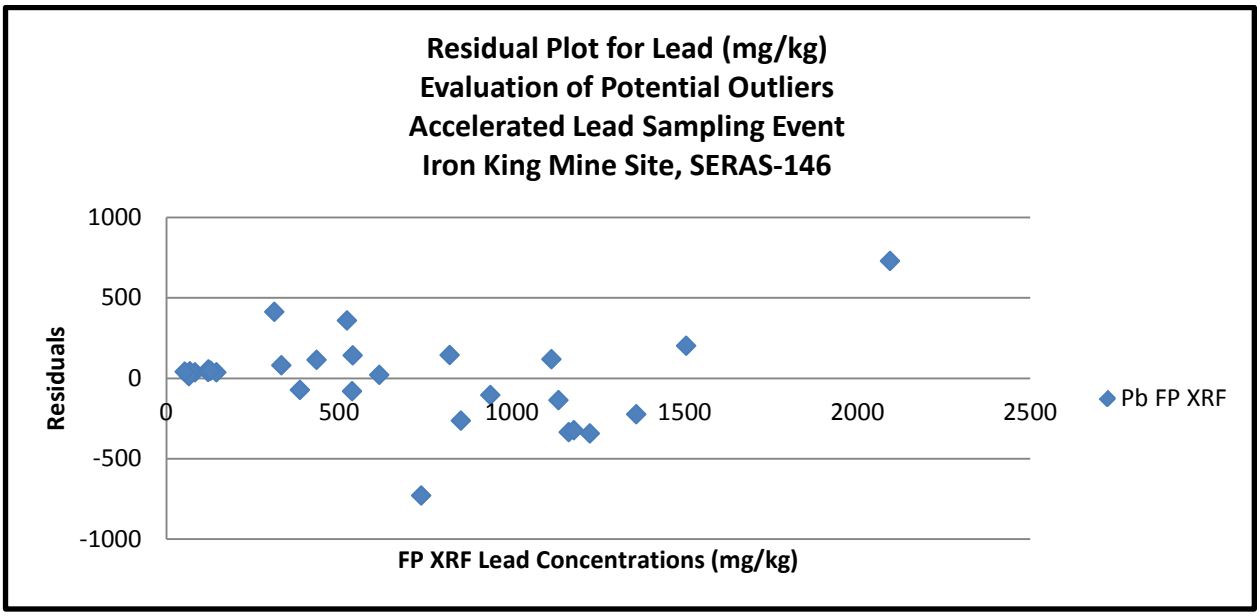
Lead. FP XRF readings for lead which were included in the statistical analyses ranged from 54 mg/kg to 2,095 mg/kg. Corresponding laboratory results ranged from 39.2 mg/kg to 3,330 mg/kg. A classical OLS regression analysis was conducted on these measurements with the XRF readings as the independent variable and the laboratory results as the dependent variable. The resulting coefficient of determination (R^2) was 0.8617 which met the criteria, R^2>0.70 for XRF confirmation analysis, identified in SERAS Standard Operating Procedure (SOP) #1720, *Operation of the NITON XLt792YW Field Portable X-ray Fluorescence Unit*. The figure below depicts the regression analysis with associated statistics listed to the right of the graph.



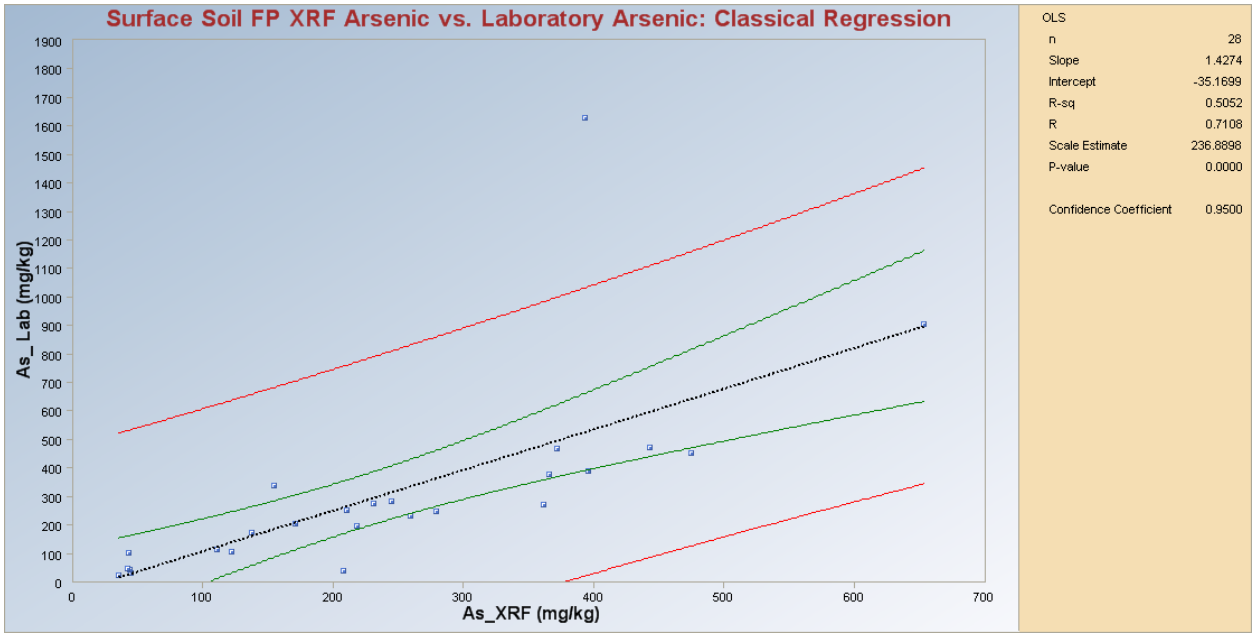
Detailed statistical output can be found in Table A. The regression analysis was performed with the confidence level set at 95% percent. The resulting OLS equation was:

Laboratory Lead = 1.2746 (FP XRF Lead) -69.3001

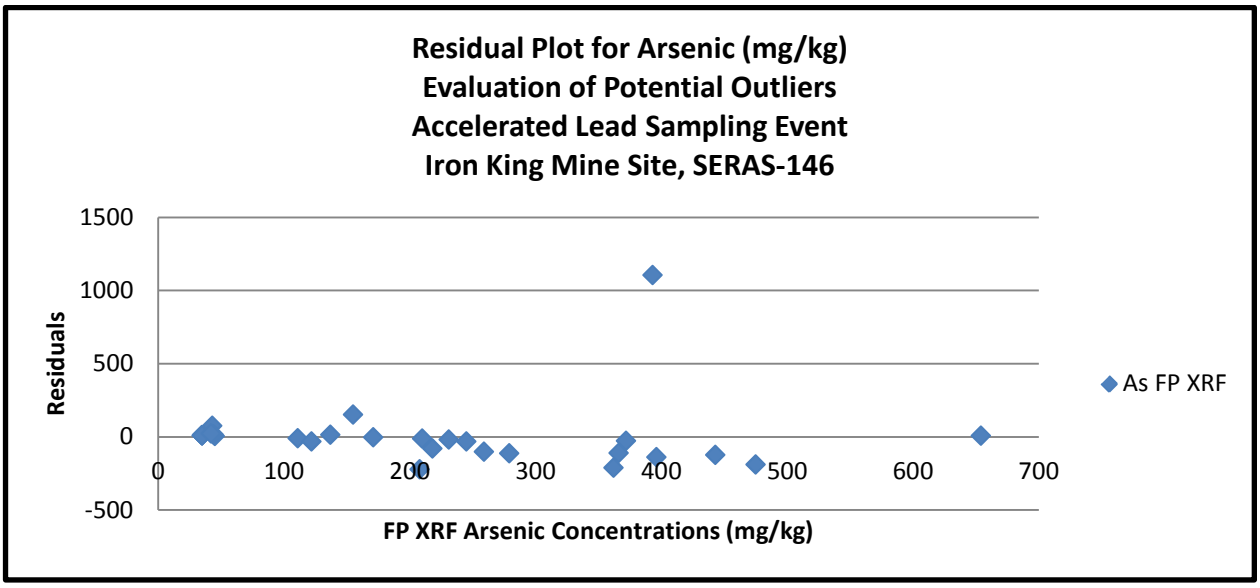
Diagnostic testing was performed on the regression analysis to determine if any potential outliers existed within the data set which may be overly-influencing the computation of the regression equation. This included examination of the residuals in relation to the independent variable XRF readings). When plotted, the data points should be distributed uniformly (with no obvious patterns) above and below the x-axis (y=0). Visual inspection of the plot below and the supporting diagnostic tests [res/scale (Student Residual); Table A] did not indicate the presence of outliers.



Arsenic. XRF As measurements ranged from not detected, at a reporting limit of 35 mg/kg, to 654 mg/kg. Corresponding laboratory analytical results ranged from 21.3 mg/kg to 1630 mg/kg. A regression analysis was conducted with the confidence level set at 95%. The computed R^2 was 0.505.



Examination of the residuals (Table B) and the associated plot (depicted below) indicated one potential outlier existed within the data: arsenic XRF = 393 mg/kg, arsenic _Lab=1630. In a regression analysis, no single data point should exercise more influence on the placement of the OLS regression line than any other point. In this case, it appeared that the potential outlier had much greater influence over the placement of the regression line than the other points. The relatively high Student Residual (highlighted in Table B) supported this conclusion.



The regression analysis was computed again with the outlying data point removed. The resulting coefficient of determination (R^2) was 0.8669 which met the criteria, R^2>0.70 for XRF confirmation analysis, identified in SERAS SOP #1720, *Operation of the NITON XLt792YW Field Portable X-ray Fluorescence Unit*. The figure below depicts the regression analysis with associated statistics listed to the right of the graph. The resulting regression equation was:

Laboratory As = 1.1419 (XRF arsenic) -15.5025

Detailed statistical output can be found in Table C.

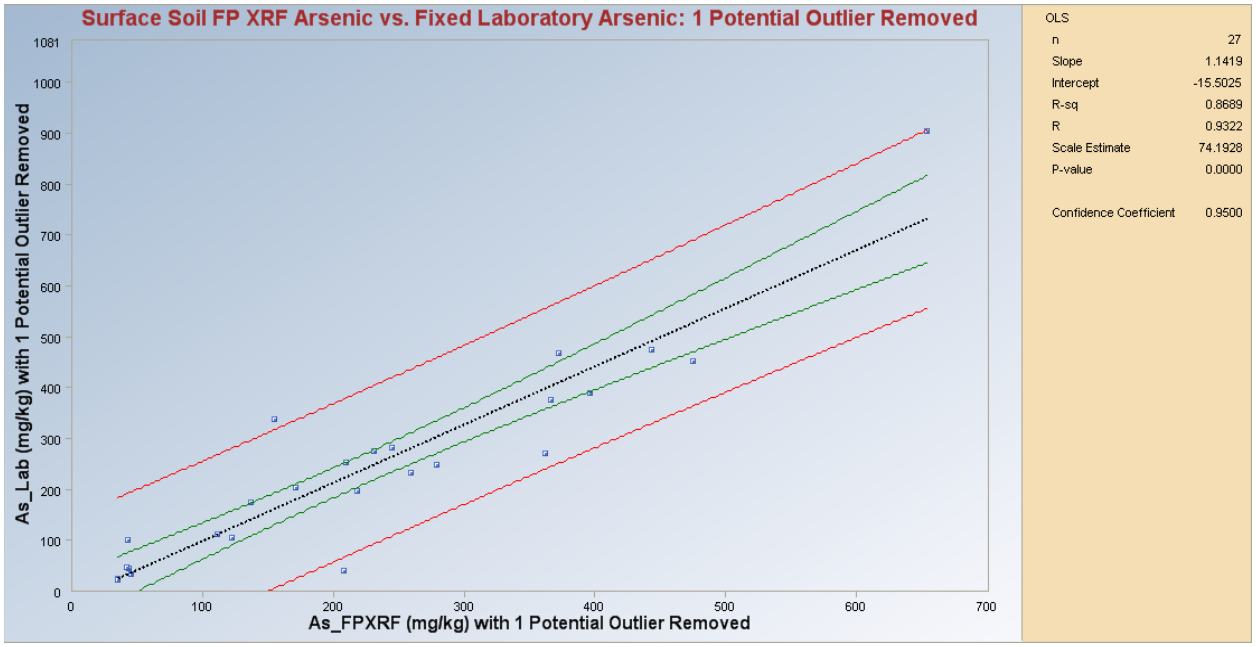


Table A. ProUCL Statistical Output for Classical Regression on Lead Results
FP XRF Lead Measurements (mg/kg) versus EPA Region 9 Confirmation Results (mg/kg)
Accelerated Residential Lead Sampling Event
Iron King Mine Site

FP XRF Lead (mg/kg) vs. Fixed Laboratory Asrenic (mg/kg): OLS Regression

Date/Time of Computation	10/18/2013 9:11:47 AM
From File	C:\Documents and Settings\dgetty\My Documents\SERAS\IronKing (146)\AcceleratedLeadSamplingResults\Lead_As_Resident.wst
Full Precision	OFF
Display Limits	True
Confidence Level for Intervals	0.95
Display Regresion Diagnostics	True
Display Regresion Tables	True
Title For Y vs X Plots	Classical Regression
Confidence Level for Regression Line	0.95
Display Confidence Band	True
Display Prediction Band	True

Regression Estimates and Inference Table

Paramater	Estimates	Std. Error	T-values	p-values
intercept	-69.3	84.59	-0.819	0.42
Lead_XRF	1.275	0.1	12.73	1.122E-12

OLS ANOVA Table

Source of Variation	SS	DOF	MS	F-Value	P-Value
Regression	12380538	1	12380538	162	0
Error	1986647	26	76410		
Total	14367185	27			

R Square	0.862
Adjusted R Square	0.856
Sqrt(MSE) = Scale	276.4

Table A (continued). ProUCL Statistical Output for Classical Regression on Lead Results
FP XRF Lead Measurements (mg/kg) versus EPA Region 9 Confirmation Results (mg/kg)
Accelerated Residential Lead Sampling Event
Iron King Mine Site

Regression Table

Obs	Y Vector	Yhat	Residuals	Res/Scale
1	955	597.3	357.7	1.294
2	761	619	142	0.514
3	737	717.1	19.86	0.0718
4	139	86.2	52.8	0.191
5	73.2	36.49	36.71	0.133
6	122	84.93	37.07	0.134
7	59.5	17.37	42.13	0.152
8	599	485.2	113.8	0.412
9	1470	1352	118.1	0.427
10	1080	1416	-335.6	-1.214
11	152	115.5	36.48	0.132
12	434	355.1	78.85	0.285
13	142	871.4	-729.4	-2.639
14	742	329.7	412.3	1.492
15	754	1018	-264	-0.955
16	1110	1435	-324.8	-1.175
17	2050	1849	201	0.727
18	1120	975.9	144.1	0.521
19	1150	1493	-343.4	-1.242
20	3330	2601	729	2.637
21	27.8	14.83	12.97	0.0469
22	1440	1664	-224.2	-0.811
23	535	616.4	-81.45	-0.295
24	1020	1126	-106.3	-0.385
25	351	424	-72.98	-0.264
26	1240	1377	-137.4	-0.497
27	39.2	-0.47	39.67	0.144
28	140	95.13	44.87	0.162

Table A (continued). ProUCL Statistical Output for Classical Regression on Lead Results
FP XRF Lead Measurements (mg/kg) versus EPA Region 9 Confirmation Results (mg/kg)
Accelerated Residential Lead Sampling Event
Iron King Mine Site

Summary Table for Prediction and Confidence Limits

Obs	X Vector	Y Vector	Yhat	s(Yhat)	s(pred)	LCL	UCL	LPL	UPL	Residuals
1	523	955	597.3	54.12	281.7	-630.5	1825	486.1	708.6	357.7
2	540	761	619	53.7	281.6	-653.4	1891	508.6	729.4	142
3	617	737	717.1	52.45	281.4	-757	2191	609.3	825	19.86
4	122	139	86.2	75.36	286.5	-90.99	263.4	-68.7	241.1	52.8
5	83	73.2	36.49	78.22	287.3	-38.52	111.5	-124.3	197.3	36.71
6	121	122	84.93	75.43	286.5	-89.65	259.5	-70.12	240	37.07
7	68	59.5	17.37	79.35	287.6	-18.34	53.09	-145.7	180.5	42.13
8	435	599	485.2	57.07	282.3	-512.1	1482	367.9	602.5	113.8
9	1115	1470	1352	69.03	284.9	-1427	4131	1210	1494	118.1
10	1165	1080	1416	72.4	285.7	-1494	4326	1267	1564	-335.6
11	145	152	115.5	73.72	286.1	-121.9	353	-36.01	267	36.48
12	333	434	355.1	61.89	283.3	-374.9	1085	227.9	482.4	78.85
13	738	142	871.4	52.76	281.4	-919.8	2663	762.9	979.8	-729.4
14	313	742	329.7	62.99	283.5	-348	1007	200.2	459.1	412.3
15	853	754	1018	55.55	281.9	-1074	3110	903.8	1132	-264
16	1180	1110	1435	73.45	286	-1514	4384	1284	1586	-324.8
17	1505	2050	1849	99.06	293.6	-1952	5650	1645	2053	201
18	820	1120	975.9	54.51	281.7	-1030	2982	863.8	1088	144.1
19	1226	1150	1493	76.75	286.9	-1576	4563	1336	1651	-343.4
20	2095	3330	2601	152.5	315.7	-2745	7948	2288	2914	729
21	66	27.8	14.83	79.5	287.6	-15.65	45.3	-148.6	178.2	12.97
22	1360	1440	1664	87.06	289.8	-1757	5085	1485	1843	-224.2
23	538	535	616.4	53.75	281.6	-650.7	1884	506	726.9	-81.45
24	938	1020	1126	58.99	282.6	-1189	3441	1005	1248	-106.3
25	387	351	424	59.17	282.7	-447.5	1295	302.4	545.6	-72.98
26	1135	1240	1377	70.35	285.2	-1454	4209	1233	1522	-137.4
27	54	39.2	-0.47	80.41	287.9	0.497	-1.437	-165.7	164.8	39.67
28	129	140	95.13	74.86	286.4	-100.4	290.7	-58.74	249	44.87

Table B. ProUCL Statistical Output for Classical Regression on Arsenic Results
XRF Arsenic Measurements (mg/kg) versus EPA Region 9 Confirmation Results (mg/kg)
Accelerated Residential Lead Sampling Event
Iron King Mine Site

FP XRF Arsenic (mg/kg) vs. Fixed Laboratory Arsenic (mg/kg): OLS Regression

User Selected Options	
Date/Time of Computation	10/18/2013 8:48:00 AM
From File	C:\Documents and Settings\dgetty\My Documents\SERAS\IronKing (146)\AcceleratedLeadSamplingResults\Lead_As_Resident.wst
Full Precision	OFF
Display Limits	True
Confidence Level for Intervals	0.95
Display Regresion Diagnostics	True
Display Regresion Tables	True
Title For Y vs X Plots	Classical Regression
Confidence Level for Regression Line	0.95
Display Confidence Band	True
Display Prediction Band	True

Regression Estimates and Inference Table

Paramater	Estimates	Std. Error	T-values	p-values
intercept	-35.17	75.32	-0.467	0.644
As_XRF	1.427	0.277	5.152	2.25E-05

OLS ANOVA Table

Source of Variation	SS	DOF	MS	F-Value	P-Value
Regression	1489517	1	1489517	26.54	0
Error	1459037	26	56117		
Total	2948553	27			

R Square	0.505
Adjusted R Square	0.486
Sqrt(MSE) = Scale	236.9

Table B (continued). ProUCL Statistical Output for Classical Regression on Arsenic Results
FP XRF Arsenic Measurements (mg/kg) versus EPA Region 9 Confirmation Results (mg/kg)
Accelerated Residential Lead Sampling Event
Iron King Mine Site

Regression Table

Obs	Y Vector	Yhat	Residuals	Res/Scale
1	174	160.4	13.62	0.0575
2	252	264.6	-12.59	-0.0531
3	276	294.6	-18.56	-0.0784
4	24.6	14.79	9.811	0.0414
5	23.5	14.79	8.711	0.0368
6	25.4	14.79	10.61	0.0448
7	23.1	14.79	8.311	0.0351
8	204	208.9	-4.917	-0.0208
9	1630	525.8	1104	4.661
10	283	314.5	-31.54	-0.133
11	474	597.2	-123.2	-0.52
12	101	26.21	74.79	0.316
13	40.1	261.7	-221.6	-0.936
14	113	123.3	-10.27	-0.0434
15	196	276	-80	-0.338
16	233	334.5	-101.5	-0.429
17	390	530.1	-140.1	-0.591
18	452	642.8	-190.8	-0.806
19	271	481.6	-210.6	-0.889
20	905	898.4	6.646	0.0281
21	33.4	29.06	4.337	0.0183
22	468	495.8	-27.83	-0.117
23	337	186.1	150.9	0.637
24	249	363.1	-114.1	-0.482
25	106	139	-32.97	-0.139
26	377	487.3	-110.3	-0.465
27	44.5	27.64	16.86	0.0712
28	46.8	24.78	22.02	0.0929

Table B (continued). ProUCL Statistical Output for Classical Regression on Arsenic Results
FP XRF Arsenic Measurements (mg/kg) versus EPA Region 9 Confirmation Results (mg/kg)
Accelerated Residential Lead Sampling Event
Iron King Mine Site

Summary Table for Prediction and Confidence Limits

Obs	X Vector	Y Vector	Yhat	s(Yhat)	s(pred)	LCL	UCL	LPL	UPL	Residuals
1	137	174	160.4	50.15	242.1	-169.3	490.1	57.29	263.5	13.62
2	210	252	264.6	44.83	241.1	-279.3	808.4	172.4	356.7	-12.59
3	231	276	294.6	44.9	241.1	-310.9	900	202.3	386.9	-18.56
4	35	24.6	14.79	67.76	246.4	-15.61	45.19	-124.5	154.1	9.811
5	35	23.5	14.79	67.76	246.4	-15.61	45.19	-124.5	154.1	8.711
6	35	25.4	14.79	67.76	246.4	-15.61	45.19	-124.5	154.1	10.61
7	35	23.1	14.79	67.76	246.4	-15.61	45.19	-124.5	154.1	8.311
8	171	204	208.9	46.67	241.4	-220.5	638.4	113	304.8	-4.917
9	393	1630	525.8	65.87	245.9	-555	1607	390.4	661.2	1104
10	245	283	314.5	45.36	241.2	-332	961.1	221.3	407.8	-31.54
11	443	474	597.2	76.61	249	-630.3	1825	439.7	754.6	-123.2
12	43	101	26.21	66.12	245.9	-27.66	80.08	-109.7	162.1	74.79
13	208	40.1	261.7	44.86	241.1	-276.3	799.7	169.5	354	-221.6
14	111	113	123.3	53.79	242.9	-130.1	376.7	12.71	233.8	-10.27
15	218	196	276	44.77	241.1	-291.3	843.3	184	368	-80
16	259	233	334.5	46.15	241.3	-353.1	1022	239.7	429.4	-101.5
17	396	390	530.1	66.48	246	-559.5	1620	393.4	666.7	-140.1
18	475	452	642.8	83.97	251.3	-678.5	1964	470.3	815.4	-190.8
19	362	271	481.6	59.85	244.3	-508.3	1471	358.5	604.6	-210.6
20	654	905	898.4	128.7	269.6	-948.2	2745	633.9	1163	6.646
21	45	33.4	29.06	65.71	245.8	-30.68	88.8	-106	164.1	4.337
22	372	468	495.8	61.73	244.8	-523.4	1515	368.9	622.7	-27.83
23	155	337	186.1	48.11	241.7	-196.4	568.6	87.18	285	150.9
24	279	249	363.1	47.79	241.7	-383.2	1109	264.8	461.3	-114.1
25	122	106	139	52.16	242.6	-146.7	424.6	31.76	246.2	-32.97
26	366	377	487.3	60.6	244.5	-514.3	1489	362.7	611.8	-110.3
27	44	44.5	27.64	65.91	245.9	-29.17	84.44	-107.8	163.1	16.86
28	42	46.8	24.78	66.32	246	-26.16	75.72	-111.5	161.1	22.02

Table C. ProUCL Statistical Output for Classical Regression on Arsenic Results – Potential Outlier Excluded
XRF Arsenic Measurements (mg/kg) versus EPA Region 9 Confirmation Results (mg/kg)
Accelerated Residential Lead Sampling Event
Iron King Mine Site

Arsenic (mg/kg) with One Outlier Removed: FP XRF vs. Laboratory OLS Regresion

User Selected Options	
Date/Time of Computation	10/18/2013 1:47:40 PM
From File	C:\Documents and Settings\dgetty\My Documents\SERAS\IronKing (146)\AcceleratedLeadSamplingResults\Lead_Aresenic_Resident.wst
Full Precision	OFF
Display Limits	True
Confidence Level for Intervals	0.95
Display Regresion Diagnostics	True
Display Regresion Tables	True
Title For Y vs X Plots	Claresenicsical Regression
Confidence Level for Regression Line	0.95
Display Confidence Band	True
Display Prediction Band	True

Regression Estimates and Inference Table

Paramater	Estimates	Std. Error	T-values	p-values
intercept	-15.5	23.62	-0.656	0.518
Arsenic_XRFNoOut	1.142	0.0887	12.87	1.57E-12

OLS ANOVA Table

Source of Variation	SS	DOF	MS	F-Value	P-Value
Regression	912169	1	912169	165.7	0
Error	137614	25	5505		
Total	1049783	26			

R Square	0.869
Adjusted R Square	0.864
Sqrt(MSE) = Scale	74.19

Table C (continued). ProUCL Statistical Output for Claresenicsical Regression on Arsenic Results – Potential Outlier Excluded
XRF Arsenic Meareseniсurements (mg/kg) versus SERARESENIC Laboratory Arsenic Results (mg/kg)
Accelerated Residential Lead Sampling Event
Iron King Mine Site

Regression Table

Obs	Y Vector	Yhat	Residuals	Res/Scale
1	174	140.9	33.06	0.446
2	252	224.3	27.7	0.373
3	276	248.3	27.72	0.374
4	24.6	24.47	0.135	0.00182
5	23.5	24.47	-0.965	-0.013
6	25.4	24.47	0.935	0.0126
7	23.1	24.47	-1.365	-0.0184
8	204	179.8	24.23	0.327
9	283	264.3	18.73	0.252
10	474	490.4	-16.37	-0.221
11	101	33.6	67.4	0.908
12	40.1	222	-181.9	-2.452
13	113	111.3	1.748	0.0236
14	196	233.4	-37.44	-0.505
15	233	280.3	-47.26	-0.637
16	390	436.7	-46.7	-0.629
17	452	526.9	-74.91	-1.01
18	271	397.9	-126.9	-1.71
19	905	731.3	173.7	2.341
20	33.4	35.88	-2.484	-0.0335
21	468	409.3	58.71	0.791
22	337	161.5	175.5	2.366
23	249	303.1	-54.1	-0.729
24	106	123.8	-17.81	-0.24
25	377	402.4	-25.44	-0.343
26	44.5	34.74	9.758	0.132
27	46.8	32.46	14.34	0.193

Table C (continued). ProUCL Statistical Output for Claresenicsical Regression on Arsenic Results – Potential Outlier Excluded
FP XRF Arsenic Mearesenicurements (mg/kg) versus SERARESENIC Laboratory Arsenic Results (mg/kg)
Accelerated Residential Lead Sampling Event
Iron King Mine Site

Summary Table for Prediction and Confidence Limits

Obs	X Vector	Y Vector	Yhat	s(Yhat)	s(pred)	LCL	UCL	LPL	UPL	Residuals
1	137	174	140.9	15.76	75.85	-149.3	431.2	108.5	173.4	33.06
2	210	252	224.3	14.28	75.55	-237.7	686.3	194.9	253.7	27.7
3	231	276	248.3	14.38	75.57	-263.1	759.6	218.7	277.9	27.72
4	35	24.6	24.47	21.23	77.17	-25.92	74.85	-19.26	68.19	0.135
5	35	23.5	24.47	21.23	77.17	-25.92	74.85	-19.26	68.19	-0.965
6	35	25.4	24.47	21.23	77.17	-25.92	74.85	-19.26	68.19	0.935
7	35	23.1	24.47	21.23	77.17	-25.92	74.85	-19.26	68.19	-1.365
8	171	204	179.8	14.74	75.64	-190.5	550	149.4	210.1	24.23
9	245	283	264.3	14.57	75.61	-280	808.5	234.3	294.3	18.73
10	443	474	490.4	24.96	78.28	-519.6	1500	439	541.8	-16.37
11	43	101	33.6	20.71	77.03	-35.6	102.8	-9.058	76.26	67.4
12	208	40.1	222	14.28	75.56	-235.2	679.3	192.6	251.4	-181.9
13	111	113	111.3	16.86	76.09	-117.9	340.4	76.52	146	1.748
14	218	196	233.4	14.29	75.56	-247.3	714.2	204	262.9	-37.44
15	259	233	280.3	14.87	75.67	-296.9	857.5	249.6	310.9	-47.26
16	396	390	436.7	21.68	77.29	-462.7	1336	392.1	481.3	-46.7
17	475	452	526.9	27.34	79.07	-558.3	1612	470.6	583.2	-74.91
18	362	271	397.9	19.51	76.71	-421.6	1217	357.7	438.1	-126.9
19	654	905	731.3	41.72	85.12	-774.9	2237	645.4	817.2	173.7
20	45	33.4	35.88	20.58	77	-38.02	109.8	-6.51	78.28	-2.484
21	372	468	409.3	20.12	76.87	-433.7	1252	367.9	450.7	58.71
22	155	337	161.5	15.15	75.72	-171.1	494.1	130.3	192.7	175.5
23	279	249	303.1	15.46	75.79	-321.1	927.3	271.3	334.9	-54.1
24	122	106	123.8	16.37	75.98	-131.2	378.8	90.11	157.5	-17.81
25	366	377	402.4	19.75	76.78	-426.4	1231	361.8	443.1	-25.44
26	44	44.5	34.74	20.65	77.01	-36.81	106.3	-7.784	77.27	9.758
27	42	46.8	32.46	20.78	77.05	-34.39	99.31	-10.33	75.25	14.34

APPENDIX B
Field XRF Results
Iron King Mine Site
Technical Memorandum
October 2013

Lockheed Martin Information Systems and Global Services
Environmental Services/SERAS
2890 Woodbridge Ave, Building 209 Annex
Edison, NJ 08837-3679
Telephone: 732-321-4200 Facsimile: 732-494-4021

LOCKHEED MARTIN

DATE: 08/22/2013

TO: Terrence Johnson, U. S. EPA/ERT

FROM: Jay Patel, Analytical Support Leader, SERAS Jay Patel

SUBJECT: Preliminary Results of Project: **IRON KING MINE SITE** WA# SER00146

Attached please find the preliminary results of the above referenced project for the following samples.

NO QC EVALUATION/VALIDATION HAS BEEN PERFORMED
DATA VALIDITY IS UNSUBSTANTIATED
AND THE DATA SHOULD BE USED WITH DISCRETION

Chain of Custody No.	# of samples	Matrix	Analyses
NA	204	Soil	Pb & As by XRF (**on-site** analysis on 08/13-15/13)
06617, 06618, 06619 006620, 06621	77	Soil	Pb & As by XRF (analysis at SERAS lab on 08/19-20/13)

CC: Central File # SER00146

S. Grossman Task Leader, SERAS
D. Aloysius

L. Martin, Hazardous Waste Coordinator, SERAS

SERAS XRF DAILY PRELIMINARY ANALYSIS REPORT
(PRELIMINARY SCREENING DATA, NO QA/QC)

Site: Iron King Mine Site
SERAS WA#: SER00146
XRF used: NITON XLt792YW
XRF S/N: 8262
Matrix type: Soil
XRF Operator: Jay Patel
Conc. Units: mg/Kg

Date Analyzed	SAMPLE ID	Location	Lead		Arsenic		
			Conc.	RL	Conc.	RL	
15-Aug-13	00W-001-1F	00W-001-1F	128	50	42	35	
15-Aug-13	00W-002-1F	00W-002-1F	188	50	82	35	
15-Aug-13	00W-003-1F	00W-003-1F	138	50	64	35	
15-Aug-13	00W-004-1F	00W-004-1F	167	50	41	35	
15-Aug-13	00W-005-1B	00W-005-1B	546	50	114	54.6	
15-Aug-13	00W-005-1F	00W-005-1F	390	50	107	39	
15-Aug-13	00W-006-1F	00W-006-1F	88	50	63	35	
15-Aug-13	00W-007-1F	00W-007-1F	88	50	49	35	
15-Aug-13	00W-008-1F	00W-008-1F	81	50	40	35	
15-Aug-13	00W-009-1F	00W-009-1F	134	50	U	35	
15-Aug-13	00W-010-1F	00W-010-1F	114	50	38	35	
15-Aug-13	00W-011-1F	00W-011-1F	63	50	U	35	
15-Aug-13	00W-012-1F	00W-012-1F	52	50	U	35	
15-Aug-13	00W-013-1F	00W-013-1F	79	50	U	35	
15-Aug-13	00W-014-1F	00W-014-1F	79	50	U	35	
15-Aug-13	00W-015-1F	00W-015-1F	U	50	35	35	
15-Aug-13	00W-016-1F	00W-016-1F	70	50	U	35	
15-Aug-13	00W-017-1F	00W-017-1F	54	50	U	35	
15-Aug-13	00W-018-1F	00W-018-1F	71	50	U	35	
15-Aug-13	00W-019-1F	00W-019-1F	80	50	U	35	
15-Aug-13	00W-020-1F	00W-020-1F	52	50	U	35	
15-Aug-13	00W-021-1F	00W-021-1F	65	50	U	35	
15-Aug-13	00W-022-1B	00W-022-1B	265	50	91	35	
15-Aug-13	00W-022-1F	00W-022-1F	278	50	97	35	
15-Aug-13	00W-023-1F	00W-023-1F	68	50	U	35	
15-Aug-13	00W-024-1F	00W-024-1F	88	50	U	35	
15-Aug-13	00W-025-1F	00W-025-1F	61	50	U	35	
15-Aug-13	00W-026-1F	00W-026-1F	85	50	U	35	
15-Aug-13	00W-027-1F	00W-027-1F	56	50	U	35	
15-Aug-13	00W-028-1F	00W-028-1F	74	50	45	35	
14-Aug-13	30W-001-1B	30W-001-1B	270	50	91	35	
14-Aug-13	30W-001-1F	30W-001-1F	287	50	76	35	
14-Aug-13	30W-002-1F	30W-002-1F	143	50	U	35	
14-Aug-13	30W-003-1F	30W-003-1F	146	50	U	35	
14-Aug-13	30W-004-1B	30W-004-1B	103	50	U	35	
14-Aug-13	30W-004-1F	30W-004-1F	78	50	U	35	
14-Aug-13	30W-005-1B	30W-005-1B	86	50	U	35	

SERAS XRF DAILY PRELIMINARY ANALYSIS REPORT
(PRELIMINARY SCREENING DATA, NO QA/QC)

Site: Iron King Mine Site
SERAS WA#: SER00146
XRF used: NITON XLt792YW
XRF S/N: 8262
Matrix type: Soil
XRF Operator: Jay Patel
Conc. Units: mg/Kg

			Lead		Arsenic		
Date Analyzed	SAMPLE ID	Location	Conc.	RL	Conc.	RL	
14-Aug-13	30W-005-1F	30W-005-1F	93	50	U	35	
14-Aug-13	30W-006-1B	30W-006-1B	143	50	42	35	
14-Aug-13	30W-006-1F	30W-006-1F	131	50	U	35	
14-Aug-13	30W-007-1B	30W-007-1B	93	50	35	35	
14-Aug-13	30W-007-1F	30W-007-1F	99	50	U	35	
14-Aug-13	30W-008-1F	30W-008-1F	123	50	38	35	
14-Aug-13	30W-009-1F	30W-009-1F	161	50	U	35	
14-Aug-13	30W-010-1F	30W-010-1F	69	50	U	35	
13-Aug-13	30W-011-1B	30W-011-1B	170	50	39	35	
13-Aug-13	30W-011-1F	30W-011-1F	163	50	59	35	
13-Aug-13	30W-012-1B	30W-012-1B	183	50	63	35	
13-Aug-13	30W-012-1F	30W-012-1F	211	50	56	35	
13-Aug-13	30W-013-1B	30W-013-1B	152	50	44	35	
13-Aug-13	30W-013-1F	30W-013-1F	150	50	44	35	
13-Aug-13	30W-014-1B	30W-014-1B	202	50	64	35	
13-Aug-13	30W-014-1F	30W-014-1F	174	50	64	35	
13-Aug-13	30W-015-1B	30W-015-1B	174	50	54	35	
13-Aug-13	30W-015-1F	30W-015-1F	175	50	64	35	
13-Aug-13	30W-016-1B	30W-016-1B	215	50	70	35	
13-Aug-13	30W-016-1F	30W-016-1F	246	50	62	35	
14-Aug-13	30W-017-1B	30W-017-1B	369	50	159	36.9	
14-Aug-13	30W-017-1F	30W-017-1F	340	50	126	35	
14-Aug-13	30W-018-1F	30W-018-1F	105	50	U	35	
13-Aug-13	30W-019-1B	30W-019-1B	569	50	127	56.9	
13-Aug-13	30W-019-1F	30W-019-1F	477	50	147	47.7	
13-Aug-13	30W-020-1B	30W-020-1B	471	50	182	47.1	
13-Aug-13	30W-020-1F	30W-020-1F	609	50	237	60.9	
14-Aug-13	30W-020-2B	30W-020-2B	500	50	180	50	
14-Aug-13	30W-020-2F	30W-020-2F	369	50	161	36.9	
14-Aug-13	30W-020-3B	30W-020-3B	1090	50	420	109	
14-Aug-13	30W-020-3F	30W-020-3F	1140	50	365	114	
14-Aug-13	30W-020-4B	30W-020-4B	254	50	669	35	
14-Aug-13	30W-020-4F	30W-020-4F	196	50	656	35	
14-Aug-13	30W-021-1B	30W-021-1B	1100	50	236	110	
14-Aug-13	30W-021-1F	30W-021-1F	1230	50	253	123	
14-Aug-13	30W-021-2F	30W-021-2F	84	50	54	35	
14-Aug-13	30W-021-3F	30W-021-3F	69	50	U	35	

SERAS XRF DAILY PRELIMINARY ANALYSIS REPORT
(PRELIMINARY SCREENING DATA, NO QA/QC)

Site: Iron King Mine Site
SERAS WA#: SER00146
XRF used: NITON XLt792YW
XRF S/N: 8262
Matrix type: Soil
XRF Operator: Jay Patel
Conc. Units: mg/Kg

Date Analyzed	SAMPLE ID	Location	Lead		Arsenic		
			Conc.	RL	Conc.	RL	
14-Aug-13	30W-021-4F	30W-021-4F	U	50	U	35	
13-Aug-13	30W-022-1B	30W-022-1B	154	50	55	35	
13-Aug-13	30W-022-1F	30W-022-1F	191	50	46	35	
13-Aug-13	30W-023-1B	30W-023-1B	217	50	85	35	
13-Aug-13	30W-023-1F	30W-023-1F	203	50	70	35	
13-Aug-13	30W-024-1B	30W-024-1B	645	50	238	64.5	
13-Aug-13	30W-024-1F	30W-024-1F	589	50	223	58.9	
14-Aug-13	30W-024-2B	30W-024-2B	140	50	458	35	
14-Aug-13	30W-024-2F	30W-024-2F	149	50	428	35	
14-Aug-13	30W-024-3F	30W-024-3F	51	50	U	35	
14-Aug-13	30W-024-4F	30W-024-4F	U	50	U	35	
13-Aug-13	36W-001-1B	36W-001-1B	147	50	U	35	
13-Aug-13	36W-001-1F	36W-001-1F	148	50	U	35	
13-Aug-13	36W-002-1B	36W-002-1B	127	50	U	35	
13-Aug-13	36W-002-1F	36W-002-1F	117	50	U	35	
13-Aug-13	36W-003-1B	36W-003-1B	318	50	43	35	
13-Aug-13	36W-003-1F	36W-003-1F	305	50	U	35	
13-Aug-13	36W-004-1B	36W-004-1B	73	50	38	35	
13-Aug-13	36W-004-1F	36W-004-1F	76	50	U	35	
13-Aug-13	36W-005-1B	36W-005-1B	63	50	U	35	
13-Aug-13	36W-005-1F	36W-005-1F	67	50	U	35	
13-Aug-13	36W-006-1B	36W-006-1B	120	50	U	35	
13-Aug-13	36W-006-1F	36W-006-1F	107	50	U	35	
14-Aug-13	36W-007-1F	36W-007-1F	145	50	U	35	
14-Aug-13	36W-008-1B	36W-008-1B	315	50	51	35	
14-Aug-13	36W-008-1F	36W-008-1F	350	50	U	35	
14-Aug-13	36W-009-1B	36W-009-1B	776	50	213	77.6	
14-Aug-13	36W-009-1F	36W-009-1F	699	50	202	69.9	
14-Aug-13	36W-010-1B	36W-010-1B	176	50	U	35	
14-Aug-13	36W-010-1F	36W-010-1F	227	50	U	35	
14-Aug-13	36W-011-1F	36W-011-1F	109	50	73	35	
14-Aug-13	36W-012-1B	36W-012-1B	185	50	U	35	
14-Aug-13	36W-012-1F	36W-012-1F	174	50	U	35	
14-Aug-13	36W-013-1B	36W-013-1B	301	50	111	35	
14-Aug-13	36W-013-1F	36W-013-1F	324	50	110	35	
14-Aug-13	36W-014-1B	36W-014-1B	799	50	206	79.9	
14-Aug-13	36W-014-1F	36W-014-1F	907	50	230	90.7	

SERAS XRF DAILY PRELIMINARY ANALYSIS REPORT
(PRELIMINARY SCREENING DATA, NO QA/QC)

Site: Iron King Mine Site
SERAS WA#: SER00146
XRF used: NITON XLt792YW
XRF S/N: 8262
Matrix type: Soil
XRF Operator: Jay Patel
Conc. Units: mg/Kg

Date Analyzed	SAMPLE ID	Location	Lead		Arsenic		
			Conc.	RL	Conc.	RL	
14-Aug-13	36W-015-1B	36W-015-1B	1270	50	279	127	
14-Aug-13	36W-015-1F	36W-015-1F	1090	50	239	109	
14-Aug-13	36W-015-2F	36W-015-2F	51	50	U	35	
14-Aug-13	36W-015-3F	36W-015-3F	U	50	U	35	
14-Aug-13	36W-015-4F	36W-015-4F	U	50	U	35	
14-Aug-13	36W-016-1F	36W-016-1F	138	50	U	35	
14-Aug-13	36W-017-1B	36W-017-1B	1630	50	391	163	
14-Aug-13	36W-017-1F	36W-017-1F	1380	50	400	138	
14-Aug-13	36W-017-2F	36W-017-2F	U	50	U	35	
14-Aug-13	36W-017-3F	36W-017-3F	U	50	U	35	
14-Aug-13	36W-017-4F	36W-017-4F	U	50	U	35	
14-Aug-13	36W-018-1B	36W-018-1B	921	50	453	92.1	
14-Aug-13	36W-018-1F	36W-018-1F	718	50	497	71.8	
14-Aug-13	36W-019-1B	36W-019-1B	971	50	299	97.1	
14-Aug-13	36W-019-1F	36W-019-1F	1480	50	424	148	
14-Aug-13	36W-020-1B	36W-020-1B	2070	50	652	207	
14-Aug-13	36W-020-1F	36W-020-1F	2120	50	655	212	
14-Aug-13	36W-020-2F	36W-020-2F	U	50	U	35	
14-Aug-13	36W-020-3F	36W-020-3F	U	50	U	35	
14-Aug-13	36W-020-4F	36W-020-4F	66	50	45	35	
14-Aug-13	36W-021-1B	36W-021-1B	1310	50	358	131	
14-Aug-13	36W-021-1F	36W-021-1F	1410	50	386	141	
14-Aug-13	36W-021-2F	36W-021-2F	U	50	U	35	
14-Aug-13	36W-021-3F	36W-021-3F	U	50	U	35	
14-Aug-13	36W-021-4F	36W-021-4F	U	50	U	35	
14-Aug-13	36W-022-1B	36W-022-1B	520	50	139	52	
14-Aug-13	36W-022-1F	36W-022-1F	555	50	171	55.5	
14-Aug-13	36W-023-1B	36W-023-1B	878	50	249	87.8	
14-Aug-13	36W-023-1F	36W-023-1F	997	50	309	99.7	
14-Aug-13	36W-023-2F	36W-023-2F	U	50	U	35	
14-Aug-13	36W-023-3F	36W-023-3F	U	50	U	35	
14-Aug-13	36W-023-4F	36W-023-4F	U	50	U	35	
14-Aug-13	36W-024-1B	36W-024-1B	199	50	U	35	
14-Aug-13	36W-024-1F	36W-024-1F	238	50	50	35	
14-Aug-13	36W-025-1B	36W-025-1B	400	50	107	40	
14-Aug-13	36W-025-1F	36W-025-1F	374	50	136	37.4	
14-Aug-13	36W-026-1B	36W-026-1B	1090	50	358	109	

SERAS XRF DAILY PRELIMINARY ANALYSIS REPORT
(PRELIMINARY SCREENING DATA, NO QA/QC)

Site: Iron King Mine Site
SERAS WA#: SER00146
XRF used: NITON XLt792YW
XRF S/N: 8262
Matrix type: Soil
XRF Operator: Jay Patel
Conc. Units: mg/Kg

Date Analyzed	SAMPLE ID	Location	Lead		Arsenic		
			Conc.	RL	Conc.	RL	
14-Aug-13	36W-026-1F	36W-026-1F	1180	50	374	118	
14-Aug-13	36W-026-2F	36W-026-2F	U	50	U	35	
14-Aug-13	36W-026-3F	36W-026-3F	U	50	U	35	
14-Aug-13	36W-026-4F	36W-026-4F	U	50	U	35	
14-Aug-13	36W-027-1B	36W-027-1B	180	50	U	35	
14-Aug-13	36W-027-1F	36W-027-1F	157	50	U	35	
15-Aug-13	40W-001-1F	40W-001-1F	50	50	U	35	
14-Aug-13	40W-002-1F	40W-002-1F	53	50	51	35	
14-Aug-13	40W-003-1F	40W-003-1F	55	50	U	35	
14-Aug-13	40W-004-1F	40W-004-1F	U	50	U	35	
14-Aug-13	40W-005-1F	40W-005-1F	U	50	U	35	
15-Aug-13	40W-006-1F	40W-006-1F	U	50	U	35	
15-Aug-13	40W-007-1F	40W-007-1F	U	50	U	35	
14-Aug-13	40W-008-1F	40W-008-1F	88	50	U	35	
14-Aug-13	40W-009-1F	40W-009-1F	61	50	U	35	
14-Aug-13	40W-010-1F	40W-010-1F	84	50	U	35	
15-Aug-13	40W-011-1F	40W-011-1F	105	50	U	35	
14-Aug-13	40W-012-1F	40W-012-1F	87	50	38	35	
14-Aug-13	40W-013-1F	40W-013-1F	U	50	U	35	
14-Aug-13	40W-014-1F	40W-014-1F	54	50	44	35	
15-Aug-13	40W-015-1F	40W-015-1F	75	50	37	35	
13-Aug-13	45J-001-1B	45J-001-1B	79	50	U	35	
13-Aug-13	45J-001-1F	45J-001-1F	90	50	U	35	
13-Aug-13	45J-002-1B	45J-002-1B	60	50	U	35	
13-Aug-13	45J-002-1F	45J-002-1F	70	50	U	35	
13-Aug-13	45J-003-1B	45J-003-1B	65	50	U	35	
13-Aug-13	45J-003-1F	45J-003-1F	67	50	U	35	
13-Aug-13	45J-004-1B	45J-004-1B	77	50	U	35	
13-Aug-13	45J-004-1F	45J-004-1F	91	50	U	35	
13-Aug-13	45J-005-1B	45J-005-1B	61	50	U	35	
13-Aug-13	45J-005-1F	45J-005-1F	U	50	U	35	
13-Aug-13	45J-006-1B	45J-006-1B	U	50	U	35	
13-Aug-13	45J-006-1F	45J-006-1F	53	50	U	35	
13-Aug-13	45J-007-1B	45J-007-1B	84	50	U	35	
13-Aug-13	45J-007-1F	45J-007-1F	82	50	U	35	
13-Aug-13	45J-008-1B	45J-008-1B	70	50	U	35	
13-Aug-13	45J-008-1F	45J-008-1F	63	50	U	35	

SERAS XRF DAILY PRELIMINARY ANALYSIS REPORT
(PRELIMINARY SCREENING DATA, NO QA/QC)

Site: Iron King Mine Site
SERAS WA#: SER00146
XRF used: NITON XLt792YW
XRF S/N: 8262
Matrix type: Soil
XRF Operator: Jay Patel
Conc. Units: mg/Kg

Date Analyzed	SAMPLE ID	Location	Lead		Arsenic		
			Conc.	RL	Conc.	RL	
13-Aug-13	45J-009-1B	45J-009-1B	84	50	U	35	
13-Aug-13	45J-009-1F	45J-009-1F	83	50	U	35	
13-Aug-13	45J-010-1B	45J-010-1B	102	50	U	35	
13-Aug-13	45J-010-1F	45J-010-1F	85	50	U	35	
13-Aug-13	45J-011-1B	45J-011-1B	69	50	U	35	
13-Aug-13	45J-011-1F	45J-011-1F	60	50	U	35	
13-Aug-13	45J-012-1B	45J-012-1B	66	50	U	35	
13-Aug-13	45J-012-1F	45J-012-1F	70	50	U	35	
13-Aug-13	45J-013-1B	45J-013-1B	50	50	U	35	
13-Aug-13	45J-013-1F	45J-013-1F	73	50	U	35	
13-Aug-13	45J-014-1B	45J-014-1B	58	50	U	35	
13-Aug-13	45J-014-1F	45J-014-1F	67	50	U	35	
13-Aug-13	45J-015-1B	45J-015-1B	95	50	U	35	
13-Aug-13	45J-015-1F	45J-015-1F	92	50	U	35	
13-Aug-13	45J-016-1B	45J-016-1B	73	50	U	35	
13-Aug-13	45J-016-1F	45J-016-1F	67	50	U	35	
15-Aug-13	45J-017-1F	45J-017-1F	65	50	U	35	
13-Aug-13	45J-018-1B	45J-018-1B	103	50	U	35	
13-Aug-13	45J-018-1F	45J-018-1F	105	50	U	35	
13-Aug-13	45J-019-1B	45J-019-1B	119	50	U	35	
13-Aug-13	45J-019-1F	45J-019-1F	122	50	U	35	
13-Aug-13	45J-020-1B	45J-020-1B	120	50	U	35	
13-Aug-13	45J-020-1F	45J-020-1F	108	50	U	35	
13-Aug-13	45J-021-1B	45J-021-1B	104	50	U	35	
13-Aug-13	45J-021-1F	45J-021-1F	91	50	U	35	
13-Aug-13	55J-001-1B	55J-001-1B	78	50	U	35	
13-Aug-13	55J-001-1F	55J-001-1F	111	50	U	35	
19-Aug-13	55J-002-1F	55J-002-1F	91	50	U	35	
19-Aug-13	55J-003-1F	55J-003-1F	84	50	U	35	
19-Aug-13	55J-004-1F	55J-004-1F	101	50	U	35	
19-Aug-13	55J-005-1F	55J-005-1F	124	50	U	35	
19-Aug-13	55J-006-1F	55J-006-1F	97	50	U	35	
13-Aug-13	55J-007-1B	55J-007-1B	89	50	U	35	
13-Aug-13	55J-007-1F	55J-007-1F	101	50	U	35	
19-Aug-13	55J-008-1F	55J-008-1F	U	50	U	35	
19-Aug-13	55J-009-1F	55J-009-1F	156	50	U	35	
13-Aug-13	55J-010-1B	55J-010-1B	68	50	U	35	

SERAS XRF DAILY PRELIMINARY ANALYSIS REPORT
(PRELIMINARY SCREENING DATA, NO QA/QC)

Site: Iron King Mine Site
SERAS WA#: SER00146
XRF used: NITON XLt792YW
XRF S/N: 8262
Matrix type: Soil
XRF Operator: Jay Patel
Conc. Units: mg/Kg

Date Analyzed	SAMPLE ID	Location	Lead		Arsenic		
			Conc.	RL	Conc.	RL	
13-Aug-13	55J-010-1F	55J-010-1F	68	50	U	35	
19-Aug-13	55J-011-1F	55J-011-1F	57	50	U	35	
13-Aug-13	55J-012-1B	55J-012-1B	156	50	51	35	
13-Aug-13	55J-012-1F	55J-012-1F	113	50	U	35	
13-Aug-13	55J-013-1B	55J-013-1B	71	50	U	35	
13-Aug-13	55J-013-1F	55J-013-1F	83	50	U	35	
13-Aug-13	55J-014-1B	55J-014-1B	117	50	U	35	
13-Aug-13	55J-014-1F	55J-014-1F	114	50	U	35	
19-Aug-13	55J-015-1F	55J-015-1F	91	50	U	35	
13-Aug-13	55J-016-1B	55J-016-1B	U	50	U	35	
13-Aug-13	55J-016-1F	55J-016-1F	U	50	U	35	
19-Aug-13	55J-017-1B	55J-017-1B	404	50	97	40.4	
19-Aug-13	55J-017-1F	55J-017-1F	415	50	120	41.5	
13-Aug-13	55J-018-1B	55J-018-1B	89	50	U	35	
13-Aug-13	55J-018-1F	55J-018-1F	80	50	U	35	
19-Aug-13	60J-001-1F	60J-001-1F	98	50	U	35	
19-Aug-13	60J-002-1F	60J-002-1F	74	50	U	35	
19-Aug-13	60J-003-1F	60J-003-1F	71	50	U	35	
19-Aug-13	60J-004-1F	60J-004-1F	56	50	U	35	
19-Aug-13	60J-005-1F	60J-005-1F	100	50	U	35	
19-Aug-13	60J-006-1F	60J-006-1F	108	50	U	35	
19-Aug-13	60J-007-1F	60J-007-1F	99	50	U	35	
19-Aug-13	60J-008-1F	60J-008-1F	U	50	U	35	
19-Aug-13	60J-009-1F	60J-009-1F	62	50	U	35	
19-Aug-13	60J-010-1F	60J-010-1F	92	50	U	35	
15-Aug-13	60J-011-1F	60J-011-1F	189	50	41	35	
15-Aug-13	60J-012-1F	60J-012-1F	139	50	U	35	
19-Aug-13	60J-013-1F	60J-013-1F	93	50	U	35	
15-Aug-13	60J-014-1F	60J-014-1F	164	50	50	35	
14-Aug-13	60J-015-1F	60J-015-1F	125	50	U	35	
14-Aug-13	60J-016-1F	60J-016-1F	112	50	U	35	
14-Aug-13	60J-017-1F	60J-017-1F	78	50	U	35	
14-Aug-13	60J-018-1F	60J-018-1F	165	50	67	35	
19-Aug-13	60J-019-1F	60J-019-1F	134	50	U	35	
19-Aug-13	60J-020-1F	60J-020-1F	96	50	U	35	
19-Aug-13	70J-001-1F	70J-001-1F	149	50	38	35	
19-Aug-13	70J-002-1F	70J-002-1F	94	50	45	35	

SERAS XRF DAILY PRELIMINARY ANALYSIS REPORT
(PRELIMINARY SCREENING DATA, NO QA/QC)

Site: Iron King Mine Site
SERAS WA#: SER00146
XRF used: NITON XLt792YW
XRF S/N: 8262
Matrix type: Soil
XRF Operator: Jay Patel
Conc. Units: mg/Kg

Date Analyzed	SAMPLE ID	Location	Lead		Arsenic		
			Conc.	RL	Conc.	RL	
19-Aug-13	70J-003-1F	70J-003-1F	86	50	65	35	
19-Aug-13	70J-004-1F	70J-004-1F	126	50	82	35	
19-Aug-13	70J-005-1B	70J-005-1B	355	50	394	35.5	
19-Aug-13	70J-005-1F	70J-005-1F	383	50	485	38.3	
14-Aug-13	70J-006-1F	70J-006-1F	180	50	124	35	
14-Aug-13	70J-007-1F	70J-007-1F	126	50	74	35	
19-Aug-13	70J-008-1F	70J-008-1F	58	50	U	35	
13-Aug-13	70J-009-1B	70J-009-1B	64	50	43	35	
13-Aug-13	70J-009-1F	70J-009-1F	70	50	U	35	
13-Aug-13	70J-010-1B	70J-010-1B	118	50	49	35	
13-Aug-13	70J-010-1F	70J-010-1F	109	50	51	35	
13-Aug-13	70J-011-1B	70J-011-1B	87	50	U	35	
13-Aug-13	70J-011-1F	70J-011-1F	68	50	U	35	
19-Aug-13	70J-012-1F	70J-012-1F	73	50	41	35	
15-Aug-13	70J-013-1F	70J-013-1F	111	50	U	35	
15-Aug-13	70J-014-1F	70J-014-1F	89	50	U	35	
19-Aug-13	70J-015-1B	70J-015-1B	414	50	400	41.4	
19-Aug-13	70J-015-1F	70J-015-1F	383	50	384	38.3	
19-Aug-13	70J-016-1F	70J-016-1F	67	50	49	35	
19-Aug-13	70J-017-1F	70J-017-1F	92	50	U	35	
15-Aug-13	70J-018-1F	70J-018-1F	161	50	45	35	
14-Aug-13	70J-019-1F	70J-019-1F	U	50	U	35	
19-Aug-13	70J-020-1B	70J-020-1B	489	50	454	48.9	
19-Aug-13	70J-020-1F	70J-020-1F	479	50	430	47.9	
19-Aug-13	70J-021-1F	70J-021-1F	78	50	48	35	
15-Aug-13	70J-022-1F	70J-022-1F	51	50	U	35	
14-Aug-13	70J-023-1F	70J-023-1F	U	50	U	35	
19-Aug-13	70J-024-1F	70J-024-1F	118	50	52	35	
20-Aug-13	70J-025-1F	70J-025-1F	170	50	96	35	
20-Aug-13	70J-026-1F	70J-026-1F	70	50	U	35	
20-Aug-13	70J-027-1F	70J-027-1F	72	50	U	35	
20-Aug-13	70J-028-1F	70J-028-1F	69	50	U	35	
15-Aug-13	70J-029-1B	70J-029-1B	334	50	U	35	
15-Aug-13	70J-029-1F	70J-029-1F	287	50	47	35	
20-Aug-13	70J-030-1F	70J-030-1F	99	50	U	35	
15-Aug-13	70J-031-1F	70J-031-1F	142	50	36	35	
15-Aug-13	80J-001-1F	80J-001-1F	U	50	U	35	

SERAS XRF DAILY PRELIMINARY ANALYSIS REPORT
(PRELIMINARY SCREENING DATA, NO QA/QC)

Site: Iron King Mine Site
SERAS WA#: SER00146
XRF used: NITON XLt792YW
XRF S/N: 8262
Matrix type: Soil
XRF Operator: Jay Patel
Conc. Units: mg/Kg

Date Analyzed	SAMPLE ID	Location	Lead		Arsenic		
			Conc.	RL	Conc.	RL	
20-Aug-13	80J-002-1F	80J-002-1F	101	50	U	35	
20-Aug-13	80J-003-1F	80J-003-1F	109	50	U	35	
20-Aug-13	80J-004-1F	80J-004-1F	93	50	U	35	
14-Aug-13	80J-005-1F	80J-005-1F	78	50	U	35	
20-Aug-13	80J-006-1F	80J-006-1F	75	50	U	35	
15-Aug-13	80J-007-1F	80J-007-1F	83	50	U	35	
15-Aug-13	80J-008-1F	80J-008-1F	110	50	U	35	
15-Aug-13	80J-009-1F	80J-009-1F	86	50	U	35	
15-Aug-13	80J-010-1F	80J-010-1F	58	50	U	35	
15-Aug-13	80J-011-1F	80J-011-1F	65	50	U	35	
15-Aug-13	80J-012-1F	80J-012-1F	U	50	U	35	
14-Aug-13	80J-013-1F	80J-013-1F	129	50	42	35	
15-Aug-13	80J-014-1F	80J-014-1F	65	50	U	35	
14-Aug-13	80J-015-1F	80J-015-1F	U	50	U	35	
20-Aug-13	80J-016-1F	80J-016-1F	115	50	U	35	
15-Aug-13	80J-017-1F	80J-017-1F	52	50	U	35	
14-Aug-13	80J-018-1F	80J-018-1F	53	50	U	35	
15-Aug-13	80J-019-1F	80J-019-1F	127	50	36	35	
15-Aug-13	80J-020-1F	80J-020-1F	144	50	45	35	
15-Aug-13	80J-021-1F	80J-021-1F	92	50	40	35	
15-Aug-13	80J-022-1F	80J-022-1F	U	50	U	35	
20-Aug-13	80J-023-1F	80J-023-1F	146	50	46	35	
14-Aug-13	80J-024-1F	80J-024-1F	U	50	U	35	
14-Aug-13	80J-025-1F	80J-025-1F	84	50	U	35	
20-Aug-13	80J-026-1F	80J-026-1F	62	50	U	35	
15-Aug-13	80J-027-1F	80J-027-1F	62	50	U	35	
15-Aug-13	80J-028-1F	80J-028-1F	50	50	U	35	
15-Aug-13	80J-029-1F	80J-029-1F	104	50	U	35	
14-Aug-13	80J-030-1F	80J-030-1F	66	50	U	35	
15-Aug-13	80J-031-1F	80J-031-1F	56	50	U	35	
14-Aug-13	80J-032-1F	80J-032-1F	75	50	U	35	
20-Aug-13	80J-033-1F	80J-033-1F	74	50	U	35	
20-Aug-13	85J-001-1F	85J-001-1F	U	50	U	35	
20-Aug-13	85J-002-1F	85J-002-1F	87	50	U	35	
20-Aug-13	85J-003-1F	85J-003-1F	90	50	U	35	
20-Aug-13	85J-004-1F	85J-004-1F	114	50	U	35	
20-Aug-13	85J-005-1F	85J-005-1F	114	50	U	35	

SERAS XRF DAILY PRELIMINARY ANALYSIS REPORT
(PRELIMINARY SCREENING DATA, NO QA/QC)

Site: Iron King Mine Site
SERAS WA#: SER00146
XRF used: NITON XLt792YW
XRF S/N: 8262
Matrix type: Soil
XRF Operator: Jay Patel
Conc. Units: mg/Kg

Date Analyzed	SAMPLE ID	Location	Lead		Arsenic		
			Conc.	RL	Conc.	RL	
20-Aug-13	85J-006-1F	85J-006-1F	103	50	37	35	
20-Aug-13	85J-007-1F	85J-007-1F	94	50	U	35	
20-Aug-13	85J-008-1F	85J-008-1F	80	50	U	35	
15-Aug-13	85J-009-1F	85J-009-1F	101	50	U	35	
20-Aug-13	85J-010-1F	85J-010-1F	92	50	U	35	
20-Aug-13	85J-011-1F	85J-011-1F	97	50	U	35	
20-Aug-13	85J-012-1F	85J-012-1F	108	50	U	35	
15-Aug-13	85J-013-1F	85J-013-1F	97	50	U	35	
20-Aug-13	85J-014-1F	85J-014-1F	115	50	U	35	
20-Aug-13	85J-015-1F	85J-015-1F	53	50	U	35	
14-Aug-13	85J-016-1F	85J-016-1F	55	50	U	35	
20-Aug-13	85J-017-1F	85J-017-1F	74	50	U	35	
20-Aug-13	85J-018-1F	85J-018-1F	117	50	U	35	
20-Aug-13	85J-019-1F	85J-019-1F	108	50	40	35	
15-Aug-13	85J-020-1F	85J-020-1F	93	50	U	35	
20-Aug-13	85J-021-1F	85J-021-1F	117	50	U	35	
20-Aug-13	85J-022-1F	85J-022-1F	114	50	U	35	
14-Aug-13	85J-023-1F	85J-023-1F	118	50	U	35	
20-Aug-13	85J-024-1F	85J-024-1F	97	50	U	35	
20-Aug-13	85J-025-1F	85J-025-1F	86	50	U	35	
20-Aug-13	85J-026-1F	85J-026-1F	115	50	U	35	
20-Aug-13	85J-027-1F	85J-027-1F	125	50	U	35	
20-Aug-13	85J-028-1F	85J-028-1F	94	50	U	35	
20-Aug-13	85J-029-1F	85J-029-1F	112	50	U	35	
20-Aug-13	85J-030-1F	85J-030-1F	92	50	U	35	
20-Aug-13	85J-031-1F	85J-031-1F	106	50	U	35	
20-Aug-13	85J-032-1F	85J-032-1F	112	50	U	35	
15-Aug-13	85J-033-1F	85J-033-1F	118	50	U	35	
14-Aug-13	85J-034-1F	85J-034-1F	154	50	42	35	
15-Aug-13	85J-035-1F	85J-035-1F	104	50	37	35	
14-Aug-13	85J-036-1F	85J-036-1F	78	50	U	35	
20-Aug-13	85J-037-1F	85J-037-1F	115	50	U	35	

RL - Reporting Level
U - Not Detected (less than the RL)
Note: Letter "F" & "B" at the end of location or sample number indicates front and back measurement of sample bag.

REAC, Edison, NJ
(732) 321-4200
EPA Contract 68-C99-223

CHAIN OF CUSTODY RECORD

Project Name: Iron King Mine Site
Project Number: 0-146
LM Contact: S. Grossman Phone: 732-321-4200

No: 06617
Sheet 01 of 01 (Do not copy)
(for addnl. samples use new form)

WO# R308007

Sample Identification

Analyses Requested

REAC#	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Pb, As *
01	55J-002-1	N/A	Soil	08/14/13	1	Poly Baggies	
02	-003-1						
03	-004-1						
04	-005-1						
05	-006-1						
06	-008-1						
07	-009-1						
08	-011-1						
09	-015-1						
10	-017-1						
11	60J-001-1						
12	-002-1						
13	-003-1						
14	-004-1						
15	-005-1						
16	-006-1						
17	-007-1						
18	-008-1						
19	-009-1						

8/19/13

Matrix:

A- Air	PW- Potable Water
AT-Animal Tissue	S- Soil
DL- Drum Liquids	SD- Sediment
DS- Drum Solids	SL- Sludge
GW- Groundwater	SW- Surface Water
O- Oil	TX-TCLP Extract
PR-Product	W- Water
PT-Plant Tissue	X- Other

Special Instructions:

* Analysis by XRF.

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #:

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
				8/19/13	11:00	All Analysis		8/19/13		8/19/13	11:30
Ship/Storage		8/20/13		8/20/13	15:00						

☆ U.S. GPO: 2000-621-161

REAC, Edison, NJ
(732) 321-4200
EPA Contract 68-C99-223

CHAIN OF CUSTODY RECORD

Project Name: Iron King Mine Site
Project Number: 0-146
LM Contact: S. Goodman Phone: 732-321-4200

No: 06618
Sheet 01 of 01 (Do not copy)
(for addnl. samples use new form)

WO# R308007 **Sample Identification**

REAC#	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	Analyses Requested *
20	80J-010-1	N/A	S	08/14/13	1	Plastic Bags	Pb, As
21	-013-1				1		
22	-019-1				1		
23	-020-1				1		
24	70J-001-1				1		
25	-002-1				1		
26	-003-1				1		
27	-004-1				1		
28	-005-1				1		
29	-008-1				1		
30	-012-1				1		
31	-015-1				1		
32	-016-1				1		
33	-017-1				1		
34	-020-1				1		
35	-021-1				1		
36	-024-1				1		
37	-025-1				1		
38	-026-1				1		

8/19/13

Matrix:

A- Air
AT-Animal Tissue
DL- Drum Liquids
DS- Drum Solids
GW- Groundwater
O- Oil
PR-Product
PT-Plant Tissue
PW- Potable Water
S- Soil
SD- Sediment
SL- Sludge
SW- Surface Water
TX-TCLP Extract
W- Water
X- Other

Special Instructions:

* Analysis by XRF.

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #:

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
All/Analysis		8/20/13		8/20/13	15:00	All/Analysis		8/19/13		8/19/13	11:30

☆ U.S. GPO: 2000-681-181

REAC, Edison, NJ
(732) 321-4200
EPA Contract 68-C99-223

CHAIN OF CUSTODY RECORD

Project Name: Iron King Mine Site
Project Number: C-46
LM Contact: S. Goodman Phone: 732-321-4200

No: 06619
Sheet 01 of 01 (Do not copy)
(for addnl. samples use new form)

WO# R308007

Sample Identification

Analyses Requested

REAC#	70J Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	★
39	SJ70-027 -1	A/A	S	8/14/13	1	Plastic Bags	Pb, As
40	-028 -1						
41	-030 -1						
42	80J-002 -1						
43	-003 -1						
44	-004 -1						
45	-006 -1						
46	-016 -1						
47	-023 -1						
48	-026 -1						
49	-033 -1						
50	85J-001 -1						
51	-002 -1						
52	-003 -1						
53	-004 -1						
54	-005 -1						
55	-006 -1						
56	-007 -1						
57	-008 -1						

8/19/13

Matrix:

A- Air
AT-Animal Tissue
DL- Drum Liquids
DS- Drum Solids
GW- Groundwater
O- Oil
PR-Product
PT-Plant Tissue
PW- Potable Water
S- Soil
SD- Sediment
SL- Sludge
SW- Surface Water
TX-TCLP Extract
W- Water
X- Other

Special Instructions:

★ Analysis by XRF.

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #:

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
				8/19/13	11:00	All Analysis		8/19/13		8/19/13	11:30
All/Shuttle		8/20/13		8/20/13	15:00						

☆ U.S. GPO: 2000-621-151

REAC, Edison, NJ
(732) 321-4200
EPA Contract 68-C99-223

CHAIN OF CUSTODY RECORD

Project Name: Iron King Mine Site
Project Number: C-146
LM Contact: S. Goetman Phone: 732-321-4200

No: 06620
Sheet 01 of 01 (Do not copy)
(for addnl. samples use new form)

WO# R308007

Sample Identification

Analyses Requested

REAC#	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	*
58	85J-010-1	N/A	S	08/14/13	1	Plastic Bags.	Pb, As
59	-011-1				1		
60	-012-1				1		
61	-014-1				1		
62	-015-1				1		
63	-017-1				1		
64	-018-1				1		
65	-019-1				1		
66	-021-1				1		
67	-022-1				1		
68	-024-1				1		
69	-025-1				1		
70	-026-1				1		
71	-027-1				1		
72	-028-1				1		
73	-029-1				1		
74	-030-1				1		
75	-031-1				1		
76	-032-1				1		

8/19/13

Matrix:

A- Air
AT-Animal Tissue
DL- Drum Liquids
DS- Drum Solids
GW- Groundwater
O- Oil
PR-Product
PT-Plant Tissue
PW- Potable Water
S- Soil
SD- Sediment
SL- Sludge
SW- Surface Water
TX-TCLP Extract
W- Water
X- Other

Special Instructions:

* Analysis by XRF

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #:

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
				8/19/13	11:00	All Analysis		8/19/13		8/19/13	11:30
All/Storage		8/20/13		8/20/13	15:00						

☆ U.S. GPO: 2000-421-151

REAC, Edison, NJ
(732) 321-4200
EPA Contract 68-C99-223

CHAIN OF CUSTODY RECORD

Project Name: Iron King Mine Site
Project Number: 0-146
LM Contact: S. Grossman Phone: 732-321-4200

No: 06621
Sheet 01 of 01 (Do not copy)
(for addnl. samples use new form)

WO# R308007 **Sample Identification**

Analyses Requested

REAC#	Sample No	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	*
77	85J-037-1	N/A	S	8/14/13	1	Plastic Bags	Pb, As

Matrix:

A- Air	PW- Potable Water
AT-Animal Tissue	S- Soil
DL- Drum Liquids	SD- Sediment
DS- Drum Solids	SL- Sludge
GW- Groundwater	SW- Surface Water
O- Oil	TX-TCLP Extract
PR-Product	W- Water
PT-Plant Tissue	X- Other

Special Instructions:

* Analysis by XRF.

SAMPLES TRANSFERRED FROM CHAIN OF CUSTODY #:

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished by	Date	Received by	Date	Time
				8/19/13	11:00	All/Analysis		8/19/13		8/19/13	11:30
All/Storage		8/20/13		8/20/13	15:00						

☆ U.S. GPO: 2000-821-151

APPENDIX C
TAL Metals Confirmation Analytical Report
Iron King Mine Site
Technical Memorandum
October 2013

Sample Summary Report

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	LCS	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:		pH:		Sample Date:		Sample Time:	
% Moisture :				% Solids :	100		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	38.9	mg/kg	1			Yes	
Antimony	11.3	mg/kg	1			Yes	
Arsenic	2.0	mg/kg	1			Yes	
Barium	40.3	mg/kg	1			Yes	
Beryllium	1.0	mg/kg	1			Yes	
Cadmium	0.96	mg/kg	1			Yes	
Chromium	2.0	mg/kg	1			Yes	
Cobalt	9.6	mg/kg	1			Yes	
Copper	5.2	mg/kg	1			Yes	
Iron	19.3	mg/kg	1			Yes	
Lead	2.1	mg/kg	1			Yes	
Manganese	2.9	mg/kg	1			Yes	
Nickel	7.8	mg/kg	1			Yes	
Selenium	6.5	mg/kg	1			Yes	
Silver	1.8	mg/kg	1			Yes	
Thallium	4.7	mg/kg	1			Yes	
Vanadium	10.2	mg/kg	1			Yes	
Zinc	10.8	mg/kg	1			Yes	
Calcium	1030	mg/kg	1			Yes	
Magnesium	965	mg/kg	1			Yes	
Sodium	1000	mg/kg	1			Yes	
Potassium	967	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9180	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0001	pH:	2	Sample Date:	08/13/2013	Sample Time:	11:32:00
% Moisture :				% Solids :	97		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	17600	mg/kg	1			Yes	
Antimony	16.0	mg/kg	1	N	J-	Yes	
Arsenic	174	mg/kg	1			Yes	
Barium	237	mg/kg	1			Yes	
Beryllium	1.0	mg/kg	1			Yes	
Cadmium	3.9	mg/kg	1			Yes	
Calcium	12500	mg/kg	1			Yes	
Chromium	28.9	mg/kg	1			Yes	
Cobalt	16.3	mg/kg	1			Yes	
Copper	116	mg/kg	1			Yes	
Iron	42900	mg/kg	1	E	J	Yes	
Lead	955	mg/kg	1			Yes	
Magnesium	7660	mg/kg	1			Yes	
Manganese	1120	mg/kg	1			Yes	
Nickel	30.0	mg/kg	1			Yes	
Potassium	3430	mg/kg	1			Yes	
Selenium	0.77	mg/kg	1	J	J	Yes	
Silver	9.7	mg/kg	1			Yes	
Sodium	441	mg/kg	1			Yes	
Thallium	2.0	mg/kg	1	J	U	Yes	
Vanadium	67.1	mg/kg	1	E	J	Yes	
Zinc	778	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9180	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0001	pH:	2	Sample Date:	08/13/2013	Sample Time:	11:32:00
% Moisture :				% Solids :	97		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	1.9	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9181	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0002	pH:	2	Sample Date:	08/13/2013	Sample Time:	11:38:00
% Moisture :				% Solids :	98.7		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	1.8	mg/kg	2	D		Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9181	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0002	pH:	2	Sample Date:	08/13/2013	Sample Time:	11:38:00
% Moisture :				% Solids :	98.7		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	11200	mg/kg	1			Yes	
Antimony	11.3	mg/kg	1	N	J-	Yes	
Arsenic	252	mg/kg	1			Yes	
Barium	160	mg/kg	1			Yes	
Beryllium	0.75	mg/kg	1			Yes	
Cadmium	5.0	mg/kg	1			Yes	
Calcium	8650	mg/kg	1			Yes	
Chromium	21.7	mg/kg	1			Yes	
Cobalt	10.1	mg/kg	1			Yes	
Copper	191	mg/kg	1			Yes	
Iron	33200	mg/kg	1	E	J	Yes	
Lead	761	mg/kg	1			Yes	
Magnesium	4460	mg/kg	1			Yes	
Manganese	501	mg/kg	1			Yes	
Nickel	19.8	mg/kg	1			Yes	
Potassium	3650	mg/kg	1			Yes	
Selenium	0.90	mg/kg	1	J	J	Yes	
Silver	7.9	mg/kg	1			Yes	
Sodium	387	mg/kg	1	J	U	Yes	
Thallium	1.9	mg/kg	1	J	U	Yes	
Vanadium	41.2	mg/kg	1	E	J	Yes	
Zinc	937	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9182	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0003	pH:	2	Sample Date:	08/13/2013	Sample Time:	13:35:00
% Moisture :				% Solids :	98.8		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	12000	mg/kg	1			Yes	
Antimony	11.5	mg/kg	1	N	J-	Yes	
Arsenic	276	mg/kg	1			Yes	
Barium	166	mg/kg	1			Yes	
Beryllium	0.82	mg/kg	1			Yes	
Cadmium	4.4	mg/kg	1			Yes	
Calcium	9020	mg/kg	1			Yes	
Chromium	25.0	mg/kg	1			Yes	
Cobalt	11.8	mg/kg	1			Yes	
Copper	185	mg/kg	1			Yes	
Iron	37200	mg/kg	1	E	J	Yes	
Lead	737	mg/kg	1			Yes	
Magnesium	4880	mg/kg	1			Yes	
Manganese	511	mg/kg	1			Yes	
Nickel	22.3	mg/kg	1			Yes	
Potassium	3490	mg/kg	1			Yes	
Selenium	0.39	mg/kg	1	J	J	Yes	
Silver	8.0	mg/kg	1			Yes	
Sodium	471	mg/kg	1			Yes	
Thallium	1.9	mg/kg	1	J	U	Yes	
Vanadium	47.1	mg/kg	1	E	J	Yes	
Zinc	791	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9182	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0003	pH:	2	Sample Date:	08/13/2013	Sample Time:	13:35:00
% Moisture :				% Solids :	98.8		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	1.9	mg/kg	2	D		Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9183	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0004	pH:	2	Sample Date:	08/13/2013	Sample Time:	13:51:00
% Moisture :				% Solids :	97.9		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.78	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9183	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0004	pH:	2	Sample Date:	08/13/2013	Sample Time:	13:51:00
% Moisture :				% Solids :	97.9		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	15700	mg/kg	1			Yes	
Antimony	2.1	mg/kg	1	JN	J-	Yes	
Arsenic	24.6	mg/kg	1			Yes	
Barium	183	mg/kg	1			Yes	
Beryllium	0.87	mg/kg	1			Yes	
Cadmium	2.6	mg/kg	1			Yes	
Calcium	8390	mg/kg	1			Yes	
Chromium	26.1	mg/kg	1			Yes	
Cobalt	14.8	mg/kg	1			Yes	
Copper	183	mg/kg	1			Yes	
Iron	29100	mg/kg	1	E	J	Yes	
Lead	139	mg/kg	1			Yes	
Magnesium	5920	mg/kg	1			Yes	
Manganese	872	mg/kg	1			Yes	
Nickel	24.0	mg/kg	1			Yes	
Potassium	5380	mg/kg	1			Yes	
Selenium	2.7	mg/kg	1	U	U	Yes	
Silver	3.4	mg/kg	1			Yes	
Sodium	393	mg/kg	1			Yes	
Thallium	1.9	mg/kg	1	J	U	Yes	
Vanadium	46.0	mg/kg	1	E	J	Yes	
Zinc	396	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9184	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0005	pH:	2	Sample Date:	08/13/2013	Sample Time:	10:33:00
% Moisture :				% Solids :	99.1		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.058	mg/kg	1	J	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9184	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0005	pH:	2	Sample Date:	08/13/2013	Sample Time:	10:33:00
% Moisture :				% Solids :	99.1		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	10200	mg/kg	1			Yes	
Antimony	2.2	mg/kg	1	JN	J-	Yes	
Arsenic	23.5	mg/kg	1			Yes	
Barium	109	mg/kg	1			Yes	
Beryllium	0.65	mg/kg	1			Yes	
Cadmium	1.0	mg/kg	1			Yes	
Calcium	11400	mg/kg	1			Yes	
Chromium	24.0	mg/kg	1			Yes	
Cobalt	16.3	mg/kg	1			Yes	
Copper	93.0	mg/kg	1			Yes	
Iron	30200	mg/kg	1	E	J	Yes	
Lead	73.2	mg/kg	1			Yes	
Magnesium	5110	mg/kg	1			Yes	
Manganese	607	mg/kg	1			Yes	
Nickel	22.2	mg/kg	1			Yes	
Potassium	2530	mg/kg	1			Yes	
Selenium	2.6	mg/kg	1	U	U	Yes	
Silver	3.1	mg/kg	1			Yes	
Sodium	383	mg/kg	1			Yes	
Thallium	1.9	mg/kg	1	U	U	Yes	
Vanadium	60.2	mg/kg	1	E	J	Yes	
Zinc	178	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9185	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0006	pH:	2	Sample Date:	08/13/2013	Sample Time:	11:15:00
% Moisture :				% Solids :	98		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	13200	mg/kg	1			Yes	
Antimony	2.1	mg/kg	1	JN	J-	Yes	
Arsenic	25.4	mg/kg	1			Yes	
Barium	158	mg/kg	1			Yes	
Beryllium	0.83	mg/kg	1			Yes	
Cadmium	1.2	mg/kg	1			Yes	
Calcium	6110	mg/kg	1			Yes	
Chromium	25.6	mg/kg	1			Yes	
Cobalt	12.8	mg/kg	1			Yes	
Copper	148	mg/kg	1			Yes	
Iron	28300	mg/kg	1	E	J	Yes	
Lead	122	mg/kg	1			Yes	
Magnesium	5490	mg/kg	1			Yes	
Manganese	669	mg/kg	1			Yes	
Nickel	28.7	mg/kg	1			Yes	
Potassium	4030	mg/kg	1			Yes	
Selenium	2.5	mg/kg	1	U	U	Yes	
Silver	3.2	mg/kg	1			Yes	
Sodium	411	mg/kg	1			Yes	
Thallium	1.8	mg/kg	1	U	U	Yes	
Vanadium	46.1	mg/kg	1	E	J	Yes	
Zinc	252	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9185	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0006	pH:	2	Sample Date:	08/13/2013	Sample Time:	11:15:00
% Moisture :				% Solids :	98		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.19	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9186	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0007	pH:	2	Sample Date:	08/13/2013	Sample Time:	09:50:00
% Moisture :				% Solids :	98.8		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	13200	mg/kg	1			Yes	
Antimony	1.7	mg/kg	1	JN	J-	Yes	
Arsenic	23.1	mg/kg	1			Yes	
Barium	186	mg/kg	1			Yes	
Beryllium	0.96	mg/kg	1			Yes	
Cadmium	1.4	mg/kg	1			Yes	
Calcium	7870	mg/kg	1			Yes	
Chromium	24.4	mg/kg	1			Yes	
Cobalt	15.0	mg/kg	1			Yes	
Copper	126	mg/kg	1			Yes	
Iron	30900	mg/kg	1	E	J	Yes	
Lead	59.5	mg/kg	1			Yes	
Magnesium	5380	mg/kg	1			Yes	
Manganese	837	mg/kg	1			Yes	
Nickel	26.6	mg/kg	1			Yes	
Potassium	3780	mg/kg	1			Yes	
Selenium	2.7	mg/kg	1	U	U	Yes	
Silver	3.3	mg/kg	1			Yes	
Sodium	451	mg/kg	1			Yes	
Thallium	1.9	mg/kg	1	J	U	Yes	
Vanadium	53.7	mg/kg	1	E	J	Yes	
Zinc	157	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9186	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0007	pH:	2	Sample Date:	08/13/2013	Sample Time:	09:50:00
% Moisture :				% Solids :	98.8		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.084	mg/kg	1	J	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9187	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0008	pH:	2	Sample Date:	08/14/2013	Sample Time:	11:42:00
% Moisture :				% Solids :	92		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	1.1	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9187	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0008	pH:	2	Sample Date:	08/14/2013	Sample Time:	11:42:00
% Moisture :				% Solids :	92		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	14900	mg/kg	1			Yes	
Antimony	7.7	mg/kg	1	N	J-	Yes	
Arsenic	204	mg/kg	1			Yes	
Barium	172	mg/kg	1			Yes	
Beryllium	0.97	mg/kg	1			Yes	
Cadmium	4.2	mg/kg	1			Yes	
Calcium	10900	mg/kg	1			Yes	
Chromium	21.2	mg/kg	1			Yes	
Cobalt	12.8	mg/kg	1			Yes	
Copper	174	mg/kg	1			Yes	
Iron	36700	mg/kg	1	E	J	Yes	
Lead	599	mg/kg	1			Yes	
Magnesium	4980	mg/kg	1			Yes	
Manganese	597	mg/kg	1			Yes	
Nickel	17.7	mg/kg	1			Yes	
Potassium	4150	mg/kg	1			Yes	
Selenium	2.9	mg/kg	1	U	U	Yes	
Silver	6.5	mg/kg	1			Yes	
Sodium	599	mg/kg	1			Yes	
Thallium	2.1	mg/kg	1	J	U	Yes	
Vanadium	45.3	mg/kg	1	E	J	Yes	
Zinc	745	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9187D	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:		pH:	2	Sample Date:	08/14/2013	Sample Time:	11:42:00
% Moisture :				% Solids :	92		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	1.1	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9187D	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:		pH:	2	Sample Date:	08/14/2013	Sample Time:	11:42:00
% Moisture :				% Solids :	92		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	14700	mg/kg	1			Yes	
Antimony	7.7	mg/kg	1			Yes	
Arsenic	200	mg/kg	1			Yes	
Barium	168	mg/kg	1			Yes	
Beryllium	0.93	mg/kg	1			Yes	
Cadmium	4.2	mg/kg	1			Yes	
Calcium	10800	mg/kg	1			Yes	
Chromium	20.9	mg/kg	1			Yes	
Cobalt	12.6	mg/kg	1			Yes	
Copper	172	mg/kg	1			Yes	
Iron	36200	mg/kg	1			Yes	
Lead	592	mg/kg	1			Yes	
Magnesium	4920	mg/kg	1			Yes	
Manganese	587	mg/kg	1			Yes	
Nickel	17.4	mg/kg	1			Yes	
Potassium	4110	mg/kg	1			Yes	
Selenium	0.40	mg/kg	1	J	J	Yes	
Silver	6.4	mg/kg	1			Yes	
Sodium	600	mg/kg	1			Yes	
Thallium	2.0	mg/kg	1	J	U	Yes	
Vanadium	44.5	mg/kg	1			Yes	
Zinc	798	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9187S	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:		pH:	2	Sample Date:	08/14/2013	Sample Time:	11:42:00
% Moisture :				% Solids :	92		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	18.3	mg/kg	1	N		Yes	
Arsenic	187	mg/kg	1			Yes	
Barium	623	mg/kg	1			Yes	
Beryllium	10.9	mg/kg	1			Yes	
Cadmium	14.6	mg/kg	1			Yes	
Chromium	61.0	mg/kg	1			Yes	
Cobalt	125	mg/kg	1			Yes	
Copper	232	mg/kg	1			Yes	
Lead	417	mg/kg	1			Yes	
Manganese	861	mg/kg	1			Yes	
Nickel	127	mg/kg	1			Yes	
Selenium	9.4	mg/kg	1			Yes	
Silver	15.9	mg/kg	1			Yes	
Thallium	10.6	mg/kg	1			Yes	
Vanadium	147	mg/kg	1			Yes	
Zinc	961	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9187S	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:		pH:	2	Sample Date:	08/14/2013	Sample Time:	11:42:00
% Moisture :				% Solids :	92		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	1.7	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9188	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0009	pH:	2	Sample Date:	08/14/2013	Sample Time:	11:52:00
% Moisture :				% Solids :	91.6		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	10100	mg/kg	1			Yes	
Antimony	46.3	mg/kg	1	N	J-	Yes	
Arsenic	1630	mg/kg	10	D		Yes	
Barium	180	mg/kg	1			Yes	
Beryllium	0.85	mg/kg	1			Yes	
Cadmium	3.5	mg/kg	1			Yes	
Calcium	4610	mg/kg	1			Yes	
Chromium	16.8	mg/kg	1			Yes	
Cobalt	7.2	mg/kg	1			Yes	
Copper	167	mg/kg	1			Yes	
Iron	51600	mg/kg	1	E	J	Yes	
Lead	1470	mg/kg	1			Yes	
Magnesium	3640	mg/kg	1			Yes	
Manganese	314	mg/kg	1			Yes	
Nickel	11.7	mg/kg	1			Yes	
Potassium	3420	mg/kg	1			Yes	
Selenium	6.5	mg/kg	1			Yes	
Silver	15.9	mg/kg	1			Yes	
Sodium	602	mg/kg	1			Yes	
Thallium	2.1	mg/kg	1	J	U	Yes	
Vanadium	47.3	mg/kg	1	E	J	Yes	
Zinc	735	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9188	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0009	pH:	2	Sample Date:	08/14/2013	Sample Time:	11:52:00
% Moisture :				% Solids :	91.6		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	3.2	mg/kg	2	D		Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9189	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0010	pH:	2	Sample Date:	08/13/2013	Sample Time:	11:39:00
% Moisture :				% Solids :	98.5		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	11200	mg/kg	1			Yes	
Antimony	15.8	mg/kg	1	N	J-	Yes	
Arsenic	283	mg/kg	1			Yes	
Barium	167	mg/kg	1			Yes	
Beryllium	0.87	mg/kg	1			Yes	
Cadmium	5.0	mg/kg	1			Yes	
Calcium	9140	mg/kg	1			Yes	
Chromium	21.4	mg/kg	1			Yes	
Cobalt	10.7	mg/kg	1			Yes	
Copper	177	mg/kg	1			Yes	
Iron	34100	mg/kg	1	E	J	Yes	
Lead	1080	mg/kg	1			Yes	
Magnesium	4300	mg/kg	1			Yes	
Manganese	534	mg/kg	1			Yes	
Nickel	20.3	mg/kg	1			Yes	
Potassium	3340	mg/kg	1			Yes	
Selenium	1.1	mg/kg	1	J	J	Yes	
Silver	10.2	mg/kg	1			Yes	
Sodium	443	mg/kg	1			Yes	
Thallium	1.8	mg/kg	1	J	U	Yes	
Vanadium	42.3	mg/kg	1	E	J	Yes	
Zinc	957	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9189	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0010	pH:	2	Sample Date:	08/13/2013	Sample Time:	11:39:00
% Moisture :				% Solids :	98.5		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	3.1	mg/kg	2	D		Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9190	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0011	pH:	2	Sample Date:	08/14/2013	Sample Time:	11:46:00
% Moisture :				% Solids :	91.1		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	11800	mg/kg	1			Yes	
Antimony	4.6	mg/kg	1	JN	J-	Yes	
Arsenic	474	mg/kg	1			Yes	
Barium	168	mg/kg	1			Yes	
Beryllium	0.77	mg/kg	1			Yes	
Cadmium	2.8	mg/kg	1			Yes	
Calcium	4430	mg/kg	1			Yes	
Chromium	20.8	mg/kg	1			Yes	
Cobalt	9.2	mg/kg	1			Yes	
Copper	264	mg/kg	1			Yes	
Iron	36400	mg/kg	1	E	J	Yes	
Lead	152	mg/kg	1			Yes	
Magnesium	4260	mg/kg	1			Yes	
Manganese	329	mg/kg	1			Yes	
Nickel	16.0	mg/kg	1			Yes	
Potassium	3240	mg/kg	1			Yes	
Selenium	0.47	mg/kg	1	J	J	Yes	
Silver	5.1	mg/kg	1			Yes	
Sodium	439	mg/kg	1	J	U	Yes	
Thallium	2.2	mg/kg	1	J	U	Yes	
Vanadium	43.1	mg/kg	1	E	J	Yes	
Zinc	478	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9190	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0011	pH:	2	Sample Date:	08/14/2013	Sample Time:	11:46:00
% Moisture :				% Solids :	91.1		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.35	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9191	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0012	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:18:00
% Moisture :				% Solids :	97.5		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.49	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9191	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0012	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:18:00
% Moisture :				% Solids :	97.5		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	13000	mg/kg	1			Yes	
Antimony	3.7	mg/kg	1	JN	J-	Yes	
Arsenic	101	mg/kg	1			Yes	
Barium	243	mg/kg	1			Yes	
Beryllium	0.83	mg/kg	1			Yes	
Cadmium	3.9	mg/kg	1			Yes	
Calcium	9510	mg/kg	1			Yes	
Chromium	22.0	mg/kg	1			Yes	
Cobalt	11.8	mg/kg	1			Yes	
Copper	165	mg/kg	1			Yes	
Iron	28200	mg/kg	1	E	J	Yes	
Lead	434	mg/kg	1			Yes	
Magnesium	5140	mg/kg	1			Yes	
Manganese	673	mg/kg	1			Yes	
Nickel	20.8	mg/kg	1			Yes	
Potassium	4330	mg/kg	1			Yes	
Selenium	2.7	mg/kg	1	U	U	Yes	
Silver	5.1	mg/kg	1			Yes	
Sodium	391	mg/kg	1	J	U	Yes	
Thallium	2.0	mg/kg	1	U	U	Yes	
Vanadium	39.9	mg/kg	1	E	J	Yes	
Zinc	700	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9192	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0013	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:20:00
% Moisture :				% Solids :	98.6		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.29	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9192	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0013	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:20:00
% Moisture :				% Solids :	98.6		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	12000	mg/kg	1			Yes	
Antimony	2.1	mg/kg	1	JN	J-	Yes	
Arsenic	40.1	mg/kg	1			Yes	
Barium	149	mg/kg	1			Yes	
Beryllium	0.80	mg/kg	1			Yes	
Cadmium	2.0	mg/kg	1			Yes	
Calcium	9270	mg/kg	1			Yes	
Chromium	57.0	mg/kg	1			Yes	
Cobalt	12.5	mg/kg	1			Yes	
Copper	118	mg/kg	1			Yes	
Iron	25900	mg/kg	1	E	J	Yes	
Lead	142	mg/kg	1			Yes	
Magnesium	5040	mg/kg	1			Yes	
Manganese	652	mg/kg	1			Yes	
Nickel	36.3	mg/kg	1			Yes	
Potassium	3530	mg/kg	1			Yes	
Selenium	2.8	mg/kg	1	U	U	Yes	
Silver	3.2	mg/kg	1			Yes	
Sodium	396	mg/kg	1	J	U	Yes	
Thallium	2.0	mg/kg	1	J	U	Yes	
Vanadium	42.8	mg/kg	1	E	J	Yes	
Zinc	317	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9193	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0014	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:32:00
% Moisture :				% Solids :	99.8		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.73	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9193	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0014	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:32:00
% Moisture :				% Solids :	99.8		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	11200	mg/kg	1			Yes	
Antimony	6.9	mg/kg	1	N	J-	Yes	
Arsenic	113	mg/kg	1			Yes	
Barium	147	mg/kg	1			Yes	
Beryllium	0.75	mg/kg	1			Yes	
Cadmium	6.0	mg/kg	1			Yes	
Calcium	9580	mg/kg	1			Yes	
Chromium	24.6	mg/kg	1			Yes	
Cobalt	14.4	mg/kg	1			Yes	
Copper	113	mg/kg	1			Yes	
Iron	34100	mg/kg	1	E	J	Yes	
Lead	742	mg/kg	1			Yes	
Magnesium	5780	mg/kg	1			Yes	
Manganese	836	mg/kg	1			Yes	
Nickel	27.2	mg/kg	1			Yes	
Potassium	2530	mg/kg	1			Yes	
Selenium	1.7	mg/kg	1	J	J	Yes	
Silver	6.4	mg/kg	1			Yes	
Sodium	385	mg/kg	1	J	U	Yes	
Thallium	1.9	mg/kg	1	J	U	Yes	
Vanadium	53.0	mg/kg	1	E	J	Yes	
Zinc	1260	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9194	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0015	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:36:00
% Moisture :				% Solids :	99.5		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	1.7	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9194	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0015	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:36:00
% Moisture :				% Solids :	99.5		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	11300	mg/kg	1			Yes	
Antimony	10.3	mg/kg	1	N	J-	Yes	
Arsenic	196	mg/kg	1			Yes	
Barium	165	mg/kg	1			Yes	
Beryllium	0.86	mg/kg	1			Yes	
Cadmium	7.2	mg/kg	1			Yes	
Calcium	7190	mg/kg	1			Yes	
Chromium	22.9	mg/kg	1			Yes	
Cobalt	16.0	mg/kg	1			Yes	
Copper	143	mg/kg	1			Yes	
Iron	40300	mg/kg	1	E	J	Yes	
Lead	754	mg/kg	1			Yes	
Magnesium	5480	mg/kg	1			Yes	
Manganese	994	mg/kg	1			Yes	
Nickel	26.7	mg/kg	1			Yes	
Potassium	3080	mg/kg	1			Yes	
Selenium	2.5	mg/kg	1	U	U	Yes	
Silver	7.8	mg/kg	1			Yes	
Sodium	518	mg/kg	1			Yes	
Thallium	1.8	mg/kg	1	J	U	Yes	
Vanadium	53.3	mg/kg	1	E	J	Yes	
Zinc	1480	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9195	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0016	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:45:00
% Moisture :				% Solids :	98.3		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	2.5	mg/kg	2	D		Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9195	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0016	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:45:00
% Moisture :				% Solids :	98.3		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	12700	mg/kg	1			Yes	
Antimony	13.6	mg/kg	1	N	J-	Yes	
Arsenic	233	mg/kg	1			Yes	
Barium	148	mg/kg	1			Yes	
Beryllium	0.83	mg/kg	1			Yes	
Cadmium	10.1	mg/kg	1			Yes	
Calcium	11600	mg/kg	1			Yes	
Chromium	19.6	mg/kg	1			Yes	
Cobalt	13.5	mg/kg	1			Yes	
Copper	162	mg/kg	1			Yes	
Iron	38900	mg/kg	1	E	J	Yes	
Lead	1110	mg/kg	1			Yes	
Magnesium	5870	mg/kg	1			Yes	
Manganese	658	mg/kg	1			Yes	
Nickel	21.3	mg/kg	1			Yes	
Potassium	3760	mg/kg	1			Yes	
Selenium	0.60	mg/kg	1	J	J	Yes	
Silver	11.2	mg/kg	1			Yes	
Sodium	405	mg/kg	1			Yes	
Thallium	2.0	mg/kg	1	J	U	Yes	
Vanadium	44.8	mg/kg	1	E	J	Yes	
Zinc	2180	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9196	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0017	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:50:00
% Moisture :				% Solids :	98.9		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	4.8	mg/kg	5	D		Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9196	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0017	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:50:00
% Moisture :				% Solids :	98.9		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	9460	mg/kg	1			Yes	
Antimony	33.1	mg/kg	1	N	J-	Yes	
Arsenic	390	mg/kg	1			Yes	
Barium	124	mg/kg	1			Yes	
Beryllium	0.68	mg/kg	1			Yes	
Cadmium	10.1	mg/kg	1			Yes	
Calcium	7320	mg/kg	1			Yes	
Chromium	20.5	mg/kg	1			Yes	
Cobalt	9.7	mg/kg	1			Yes	
Copper	222	mg/kg	1			Yes	
Iron	35100	mg/kg	1	E	J	Yes	
Lead	2050	mg/kg	1			Yes	
Magnesium	3790	mg/kg	1			Yes	
Manganese	428	mg/kg	1			Yes	
Nickel	17.7	mg/kg	1			Yes	
Potassium	3520	mg/kg	1			Yes	
Selenium	2.7	mg/kg	1			Yes	
Silver	18.3	mg/kg	1			Yes	
Sodium	359	mg/kg	1			Yes	
Thallium	1.8	mg/kg	1	J	U	Yes	
Vanadium	38.7	mg/kg	1	E	J	Yes	
Zinc	1960	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9197	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0018	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:53:00
% Moisture :				% Solids :	98.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	2.2	mg/kg	2	D		Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9197	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0018	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:53:00
% Moisture :				% Solids :	98.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	14200	mg/kg	1			Yes	
Antimony	17.2	mg/kg	1	N	J-	Yes	
Arsenic	452	mg/kg	1			Yes	
Barium	124	mg/kg	1			Yes	
Beryllium	1.0	mg/kg	1			Yes	
Cadmium	21.2	mg/kg	1			Yes	
Calcium	9060	mg/kg	1			Yes	
Chromium	22.8	mg/kg	1			Yes	
Cobalt	11.0	mg/kg	1			Yes	
Copper	270	mg/kg	1			Yes	
Iron	42000	mg/kg	1	E	J	Yes	
Lead	1120	mg/kg	1			Yes	
Magnesium	5060	mg/kg	1			Yes	
Manganese	367	mg/kg	1			Yes	
Nickel	24.9	mg/kg	1			Yes	
Potassium	3840	mg/kg	1			Yes	
Selenium	0.96	mg/kg	1	J	J	Yes	
Silver	9.4	mg/kg	1			Yes	
Sodium	677	mg/kg	1			Yes	
Thallium	1.9	mg/kg	1	J	U	Yes	
Vanadium	50.6	mg/kg	1	E	J	Yes	
Zinc	6000	mg/kg	10	ED	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9198	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0019	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:54:00
% Moisture :				% Solids :	99.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	3.8	mg/kg	5	D		Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY9198	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0019	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:54:00
% Moisture :				% Solids :	99.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	11900	mg/kg	1			Yes	
Antimony	13.6	mg/kg	1	N	J-	Yes	
Arsenic	271	mg/kg	1			Yes	
Barium	103	mg/kg	1			Yes	
Beryllium	0.72	mg/kg	1			Yes	
Cadmium	11.9	mg/kg	1			Yes	
Calcium	5960	mg/kg	1			Yes	
Chromium	25.7	mg/kg	1			Yes	
Cobalt	12.3	mg/kg	1			Yes	
Copper	142	mg/kg	1			Yes	
Iron	35500	mg/kg	1	E	J	Yes	
Lead	1150	mg/kg	1			Yes	
Magnesium	5100	mg/kg	1			Yes	
Manganese	569	mg/kg	1			Yes	
Nickel	21.9	mg/kg	1			Yes	
Potassium	2170	mg/kg	1			Yes	
Selenium	0.88	mg/kg	1	J	J	Yes	
Silver	10.3	mg/kg	1			Yes	
Sodium	397	mg/kg	1	J	U	Yes	
Thallium	2.0	mg/kg	1	J	U	Yes	
Vanadium	61.5	mg/kg	1	E	J	Yes	
Zinc	2160	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY91A0	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0021	pH:	2	Sample Date:	08/14/2013	Sample Time:	12:35:00
% Moisture :				% Solids :	88.6		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.073	mg/kg	1	J	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	MY91A0	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0021	pH:	2	Sample Date:	08/14/2013	Sample Time:	12:35:00
% Moisture :				% Solids :	88.6		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	24500	mg/kg	1			Yes	
Antimony	1.2	mg/kg	1	JN	J-	Yes	
Arsenic	33.4	mg/kg	1			Yes	
Barium	121	mg/kg	1			Yes	
Beryllium	1.2	mg/kg	1			Yes	
Cadmium	0.62	mg/kg	1			Yes	
Calcium	15600	mg/kg	1			Yes	
Chromium	27.7	mg/kg	1			Yes	
Cobalt	10.9	mg/kg	1			Yes	
Copper	28.6	mg/kg	1			Yes	
Iron	31500	mg/kg	1	E	J	Yes	
Lead	27.8	mg/kg	1			Yes	
Magnesium	5930	mg/kg	1			Yes	
Manganese	538	mg/kg	1			Yes	
Nickel	21.9	mg/kg	1			Yes	
Potassium	2120	mg/kg	1			Yes	
Selenium	3.0	mg/kg	1	U	U	Yes	
Silver	2.9	mg/kg	1			Yes	
Sodium	431	mg/kg	1	J	U	Yes	
Thallium	2.2	mg/kg	1	U	U	Yes	
Vanadium	64.9	mg/kg	1	E	J	Yes	
Zinc	124	mg/kg	1	E	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	PBS01	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:		pH:		Sample Date:		Sample Time:	
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	20.0	mg/kg	1	U	U	Yes	
Antimony	6.0	mg/kg	1	U	U	Yes	
Arsenic	1.0	mg/kg	1	U	U	Yes	
Barium	20.0	mg/kg	1	U	U	Yes	
Beryllium	0.10	mg/kg	1	J	J	Yes	
Cadmium	0.50	mg/kg	1	U	U	Yes	
Calcium	500	mg/kg	1	U	U	Yes	
Chromium	1.0	mg/kg	1	U	U	Yes	
Cobalt	5.0	mg/kg	1	U	U	Yes	
Copper	2.5	mg/kg	1	U	U	Yes	
Iron	-1.8	mg/kg	1	J	J	Yes	
Lead	1.0	mg/kg	1	U	U	Yes	
Magnesium	500	mg/kg	1	J	U	Yes	
Manganese	1.5	mg/kg	1	U	U	Yes	
Nickel	4.0	mg/kg	1	U	U	Yes	
Potassium	-18	mg/kg	1	J	J	Yes	
Selenium	3.5	mg/kg	1	U	U	Yes	
Silver	1.0	mg/kg	1	U	U	Yes	
Sodium	500	mg/kg	1	U	U	Yes	
Thallium	2.5	mg/kg	1	U	U	Yes	
Vanadium	5.0	mg/kg	1	U	U	Yes	
Zinc	6.0	mg/kg	1	J	U	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9180	Lab Code:	CHEM
Sample Number:	PBS02	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:		pH:		Sample Date:		Sample Time:	
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.10	mg/kg	1	U	U	Yes	

Sample Summary Report

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	LCS	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:		pH:		Sample Date:		Sample Time:	
% Moisture :				% Solids :	100		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	40.4	mg/kg	1			Yes	
Antimony	12.0	mg/kg	1			Yes	
Arsenic	1.9	mg/kg	1			Yes	
Barium	42.2	mg/kg	1			Yes	
Beryllium	0.98	mg/kg	1			Yes	
Cadmium	0.98	mg/kg	1			Yes	
Chromium	2.2	mg/kg	1			Yes	
Cobalt	9.7	mg/kg	1			Yes	
Copper	5.3	mg/kg	1			Yes	
Iron	20.7	mg/kg	1			Yes	
Lead	2.0	mg/kg	1			Yes	
Manganese	3.2	mg/kg	1			Yes	
Nickel	8.0	mg/kg	1			Yes	
Selenium	6.3	mg/kg	1			Yes	
Silver	1.9	mg/kg	1			Yes	
Thallium	4.7	mg/kg	1			Yes	
Vanadium	10.6	mg/kg	1			Yes	
Zinc	12.0	mg/kg	1			Yes	
Potassium	985	mg/kg	1			Yes	
Calcium	1070	mg/kg	1			Yes	
Magnesium	1010	mg/kg	1			Yes	
Sodium	1040	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY9199	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0020	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:56:00
% Moisture :				% Solids :	98.9		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	9.5	mg/kg	10	D		Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY9199	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0020	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:56:00
% Moisture :				% Solids :	98.9		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	7460	mg/kg	1			Yes	
Antimony	48.6	mg/kg	1	N	J-	Yes	
Arsenic	905	mg/kg	10	D		Yes	
Barium	123	mg/kg	1			Yes	
Beryllium	0.82	mg/kg	1			Yes	
Cadmium	18.7	mg/kg	1	N	J	Yes	
Calcium	5800	mg/kg	1			Yes	
Chromium	14.7	mg/kg	1			Yes	
Cobalt	8.4	mg/kg	1	E	J	Yes	
Copper	296	mg/kg	1			Yes	
Iron	48800	mg/kg	1			Yes	
Lead	3330	mg/kg	1			Yes	
Magnesium	3140	mg/kg	1			Yes	
Manganese	447	mg/kg	1			Yes	
Nickel	12.5	mg/kg	1			Yes	
Potassium	3250	mg/kg	1			Yes	
Selenium	6.6	mg/kg	1			Yes	
Silver	24.7	mg/kg	1			Yes	
Sodium	502	mg/kg	1			Yes	
Thallium	1.9	mg/kg	1	J	U	Yes	
Vanadium	34.5	mg/kg	1			Yes	
Zinc	4370	mg/kg	10	D		Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY9199D	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:		pH:	2	Sample Date:	08/13/2013	Sample Time:	14:56:00
% Moisture :				% Solids :	98.9		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	8.6	mg/kg	10			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY9199D	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:		pH:	2	Sample Date:	08/13/2013	Sample Time:	14:56:00
% Moisture :				% Solids :	98.9		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	7520	mg/kg	1			Yes	
Antimony	49.0	mg/kg	1			Yes	
Arsenic	894	mg/kg	10			Yes	
Barium	121	mg/kg	1			Yes	
Beryllium	0.88	mg/kg	1			Yes	
Cadmium	18.6	mg/kg	1			Yes	
Calcium	5810	mg/kg	1			Yes	
Chromium	14.7	mg/kg	1			Yes	
Cobalt	8.4	mg/kg	1			Yes	
Copper	297	mg/kg	1			Yes	
Iron	48800	mg/kg	1			Yes	
Lead	3300	mg/kg	1			Yes	
Magnesium	3110	mg/kg	1			Yes	
Manganese	445	mg/kg	1			Yes	
Nickel	12.5	mg/kg	1			Yes	
Potassium	3270	mg/kg	1			Yes	
Selenium	6.7	mg/kg	1			Yes	
Silver	24.5	mg/kg	1			Yes	
Sodium	498	mg/kg	1			Yes	
Thallium	1.9	mg/kg	1	J	U	Yes	
Vanadium	34.4	mg/kg	1			Yes	
Zinc	4300	mg/kg	10			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY9199S	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:		pH:	2	Sample Date:	08/13/2013	Sample Time:	14:56:00
% Moisture :				% Solids :	98.9		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	8.9	mg/kg	10			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY9199S	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:		pH:	2	Sample Date:	08/13/2013	Sample Time:	14:56:00
% Moisture :				% Solids :	98.9		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	57.9	mg/kg	1	N		Yes	
Arsenic	944	mg/kg	10			Yes	
Barium	525	mg/kg	1			Yes	
Beryllium	10.4	mg/kg	1			Yes	
Cadmium	34.6	mg/kg	1	N		Yes	
Chromium	55.6	mg/kg	1			Yes	
Cobalt	108	mg/kg	1			Yes	
Copper	348	mg/kg	1			Yes	
Lead	3860	mg/kg	1			Yes	
Manganese	539	mg/kg	1			Yes	
Nickel	113	mg/kg	1			Yes	
Selenium	16.1	mg/kg	1			Yes	
Silver	33.3	mg/kg	1			Yes	
Thallium	10.7	mg/kg	1			Yes	
Vanadium	134	mg/kg	1			Yes	
Zinc	5500	mg/kg	10			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A1	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0022	pH:	2	Sample Date:	08/13/2013	Sample Time:	15:02:00
% Moisture :				% Solids :	99.5		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	8340	mg/kg	1			Yes	
Antimony	18.8	mg/kg	1	N	J-	Yes	
Arsenic	468	mg/kg	1			Yes	
Barium	102	mg/kg	1			Yes	
Beryllium	0.73	mg/kg	1			Yes	
Cadmium	14.5	mg/kg	1	N	J	Yes	
Calcium	5250	mg/kg	1			Yes	
Chromium	18.6	mg/kg	1			Yes	
Cobalt	9.8	mg/kg	1	E	J	Yes	
Copper	182	mg/kg	1			Yes	
Iron	37000	mg/kg	1			Yes	
Lead	1440	mg/kg	1			Yes	
Magnesium	4050	mg/kg	1			Yes	
Manganese	492	mg/kg	1			Yes	
Nickel	15.9	mg/kg	1			Yes	
Potassium	2430	mg/kg	1			Yes	
Selenium	2.8	mg/kg	1			Yes	
Silver	12.4	mg/kg	1			Yes	
Sodium	384	mg/kg	1	J	U	Yes	
Thallium	1.9	mg/kg	1	J	U	Yes	
Vanadium	36.9	mg/kg	1			Yes	
Zinc	4230	mg/kg	10	D		Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A1	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0022	pH:	2	Sample Date:	08/13/2013	Sample Time:	15:02:00
% Moisture :				% Solids :	99.5		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	3.7	mg/kg	5	D		Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A2	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0023	pH:	2	Sample Date:	08/13/2013	Sample Time:	15:01:00
% Moisture :				% Solids :	99.4		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	1.4	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A2	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0023	pH:	2	Sample Date:	08/13/2013	Sample Time:	15:01:00
% Moisture :				% Solids :	99.4		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	9040	mg/kg	1			Yes	
Antimony	9.5	mg/kg	1	N	J-	Yes	
Arsenic	337	mg/kg	1			Yes	
Barium	158	mg/kg	1			Yes	
Beryllium	0.77	mg/kg	1			Yes	
Cadmium	6.5	mg/kg	1	N	J	Yes	
Calcium	6340	mg/kg	1			Yes	
Chromium	19.4	mg/kg	1			Yes	
Cobalt	11.9	mg/kg	1	E	J	Yes	
Copper	140	mg/kg	1			Yes	
Iron	33800	mg/kg	1			Yes	
Lead	535	mg/kg	1			Yes	
Magnesium	4360	mg/kg	1			Yes	
Manganese	1520	mg/kg	1			Yes	
Nickel	18.7	mg/kg	1			Yes	
Potassium	2910	mg/kg	1			Yes	
Selenium	0.40	mg/kg	1	J	J	Yes	
Silver	6.6	mg/kg	1			Yes	
Sodium	381	mg/kg	1	J	U	Yes	
Thallium	1.9	mg/kg	1	J	U	Yes	
Vanadium	48.1	mg/kg	1			Yes	
Zinc	1480	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A3	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0024	pH:	2	Sample Date:	08/13/2013	Sample Time:	15:05:00
% Moisture :				% Solids :	99.3		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	9640	mg/kg	1			Yes	
Antimony	12.4	mg/kg	1	N	J-	Yes	
Arsenic	249	mg/kg	1			Yes	
Barium	142	mg/kg	1			Yes	
Beryllium	0.78	mg/kg	1			Yes	
Cadmium	11.4	mg/kg	1	N	J	Yes	
Calcium	6570	mg/kg	1			Yes	
Chromium	21.3	mg/kg	1			Yes	
Cobalt	12.3	mg/kg	1	E	J	Yes	
Copper	168	mg/kg	1			Yes	
Iron	34600	mg/kg	1			Yes	
Lead	1020	mg/kg	1			Yes	
Magnesium	5020	mg/kg	1			Yes	
Manganese	666	mg/kg	1			Yes	
Nickel	20.6	mg/kg	1			Yes	
Potassium	3260	mg/kg	1			Yes	
Selenium	1.7	mg/kg	1	J	J	Yes	
Silver	8.7	mg/kg	1			Yes	
Sodium	430	mg/kg	1			Yes	
Thallium	1.9	mg/kg	1	J	U	Yes	
Vanadium	44.1	mg/kg	1			Yes	
Zinc	2860	mg/kg	10	D		Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A3	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0024	pH:	2	Sample Date:	08/13/2013	Sample Time:	15:05:00
% Moisture :				% Solids :	99.3		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	2.4	mg/kg	2	D		Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A4	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0025	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:42:00
% Moisture :				% Solids :	99.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.68	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A4	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0025	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:42:00
% Moisture :				% Solids :	99.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	9970	mg/kg	1			Yes	
Antimony	5.2	mg/kg	1	N	J-	Yes	
Arsenic	106	mg/kg	1			Yes	
Barium	137	mg/kg	1			Yes	
Beryllium	0.78	mg/kg	1			Yes	
Cadmium	5.6	mg/kg	1	N	J	Yes	
Calcium	7130	mg/kg	1			Yes	
Chromium	20.6	mg/kg	1			Yes	
Cobalt	12.4	mg/kg	1	E	J	Yes	
Copper	146	mg/kg	1			Yes	
Iron	32700	mg/kg	1			Yes	
Lead	351	mg/kg	1			Yes	
Magnesium	5110	mg/kg	1			Yes	
Manganese	699	mg/kg	1			Yes	
Nickel	21.8	mg/kg	1			Yes	
Potassium	3370	mg/kg	1			Yes	
Selenium	2.6	mg/kg	1	U	U	Yes	
Silver	4.9	mg/kg	1			Yes	
Sodium	376	mg/kg	1	J	U	Yes	
Thallium	1.9	mg/kg	1	J	U	Yes	
Vanadium	43.5	mg/kg	1			Yes	
Zinc	883	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A5	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0026	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:47:00
% Moisture :				% Solids :	99.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	3.0	mg/kg	2	D		Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A5	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0026	pH:	2	Sample Date:	08/13/2013	Sample Time:	14:47:00
% Moisture :				% Solids :	99.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	8490	mg/kg	1			Yes	
Antimony	25.4	mg/kg	1	N	J-	Yes	
Arsenic	377	mg/kg	1			Yes	
Barium	118	mg/kg	1			Yes	
Beryllium	0.83	mg/kg	1			Yes	
Cadmium	17.9	mg/kg	1	N	J	Yes	
Calcium	6060	mg/kg	1			Yes	
Chromium	22.9	mg/kg	1			Yes	
Cobalt	12.8	mg/kg	1	E	J	Yes	
Copper	229	mg/kg	1			Yes	
Iron	39700	mg/kg	1			Yes	
Lead	1240	mg/kg	1			Yes	
Magnesium	3890	mg/kg	1			Yes	
Manganese	599	mg/kg	1			Yes	
Nickel	21.8	mg/kg	1			Yes	
Potassium	2400	mg/kg	1			Yes	
Selenium	1.1	mg/kg	1	J	J	Yes	
Silver	11.7	mg/kg	1			Yes	
Sodium	390	mg/kg	1			Yes	
Thallium	1.9	mg/kg	1	J	U	Yes	
Vanadium	42.6	mg/kg	1			Yes	
Zinc	3110	mg/kg	10	D		Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A6	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0027	pH:	2	Sample Date:	08/13/2013	Sample Time:	17:34:00
% Moisture :				% Solids :	99.1		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	11500	mg/kg	1			Yes	
Antimony	1.9	mg/kg	1	JN	J-	Yes	
Arsenic	44.5	mg/kg	1			Yes	
Barium	150	mg/kg	1			Yes	
Beryllium	0.74	mg/kg	1			Yes	
Cadmium	1.0	mg/kg	1	N	J	Yes	
Calcium	10800	mg/kg	1			Yes	
Chromium	34.8	mg/kg	1			Yes	
Cobalt	13.9	mg/kg	1	E	J	Yes	
Copper	119	mg/kg	1			Yes	
Iron	25400	mg/kg	1			Yes	
Lead	39.2	mg/kg	1			Yes	
Magnesium	6190	mg/kg	1			Yes	
Manganese	881	mg/kg	1			Yes	
Nickel	32.2	mg/kg	1			Yes	
Potassium	3830	mg/kg	1			Yes	
Selenium	2.8	mg/kg	1	U	U	Yes	
Silver	2.7	mg/kg	1			Yes	
Sodium	404	mg/kg	1	J	U	Yes	
Thallium	2.0	mg/kg	1	U	U	Yes	
Vanadium	42.1	mg/kg	1			Yes	
Zinc	139	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A6	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0027	pH:	2	Sample Date:	08/13/2013	Sample Time:	17:34:00
% Moisture :				% Solids :	99.1		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.090	mg/kg	1	J	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A7	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0028	pH:	2	Sample Date:	08/13/2013	Sample Time:	16:12:00
% Moisture :				% Solids :	97.1		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.21	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A7	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0028	pH:	2	Sample Date:	08/13/2013	Sample Time:	16:12:00
% Moisture :				% Solids :	97.1		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	14300	mg/kg	1			Yes	
Antimony	3.1	mg/kg	1	JN	J-	Yes	
Arsenic	46.8	mg/kg	1			Yes	
Barium	269	mg/kg	1			Yes	
Beryllium	1.0	mg/kg	1			Yes	
Cadmium	2.8	mg/kg	1	N	J	Yes	
Calcium	7760	mg/kg	1			Yes	
Chromium	33.5	mg/kg	1			Yes	
Cobalt	21.4	mg/kg	1	E	J	Yes	
Copper	301	mg/kg	1			Yes	
Iron	42400	mg/kg	1			Yes	
Lead	140	mg/kg	1			Yes	
Magnesium	7480	mg/kg	1			Yes	
Manganese	1640	mg/kg	1			Yes	
Nickel	38.8	mg/kg	1			Yes	
Potassium	3320	mg/kg	1			Yes	
Selenium	2.8	mg/kg	1	U	U	Yes	
Silver	4.8	mg/kg	1			Yes	
Sodium	1060	mg/kg	1			Yes	
Thallium	2.0	mg/kg	1	J	U	Yes	
Vanadium	73.7	mg/kg	1			Yes	
Zinc	432	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A8	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0029	pH:	2	Sample Date:	08/13/2013	Sample Time:	16:12:00
% Moisture :				% Solids :	97.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.18	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A8	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0029	pH:	2	Sample Date:	08/13/2013	Sample Time:	16:12:00
% Moisture :				% Solids :	97.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	13500	mg/kg	1			Yes	
Antimony	2.6	mg/kg	1	JN	J-	Yes	
Arsenic	40.9	mg/kg	1			Yes	
Barium	236	mg/kg	1			Yes	
Beryllium	0.95	mg/kg	1			Yes	
Cadmium	2.6	mg/kg	1	N	J	Yes	
Calcium	7850	mg/kg	1			Yes	
Chromium	33.2	mg/kg	1			Yes	
Cobalt	20.0	mg/kg	1	E	J	Yes	
Copper	265	mg/kg	1			Yes	
Iron	38600	mg/kg	1			Yes	
Lead	306	mg/kg	1			Yes	
Magnesium	7150	mg/kg	1			Yes	
Manganese	1250	mg/kg	1			Yes	
Nickel	35.9	mg/kg	1			Yes	
Potassium	3220	mg/kg	1			Yes	
Selenium	2.6	mg/kg	1	U	U	Yes	
Silver	4.4	mg/kg	1			Yes	
Sodium	1040	mg/kg	1			Yes	
Thallium	1.9	mg/kg	1	J	U	Yes	
Vanadium	67.4	mg/kg	1			Yes	
Zinc	389	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A9	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0030	pH:	2	Sample Date:	08/13/2013	Sample Time:	09:50:00
% Moisture :				% Solids :	98.6		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	10900	mg/kg	1			Yes	
Antimony	1.3	mg/kg	1	JN	J-	Yes	
Arsenic	21.3	mg/kg	1			Yes	
Barium	187	mg/kg	1			Yes	
Beryllium	0.77	mg/kg	1			Yes	
Cadmium	1.2	mg/kg	1	N	J	Yes	
Calcium	7170	mg/kg	1			Yes	
Chromium	20.6	mg/kg	1			Yes	
Cobalt	13.5	mg/kg	1	E	J	Yes	
Copper	110	mg/kg	1			Yes	
Iron	26000	mg/kg	1			Yes	
Lead	51.5	mg/kg	1			Yes	
Magnesium	4830	mg/kg	1			Yes	
Manganese	907	mg/kg	1			Yes	
Nickel	21.3	mg/kg	1			Yes	
Potassium	3390	mg/kg	1			Yes	
Selenium	2.8	mg/kg	1	U	U	Yes	
Silver	2.8	mg/kg	1			Yes	
Sodium	406	mg/kg	1	J	U	Yes	
Thallium	2.0	mg/kg	1	J	U	Yes	
Vanadium	46.2	mg/kg	1			Yes	
Zinc	145	mg/kg	1			Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	MY91A9	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	146-0030	pH:	2	Sample Date:	08/13/2013	Sample Time:	09:50:00
% Moisture :				% Solids :	98.6		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.083	mg/kg	1	J	J	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	PBS01	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:		pH:		Sample Date:		Sample Time:	
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	20.0	mg/kg	1	U	U	Yes	
Antimony	6.0	mg/kg	1	U	U	Yes	
Arsenic	1.0	mg/kg	1	U	U	Yes	
Barium	20.0	mg/kg	1	U	U	Yes	
Beryllium	0.50	mg/kg	1	U	U	Yes	
Cadmium	-0.011	mg/kg	1	J	J	Yes	
Calcium	500	mg/kg	1	U	U	Yes	
Chromium	1.0	mg/kg	1	U	U	Yes	
Cobalt	5.0	mg/kg	1	U	U	Yes	
Copper	2.5	mg/kg	1	U	U	Yes	
Iron	10.0	mg/kg	1	U	U	Yes	
Lead	1.0	mg/kg	1	U	U	Yes	
Magnesium	500	mg/kg	1	U	U	Yes	
Manganese	1.5	mg/kg	1	U	U	Yes	
Nickel	4.0	mg/kg	1	U	U	Yes	
Potassium	500	mg/kg	1	U	U	Yes	
Selenium	3.5	mg/kg	1	U	U	Yes	
Silver	1.0	mg/kg	1	U	U	Yes	
Sodium	500	mg/kg	1	U	U	Yes	
Thallium	2.5	mg/kg	1	U	U	Yes	
Vanadium	5.0	mg/kg	1	U	U	Yes	
Zinc	6.0	mg/kg	1	U	U	Yes	

Case No:	43738	Contract:	EPW09038	SDG No:	MY9199	Lab Code:	CHEM
Sample Number:	PBS02	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:		pH:		Sample Date:		Sample Time:	
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.10	mg/kg	1	U	U	Yes	

APPENDIX D
TCLP Metals Analytical Report
Iron King Mine Site
Technical Memorandum
October 2013

United States Environmental Protection Agency
Region 9 Laboratory
1337 S. 46th Street Building 201
Richmond, CA 94804

Date: **9/9/2013**

Subject: **Analytical Testing Results - Project R13SA1**
SDG: 13231B

From: **Brenda Bettencourt, Director**
EPA Region 9 Laboratory
MTS-2

To: **Zi Zi Searles**
California Site Cleanup Section 1
SFD-7-1

Attached are the results from the analysis of samples from the **Iron King Mine Wells/Jones Street 2013 Sampling** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Electronic CC: Scott Grossman, SERAS
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Jeff Dhont, EPA Region 9

Analyses included in this report:

TCLP Metals by ICP
TCLP Extraction by 1311
TCLP Mercury

United States Environmental Protection Agency
Region 9 Laboratory

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Project Manager:	Zi Zi Searles	**California Site Cleanup Section 1**	**SDG:** 13231B
Project Number:	R13SA1	**75 Hawthorne Street**	**Reported:** 09/09/13 16:31
Project:	Iron King Mine Wells/Jones Street 2013 Sampling	**San Francisco CA, 94105**	

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
146-0101	1308026-01	Soil	08/15/13 00:00	08/19/13 14:00
146-0102	1308026-02	Soil	08/15/13 00:00	08/19/13 14:00
146-0103	1308026-03	Soil	08/15/13 00:00	08/19/13 14:00

SDG ID 13231B

Samples were processed according to the Toxicity Characteristic Leaching Procedure (TCLP, EPA method SW 1311) prior to digestion and analysis. Results reported are concentrations in the resulting leachate.

Mercury: Samples were received at 19 degrees C, which is outside the recommended temperature range of 0 to 6 degrees C for mercury samples. The results for mercury analysis were flagged as estimated.

Mercury TCLP: The extraction blank (B13H129-BLK2) concentration for mercury is above 1/2 the quantitation limit for mercury. Sample concentrations of the three samples are approximately the same as the blank concentration. Sample results are flagged as estimated. The regulatory limit for mercury (0.2 mg/L) is substantially higher than the reported blank and sample concentrations.

Work Order(s)

1308026

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Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
Lab ID: **1308026-01**									**Soil - Sampled: 08/15/13 00:00**
Sample ID: **146-0101**					**Analysis of Toxicity Characteristic Leaching Procedure (TCLP) Extracts**				
Arsenic		0.66		0.20	mg/L	B13H133	08/29/13	08/30/13	6010C/SOP503
Barium		ND	U	0.50	"	"	"	"	6010C/SOP503
Cadmium		0.026	C1, J	0.050	"	"	"	"	6010C/SOP503
Chromium		ND	U	0.10	"	"	"	"	6010C/SOP503
Lead		ND	U	0.30	"	"	"	"	6010C/SOP503
Selenium		ND	U	0.20	"	"	"	"	6010C/SOP503
Silver		ND	U	0.10	"	"	"	"	6010C/SOP503
Mercury		0.00028	A2, B1, C1, J	0.00030	"	B13H129	08/29/13	08/29/13	245.1/SOP515
TCLP Extraction		Performed			N/A	B13H113	08/26/13	08/27/13	1311/SOP250
Lab ID: **1308026-02**									**Soil - Sampled: 08/15/13 00:00**
Sample ID: **146-0102**					**Analysis of Toxicity Characteristic Leaching Procedure (TCLP) Extracts**				
Arsenic		0.43		0.20	mg/L	B13H133	08/29/13	08/30/13	6010C/SOP503
Barium		ND	U	0.50	"	"	"	"	6010C/SOP503
Cadmium		0.088		0.050	"	"	"	"	6010C/SOP503
Chromium		ND	U	0.10	"	"	"	"	6010C/SOP503
Lead		ND	U	0.30	"	"	"	"	6010C/SOP503
Selenium		ND	U	0.20	"	"	"	"	6010C/SOP503
Silver		ND	U	0.10	"	"	"	"	6010C/SOP503
Mercury		0.00020	A2, B1, C1, J	0.00030	"	B13H129	08/29/13	08/29/13	245.1/SOP515
TCLP Extraction		Performed			N/A	B13H113	08/26/13	08/27/13	1311/SOP250
Lab ID: **1308026-03**									**Soil - Sampled: 08/15/13 00:00**
Sample ID: **146-0103**					**Analysis of Toxicity Characteristic Leaching Procedure (TCLP) Extracts**				
Arsenic		0.40		0.20	mg/L	B13H133	08/29/13	08/30/13	6010C/SOP503
Barium		0.33	C1, J	0.50	"	"	"	"	6010C/SOP503
Cadmium		0.033	C1, J	0.050	"	"	"	"	6010C/SOP503
Chromium		ND	U	0.10	"	"	"	"	6010C/SOP503
Lead		ND	U	0.30	"	"	"	"	6010C/SOP503
Selenium		ND	U	0.20	"	"	"	"	6010C/SOP503
Silver		ND	U	0.10	"	"	"	"	6010C/SOP503
Mercury		0.00022	A2, B1, C1, J	0.00030	"	B13H129	08/29/13	08/29/13	245.1/SOP515
TCLP Extraction		Performed			N/A	B13H113	08/26/13	08/27/13	1311/SOP250

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Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch B13H113 - 1311 TCLP - TCLP extraction										**Prepared: 08/26/13 Analyzed: 08/27/13**
										Analysis of Toxicity Characteristic Leaching Procedure (TCLP) Extracts - Quality Control
Blank (B13H113-BLK1)										
TCLP Extraction	Performed			N/A						
Duplicate (B13H113-DUP1)		**Source: 1308026-01**								
TCLP Extraction	Performed			N/A		Performed				200
Batch B13H129 - Leachate Digest - Metals, TCLP, Mercury										**Prepared & Analyzed: 08/29/13**
										Analysis of Toxicity Characteristic Leaching Procedure (TCLP) Extracts - Quality Control
Blank (B13H129-BLK1)										
Mercury	ND	U	0.00003	mg/L						
Blank (B13H129-BLK2)										
Mercury	0.00021	C1, J	0.0003	mg/L						
LCS (B13H129-BS1)										
Mercury	0.000228		0.00003	mg/L	0.0002(		114	85-115		200
Duplicate (B13H129-DUP1)		**Source: 1308026-01**								
Mercury	0.000201	C1, J	0.0003	mg/L		0.000284			**34**	20
Matrix Spike (B13H129-MS1)		**Source: 1308026-01**								
Mercury	0.00242		0.0003	mg/L	0.0020(	0.000284	107	70-130		20
Matrix Spike Dup (B13H129-MSD1)		**Source: 1308026-01**								
Mercury	0.00249		0.0003	mg/L	0.0020(	0.000284	110	70-130	3	20
Batch B13H133 - Leachate Digest - Metals, TCLP, ICP										**Prepared: 08/29/13 Analyzed: 08/30/13**
										Analysis of Toxicity Characteristic Leaching Procedure (TCLP) Extracts - Quality Control
Blank (B13H133-BLK1)										
Arsenic	ND	U	0.2	mg/L						
Barium	ND	U	0.5	"						
Cadmium	ND	U	0.05	"						
Chromium	ND	U	0.1	"						
Lead	ND	U	0.3	"						
Selenium	ND	U	0.2	"						
Silver	ND	U	0.1	"						
LCS (B13H133-BS1)										
Arsenic	20.6		0.2	mg/L	20.0		103	80-120		200
Barium	18.2		0.5	"	20.0		91	80-120		200
Cadmium	0.479		0.05	"	0.500		96	80-120		200
Chromium	1.95		0.1	"	2.00		98	80-120		200
Lead	4.72		0.3	"	5.00		94	80-120		200
Selenium	20		0.2	"	20.0		100	80-120		200
Silver	0.47		0.1	"	0.500		94	80-120		200
Duplicate (B13H133-DUP1)		**Source: 1308026-01**								
Arsenic	0.662		0.2	mg/L		0.656			1	20
Barium	ND	U	0.5	"		ND				20
Cadmium	ND	U	0.05	"		0.026				20
Chromium	ND	U	0.1	"		ND				20

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Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch B13H133 - Leachate Digest - Metals, TCLP, ICP										**Prepared: 08/29/13 Analyzed: 08/30/13**
										Analysis of Toxicity Characteristic Leaching Procedure (TCLP) Extracts - Quality Control
Duplicate (B13H133-DUP1)		**Source: 1308026-01**								
Lead	ND	U	0.3	"		ND				20
Selenium	ND	U	0.2	"		ND				20
Silver	ND	U	0.1	"		ND				20
Matrix Spike (B13H133-MS1)		**Source: 1308026-01**								
Arsenic	21.2		0.2	mg/L	20.0	0.656	103	75-125		20
Barium	17.7		0.5	"	20.0	ND	89	75-125		20
Cadmium	0.492		0.05	"	0.500	0.026	93	75-125		20
Chromium	1.94		0.1	"	2.00	ND	97	75-125		20
Lead	4.63		0.3	"	5.00	ND	93	75-125		20
Selenium	19.7		0.2	"	20.0	ND	98	75-125		20
Silver	0.462		0.1	"	0.500	ND	92	75-125		20
Matrix Spike Dup (B13H133-MSD1)		**Source: 1308026-01**								
Arsenic	20.6		0.2	mg/L	20.0	0.656	99	75-125	3	20
Barium	17.6		0.5	"	20.0	ND	88	75-125	0.7	20
Cadmium	0.479		0.05	"	0.500	0.026	90	75-125	3	20
Chromium	1.88		0.1	"	2.00	ND	94	75-125	3	20
Lead	4.49		0.3	"	5.00	ND	90	75-125	3	20
Selenium	19.2		0.2	"	20.0	ND	96	75-125	3	20
Silver	0.452		0.1	"	0.500	ND	90	75-125	2	20

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Qualifiers and Comments

J The reported result for this analyte should be considered an estimated value.

C1 The reported concentration for this analyte is below the quantitation limit.

B1 The concentration of this analyte found in this sample was less than five times the concentration found in the associated method blank.

A2 The sample was received above the recommended temperature range.

U Not Detected

NR Not Reported

RE1, RE2, etc: Result is from a sample re-analysis.