



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10

1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140



April 25, 2013

Reply To: ECL-112

James E. Trunzo, Vice President
Specialty Chemical Products LLC
Post Office Box 68
Rock Island, Washington 98850

Re: Rock Island Silicon Plant (Former), 100 4th Street, Rock Island, WA

Dear Mr. Trunzo:

The U.S. Environmental Protection Agency (EPA), through its contractor, Ecology and Environment, Inc. (E & E), has completed the site investigation (SI) of the former Rock Island Silicon Plant site. A copy of the SI report is enclosed.

Based on the SI, EPA has determined that no further action under the Federal Superfund Program is warranted at the former Rock Island Silicon Plant site.

In accordance with EPA's decision regarding the tracking of no further action sites, the referenced site will be removed from EPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database and placed in a separate archival database as a historical record.

Thank you for your cooperation and that of your staff during EPA's past sampling activities. If you have any questions, please feel free to contact me at (206) 553-0323.

Sincerely,

Monica Tonel
Site Assessment Manager

cc: (w/ Enclosure)

Douglas S. Morrison, Environmental Law Northwest
Paul C. Grabau, Farallon Consulting
Ted Benson, WA Department of Ecology
Ecology-Central Regional Office ✓
Barbara J. Trejo, WA Department of Health
Chelan Douglas Health District

**SITE INSPECTION
ROCK ISLAND SILICON PLANT
(FORMER)
Rock Island, Washington**

**Contract Number: EP-S7-06-02
Technical Direction Document Number: 12-05-0002**

April 2013

Prepared for:

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
1200 Sixth Avenue
Seattle, Washington 98101**

Prepared by:

**ECOLOGY AND ENVIRONMENT, INC.
720 Third Avenue, Suite 1700
Seattle, Washington 98104**

Table of Contents

Section	Page
1 Introduction	1-1
2 Site Background.....	2-1
2.1 Site Location	2-1
2.2 Site Description	2-1
2.3 Site Ownership History	2-2
2.4 Historic and Current Site Operations	2-2
2.4.1 Current Operations	2-2
2.4.2 Historical Operations.....	2-3
2.5 Previous Site Investigations	2-5
2.5.1 Rock Island Arsenic and Selenium Update, 1980.....	2-5
2.5.2 Hanna Mining Company Ground Water Sampling Program, 1982	2-6
2.5.3 Environmental Audit of M.H. Hanna Company, July 1988.....	2-6
2.5.4 Post Environmental Audit Site Characterization, 1988	2-7
2.5.5 Characterization of Mercury in Soil/Fill at Silicon Metaltech, Inc., 1989.....	2-9
2.5.6 Underground Tank Closure, 1990	2-9
2.5.7 Laboratory Testing of Fume Waste via the Toxicity Characteristic Leaching Procedure (TCLP) Method, 1991.....	2-9
2.5.8 Carbon Block and Hard Pan Furnace Wastes Analytic Data Summary, 1991	2-9
2.5.9 Site Hazard Assessment, Silicon Metaltech Inc., 1991.....	2-10
2.5.10 Environmental Due Diligence Report, 1992.....	2-10
2.5.11 Department of Health Investigation Letter, 1993.....	2-10
2.5.12 Fume Characterization Summary Report, 2008	2-11
2.5.13 START Preliminary Assessment	2-12
2.6 Previous Rock Island Area Investigations	2-12
2.6.1 Washington State University Water Quality Report.....	2-12
2.6.2 Washington Department of Social and Health Services Water Quality Report for Drinking Water at Rock Island, 1989	2-13
2.6.3 Water Quality at Rock Island, December 1990.....	2-13
2.6.4 Ground Water Production Evaluation, City of Rock Island, Washington, September 2007	2-14
2.6.5 Phase I Hydrogeologic Evaluation, Proposed Golf Course Well Site, City of Rock Island, Washington, February 2009	2-15

Table of Contents (cont.)

Section	Page
2.6.6	Phase II Hydrogeologic Evaluation, Golf Course Well Site, City of Rock Island, Washington, January 2010..... 2-16
2.6.7	EPA Removal Assessment, July 2011 2-16
2.6.8	Chelan-Douglas Health District, Spring 2012 2-17
2.6.9	EPA Removal Assessment, October 2012 2-17
2.7	Summary of SI Investigation Locations..... 2-18
2.7.1	Potential Sources..... 2-18
2.7.2	Targets..... 2-18
2.7.3	Off-Site Sources of Arsenic and Lead..... 2-18
3	Field Activities and Analytical Protocol 3-1
3.1	Sampling Methodology 3-1
3.1.1	Surface Soil Sampling..... 3-2
3.1.2	Subsurface Sampling..... 3-2
3.1.3	Ground Water Sampling..... 3-2
3.1.3.2	Established Wells..... 3-2
3.1.3.1	Temporary Wells 3-2
3.2	Analytical Protocol..... 3-3
3.3	Global Positioning System..... 3-4
3.4	Investigation-Derived Waste..... 3-4
4	Quality Assurance/ Quality Control 4-1
4.1	Satisfaction of Data Quality Objectives..... 4-1
4.2	QA/QC Samples..... 4-2
4.3	Project-Specific Data Quality Objectives 4-2
4.3.1	Precision..... 4-2
4.3.2	Accuracy..... 4-2
4.3.3	Completeness 4-2
4.3.4	Representativeness 4-2
4.3.5	Comparability..... 4-3
4.4	Laboratory QA/QC Parameters..... 4-3
4.4.1	Holding Times/Temperatures/Sample Containers 4-3
4.4.2	Laboratory Blanks..... 4-3
4.4.3	Serial Dilution Analyses..... 4-3
4.4.4	Rinsate Blanks..... 4-3
5	Analytical Results Reporting and Background Samples 5-1
5.1	Analytical Results Evaluation Criteria..... 5-1
5.1.1	Sample Results Reporting..... 5-1
5.2	Background Samples..... 5-2
5.2.1	Background Borehole Soil Samples..... 5-2
5.2.1.1	Sample Locations..... 5-2
5.2.1.2	Sample Results..... 5-2
5.2.2	Background Residential Soil Samples 5-2
5.2.2.1	Sample Locations..... 5-2

Table of Contents (cont.)

Section	Page
5.2.2.2 Sample Results.....	5-3
5.2.3 Background Temporary Well Ground Water Sample.....	5-3
5.2.3.1 Sample Location	5-3
5.2.3.2 Sample Results.....	5-3
5.2.4 Background Domestic Well Ground Water Sample	5-3
5.2.4.1 Sample Location	5-3
5.2.4.2 Sample Results.....	5-3
6 Potential Sources.....	6-1
6.1 Fume Settling Ponds.....	6-1
6.1.1 Sample Locations	6-2
6.1.2 Sample Results	6-3
6.2 Fume Storage Area.....	6-3
6.2.2 Sample Results	6-4
6.3 Off-Site Sources of Arsenic and Lead - Rock Island Orchards	6-4
6.3.1 Off-Site Soil Sampling.....	6-5
6.3.1.1 Area Residence 1 Sample Locations	6-5
6.3.1.2 Area Residence 1 Sample Results	6-5
6.3.2.1 Area Residence 2 Sample Locations	6-6
6.3.2.2 Area Residence 2 Sample Results	6-6
6.3.1.1 Area Residence 3 Sample Locations	6-6
6.3.1.2 Area Residence 3 Sample Results	6-7
6.4.1.1 Original Background Area Residence Sample Locations.....	6-7
6.4.1.2 Original Background Area Residence Sample Results.....	6-7
7 Ground Water Migration Pathway and Targets	7-1
7.1 Geologic Setting.....	7-1
7.2 Aquifer System.....	7-2
7.3 Drinking Water Targets.....	7-2
7.4 Ground Water Sampling.....	7-3
7.4.1 Temporary Well Locations.....	7-3
7.4.2 Temporary Well Sample Results.....	7-3
7.4.3 Production Well Sample Location	7-4
7.4.4 Production Well Sample Results.....	7-4
7.4.5 Domestic Well Sample Locations	7-4
7.4.6 Domestic Well Sample Results	7-4
8 Summary and Conclusions	8-1
8.1 Sources	8-1
8.2 Targets.....	8-2
8.3 Conclusions	8-3
9 References	9-1

Table of Contents (cont.)

Section	Page
A	Sample Plan Alteration Forms
B	Photographic Documentation
C	Drilling Logs
D	Chain-of-Custody Documentation
E	Data Validation Memoranda
F	Global Positioning System Coordinates

List of Tables

Table

Table 2-1	Summary of Analytical Results for Total Metals
Table 2-2	Summary of Analytical Results for Total Metals – EP Toxicity and TCLP Leachate
Table 3-1	Fixed Laboratory Sample Collection Summary
Table 3-2	Sample Coding
Table 3-3	Investigation-Derived Waste Sample Analytical Results Summary
Table 6-1	Fume Pond Soil/Fume Samples Analytical Results Summary
Table 6-2	Fume Storage Area Sample Analytical Results Summary
Table 6-3	Area Residence Sample Analytical Results Summary
Table 7-1	Well Population by Distance Ring
Table 7-2	Fume Pond Ground Water Sample Analytical Results Summary
Table 7-3	Production Well and Residential Well Ground Water Analytical Results Summary

This page intentionally left blank.

List of Figures

Figure

Figure 2-1 Site Location Map

Figure 2-2 Site Map

Figure 2-3 1988 Post Environmental Audit Site Characterization ERM NW Sampling Locations

Figure 2-4 Rock Island Wells Sampled by WSU in 1978-1979

Figure 2-5 Surface Water Locations Sampled by WSU 1978-1979

Figure 2-6 Arsenic Levels in Rock Island Wells Ground Water Production Evaluation, GeoEngineers 2007

Figure 2-7 EPA Removal Assessment Sample Location Map – July 2011

Figure 2-8 Chelan-Douglas Health District 2012 Arsenic Results

Figure 2-9 EPA Removal Assessment Sample Location Map – October 2012

Figure 3-1 Sample/Station Location Map

Figure 5-1 Background Location 1

Figure 5-2 Background Location 2

Figure 6-1 Area Residence 1

Figure 6-2 Area Residence 2

Figure 6-3 Area Residence 3

Figure 7-1 4-Mile TDL Map

This page intentionally left blank.

List of Abbreviations and Acronyms

<u>Acronym</u>	<u>Definition</u>
°F	Degrees Fahrenheit
AST	American Silicon Technologies
bgs	Below Ground Surface
BS	Blank Spike
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
CRQL	Contract Required Quantitation Limit
DDE	1,1-Dichloro-2,2-bis(p-chlorophenyl) Ethylene
DDT	Dichlorodiphenyltrichloroethane
DOH	Washington State Department of Health
DQO	Data Quality Objective
DSHS	Washington State Department of Social and Health Services
E & E	Ecology and Environment, Inc.
Ecology	Washington State Department of Ecology
EEC	Environmental Engineering and Consulting, Inc.
EP	Extraction Procedure
EPA	United States Environmental Protection Agency
GPS	Global Positioning System
IDW	Investigation-Derived Waste
MCL	Maximum Contaminant Level
MEL	Manchester Environmental Laboratories
mg/kg	Milligrams Per Kilogram
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MTCA	Model Toxics Control Act
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
PA	Preliminary Assessment
PCBs	Polychlorinated Biphenyls
ppb	Parts Per Billion
ppm	Parts Per Million
PUD	Public Utility District
PVC	Polyvinyl Chloride
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percent Difference
SCP	Specialty Chemical Products, LLC
SHA	Site Hazard Assessment

List of Abbreviations and Acronyms (cont.)

SI	Site Inspection
SPAF	Sample Plan Alteration Form
SPLP	Synthetic Precipitation Leaching Procedure
SQAP	Sampling and Quality Assurance Plan
SQL	Sample Quantitation Limit
START	Superfund Technical Assessment and Response Team
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCLP	Toxicity Characteristic Leaching Procedure
TDD	Technical Direction Document
TDL	Target Distance Limit
TM	Task Monitor
UST	Underground Storage Tank
VOC	Volatile Organic Compound
WSU	Washington State University
µg/L	Micrograms Per Liter

1

Introduction

Ecology and Environment, Inc., (E & E) was tasked by the United States Environmental Protection Agency (EPA) to provide technical support for completion of a Site Inspection (SI) at the Rock Island Silicon Plant (Former) . E & E completed SI activities under Technical Direction Document (TDD) Number 12-05-0002, issued under EPA, Region 10, Superfund Technical Assessment and Response Team (START)-3, Contract Number EP-S7-06-02. This SI was conducted in coordination with the EPA Removal Program as well as the EPA Office of Environmental Assessment. SI field work was conducted at the same time as Removal Program field work to ensure sampling data from these two programs would be contemporaneous and could be evaluated together as one larger data set. In addition, an EPA hydrogeologist from the Office of Environmental Assessment participated in the field event to gather ancillary data, in particular relating to ground water flow, which could be used to support both programs.

The specific goals for the former Rock Island Silicon Plant SI, identified by the EPA, are to:

- Determine the potential threat to public health or the environment posed by the site;
- Determine the potential for a release of hazardous constituents into the environment; and
- Determine the potential for placement of the site on the National Priorities List (NPL).

Completion of the SI included reviewing existing site information, determining regional characteristics, collecting receptor information within the range of site influence, executing a sampling plan, and producing this report. The report is organized as follows:

- Section 1, Introduction -- Authority for performance of this work, goals for the project, and summary of the report contents;
- Section 2, Site Background -- Site description, site operations and waste characteristics, and a summary of investigation locations;



1. Introduction

- Section 3, Field Activities and Analytical Protocol – Summary of the field effort;
- Section 4, Quality Assurance/Quality Control (QA/QC) – Summary of the laboratory data;
- Section 5, Analytical Results Reporting and Background Samples – Discussion of results reporting criteria, background sample locations, and analytical results;
- Section 6, Potential Sources – Discussion of site sources, sample locations, and analytical results;
- Section 7, Ground Water Migration Pathways and Targets – Discussion of the migration pathway, sample locations, and analytical results;
- Section 8, Summary and Conclusions – Summary of the investigation and recommendation for the site based on the information gathered during the investigation; and
- Section 9, References – Alphabetical listing of the references cited throughout the text.

2

Site Background

This section describes the background of the site including location, description, ownership history, operations and source characteristics, previous investigations, and the SI site visit.

2.1 Site Location

Site Name:	Rock Island Silicon Plant (Former)
CERCLIS ID Number:	WAN001002939
Site Address:	100 S. 4 th Street, Rock Island, Washington
Latitude:	47° 22' 13.50 North
Longitude:	120° 08' 24.34 West
Legal Description:	Township 22 North, Range 21 East, Sections 25 and 26
County:	Douglas
Congressional District:	4
Site Owner(s):	Columbia Ventures Corporation
Site Operator(s):	Specialty Chemical Products, LLC 100 S. 4 th Street, P.O. Box 68 Rock Island, WA 98850
Site Contact(s):	James Trunzo, Columbia Ventures Corporation

2.2 Site Description

The former Rock Island Silicon Plant is located within the city limits of Rock Island, Washington (Figure 2-1). The former silicon plant is approximately 7 miles east of the city of Wenatchee on State Highway 28. The plant site is located on a crescent-shaped parcel of land totaling 58 acres, and is bounded by the Columbia River to the south and the main line of the Burlington Northern Railroad to the north. Site features are depicted on Figure 2-2.

The site is located in an industrial area; areas across State Highway 28 to the north are commercial and residential, including agricultural areas used as fruit orchards.

The site consists of an out-of-use raw materials building and stockpile area, former processing buildings (including a furnace building, silicon storage building, and several other storage buildings), waste disposal area, eight fume



2. Site Background

settling ponds, and fume storage area. Piles of material from furnace cleaning activities are stored in concrete storage bays on site, located southwest of the furnace building. Access roads lead to a building used for offices. A trailer is located near the site of the former QC laboratory where QC monitoring was conducted while the plant was producing silicon. A former drywell was associated with the former QC lab. A former transformer area is located north of the furnace building (see Figure 2-3). There are three on-site water supply wells (Well No. 1, Well No. 2, and Well No. 3); two of these are out-of-service and one is used for non-potable water (Well No. 2).

2.3 Site Ownership History

The United States Department of Defense built the facility in 1942 during World War II. During this time, the plant was operated by Ohio Ferro Alloys (Ecology 2009).

The plant was purchased in 1948 by Keokuk Electro Metals Company. In 1959, Keokuk Electro Metals Company merged into Vanadium Corporation of America, which, in turn, merged with Foote Mineral in 1967 (Ecology 2009).

Subsequently, the plant was purchased from Foote Mineral by the Hanna Mining Company, now M.A. Hanna Company, in 1974 (Ecology 2009).

In 1988, Silicon Metaltech, Inc. obtained ownership and operated the facility until 1993, when ownership changed to American Silicon Technologies (AST). Specialty Chemical Products, LLC (SCP), a subsidiary of Columbia Ventures Corporation, purchased the plant in 2001 and began using the facility for small-scale pilot plant experimentation with a small laboratory in support of the operation (Ecology 2009).

2.4 Historic and Current Site Operations

2.4.1 Current Operations

Currently, SCP operates a pilot plant and a small laboratory for the purpose of developing technology to produce amorphous precipitated silica using silica fume. Silica fume was a by-product of the silicon and ferrosilicon metal production which formerly took place on the property. SCP is planning to recycle the silica fume that is currently stored on site (Ecology 2009).

SCP currently has a National Pollutant Discharge Elimination System (NPDES) permit (Permit No. WA-000286-1) for discharging non-contact cooling water into the Columbia River. The permit was issued by the Washington State Department of Ecology (Ecology) in April 2009 as a renewal for a previous permit issued in 1986. The permit allows for the operation of a single outfall which extends approximately 1,400 feet into the Columbia River from the river bank (see Figure 2-2). Constructed before the river level rose following completion of a second powerhouse at the Chelan County Public Utility District's (PUD's) Rock Island Dam, the 18-inch corrugated steel outfall pipe is embedded 5 feet below the river



2. Site Background

bottom in a trench surrounded by imported trench backfill. The outfall has a diffuser that consists of ten 2.5-inch steel risers spaced 8 feet apart. The risers extend one foot above the bottom of the river. The permit requires monthly monitoring for pH and temperature (Ecology 2009).

Catch basins on site were previously tied into the non-contact cooling water outfall on the Columbia River, but the outfall has been closed and storm water connections to the outfall have been cut off. A newly constructed swale near the former QC laboratory currently collects some storm water runoff from paved areas near the offices. The site manager indicated that runoff from the remainder of the site infiltrates the ground.

Piles of material composed of carbon and silica metal from furnace cleaning activities (also known as hard pan and carbon block), are stored in concrete storage bays until these materials can be sold to a steel mill.

2.4.2 Historical Operations

Ohio Ferro Alloys began operation at the plant in 1942, producing pig iron and ferrosilicon until the end of World War II. Ferrosilicon is a combination of silicon and iron, which is used in metallurgical industries. The plant was purchased in 1948 by Keokuk Electro Metals Company, which rebuilt the operation's furnaces and added a fourth furnace. As the demand for ferrosilicon on the West Coast began to diminish in the early 1950's, the plant turned to the production of silicon metal. The market existed at this time because large aluminum producers were constructing facilities in the area to take advantage of low-cost hydroelectric power (Ecology 1999).

Subsequent owners (Vandium Corporation of America, Foote Mineral, Hanna Mining Company, and Silicon Metaltech, Inc.) continued operating the plant and producing silicon metal (Ecology 1999). Air emission controls (hooding, ducting, and a baghouse) were installed by Hanna Mining Company in 1975 (Ecology 1999). AST operated the plant from 1993 until September 1999, producing silicon metal, which was used as an alloying element in other metallurgical industries, such as the aluminum industry (Ecology 2009).

When the plant was producing ferrosilicon, iron scrap was added to the furnace feed. Prepared raw materials consisting of powdered or granular coal, charcoal, coke, silica sand (or crushed quartz), and a binder material also may have been used, and would have been delivered to the plant in briquette form (Ecology 2009). Raw materials were delivered to the plant's storage yard or conveyed directly into a raw materials preparation building. These materials were then fed into individual batch hoppers, moved across scales, and conveyed to the electric arc furnaces (ERM-Northwest, Inc. 1988a).

The materials were heated in the furnace to a temperature as high as 6,000 degrees Fahrenheit (°F) using the application of high-voltage electrical power via



2. Site Background

carbon electrodes and heat produced by chemical reactions. The heat caused the smelting reactions to take place. Molten metal, at 3,000°F when tapped from the furnace, flowed into a ladle with a capacity of 3 tons. Final refining took place in the ladle to remove impurities. The molten metal was then poured into “casting dishes.”

After cooling, the metal casts were broken in pieces, weighed, graded, and then stored. The metal was then crushed and screened to meet customer size requirements. Silicon metal was shipped in bulk, in jumbo sacks, or in palletized wooden boxes (ERM-Northwest, Inc. 1988a).

The plant also had a silica fume bagging facility. This operation stored, classified (by size), and packaged silica fume collected by the air pollution control system on the furnaces. The majority of this material was packaged in bags or shipped in bulk by truck or rail.

The fume was deposited on site from 1974 through 1980; and from 1980 through 1988, approximately 85 percent of the 35 to 40 tons of fume generated each day had been collected and marketed for various applications, such as concrete amendment. The remainder, which consisted of particulates too small to be recovered, recycled, or marketed, was slurried and deposited on site in one of several unlined fume settling ponds. Estimated depths of ponds range from about 1.5 to 11 feet from the surface of the fume material (ERM-Northwest, Inc. 1988a).

The fume pond system comprised eight settling ponds (Fume Settling Ponds 1 through 8, as shown on Figure 2-2). The ponds were generally developed by filling existing topographic depressions with fume slurry, and ponds were added as more fume was produced. Ponds were allowed to dry out, and the dried fume was excavated and transferred to the fume storage area. Excavated ponds would then be used to deposit more fume slurry (Farallon Consulting 2008).

By 1991, the plant had produced 13,076 tons of silicon metal (which is 98.9 percent silicon), 1,364 tons of dross (impurities removed during the smelting process), and 3,357 tons of fume (EEC 1992).

Additional by-products of the smelting process are carbon block and hard pan. These refer to materials that accumulate on the lining of the furnaces and require periodic removal. Carbon block and hard pan were stored in bins on site, as they could be recycled and sold for use in the steel industry (EEC 1991b). Another by-product produced by the plant was dross, including dross collected from ladle and casting dishes, plus silicon or ferrosilicon product fines (ERM-Northwest, Inc. 1988a). Dross was sold to commercial consumers as a product. One such major consumer used it as a component of foundry additives (Trunzo 2012).

2. Site Background

The facility's air emissions were once regulated under the Chelan Douglas County Health Department; however, three air pollutants (particulate matter, sulfur dioxide, and carbon monoxide) were emitted by this facility at rates greater than the 100 tons per year threshold, and this necessitated an Ecology air operating permit in 1991 (Ecology 1999).

Ecology issued three notices of opacity violations to AST in 1993 and 1994, and the EPA issued a fourth notice in 1994 (Ecology 1998). For 1996, emissions of particulate matter were 1,068.6 tons per year, of which 936.7 tons per year were particulate matter less than 10 microns in size, according to the air operating permit application submitted by AST. Also for 1996, emissions of sulfur oxides as sulfur dioxide were reported as 670.8 tons per year, and carbon monoxide emissions were 463.1 tons for the same year. The application reported 0.2 ton per year of lead was emitted, and no nitrogen oxides or volatile organic compounds (VOCs) were emitted. In 1998, AST reached a settlement with Ecology regarding historic air quality conditions. AST had submitted an air operating permit application in 1995; however, the permit underwent several drafts and revisions before final approval in May of 1999. The 1999 air operating permit indicated that AST included sampling data in the air permit application that showed that the particulate matter from the furnaces was emitted as amorphous silica, with no crystalline silica emitted (Ecology 1999). In September of 1999, AST ceased operations due to financial reasons. In February of 2001, Ecology rescinded AST's air operating permit and permission to operate (Ecology 2001).

2.5 Previous Site Investigations

The following sections describe previous environmental investigations and other related investigations that have been conducted at the site.

2.5.1 Rock Island Arsenic and Selenium Update, 1980

In October 1980, Ecology published a memo concerning arsenic and selenium in Rock Island, Washington. According to the memo, fly ash (fume) from the Hanna Mining Company in Rock Island was found to have high concentrations of arsenic, selenium, cadmium, lead, and mercury. Further, ponding of the fly ash was considered to possibly pose serious environmental and public health problems. The memo also indicated that a Washington State University (WSU) study had found high levels of arsenic and selenium in the ground water of Rock Island (Ecology 1980). Ecology collected a sample of water from a fume settling pond for arsenic analysis. Arsenic was detected at a concentration of 3,390 micrograms per liter ($\mu\text{g/L}$). As a result of this analysis, Ecology requested that Hanna Mining Company install ground water monitoring wells to determine if metals were leaching from the ponds to the ground water (Ecology 1980).

2.5.2 Hanna Mining Company Ground Water Sampling Program, 1982

In 1982, at the request of Ecology, Hanna Mining Company installed monitoring wells to determine if fume settling ponds were impacting ground water at the site. Two shallow ground water monitoring wells were installed. MW1 was 36 feet deep and was located downgradient of a fume settling pond. MW2 was 29 feet deep and was located upgradient of the fume settling pond. Locations of the former monitoring wells (MW1 and MW2) are shown on Figure 2-3.

Hanna Mining Company collected ground water samples from these wells for analysis of selected metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) six times over a period of eight months. Only one analyte (cadmium) was detected above the Model Toxics Control Act (MTCA) Method A cleanup levels for ground water. Cadmium was detected in a single ground water sample collected from MW1 during the June 1982 sampling event. The cadmium level was not confirmed in the three prior or two subsequent ground water monitoring events. No other analytes were detected at concentrations above MTCA Method A cleanup levels for ground water (Farallon Consulting 2008). In a memo dated October 1, 1982, Ecology agreed that no contamination of shallow ground water in the area of the waste disposal lagoons (i.e., fume settling ponds) was observed, and that sampling could be discontinued (Ecology 1982).

2.5.3 Environmental Audit of M.H. Hanna Company, July 1988

In 1988, a property pre-acquisition environmental audit of the plant was conducted by ERM-Northwest, Inc. for Silicon Metaltech, Inc. to ascertain whether environmental issues were present. Findings of this audit are summarized below:

- **Air Quality:** The audit report indicated that the Hanna Mining Company facility had prior air pollution control violations due to excessive dust emissions; these violations resulted in a consent agreement with Ecology.
- **Surface Water Quality:** The facility was operating under a NPDES permit for non-contact cooling water. The non-contact cooling water discharged via an outfall on the Columbia River and was monitored for temperature and pH. No violations had been reported.
- **Ground Water Quality:** Ecology had requested that Hanna Mining Company install two monitoring wells on site (as summarized in Section 2.5.2). Results of the ground water sampling and analysis program, which was undertaken from February through July of 1982, were compared to EPA primary drinking water standards and did not indicate ground water contamination.
- **On-Site Waste Disposal:** The Hanna Mining Company facility produced fume waste from the baghouses, baghouse bags, and furnace waste from annual maintenance. These wastes were dumped on site. The fume was deposited in a series of ponds.

2. Site Background

- **Furnace Waste:** Furnaces were shut down once per year for maintenance and repair. During this annual maintenance, approximately 35 tons of waste materials were produced.
- **Underground Storage Tanks:** At the time of the 1988 report, there were two underground storage tanks (USTs) at the facility. The tanks included a 4,000-gallon fuel oil tank for the boiler and a 1,000-gallon leaded gasoline tank for filling company vehicles. According to the site manager, there was another 20,000-gallon diesel tank that had been removed in 1986 (see Figure 2-3) (ERM-Northwest, Inc. 1988a).

2.5.4 Post Environmental Audit Site Characterization, 1988

Silicon Metaltech requested additional work to address issues identified during the property pre-acquisition environmental audit. A report by ERM-Northwest, Inc., dated December 1988, presents the results of this work.

Additional work included tank integrity testing for two USTs that were in use at the time of the audit (determined to be in good condition), and the collection of soil samples from areas adjacent to and underlying the two USTs that were in use, as well as from the location of a removed UST. Also included in this work were sampling and analysis of:

- Soil underlying the laboratory drywell discharge;
- Soil underlying the former transformer;
- Fume settling ponds and the fume storage area to determine hazardous characteristics;
- Process cooling water discharged to the Columbia River; and
- Ground water from MW1 and MW2 (i.e., the ground water monitoring wells installed in 1981, see Section 2.5.2).

Sample locations for fume settling ponds and the fume storage area are shown on Figure 2-3. Specific sample locations for other soil samples were not provided in the report; however, the locations of known sample positions are shown (former drywell, former transformer area, USTs, and former UST).

Soil samples taken from areas adjacent to and underlying the three USTs (two present and one former) were analyzed for three priority pollutant hydrocarbons: benzene, toluene, and xylene. Results indicated that benzene, toluene, and xylene were not detected. Detection limits were 11 parts per billion (ppb).

Soil underlying the laboratory drywell was sampled and analyzed for VOCs, semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and Target Analyte List (TAL) metals. Results indicated the presence of two phthalates (bi-n-butyl phthalate and bis[2-ethylhexyl]phthalate) at



2. Site Background

concentrations of 190 ppb and 100 ppb, respectively. Four samples exhibited elevated levels of mercury, ranging from 35 to 4,000 parts per million (ppm), and somewhat elevated lead, ranging up to 160 ppm. Lead and mercury contamination was present within a zone along the clay drywell outflow drain pipe. No other analytes were detected.

Soil in the former transformer area was found to contain PCBs at levels of concern. Samples of soil collected near the transformer area had 4 ppm and 6.1 ppm total PCBs.

Fifteen fume waste samples were collected from fume ponds and fume waste areas. Samples were collected from 0 to 3 feet below the surface using a post hole digger. For fume settling ponds 1, 2, and 6, two samples were collected from each pond and composited for analysis. For ponds 3, 4, and 5, one sample was collected from each pond. Samples from ponds 4 and 5 were composited for analysis. Samples were also collected from the fume storage area on site. Development of the sampling plan involved consideration of the relative ages of the fume ponds, since different fume ponds were in use at different times throughout the history of the site. These samples were analyzed for TAL metals and results were used to determine that the fume waste did not meet the definition of dangerous waste, as defined by Washington State Regulation WAC 173-303.

A sample of the plant's effluent discharge to the Columbia River was collected and analyzed for SVOCs, VOCs, PCBs, pesticides, and TAL metals. Analytes detected included copper at 0.089 ppm, nickel at 0.008 ppm, and zinc at 0.002 ppm. These values did not exceed EPA secondary drinking water standards (ERM-Northwest, Inc. 1988b).

According to the conclusions of this report, fume waste did not appear to meet the definition of dangerous waste, as defined in Washington State Dangerous Waste Regulations, and the effluent discharged into the Columbia River did not exceed EPA secondary drinking water standards. The report concluded that contaminants which could contribute to ground water contamination were not present in the fume waste at levels of concern relative to State of Washington Dangerous Waste Regulations (ERM-Northwest, Inc. 1988b).

Ground water samples were collected from two on-site monitoring wells (MW1 and MW2), which were installed in 1981 (see Section 2.5.2). Samples were submitted for analysis of arsenic, cadmium, lead, mercury, and selenium. Arsenic levels detected in ground water samples from on-site wells ranged from < 2 to 4 µg/L. No analytes were detected above EPA Maximum Contaminant Levels (MCLs).

The report indicated that ground water generally flows from the northwest toward the southeast, and that hydrogeologic conditions may occur during certain times of the year during which the ground water beneath the site may flow in a north to

northeasterly direction, toward the town of Rock Island and the private and municipal water supply well located in that area (ERM-Northwest, Inc. 1988b).

2.5.5 Characterization of Mercury in Soil/Fill at Silicon Metaltech, Inc., 1989

In August 1988, soil in the drywell area adjacent to the QC laboratory (Figure 2-3) was sampled. Soil samples indicated that some soil or fill was contaminated with mercury in the area underlying the former QC laboratory. The contamination appeared to be limited to a zone lying along the clay drain pipe extending from the laboratory drywell (ERM-Northwest, Inc. 1989). The drain pipe and 13 cubic feet of surrounding soil were removed and placed in wooden crates lined with plastic. The report recommended further remediation of this area to reduce mercury levels. At the time of this investigation, mercury had not been used at the plant QC laboratory in significant quantities since the 1960s. The report concluded that the mercury found in soil at the drywell did not appear to be the result of an ongoing release to the environment (ERM-Northwest, Inc. 1989).

START obtained copies of Uniform Hazardous Waste Manifests, dated April 27, 1992, which indicated that contaminated soil was disposed of off site by Chemical Waste Management of the Northwest (CWM 1992).

2.5.6 Underground Tank Closure, 1990

In 1990, Environmental Engineering and Consulting, Inc. (EEC) monitored and documented the removal of a 1,000-gallon capacity unleaded gasoline UST. Soil samples were analyzed for total petroleum hydrocarbons and benzene, toluene, and xylene. The report for the removal efforts indicated that soil in the vicinity of the tank excavation was not contaminated by residual petroleum hydrocarbons or benzene, toluene, and xylene (EEC 1990).

2.5.7 Laboratory Testing of Fume Waste via the Toxicity Characteristic Leaching Procedure (TCLP) Method, 1991

A letter from Mr. Patrick Wicks, EEC, to Mr. Jim Trunzo, Silicon Metaltech, Inc., dated April 17, 1991, describes results of fume waste samples. Five fume samples were collected by EEC and submitted for analysis of Toxicity Characteristic Leaching Procedure (TCLP) metals and TCLP SVOCs. Results showed that no samples exceeded the EPA TCLP regulatory limits (EEC 1991a).

2.5.8 Carbon Block and Hard Pan Furnace Wastes Analytic Data Summary, 1991

A letter report, dated May 2, 1991, provides results of testing of carbon block and hard pan at the site. Carbon block and hard pan are by-products of the smelting process which build up as a lining of the furnace and which were periodically removed. Carbon block and hard pan were stored in storage bins on site. Testing of carbon block and hard pan samples was recommended by ERM-Northwest, Inc. in 1988 to assess whether any wastes disposed in the on-site piles were

2. Site Background

hazardous waste. The letter includes the results of samples collected from a furnace during a 1988 maintenance overhaul. Since all furnaces process the same materials, these samples are assumed to be representative of all carbon block and hard pan at the site. The letter states that laboratory results indicated the carbon block and hard pan had levels of metals similar to background soil, although chromium was higher in the carbon block sample. Based on these results, the letter concluded that the carbon block and hard pan would not be classified as hazardous under the Extraction Procedure (EP) toxicity test (EEC 1991b).

2.5.9 Site Hazard Assessment, Silicon Metaltech Inc., 1991

In May 1991, Science Applications International Corporation conducted a Site Hazard Assessment (SHA) for Ecology. The SHA included an interview of a site representative to determine the processes related to the fume waste ponds and an inspection of the area where mercury contaminated soil had been removed. The bulk of the mercury contaminated soil had been removed, placed in plastic-lined crates, and was being stored near the fume waste pond directly west of the furnace building. The SHA recommended that the mercury-contaminated soil be disposed of offsite (SAIC 1991).

2.5.10 Environmental Due Diligence Report, 1992

In 1992, an environmental due diligence report was prepared by EEC for Mr. Kenneth Peterson of AST for the purchase of the site. The report discussed the following:

- **USTs:** There was one active 5,000-gallon UST used for boiler fuel. Results of a 1988 tank tightness test and subsurface soil sampling indicated no apparent leakage from the tank. This tank was exempt from UST regulations since it was used for on-site heating fuel. Two additional USTs were previously removed from site in 1988 and 1989, and subsurface soil testing indicated no apparent leakage from either tank.
- **Laboratory Drywell:** The cleanup of mercury contamination found at the QC laboratory drywell had not been completed. For this reason, Silicon Metaltech, Inc. had been listed as a contaminated site in Ecology's database.
- **PCBs:** A corrective action for this contaminated area was recommended in 1988, but no remedial actions had been taken related to PCBs.
- **Fume Hazardous Waste Determination:** Fume waste was tested in 1991 using TCLP analysis, and was determined not to be a hazardous waste (EEC 1992).

2.5.11 Department of Health Investigation Letter, 1993

A 1993 letter from the Washington State Department of Health (DOH), Office of Toxic Substances, to Ecology, Toxics Cleanup Program, indicated that the DOH had conducted a health investigation of Silicon Metaltech, Inc. DOH concluded that the site did not present a significant hazard to public health (DOH 1993). A copy of the original DOH investigation was not available.

2.5.12 Fume Characterization Summary Report, 2008

A summary of fume characterization activities was prepared by Farallon Consulting in October 2008 to address concerns expressed by Ecology in 2008 regarding potential health or environmental risks from fume material at the SCP facility. Ecology expressed these concerns as part of an evaluation of a request by SCP to terminate coverage of the NPDES permit (Farallon Consulting 2008). Fume material and ground water characterization, as well as conclusions of this report, are presented below:

- **Fume Material Characterization:** The fume material was sampled and analyzed for various metals by ERM-Northwest, Inc. in 1988 (as described in Section 2.5.4). Eight samples were collected from 15 locations (FW2 through FW16) in the fume ponds and fume storage area (see Figure 2-3 for sample locations). Material from some locations was composited, based on the relative age of the deposited materials. Total chromium and cadmium were the only metals detected at concentrations above MTCA Method A cleanup levels in the 1988 fume samples. A summary of analytical results is presented in Table 2-1. The pH of the fume material was neutral to slightly basic, ranging from 8.84 to 7.80.

Twelve fume leachate samples were also analyzed between 1988 and 1996, with no analytes detected above EP Toxicity or TCLP regulatory screening levels. A summary of EP Toxicity and TCLP analytical results is presented in Table 2-2. Results of a bioassay test conducted using a sample of the fume slurry discharge in July 1996 using 30 rainbow trout did not express a toxic effect.

- **Ground Water Characterization:** In April 1981, Hanna Mining Company installed two shallow ground water monitoring wells under the direction of Ecology (MW1 and MW2) (see Figure 2-3) and sampled them six times over a period of eight months. Samples were analyzed for arsenic, cadmium, chromium, lead, mercury, and selenium. Cadmium was the only constituent detected above the MTCA cleanup levels. In 1982, Ecology agreed that further sampling of the ground water was not necessary.

The wells were sampled again, in 1988, for arsenic, cadmium, lead, mercury, and selenium. No analytes were detected above the MTCA cleanup levels.

- **Conclusions:** Farallon Consulting concluded that there was no evidence of ground water contamination from the fume material and negligible potential for adverse effects to aquatic organisms from this material. They further concluded that, since operations at the site were similar through the 1980s and 1990s, fume waste material generated during those years would be of similar composition to earlier sample results (Farallon Consulting 2008).

2.5.13 START Preliminary Assessment

A Preliminary Assessment (PA) was prepared by E & E in 2012 for the EPA. The PA was conducted in response to a citizen's petition (E & E 2012b).

The PA indicated that potential sources of contamination at the site are the fume settling ponds and fume storage area, which are unlined and have the potential to leach metals or other fume components to the ground water. The primary contaminants of concern that were associated with these sources were determined to be cadmium and chromium, though arsenic was also detected in these sources. The PA indicated that the waste disposal area had not been sampled, and potential contaminants associated with this area were not known.

Though a number of wells in Rock Island, Washington, contained elevated concentrations of arsenic, the PA concluded that the fume pond and plant were not likely sources for this contamination based on earlier sampling. However, independent verification of fume pond and onsite ground water sampling results had not been conducted, and documentation of QA for these data was not available.

The PA also indicated that an additional potential source of high arsenic concentrations in ground water in the Rock Island area was historical lead arsenate pesticide use, and that arsenic from lead arsenate pesticide application or storage areas may remain in area soils.

2.6 Previous Rock Island Area Investigations

The START reviewed ground water quality and sampling information for the Rock Island area. Previous ground water investigations are summarized below:

2.6.1 Washington State University Water Quality Report

A preliminary water quality report was commissioned by the Chelan County PUD to determine background data and to predict potential impacts to ground water quality that could occur following the proposed raising of Rock Island Dam.

Ground water samples were collected in August 1973 through November 1974, and analyzed for nutrient and coliform contamination. In addition, static water levels were measured. The report indicated that many wells were not properly sealed and, therefore, were potential pathways for surface contamination to reach the ground water. Analysis for metals was not conducted during this study (WSU 1975).

A follow-up report by WSU included data collected during 1978 and 1979 after the water level in the Columbia River was raised by the construction of the addition to the Rock Island Dam. For this phase of the study, samples were collected from 25 ground water locations throughout the city of Rock Island (see Figure 2-4) and four surface water locations on the Columbia River (two upriver of Rock Island, and two downriver of Rock Island) (see Figure 2-5). The samples



2. Site Background

were analyzed for certain metals (along with nutrients and coliform), including arsenic, bromine, cadmium, chromium, copper, iron, lead, manganese, selenium, silver, and zinc.

Arsenic values exceeded the 1978 EPA Safe Drinking Water Act MCL of 50 µg/L in one well, Well 85, which was reported to have an arsenic concentration of 86 µg/L when sampled in September 1978. Well 85 was sampled again the following spring. At that time, arsenic concentrations were reported as 43 µg/L, which was below the EPA MCL of 50 µg/L. Other metals detected in ground water included chromium, copper, iron, manganese, and zinc; none of these metals were detected at concentrations above MCLs.

Surface water samples from the Columbia River indicated that all metals analytical results were below detectable levels, except manganese and iron which were within Ecology's Class A Water Quality Criteria.

Ground water flow during the monitoring period was generally to the southeast; however, ground water direction varied seasonally. During the irrigation season (about April to September), cones of depression on the ground water table associated with wells supplying local orchards caused local variations in ground water flow direction (WSU 1979).

2.6.2 Washington Department of Social and Health Services Water Quality Report for Drinking Water at Rock Island, 1989

A letter dated April 6, 1989, from the Washington State Department of Social and Health Services (DSHS) to Washington State Representative, included an attached water quality report and indicated that follow-up sampling had been conducted in response to high levels of metals reported in Rock Island wells during earlier sampling.

DSHS indicated that all of the re-samples and results had not confirmed the earlier results which were reported from an uncertified laboratory. The report concluded that there were no health concerns with the drinking water at that time. Although one well showed mercury levels just above the MCL, this was most likely due to the type of sample container used for collection. A follow-up sample from this well indicated mercury levels below the detection limit (DSHS 1989).

2.6.3 Water Quality at Rock Island, December 1990

In a memo dated December 31, 1990, entitled "Water Quality at Rock Island," Ecology summarized the water quality history of the area in order to achieve a basis for coordination of objectives between programs (Water Quality, Financial Assistance, and Toxics Cleanup). This summary is provided below:

- In 1973, a WSU water quality study was commissioned by the Chelan County PUD to predict ground water quality impacts which would occur

2. Site Background

by the proposed raising of the Rock Island Dam. The report determined that arsenic and selenium values exceeding the ground water standards set by EPA could be found in wells. Various rounds of follow-up sampling failed to confirm earlier results;

- In 1980, two soil samples (i.e., one surface soil and one at one foot below ground surface [bgs]) were collected from land in use as an orchard and from land not in use as an orchard. Results from these four samples indicated the following:
 - Non-orchard soil:
 - Surface – 9.3 milligrams per kilogram (mg/kg) arsenic, 3.4 mg/kg selenium, and
 - 1.0 foot bgs – 20.0 mg/kg arsenic, 5.1 mg/kg selenium,
 - Orchard soil:
 - Surface – 30.0 mg/kg arsenic, 5.3 mg/kg selenium, and
 - 1.0 foot bgs – 42.0 mg/kg arsenic, 6.0 mg/kg selenium;
- In 1980, Ecology collected a sample of water from a fume settling pond at the former plant site for arsenic analysis (as described in Section 2.5.1). Arsenic was detected at a concentration of 3,390 µg/L. In 1982, at the request of Ecology, Hanna Mining Company installed two monitoring wells adjacent to a fume settling pond at the plant to determine if the ponds were impacting ground water. Results of ground water monitoring indicated that fume pond materials were not leaching to ground water. Ground water monitoring was conducted without a written procedure, and well construction details were unknown. Ground water monitoring results did show a seasonal variation and were within EPA drinking water standards. (Ecology 1990)

2.6.4 Ground Water Production Well Evaluation, City of Rock Island, Washington, September 2007

A hydrogeologic evaluation was performed by GeoEngineers in support of a water system improvement project for the City of Rock Island. The City of Rock Island water system Well No. 3 had exceedances of water quality standards for arsenic; for this reason, the city intended to install a new well to replace Well No. 3. This report consists of a review of background hydrogeologic and ground water quality information, and a hydrogeologic reconnaissance. As part of the hydrogeologic evaluation, water samples were collected from private wells. Figure 2-6 shows the results of analysis for arsenic in these wells (GeoEngineers 2007).

Conclusions and recommendations included the following:



2. Site Background

- The glaciofluvial aquifer underlying the city is relatively shallow and primarily overlain by permeable sand and gravel deposits with no continuous low-permeability aquitard within the unsaturated zone. Because of this, the aquifer is highly susceptible to contamination introduced either on the ground surface or within the unsaturated zone. Development of a Wellhead Protection Plan was recommended;
- Elevated nitrate concentrations in Well No. 2 were suspected to be related to discharges from septic tanks located upgradient of the well, and possibly the leaching of nitrogen-bearing fertilizers in upgradient agricultural areas;
- Historic use of lead arsenate pesticides in orchards situated upgradient (northwest) of Well No. 3 was believed to be the most likely source of arsenic in that well;
- Ground water contamination levels in the Rock Island area (arsenic and nitrate) did not appear to be evenly distributed across the aquifer, and there was a potential for finding a source of ground water with favorable arsenic and nitrate concentrations within the city boundaries;
- Most arsenic exceedances in this region occur within and adjacent to agricultural areas with historic orchard use. Widespread arsenic and lead soil contamination in these areas is generally attributed to application of lead arsenate pesticides, which were primarily used to control chewing insects in apple and pear orchards. Lead arsenate pesticide use was widespread in Washington until 1948, when dichlorodiphenyl-trichloroethane (DDT) was introduced. Arsenic bonds strongly to soil particles and can persist in the environment for decades; and
- Permeable, relatively alkaline soil conditions are conducive to the mobilization of arsenic to ground water. GeoEngineers believed that the historic use of lead arsenate pesticides in orchards situated upgradient (northwest) of Well No. 3 was the most likely source of arsenic in that well.

2.6.5 Phase I Hydrogeologic Evaluation, Proposed Golf Course Well Site, City of Rock Island, Washington, February 2009

In 2009, GeoEngineers evaluated the feasibility of installing a new ground water production well at the golf course in Rock Island, Washington (see Figure 2-6). This evaluation was conducted for the City of Rock Island, which was evaluating the site for a proposed drinking water well. GeoEngineers conducted an environmental review, ground water monitoring well installation, and ground water sampling. Arsenic levels in the monitoring wells were below MCLs. GeoEngineers concluded that the golf course site was suitable for an additional well (GeoEngineers 2009).



2. Site Background

2.6.6 Phase II Hydrogeologic Evaluation, Golf Course Well Site, City of Rock Island, Washington, January 2010

GeoEngineers observed golf course municipal well drilling, installation, and testing. A total of eight ground water samples were collected from borings at the potential well site for laboratory analysis of nitrate and arsenic. Nitrate and arsenic concentrations in these samples were well below EPA drinking water standard concentrations (GeoEngineers 2010).

2.6.7 EPA Removal Assessment, July 2011

On July 7, 2011, the EPA Removal Program sampled soil, sediment, and ground water in the area of Rock Island, Washington in support of a removal assessment (see Figure 2-7). This action was in response to an EPA Public Petition from a local resident. The removal assessment was conducted to determine whether Rock Island residents were being exposed to potentially contaminated ground water and to identify the source of contamination, if possible (TechLaw, Inc. 2012).

Soil and sediment samples were collected from the following locations:

- Two background soil samples were collected from Kirby Billingsley Hydro Park (BG-1). One sample was collected from 0 to 6 inches bgs and one sample was collected from 3.0 to 3.5 feet bgs.
- Three soil samples, including a duplicate sample, were collected on residential property (SS-1/SS-2). Of these, one sample and a field duplicate were collected from 0 to 6 inches bgs and one sample was collected from 3.0 to 3.5 feet bgs.
- One soil sample was collected east of the former silicon plant property south of State Highway 28, from 0 to 6 inches bgs (SS-3).
- One sediment sample was collected at a fresh water pond east of the silicon plant property and south of State Highway 28, from 0 to 6 inches in depth (SD-1).

Analytical results indicated that soil at the residential property tested above MTCA Method A cleanup levels and EPA residential soil risk-based protection of ground water screening levels for arsenic, lead, 1,1-dichloro-2,2-bis(p-chlorophenyl) ethylene (DDE), and DDT. Soil sample SS-3, collected south of State Highway 28, slightly exceeded the arsenic MTCA Method A cleanup levels. Background soil samples also exceeded MTCA Method A cleanup levels for arsenic and lead (TechLaw Inc. 2012). Because this area has been historically used for orchards, it is possible that a former orchard may have been located at the site currently occupied by the Kirby Billingsley Hydro Park. Therefore, the sample results from the park were not used as background concentrations for comparison purposes (TechLaw, Inc. 2012).

2. Site Background

Ground water samples were collected from three residential wells (GW-1/GW-2, GW-3, and GW-4) within Rock Island (see Figure 2-7). GW-1/GW-2 is located approximately 600 feet north of State Highway 28. GW-3 is approximately 0.5 mile west of GW-1, and GW-4 is approximately 0.7 mile north of GW-1. Two ground water samples, including a duplicate sample (GW-2), were collected from location GW-1 (TechLaw, Inc. 2012).

Analytical results indicated that concentrations of arsenic in ground water at the GW-1/GW-2 sample location were 117 µg/L and 114 µg/L, more than eleven times higher than the EPA MCL for arsenic of 10 µg/L. The concentration of arsenic in the ground water sample from GW-3 was 18.9 µg/L. The concentration of arsenic in the ground water sample from GW-4 was 2.6 µg/L, below the MCL of 10 µg/L. No other metals in the ground water samples exceeded MCLs (TechLaw, Inc. 2012).

The removal assessment report recommended further investigation to determine the extent, magnitude, and source of the metals contamination to residential soil and ground water (TechLaw, Inc. 2012).

2.6.8 Chelan-Douglas Health District, Spring 2012

During March, April, and May of 2012, the Chelan-Douglas Health District accepted water samples brought into the Health District by Rock Island well owners for total arsenic analysis. The sampling methodologies used to collect these samples are not known, as each well owner obtained their own aliquots. Analytical results were supplied directly to the well owners, and a total of 34 sample results were later supplied by the well owners to the Health District. Analysis was conducted by Cascade Analytical, Inc. in Wenatchee, Washington. Reported concentrations ranged from 1.4 to 109 ppb (µg/L) arsenic; with a total of six results exceeding the EPA MCL of 10 µg/L. Figure 2-8 depicts these results by location (Prosch 2012).

2.6.9 EPA Removal Assessment, February 2013

In February 2013, the EPA Removal Program completed a removal assessment trip report summarizing work conducted in October 2012 to collect additional data for use in determining whether Rock Island area residents were being exposed to contaminated ground water. As previously mentioned, this field work was conducted concurrently with this SI. For two days, residents of Rock Island could obtain sample bottles and instructions from EPA and contractor staff and return the filled sample bottles for analysis. In addition, EPA Removal Program representatives went to some residences and collected ground water samples. In total 22 samples were collected: 13 by area residents and 9 by the Removal Program. All samples were analyzed for arsenic at a fixed laboratory and all samples were field tested for nitrate and nitrite. Arsenic concentrations in four samples exceeded the EPA MCL. These concentrations ranged from 11.2 to 22.4 µg/L. Field screening results indicated that nitrate in three of these same samples exceeded



2. Site Background

the EPA MCL of 10 µg/L; as well as in one additional sample. Figure 2-9 depicts arsenic results from the removal assessment. (TechLaw 2013)

2.7 Summary of SI Investigation Locations

Sampling under the Rock Island Silicon Plant SI was conducted at those areas considered potential contamination sources and at areas that may have been contaminated through the migration of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-regulated hazardous substances from sources onsite. Based on a review of background information, the following areas or features were identified for investigation under this SI.

2.7.1 Potential Sources

The potential sources at the site include:

- **Fume Pond Settling System:** The fume pond settling system comprises eight former settling ponds located in the central portion of the facility. The volume of fume in the ponds was calculated to be 43,533 cubic yards in 2003, after silicon metal manufacturing activities had ceased (Specialty Chemical Products 2003). Samples from the fume ponds indicate the possible presence of chromium and cadmium at concentrations above MTCA Method A Cleanup Levels. Antimony, arsenic, copper, lead, mercury, nickel, silver, and zinc also were detected (Farallon Consulting 2008).
- **Fume Storage Area:** In addition to the ponds, there is a fume storage area which consists of fume stockpiles that were formed by periodic excavation of fume material from the ponds. The volume of fume in the storage area was calculated to be 133,057 cubic yards in 2003 (Specialty Chemical Products 2003). Potential hazardous substances associated with the storage piles are those found in the fume, which are chromium and cadmium.

2.7.2 Targets

A number of Rock Island area residences obtain drinking and irrigation water from ground water. Additionally, the City of Rock Island operates a municipal water system which supplies potable water to residences and businesses of Rock Island. Arsenic contamination has been detected in a number of these wells at levels that exceed the EPA MCL. This SI was designed to aid in determining whether the former Rock Island Silicon Plant has impacted nearby ground water. Potential contaminants of concern are TAL metals.

2.7.3 Off-Site Sources of Arsenic and Lead

Most exceedances of the EPA arsenic MCL in eastern Washington ground water occur within and adjacent to agricultural areas with historic orchard use. Widespread arsenic and lead soil contamination in these areas is generally attributed to application of lead arsenate pesticides, which were primarily used to



2. Site Background

control chewing insects in apple and pear orchards up until approximately 1948. Arsenic is known to bond strongly to soil particles and can persist in the environment for decades (GeoEngineers 2007).

Throughout the nation, mixing of lead arsenate pesticides with water often occurred in a "mixing area" at the orchard. This mixture was then loaded into sprayers for application. The soil levels of both lead and arsenic are generally much higher at these mixing and loading areas. These mix/load locations typically have a water source such as an old well (WDHFS 2002). This SI was designed to aid in determining whether arsenic in residential wells is from the former Rock Island Silicon Plant or from the application, mixing, or potential mishandling of lead arsenate.

This page intentionally left blank.

3

Field Activities and Analytical Protocol

A sampling and quality assurance plan (SQAP) for the former Rock Island Silicon Plant SI was developed by the START prior to field sampling (E & E 2012a). The SQAP describes the sampling strategy, sampling methodology, and analytical program used to investigate potential hazardous substance sources and potential targets. With few exceptions, the SI field activities were conducted in accordance with the approved SQAP. Deviations from the SQAP are described, when applicable, in this section and in the sampling location discussions in Section 6 (source areas) and Section 7 (target areas). Deviations are also documented in the Sample Plan Alteration Form (SPAF) provided in Appendix A. All deviations to this SQAP were pre-approved by the EPA Task Monitor (TM) during the field sampling event.

The SI field sampling event was conducted from October 29, 2012 through November 2, 2012. A total of 53 samples, including six background samples, were collected for the SI. Sample types and methods of collection are described below. A list of all samples collected for laboratory analysis under this SI is contained in Table 3-1. Photographic documentation of SI field activities is included as Appendix B. Drilling logs were prepared for each borehole installed and are provided as Appendix C.

Alphanumeric identification numbers applied by the START to each sample location (e.g., FP01SB01) are used in the report as the sample location identifiers. Sample locations are provided on Figure 3-1. On this figure, samples collected from borehole locations are labeled only with the borehole number (e.g. FP01, AR01, BK02, etc.). Table 3-2 summarizes the sample coding system used for formulating sample numbers.

This section describes sampling methodology, analytical protocol, global positioning system (GPS) coordinates, and investigation-derived waste (IDW).

3.1 Sampling Methodology

Grass, leaves, and other vegetative material, rocks, and other debris unsuitable for analysis were removed from soil samples before being placed into sample containers. Samples were stored on ice in coolers continuously maintained under the custody of START personnel. Sampling methods used for each sample type are described below.

3. Field Activities and Analytical Protocol

3.1.1 Surface Soil Sampling

Surface soil samples were collected using dedicated plastic scoops. Collected material was placed in a dedicated plastic bowl, thoroughly homogenized, and then placed into pre-labeled containers.

3.1.2 Subsurface Sampling

Subsurface soil samples were collected either with a decontaminated stainless steel hand auger or with a decontaminated stainless steel split-spoon sampler lined with a dedicated Teflon™ sleeve. Material collected with the hand auger was transferred directly into a dedicated plastic bowl, while material collected with the split-spoon sampler was transferred into a dedicated plastic bowl using a dedicated plastic scoop. In both cases, material in the bowl was thoroughly homogenized with a dedicated plastic scoop and then placed into pre-labeled containers.

3.1.3 Ground Water Sampling

Ground water was collected from established wells (i.e., domestic and production wells) and newly installed temporary wells using the following techniques.

3.1.3.1 Established Wells

During purging of domestic and the onsite production wells, water quality parameters (pH, conductivity, temperature, dissolved oxygen, and oxidation reduction potential) were monitored and recorded in a field logbook. Once water conditions had stabilized (i.e., three successive readings taken at 5-minute intervals meeting the tolerances stated in the Ground Water Well Sampling Standard Operating Procedures provided in the SQAP), water samples were collected. Domestic and onsite production well samples were not filtered. These samples were collected directly into pre-labeled sample containers. Sample containers were pre-preserved, as necessary.

3.1.3.2 Temporary Wells

After the borehole was completed, a casing and screen were inserted into the borehole. The wells were constructed using 2-inch-inner-diameter, Schedule 40 polyvinyl chloride (PVC) threaded, flush-jointed riser pipes, screened with one 5-foot or 10-foot section of 2-inch, 0.010 inch factory-slotted PVC well screens that were certified clean by the manufacturer. The well screen penetrated into the saturated zone. A silica sand filter pack was installed in each temporary well. A low-flow, variable speed, stainless steel bladder pump was used to ensure a flow rate between 100 and 500 milliliters per minute to allow low flow purging and sampling.

Greater than three volumes of water were purged from the temporary wells prior to sampling to ensure the samples were not turbid and were representative of ambient ground water. During purging, water quality parameters (pH, conductivity, temperature, dissolved oxygen, and oxidation reduction potential) were monitored and recorded in a field logbook. Further, drawdown on the water

3. Field Activities and Analytical Protocol

table was monitored at 5-minute intervals with a water level indicator. Drawdown was not allowed to exceed 0.3 foot during purging and sampling. Ground water samples collected from temporary wells were filtered in the field using a 0.45-micron in-line filter while pouring the water into sample containers. Sample containers were pre-preserved, as necessary.

Temporary wells were abandoned generally within 24 hours of drilling with Cetco™ medium bentonite chips to within 0.5 foot of the ground surface. Fume material or native soil was used to fill the remainder of the borehole, depending on well location.

3.2 Analytical Protocol

Analytical protocols applied to the SI samples included off-site fixed laboratory analysis of TAL metals (as a total concentration of each individual metal) including mercury, synthetic precipitation leaching procedure (SPLP) for arsenic and lead, and select anions (bromide, chloride, bicarbonate, sulfate, and nitrate plus nitrite), and alkalinity in varying combinations based on information requirements. Analyses applied to the samples are presented in Table 3-1. Chain-of-custody forms are provided in Appendix D. Data validation memoranda and laboratory data sheets of analytical results for all samples are provided in Appendix E.

The following samples were submitted to EPA's Manchester Environmental Laboratory (MEL), a Contract Laboratory Program (CLP) laboratory, and a START-subcontracted laboratory for analysis:

- **TAL Metals by CLP Method ISM01.3 and EPA SW-846 6000 Series:** Fifteen water samples and 38 soil samples, including QA/QC samples, were submitted for analysis to Test America Laboratories, Inc., a CLP laboratory located in South Burlington, Vermont.
- **SPLP for Arsenic and Lead by EPA Methods 1312 and 6020:** Eleven soil samples, including QA/QC samples, were submitted for analysis to MEL, located in Port Orchard, Washington.
- **Anions (Sulfate, Bromide, and Chloride) by EPA Method 300.0:** Eight water samples, including QA/QC samples, were submitted for analysis to MEL, located in Port Orchard, Washington.
- **Nitrate plus Nitrite by EPA Method 353.2:** Eight water samples, including QA/QC samples, were submitted for analysis to MEL, located in Port Orchard, Washington.
- **Alkalinity by EPA Method 310.2 and Bicarbonate by SM Method 2320B:** Eight water samples, including QA/QC samples, were submitted for analysis to ALS Environmental, a subcontracted laboratory in Kelso, Washington.

3. Field Activities and Analytical Protocol

3.3 Global Positioning System

GPS coordinates of SI sample locations were collected utilizing a Trimble™ Geo XH handheld unit with a Zephyr™ external antenna. Recorded GPS coordinates by sample point are listed in Appendix F.

3.4 Investigation-Derived Waste

IDW generated during the SI sampling effort included disposable personal protective clothing and dedicated sampling equipment, soil cuttings from drilling operations, well purge water, and equipment decontamination water. All soil cuttings from drilling operations and purge/decontamination water were contained in 55-gallon drums. In total, 19 drums of IDW were generated, including 12 drums containing soil/fume cuttings and seven containing purge/decontamination water. All disposable IDW (i.e., sampling supplies and personal protection equipment) was double-bagged in plastic bags and disposed of at the local municipal landfill in Seattle, Washington. Materials that could be recycled (plastic, cardboard, steel, and paper) were segregated from trash at the EPA warehouse in Seattle, Washington, and collected by Waste Management.

Disposal decisions for drums containing IDW will be based on results from soil samples collected during drilling and from four water samples collected from the IDW drums containing purge/decontamination water (ID01WT through ID04WT). Table 3-3 provides IDW water sample results. At present, E & E is coordinating pick-up of IDW drums and transport of them to the disposal facility.

4

Quality Assurance/ Quality Control

QA/QC data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of sampling equipment, glassware, and reagents. Specific QC requirements for laboratory analyses are incorporated in the *Contract Laboratory Program Statement of Work for Inorganic Analyses* (EPA 2011). These QC requirements, or equivalent requirements, found in the analytical methods were followed for analytical work on the project. This section describes the QA/QC measures taken for the project and provides an evaluation of the usability of data presented in this report.

Data from the START-subcontracted commercial laboratory were reviewed and validated by a START chemist. Data qualifiers and labels were applied, as necessary, according to the following guidance:

- EPA (2009) *Guidance for Labeling Externally Validated Laboratory Data for Superfund Use*; and
- EPA (2010) *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review*.

In the absence of other QC guidance, method- and/or SOP-specific QC limits were also utilized to apply qualifiers to the data.

4.1 Satisfaction of Data Quality Objectives

The following EPA guidance document was used to establish data quality objectives (DQOs) for this project:

- (EPA 2000) *Guidance for the Data Quality Objectives Process* (EPA QA/G-4), EPA/600/R-96/055.

The EPA TM determined that definitive data without error and bias determination would be used for the sampling and analyses conducted during the field activities. The data quality achieved during the field work produced sufficient data that met the DQOs stated in the SQAP (E & E 2012a). A detailed discussion of accomplished project objectives is presented in the following sections.

4. Quality Assurance/Quality Control

4.2 QA/QC Samples

Trip blank QA samples are only required for VOC analyses and were not collected for this project. Rinsate blank QA samples were collected for each 20 samples collected using non-dedicated sampling equipment. QC samples included matrix spike/matrix spike duplicate (MS/MSD) and/or blank spike (BS) samples at a rate of one MS/MSD and/or BS per 20 samples per matrix.

4.3 Project-Specific Data Quality Objectives

The laboratory data were reviewed to ensure that DQOs for the project were met. The following describes the laboratories' abilities to meet project DQOs for precision, accuracy, and completeness and the field team's ability to meet project DQOs for representativeness and comparability. The laboratories and the field team were able to meet DQOs for the project, except the slight exceedance for accuracy as noted below.

4.3.1 Precision

Precision measures the reproducibility of the sampling and analytical methodology. Laboratory and field precision is defined as the relative percent difference (RPD) between duplicate sample analyses. The laboratory duplicate samples or MS/MSD samples measure the precision of the analytical method. The RPD values were reviewed for all commercial laboratory samples. A total of 31 sample results (approximately 2.4 percent of the data) were qualified based on precision outliers; therefore, the project DQO for precision of 90 percent was met.

4.3.2 Accuracy

Accuracy indicates the conformity of the measurements to fact. Laboratory accuracy is defined as the MS/MSD/BS percent recovery (%R) for all laboratory analyses. The %R values were reviewed for all MS/MSD/BS analyses. A total of 136 sample results (approximately 10.7 percent of the data) were qualified based on accuracy outliers; therefore, the project DQO for accuracy of 90 percent was slightly exceeded. No actions were taken based on slightly exceeding the DQO for accuracy.

4.3.3 Completeness

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). All laboratory data were reviewed for data validation and usability. No sample results were rejected; therefore, the project DQO for completeness of 90 percent was met.

4.3.4 Representativeness

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. The number and selection of samples were determined in the field to account accurately for site variations and sample matrices. The DQO for representativeness was met.

4. Quality Assurance/Quality Control

4.3.5 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. Data produced for this site followed applicable field sampling techniques and specific analytical methodology. The DQO for comparability was met.

4.4 Laboratory QA/QC Parameters

The laboratory data also were reviewed for holding times/temperatures/sample containers, laboratory blank samples, serial dilution analyses, and rinsate blanks. These QA/QC parameters are summarized below.

4.4.1 Holding Times/Temperatures/Sample Containers

All holding times, sample temperatures, and containers were acceptable.

4.4.2 Laboratory Blanks

All laboratory blanks met the frequency criteria. The following potential contaminant of concern was detected in the laboratory blanks:

- Inorganics: Aluminum, antimony, barium, beryllium, cobalt, iron, magnesium, manganese, nickel, potassium, selenium, silver, thallium, vanadium, and zinc.

See the data validation memoranda (Appendix E) for results qualified based on blank contamination.

4.4.3 Serial Dilution Analyses

Serial dilution analyses met the frequency criteria. A total of 20 sample results (approximately 1.6 percent of the data) were qualified based on serial dilution outliers.

4.4.4 Rinsate Blanks

Rinsate blank analyses were performed at a frequency of one per 20 samples collected using non-dedicated sampling equipment. There were no detections in the rinsate blank analyses except copper (0.80 µg/L) and sodium (8.9 µg/L) in RS03WT. All associated sodium results were already qualified as estimated quantities below the Contract Required Quantitation Limit (CRQL) (JQ); therefore, no additional actions were taken. Associated copper sample results were qualified as estimated quantities with a high bias (JH) if not previously qualified, or as estimated quantities with an unknown bias (JK) if previously qualified as estimated quantities with a low bias.

This page intentionally left blank.

5

Analytical Results Reporting and Background Samples

This section describes the reporting and methods applied to analytical results presented in Section 6 (sources) and Section 7 (targets) of this report, and discusses background locations and sample results. Table 3-1 lists all samples collected for laboratory analysis.

5.1 Analytical Results Evaluation Criteria

Analytical results presented in the summary tables of Sections 6 and 7 show all analytes detected above laboratory detection limits in bold type. Analytical results indicating significant/elevated concentrations of contaminants in source samples (Section 6) and target samples (Section 7) with respect to background concentrations are shown underlined and in bold type. For the purposes of this investigation, significant/elevated concentrations include those concentrations that are:

- Equal to or greater than the sample's CRQL or the Sample Quantitation Limit (SQL) when a non-CLP laboratory was used; and
- Equal to or greater than the background sample's CRQL or SQL when the background concentration was below detection limits; or
- At least three times greater than the background concentration when the background concentration was equal to or exceeded the detection limit.

The analytical summary tables present all detected compounds, but only those detected analytes at potential sources and targets meeting the significant/elevated concentration criteria are discussed in the report text. All detected concentrations are also discussed for the background samples. When samples were diluted for re-analysis at a laboratory, the dilution results were considered for evaluation and are provided in the tables.

5.1.1 Sample Results Reporting

The analytes aluminum, calcium, iron, magnesium, potassium, and sodium are common earth crust elements. Based on EPA Region 10 policy, these common earth crust elements will not be discussed in this report.

5. Analytical Results Reporting and Background Samples

5.2 Background Samples

Background samples were collected for each of the naturally occurring media from which SI samples were collected. These media are soil and ground water. Background sample locations are depicted on Figures 5-1 and 5-2 (also see Figure 3-1). Results for the appropriate background samples are shown in the first column of the analytical results summary tables in Sections 6 and 7 for comparison against source or target results.

5.2.1 Background Borehole Soil Samples

5.2.1.1 Sample Locations

Two background borehole soil samples (BK01SB01 and BK01SB02) were collected from borehole BK01 drilled in an area expected to be outside the site's range of influence (Figure 5-1). This property is approximately 1 mile west of the former Rock Island Silicon Plant and fronts the Columbia River. The borehole was placed in an orchard. Sample BK01SB01 was collected from 0.5 to 1.5 feet bgs and consisted of sandy loam and brown silt. Sample BK01SB02 was collected from 8 to 9 feet bgs and consisted of brown silty gravel. These samples will be used for comparison to all borehole soil/fume samples collected from the Rock Island Silicon Plant property.

5.2.1.2 Sample Results

The two background borehole soil samples were analyzed for TAL metals including mercury. BK01SB01 also was analyzed by SPLP for arsenic and lead (Table 6-1). Ten TAL metals (arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, and zinc) were detected in both BK01SB01 and BK01SB02. When comparing onsite borehole soil sample results to background concentrations, the higher sample result per analyte of the two background samples was used.

5.2.2 Background Residential Soil Samples

5.2.2.1 Sample Locations

A residence that is expected to be outside the site's range of influence and once was pastureland was selected as the background soil sample location (Figure 5-2). Two co-located background soil samples were collected from this property: one from 6 to 12 inches bgs (BK02SS) and one from 12 to 15 inches bgs (BK02SB). Analytical results from these samples indicate concentrations of arsenic and lead that appear to be under the influence of a source of contamination (Table 6-2). For this reason, these results are not considered to be representative of background conditions.

In this report, the shallow background borehole sample (BK01SB01), collected from 0.5 to 1.5 feet bgs, will be used for determining whether metals concentrations in area residential soil samples are elevated. The original background residential soil samples (BK02SS and BK02SB) also will be compared to BK01SB01 to demonstrate elevated concentrations in those samples.

5. Analytical Results Reporting and Background Samples

5.2.2.2 Sample Results

As discussed above, BK01SB01 was analyzed for TAL metals including mercury and by SPLP for arsenic and lead (Table 6-2). Ten TAL metals (arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, and zinc) were detected in this sample.

5.2.3 Background Temporary Well Ground Water Sample

5.2.3.1 Sample Location

One background temporary well ground water sample (BK01GW) was collected from a well (BK01) installed in an area expected to be outside of the site's range of influence (Figure 5-1). This well was drilled to 15 feet bgs, and a 10-foot temporary well screen was installed from 5 to 15 feet bgs. The static water level in this well was 5.42 feet bgs. Ground water was estimated to have been first encountered at 9 feet bgs during drilling. The sample was filtered and consisted of clear water with no odor. In this SI report, the sample will be used for comparison to onsite filtered borehole ground water samples.

5.2.3.2 Sample Results

The background temporary well ground water sample was analyzed for TAL metals including mercury, anions (sulfate, bromide, and chloride), nitrate plus nitrite, alkalinity, and bicarbonate (Table 7-2). Five TAL metals (arsenic, barium, copper, manganese, and nickel) were detected in this sample, as well as chloride, nitrate plus nitrite, and sulfate.

5.2.4 Background Domestic Well Ground Water Sample

5.2.4.1 Sample Location

One background domestic well ground water sample (BK02GW) was collected from a private well located in an area expected to be outside of the site's range of influence (Figure 5-2). According to its well log, this well has a total depth of 50 feet bgs and is not screened. The static water level was measured at 10 feet below the top of the casing at the time the well was drilled in August 2006. Sample BK02GW was not filtered and consisted of clear water with no odor and will be used in this report for comparison to unfiltered domestic well samples.

5.2.4.2 Sample Results

The background domestic well ground water sample was analyzed for TAL metals including mercury, anions (sulfate, bromide, and chloride), nitrate plus nitrite, alkalinity, and bicarbonate (Table 7-3). Six TAL metals (arsenic, barium, chromium, lead, vanadium, and zinc) were detected in this sample as well as chloride, nitrate plus nitrite, and sulfate.

This page intentionally left blank.

6

Potential Sources

This section describes potential sources, sample locations, and analytical results of SI samples obtained from potential sources that were detected at concentrations that were significant relative to background concentrations. In the text below, the term “significant concentration(s)” is taken to mean the value is significant relative to background concentrations. Also, qualifiers associated with analytical results are not discussed. Please refer to the corresponding analytical summary tables for information relating to these qualifiers.

6.1 Fume Settling Ponds

During the operational period of the silicon plant, fume was collected and marketed for various applications, such as concrete amendment. The remainder, which consisted of particulates too small to be recovered, recycled, or marketed, was slurried and deposited onsite in one of several unlined fume settling ponds (ERM-Northwest, Inc. 1988a).

The fume settling pond system comprised eight settling ponds (Ponds 1 through 8). The ponds were generally developed by filling existing topographic depressions with fume slurry, and ponds were added as more fume was produced. Ponds were allowed to dry out, and the dried fume was excavated and transferred to the fume storage area. Excavated ponds would then be reused to deposit more fume slurry (Farallon Consulting 2008).

The volume of fume in the ponds was calculated to be 43,533 cubic yards in 2003 (Specialty Chemical Products 2003). Samples from the fume ponds during earlier investigations indicate the possible presence of chromium and cadmium at concentrations above MTCA Method A Cleanup Levels. Antimony, arsenic, copper, lead, mercury, nickel, silver, and zinc also were detected (Farallon Consulting 2008).

The ponds were determined to have the following fume material depths (from Farallon 2008):

- **Pond 1** – 1 foot at the west end to approximately 10.5 feet at the east end.
- **Pond 2** – Depth of fume ranges from a few feet to approximately 11 feet.
- **Pond 3** – Depth of fume ranges from 2 to 3 feet on the east end to approximately 6 feet on the west end.
- **Pond 4** – The pond has a flat floor with a maximum depth of 10 feet.



6. Potential Sources

- **Pond 5** – The pond has a flat floor with a maximum depth of 6.5 on the north end.
- **Pond 6** – The pond has a generally flat bottom with a maximum depth of 2.75 feet.
- **Pond 7** – The pond has a generally flat bottom with a depth of 1.5 feet; however, a terrace in the fume surface on the west end results in a maximum depth of 4 feet in that area.
- **Pond 8** – The pond has a generally flat bottom and surface with depths ranging to a maximum of 3 feet.

6.1.1 Sample Locations

Six boreholes were planned for placement on the Rock Island Silicon Plant property within six of the fume settling ponds (i.e., Fume Ponds 1, 2, 4, 5, 6, and 7). Three subsurface soil samples were to be collected from each borehole with one of these samples collected of native soil from a 1.5-foot interval beginning at the water table. Drilling of on-site boreholes was to be conducted using a track-mounted hollow-stem auger. Subsurface soil samples from these boreholes were to be collected with a decontaminated spilt-spoon sampler.

Fume Ponds 4, 5, 6, and 7 are located on a plateau that is approximately 60 to 70 feet higher in elevation than Fume Ponds 1 and 2. Adverse soil conditions were encountered during drilling at Fume Pond 7. Clay was encountered beneath the fume material which extended from 7.5 feet bgs to the total depth of the borehole at 80 feet bgs. The drill rig's engine was taxed and subject to overheating while drilling as it attempted to drill through the clay to ground water. At 80 feet bgs, drilling could not continue without risking significant damage to the drill rig.

Since it had been determined that the drill rig would not be successful at reaching ground water at fume ponds located on the plateau, no further hollow-stem auger drilling occurred in this area. Instead, shallow boreholes (maximum depth of 4 feet bgs) were advanced at the remaining fume ponds (i.e., Fume Ponds 4, 5, and 6) using decontaminated stainless-steel hand augers. At Fume Pond 5, densely packed, essentially laminated, fume material prevented augering below 12 inches bgs, and the same conditions in Fume Pond 4 prevented augering below 2.5 feet bgs. Native soil at the water table could not be reached in Fume Ponds 4, 5, and 6 with the hand auger.

In total, 14 subsurface samples were collected from the fume ponds as follows (Figure 3-1):

- **Fume Pond 1** – FP01SB01 (fume material from 0.5 to 2 feet bgs), FP01SB02 (fume material from 8.5 to 10 feet bgs), and FP01SB03 (native soil from 24.5 to 25.5 feet bgs).



6. Potential Sources

- **Fume Pond 2** – FP02SB01 (fume material from 0.5 to 2 feet bgs), FP02SB02 (fume material from 8.5 to 10 feet bgs), and FP02SB03 (native soil from 15 to 16.5 feet bgs).
- **Fume Pond 4** – FP04SB01 (fume material from 6 to 12 inches bgs) and FP04SB02 (fume material from 2 to 2.5 feet bgs).
- **Fume Pond 5** – FP05SB01 (fume material from 6 to 12 inches bgs).
- **Fume Pond 6** – FP06SB01 (fume material from 6 to 12 inches bgs) and FP06SB02 (fume material from 3.5 to 4 feet bgs).
- **Fume Pond 7** – FP07SB01 (fume material from 0.5 to 2 feet bgs), FP07SB02 (fume material from 2.5 to 4 feet bgs), and FP07SB03 (native soil from 80 to 81 feet bgs).

6.1.2 Sample Results

All samples were analyzed for TAL metals. Sample FP01SB01 from Fume Pond 1 and sample FP06SB01 from Fume Pond 6 were also analyzed for arsenic and lead by SPLP. Table 6-1 provides these sample results. A total of six TAL metals were present at significant concentrations relative to background concentrations (cadmium, copper, lead, selenium, silver, and zinc). All significant concentrations were from fume material (i.e., native soils did not contain significant concentrations of metals). Fume Ponds 1 and 2 contained significant concentrations of cadmium (ranging from 1.1 to 2 mg/kg) and lead (ranging from 83.9 to 316 mg/kg) in both fume intervals sampled. In addition, lead (130 mg/kg) was present at a significant concentration in Fume Pond 4 at the 2- to 2.5-foot interval. Zinc was present at significant concentrations in seven of eleven fume samples (ranging from 230 to 763 mg/kg). Copper was present at significant concentrations in two fume samples (i.e., Fume Pond 2 in the 0.5- to 2-foot interval at 210 mg/kg and Fume Pond 4 in the 2- to 2.5-foot interval at 87 mg/kg); while selenium and silver were each detected at a significant concentration in one sample for each (Fume Pond 5 in the 0.5- to 1-foot interval at 4.7 mg/kg and Fume Pond 2 in the 0.5- to 2-foot interval at 1.4 mg/kg, respectively). Arsenic was not detected at significant concentrations in any of the fume material samples.

SPLP results indicate leachable concentrations of arsenic in Fume Ponds 1 and 6 (FP01SB01 at 85.8 µg/L and FP06SB01 at 49.4 µg/L) and lead in Fume Pond 1 (FP01SB01 at 100 µg/L) at levels that are significant relative to background concentrations. However, given that native soil beneath fume waste in Fume Pond 1 and deeper fume waste in Fume Pond 6 did not contain significant concentrations of total arsenic or lead, it appears vertical migration of these contaminants is limited.

6.2 Fume Storage Area

A fume storage area exists on the western end of the property which consists of fume stockpiles that were formed by periodic excavation of fume material from



6. Potential Sources

the ponds. The volume of fume in the storage area was calculated to be 133,057 cubic yards in 2003 (Specialty Chemical Products 2003). Potential hazardous substances associated with the storage piles are those found in the fume, which are chromium and cadmium (Farallon Consulting 2008), and potentially other heavy metals.

6.2.1 Sample Locations

A total of four samples of fume material (FS01SB through FS04SB) were collected. All samples were collected from 6 to 9 inches bgs and are depicted on Figure 3-1. The samples were collected from spatially separated locations to assess various areas of the fume stockpiles.

6.2.2 Sample Results

All samples were analyzed for TAL metals. Sample FS01SB was also analyzed for arsenic and lead by SPLP. Table 6-2 provides these sample results. A total of three TAL metals were present at significant concentrations relative to background concentrations (selenium, silver, and zinc). Zinc was present in all four samples at significant concentrations (ranging from 226 to 476 mg/kg), while selenium (5.0 mg/kg in FS02SB) and silver (1.8 mg/kg in FS01SB) were each detected in one sample at significant concentrations. No other TAL metals were present at significant concentrations. SPLP results from FS01SB revealed the presence of arsenic (14.8 µg/L) at a significant concentration relative to the background concentration.

6.3 Off-Site Sources of Arsenic and Lead - Rock Island Orchards

In eastern Washington, most exceedances of EPA arsenic MCL in ground water are due to historic use of lead arsenate pesticides. Further, widespread arsenic and lead soil contamination in eastern Washington orchards is generally attributed to the application of lead arsenate pesticides. These pesticides were in heavy use until approximately 1948. Arsenic is known to bond strongly to soil particles and can persist in the environment for decades (GeoEngineers 2007).

As previously discussed, many orchards throughout the nation with characteristics similar to Rock Island orchards had an area that was used to mix the lead arsenate pesticides with water and to load this mixture into sprayers. The soil levels of both lead and arsenic in these areas were generally high. These mix/load sites typically had a water source such as an old well (WDHFS 2002).

Original lead arsenate formulations became more refined over time, and eventually two principal forms were marketed: basic lead arsenate $[\text{Pb}_5\text{OH}(\text{AsO}_4)_3]$ for use in certain areas in California, and acid lead arsenate $[\text{PbHAsO}_4]$ for all other locations (WSU 2004). The composition of acid lead arsenate used in Washington State was approximately 22 percent arsenic and 44 percent lead. Application rates for orchards in Washington State peaked in 1943 at an estimated 191 pounds/acre lead and 71 pounds/acre arsenic. Arsenic

6. Potential Sources

from the application of lead arsenate pesticide likely occurs as arsenate in shallow soil conditions. Arsenic mobility in shallow soil conditions is likely to be limited, but potentially variable, depending on soil pH and soil type. Arsenic mobility can increase by either increasing pH or reducing the arsenic oxidation state from arsenate to arsenite. In alkaline soil or silica-rich sandy soil, arsenic would be expected to migrate more readily. Similarly, soil liming could increase pH and mobilize arsenic. Soil liming can include the application of phosphate fertilizers which often were used in replanted Washington orchards to enhance the growth of young trees (Landau 2006).

6.3.1 Off-Site Soil Sampling

Soil samples were collected at four Rock Island residences (termed Area Residence 1, Area Residence 2, Area Residence 3, and Original Background Area Residence in this report). Of these, two contained orchards, one was the location of a former orchard, and one is not known to have been associated with an orchard (this location was originally selected as a background location for this reason). In general, three locations were sampled at each residence, with one location at the wellhead and two from current/former orchards. At the original background location, only one location was sampled (see Figure 3-1).

The SQAP proposed collecting two soil samples at each location, one from 0 to 6 inches bgs and one from 2 to 4 feet bgs. During sampling, it was determined that the upper 6 inches of soil at most locations contained irrigation hoses or pipes, indicating that this surficial layer had been disturbed over time. Also during sampling, the presence of rocky soil prevented hand augering to the desired depth of 4 feet bgs. Instead of sampling the 0- to 6-inch interval, the first interval sampled generally started at 6 inches bgs and extended to 9 or 12 inches bgs, depending on the depth rocks were encountered. The second sample interval also was more shallow than planned due to early refusal from rocky conditions; at two locations, a second sample could not be collected due to rocky conditions.

6.3.1.1 Area Residence 1 Sample Locations

This residence has an orchard, and the property owner confirmed that lead arsenate had once been used at the orchard for pest control. Three co-located soil sample sets were collected. Samples AR01SS/AR01SB were collected from approximately 5 feet north of the wellhead from soil in an orchard. This location is downslope of the oldest orchard on site. Soil samples AR02SS/AR02SB and AR03SS/AR03SB were collected in the oldest orchard on the property, which was considered to be the most likely location for historic lead arsenate use (Figure 6-1). Soil samples AR01SS, AR02SS, and AR03SS were collected from 6 to 12 inches bgs. Deeper soil samples AR01SB and AR03SB were collected from 2 to 2.5 feet bgs, while soil sample AR02SB was collected from 2.5 to 3 feet bgs.

6.3.1.2 Area Residence 1 Sample Results

All samples were analyzed for TAL metals. Samples AR01SS (from near the wellhead) and AR02SS (from the historic orchard) were also analyzed for arsenic

6. Potential Sources

and lead by SPLP. Table 6-3 provides these sample results. A total of four TAL metals were present at significant concentrations relative to background concentrations (arsenic, cadmium, lead, and mercury). Arsenic was detected at significant concentrations in samples AR01SS, AR02SB, and AR03SS (ranging from 30.9 to 685 mg/kg). Lead was detected at significant concentrations in all samples, with the exception of AR03SB (ranging from 65.8 to 4,390 mg/kg). Cadmium (1.2 mg/kg) and mercury (0.34 mg/kg) were each detected in one sample at significant concentrations (AR01SS and AR02SB, respectively). SPLP results revealed the presence of arsenic and lead at significant concentrations in AR01SS (3,670 µg/L and 67 µg/L, respectively) and lead at a significant concentration in AR02SS (41 µg/L).

Total and SPLP arsenic and lead result in AR01SS, collected near the wellhead, were an order of magnitude higher than in most other samples collected from this property.

6.3.2.1 Area Residence 2 Sample Locations

This residence has an orchard and the property owner confirmed that lead arsenate had once been used at the orchard for pest control. Three co-located soil sample sets were collected. Soil samples AR04SS/AR04SB were collected from soil beneath a spigot near the wellhead. The wellhead was in an orchard. Soil samples AR05SS/AR05SB and AR06SS/AR06SB were collected from an orchard on the property (Figure 6-2). Soil samples AR04SS, AR05SS and AR06SS were collected from a 3- to 6-inch interval beginning between 5 or 6 inches bgs. Deeper soil samples AR04SB, AR05SB and AR06SB immediately followed the shallow samples and extended to 15 inches bgs.

6.3.2.2 Area Residence 2 Sample Results

All samples were analyzed for TAL metals. Samples AR04SS (from wellhead area) and AR05SS (from historic orchard) were also analyzed for arsenic and lead by SPLP. Table 6-3 provides these sample results. A total of four TAL metals were present at significant concentrations relative to background concentrations (arsenic, barium, copper, and lead). Arsenic and lead were detected in all samples at significant concentrations (ranging from 19.9 to 86.4 mg/kg and 92.8 to 710 mg/kg, respectively), with the exception of lead in AR05SB. Barium (499 mg/kg) and copper (57.4 mg/kg) were detected at significant concentrations in one sample, AR04SS. SPLP results revealed the presence of arsenic at significant concentrations in AR05SS (16 µg/L) and lead in AR04SS and AR05SS (15 µg/L and 12 µg/L, respectively).

6.3.1.1 Area Residence 3 Sample Locations

Area residence 3 was the location of a former orchard which was removed in 2004 in preparation for construction of a home and garage the same year. The current home owner deposited 2 to 4 inches of topsoil on locations meant to be lawn prior to seeding these areas. A strip of land on the eastern border of the property did not receive topsoil. The property owner did not know whether lead

6. Potential Sources

arsenate had been used on the land during the time it was in crop production, which occurred prior to his ownership. The well at the property was installed in 2004 to provide domestic water to the residence.

Three soil samples were collected from 6 to 12 inches bgs; one was placed near the wellhead (AR07SS) and two were placed outside of topsoil areas along the eastern property line (AR08SS and AR09SS). At AR07SS, a co-located deeper soil sample was collected (AR07SB) from 13 to 15 inches bgs where hand auger refusal was met. At the two remaining sample locations, rocky conditions prevented obtaining deeper samples. Sample locations are depicted on Figure 6-3.

6.3.1.2 Area Residence 3 Sample Results

All samples were analyzed for TAL metals. Samples AR07SS (from wellhead area) and AR08SS (from historic orchard) were also analyzed for arsenic and lead by SPLP. Table 6-3 provides these sample results. No TAL metals or SPLP results were significant relative to background concentrations at this property.

6.4.1.1 Original Background Area Residence Sample Locations

The residence originally selected for the background location is not known to have been associated with a former orchard. The property owner indicated that the land was formerly a pasture and, to her knowledge, had never been an orchard. Satellite images from 1990 depict an orchard immediately adjacent to the eastern boundary of this property which, by 2002, was no longer present (GoogleEarth™ 1990 and 2002). Given the topography of this area, runoff from the former orchard can be expected to have flowed to the west and onto the background property, and also to the north.

During sampling, rocky soil conditions at the wellhead prevented obtaining samples at this location. Instead, the sampling location was off-set approximately 30 feet north of the wellhead. Two co-located soil samples (BK02SS and BK02SB) were collected at this location (Figure 5-2). BK02SS was collected from 6 to 12 inches bgs, and BK02SB was collected from 12 to 15 inches bgs.

6.4.1.2 Original Background Area Residence Sample Results

Both samples were analyzed for TAL metals. Sample BK01SS also was analyzed for arsenic and lead by SPLP. Table 6-3 provides these sample results. The samples BK01SS and BK01SB contained elevated concentrations of arsenic at 44.8 mg/kg and 32.3 mg/kg, respectively. Sample BK02SS also contained elevated concentrations of lead at 198 mg/kg. SPLP results from BK02SS revealed the presence of both arsenic (162 µg/L) and lead (7.2 µg/L) at elevated concentrations with respect to background concentrations. The presence of arsenic and lead contamination to soils on this property may be the result of rain water or irrigation water runoff from the adjacent former orchard; though the actual source for this contamination is not known.

This page intentionally left blank.

7

Ground Water Migration Pathway and Targets

At the direction of the TM, and because of the relatively few targets associated with surface water migration, soil exposure, and air migration pathways, this section focuses solely on the ground water migration pathway.

The target distance limit (TDL) for the ground water migration pathway is a 4-mile radius that extends from the sources at the site. Figure 7-1 depicts the ground water migration pathway TDL. In a fashion similar to the Section 6 discussions of analytical results in this report, the term “elevated concentration(s)” is taken to mean the value is elevated relative to background concentrations. Also, qualifiers associated with analytical results are not discussed. Please refer to the corresponding analytical summary tables for information relating to these qualifiers.

7.1 Geologic Setting

The site is located within the Columbia Basin, a physiographic province underlain by Miocene Columbia River Basalt Group rocks (GeoEngineers 2007).

The site is located at the southeastern edge of the city of Rock Island. The city of Rock Island is located in a “tea cup” shaped valley surrounded by bluffs. There are seven lakes situated in a chain-like pattern paralleling the surrounding bluffs, suggesting that they are located along the path of an earlier meander of the Columbia River (GeoEngineers 2007).

Surficial geology within the Columbia River valley near and within the city of Rock Island generally consist of Quaternary glaciofluvial and mass wasting deposits, with minor alluvial sediments. Glaciofluvial deposits generally consist of unsorted mixtures of silt, sand, gravel, cobbles, and boulders deposited during Pleistocene catastrophic flooding events. Mass wasting deposits generally consist of landslide material, talus, and colluvium composed of unsorted sediments and angular basalt fragments. Alluvial deposits generally consist of silt, sand, and gravel deposited by the Columbia River (GeoEngineers 2007).

The site is underlain by alluvial deposits and glaciofluvial deposits (USGS 1982). Well logs at the site indicate sand and gravel (Ecology 2011a).



7. Ground Water Migration Pathway and Targets

7.2 Aquifer System

The city of Rock Island is underlain by a glaciofluvial aquifer consisting of sand and gravel with relatively high hydraulic conductivity and transmissivity. The aquifer is unconfined, and saturated aquifer thickness varies from less than 10 feet along boundaries with bedrock and mass wasting deposits to more than 180 feet within the interior of the city (GeoEngineers 2007). The Washington State University College of Engineering Research Division (WSU 1979) monitored ground water elevations in the Rock Island area during the period from August 1973 through November 1974 (see Section 2.5.1). This study determined that ground water flow was generally to the southeast; however, ground water direction varied seasonally. During the irrigation season (about April to September) cones of depression on the ground water table, associated with wells supplying local orchards, caused local variations in ground water flow direction (GeoEngineers 2007).

There are three former production wells onsite at the former Silicon Plant property (Wells No.1, No. 2, and No. 3). Wells No.1 and No. 3 are no longer in service. The pump from Well No. 3 has been removed. The power source to Well No. 1 has been disconnected. Well No. 2, used for non-potable purposes, is screened from 74 to 105 feet bgs, and Well No. 3 is screened from 65 to 105 feet bgs. Construction details for Well No. 1 could not be obtained.

Well logs for monitoring wells at the site indicate that ground water was 28 feet bgs, when recorded in February (Ecology 2011a).

7.3 Drinking Water Targets

Ground water is used to supply domestic and municipal wells within the 4-mile TDL. Drinking water populations by distance ring are provided in Table 7-1.

Domestic drinking water well logs within the TDL are maintained by Ecology. A search of Ecology's well logs revealed domestic wells within the 4-mile TDL (Ecology 2011a). Based on the most current census data, the average household size in Douglas County is 2.5 people (USDOC 2001). Approximately 580 people (232 wells times 2.5 people per household) utilize domestic drinking water wells within the TDL.

The City of Rock Island's water system consists of a single pressure zone, four wells (two wells actively used for drinking water supply, one for irrigation, and one inactive well), and two reservoirs. The water system serves approximately 298 residential and commercial connections. The two active wells are located within 0.25 to 0.5 mile of the site. The total water service area population is about 1,043 people (City of Rock Island 2007). The pumping capacity of the wells could not be obtained. For the purposes of this report, it is assumed that no well contributes more than 40 percent of the total pumping capacity. The site is not located within a wellhead protection area.

7. Ground Water Migration Pathway and Targets

Ground water sampling results from wells in the Rock Island area indicated the presence of arsenic above MCLs in five residential wells and one city well (GeoEngineers 2007; TechLaw, Inc. 2012).

Ground water is used for irrigation of food crops of five or more acres within 0.5 mile of the site (Ecology 2011b).

7.4 Ground Water Sampling

This section describes ground water sample locations and the analytical results associated with these samples.

7.4.1 Temporary Well Locations

The SQAP had proposed the installation of seven temporary monitoring wells at the former silicon plant property. Six were to be in fume ponds (i.e., Fume Ponds 1, 2, 4, 5, 6, and 7) and one at a location to the northwest of the ponds in the direction of residential areas of Rock Island. As previously described, adverse soil conditions prevented drilling to ground water at locations on the plateau at the site. For this reason, temporary wells were not installed at Fume Ponds 4, 5, 6, or 7, or in the location northwest of these ponds.

One temporary well was installed at Fume Pond 1 (FP01). This well was drilled to 25.5 feet bgs and a 5-foot temporary well screen was placed from 19 to 24 feet bgs. The static water level in this well was 12.35 feet bgs and one filtered ground water sample (FP01GW) was collected. The depth at which water was first encountered in this well was not possible to discern with accuracy due to the drilling method employed (i.e., hollow stem auger).

At Fume Pond 2, the first attempt at collecting a ground water sample was not successful. A temporary well was installed at FP02A to a total depth of 16.5 feet bgs. A temporary 5-foot well screen was installed from 9 to 14 feet bgs; however, this well did not produce a sufficient volume of water for sampling. A second temporary well was installed a few feet to the east at FP02B. This well was drilled to 25 feet bgs and a longer 10-foot temporary well screen was placed from 14 to 24 feet bgs in order to ensure ground water sampling would be successful. The static water level in this well was 5.8 feet bgs. One filtered ground water sample (FP02GW) was collected. The depth at which water was first encountered in this well also was not possible to discern with accuracy due to the drilling method employed.

7.4.2 Temporary Well Sample Results

Temporary well samples were analyzed for TAL metals including mercury, anions (sulfate, bromide, and chloride), nitrate and nitrite, alkalinity, and bicarbonate (Table 7-2). Four TAL metals were present at elevated concentrations with respect to background concentrations (arsenic, manganese, vanadium, and zinc). Of these analytes, arsenic, manganese, and vanadium were not likewise detected at significant concentrations in fume samples and, for this reason, are not considered to be attributable to that material. Zinc was present at

7. Ground Water Migration Pathway and Targets

an elevated concentration of 18.7 µg/L in FP01GW from Fume Pond 1 and at an elevated concentration of 5.0 µg/L in FP02GW from Fume Pond 2.

7.4.3 Production Well Sample Location

One ground water sample (PW01GW) was collected from the only remaining operational onsite production well, Well No. 2. The well has a depth of 105 feet bgs and is screened in water-bearing sand from 74 to 105 feet bgs. The sample collected from this well was not filtered.

7.4.4 Production Well Sample Results

The production well sample was analyzed for TAL metals including mercury, anions (sulfate, bromide, and chloride), nitrate and nitrite, alkalinity, and bicarbonate (Table 7-3). Five TAL metals were present at elevated concentrations with respect to background concentrations (barium, copper, lead, manganese, and nickel). Of these analytes, barium, manganese, and nickel were not likewise detected at significant concentrations in fume samples and, for this reason, are not considered to be attributable to that material. Copper and lead were present at elevated concentrations of 16.3 µg/L and 56.2 µg/L, respectively.

7.4.5 Domestic Well Sample Locations

Three area domestic wells were sampled (AR01GW, AR02GW, and AR03GW). Each well was in either a current or former orchard. Each well had been sampled during earlier investigations and each had been shown either to contain arsenic above the EPA MCL of 10 µg/L or be near a well that had arsenic above this level. The locations of the wells are depicted on Figure 3-1 and also on Figures 6-1, 6-2, and 6-3. The well associated with AR01GW is a hand dug well. A well log is not available for this well; however, the well owner believes the well is approximately 65 feet deep. The well associated with AR02GW is 73 feet deep and is screened from 62.5 to 72.5 feet bgs according to its well log. The static water level in this well was 22.5 feet below the top of the well at the time the well was drilled in September 2010. The well associated with AR03GW is 44 feet deep and is not screened according to its well log. The static water level in this well was 15 feet below the top of the well at the time the well was drilled in November 2004. Samples AR01GW, AR02GW, and AR03GW were not filtered and each consisted of clear water with no odor.

7.4.6 Domestic Well Sample Results

The domestic well samples were analyzed for TAL metals including mercury, anions (sulfate, bromide, and chloride), nitrate and nitrite, alkalinity, and bicarbonate (Table 7-3). Five TAL metals were present at elevated concentrations with respect to background concentrations (arsenic, barium, copper, manganese, and nickel). Arsenic and copper were detected in all three wells sampled at elevated concentrations ranging from 13 to 123 µg/L for arsenic and 16.3 to 21.2 µg/L for copper. At the locations of AR01GW and AR02GW, total and SPLP arsenic were likewise detected at significant concentrations in residential soil, as was barium in soil near AR02GW.

8

Summary and Conclusions

The former Rock Island Silicon Plant site is located within the city limits of Rock Island, Washington. The plant site is located on 58 acres of land, and is bounded by the Columbia River to the south and the main line of the Burlington Northern Railroad to the north. Areas north of the railroad are commercial and residential, including agricultural areas used as fruit orchards.

The site contains an out-of-use raw materials building and stockpile area, former processing buildings (including a furnace building, silicon storage building, and several other storage buildings), waste disposal area, eight fume settling ponds, and fume storage area.

Upon opening in 1942, the plant produced pig iron and ferrosilicon until the end of World War II. As the demand for ferrosilicon on the West Coast began to diminish in the early 1950s, the plant turned to the production of silicon metal. Silicon metal was shipped to customers in bulk, in jumbo sacks, or in palletized wooden boxes.

The plant also had a silica fume bagging facility. This operation stored, classified (by size), and packaged silica fume collected by the air pollution control system on the furnaces. The majority of this material was packaged in bags or shipped in bulk by truck or rail. The remainder, which consisted of particulates too small to be recovered, recycled, or marketed, was slurried and deposited on site in one of several unlined fume settling ponds. Ponds were allowed to dry out, and the dried fume was excavated and transferred to the fume storage area. Excavated ponds would then be used to deposit more fume slurry.

During this SI, samples of fume material from fume ponds and the fume storage area were collected, as well as samples of on-site and off-site ground water. Further, soil samples were collected off site from four Rock Island current or former orchards and one former pasture.

8.1 Potential Sources

Estimated depths of the eight on-site fume ponds (Fume Ponds 1 through 8) range from about 1.5 to 11 feet from the surface of the fume material. The volume of fume in the ponds was calculated to be 43,533 cubic yards in 2003. The fume storage area, located on the western end of the site, was calculated to contain 133,057 cubic yards of fume in 2003.



8. Summary and Conclusions

A total of six TAL metals were present in fume pond material at significant concentrations with respect to background concentrations, including cadmium, copper, lead, selenium, silver, and zinc; while the fume storage stockpiles also contained significant concentrations of selenium, silver, and zinc. SPLP results indicate the presence of arsenic and lead in fume pond material and arsenic in fume stockpile material at leachable concentrations that were significant relative to background concentrations; however, since native soil samples collected beneath Fume Ponds 1, 2, and 7 did not have significant concentrations of these metals, it appears vertical migration of these contaminants within the soil column has not occurred despite their ability to leach under normal precipitation conditions.

8.2 Targets

In 1980, a study conducted by WSU found high levels of arsenic and selenium in the ground water of Rock Island. A concern was raised that the fume at the Rock Island Silicon Plant may be contributing to that contamination.. In 1982, plant operators installed two shallow monitoring wells at the request of Ecology with depths of 29 and 36 feet. During the course of six rounds of sampling conducted by consultants for the plant operators, neither arsenic nor selenium were present in ground water samples at concentrations in excess of MTCA Method A cleanup levels. Resampling of these wells in 1988 by consultants for the plant operators confirmed the absence of arsenic and selenium at levels that exceeded regulatory criteria, in this case EPA MCLs.

For this SI, ground water at the former Rock Island Silicon Plant was resampled to confirm results obtained by consultants for the plant operators. Three ground water samples were collected from the former silicon plant: two from newly installed temporary monitoring wells and one from the only remaining operational production well. The monitoring wells were installed in Fume Pond 1 and Fume Pond 2 to 25.5 and 25 feet bgs, respectively. The production well has a depth of 105 feet. Four TAL metals were present at elevated concentrations with respect to background (arsenic at 7.9 µg/L, manganese at 164 µg/L and 1,370 µg/L, vanadium at 10.6 µg/L, and zinc at 18.7 µg/L and 5.0 µg/L). Of these, only zinc was likewise present in fume material at significant concentrations per TAL metals analysis. An MCL does not exist for zinc, nor do MTCA Method A ground water cleanup levels.

During the SI, samples of water from three Rock Island domestic wells were collected at locations that previously had contained arsenic above the EPA MCL during earlier sampling. Each of these locations was associated with a current or former orchard where lead arsenate either is known to have been used or may have been used. SI analytical results revealed the presence of five TAL metals (arsenic, barium, copper, manganese, and nickel) at elevated concentrations in at least one of these water samples. Arsenic and copper were detected at elevated concentrations in all three wells. Arsenic concentrations ranged from 13 to 123 µg/L, exceeding the EPA MCL of 10 µg/L at all locations. Copper

8. Summary and Conclusions

concentrations ranged from 16.3 to 21.2 $\mu\text{g/L}$, with none exceeding the EPA MCL of 1,300 $\mu\text{g/L}$. Barium has an EPA MCL of 2,000 $\mu\text{g/L}$, which was not exceeded in domestic well water. No EPA MCLs or MTCA Method A ground water cleanup levels exist for manganese and nickel. Soil near each wellhead and in current/former orchards at these residences was also sampled. TAL metals and SPLP results for arsenic in soil at these residences were likewise detected at significant concentrations.

8.3 Conclusions

Fume material at the former Rock Island Silicon Plant has been identified as containing significant concentrations of total cadmium, copper, lead, selenium, silver, and zinc, with respect to background concentrations. These constituents do not appear to be impacting ground water, with the possible exception of zinc which was present at elevated concentrations in on-site shallow monitoring wells; though it was not present at significant concentrations in native soil beneath the fume ponds. Zinc was not detected at elevated concentrations in Rock Island residential wells, indicating that migration of zinc from the site to these wells has not occurred. Arsenic, though not present at significant concentrations in fume material via TAL metals analysis, was present at a significant concentrations in fume samples analyzed by SPLP and was detected at a concentration of 7.9 $\mu\text{g/L}$ in one on-site well (the shallow well placed in Fume Pond 1). It should be noted that arsenic was not present at significant concentrations in native soil beneath the fume, and its detection at a concentration of 7.9 $\mu\text{g/L}$ observed in shallow ground water is lower than the EPA MCL of 10 $\mu\text{g/L}$ and lower than the concentrations observed in the domestic wells sampled. For these reasons, it does not appear that fume material from the former Rock Island Silicon Plant is responsible for elevated concentrations of arsenic in Rock Island domestic wells.

The previously detected elevated concentration of selenium, and the currently detected elevated concentrations of barium, copper, manganese, and nickel in residential well water do not appear to be attributable to the Rock Island Silicon Plant fume material since these analytes were either not present at significant concentrations in fume samples (in the case of barium, manganese, nickel, and selenium) or, although present in fume material at significant concentrations, had not migrated to on-site ground water (in the case of copper).

Area Residence 1 contained the highest arsenic concentrations both in well water and in soil samples. Total TAL metals (arsenic) concentrations in soil at the wellhead were 685 mg/kg at the 6- to 12-inch sample depth and 30.9 mg/kg at the 24- to 30-inch sample depth (whereas the highest total arsenic concentration in fume material at the former silicon plant was 18.9 mg/kg). The SPLP arsenic result for the shallow soil sample collected at the wellhead was 3,670 $\mu\text{g/L}$ (whereas the highest SPLP arsenic result in fume material at the former silicon plant was 85.8 $\mu\text{g/L}$). The well water sample had an arsenic concentration of 123 $\mu\text{g/L}$ (whereas are the highest concentration of arsenic in ground water at the former silicon plant was 7.9 $\mu\text{g/L}$). Given these results, it appears likely that the



8. Summary and Conclusions

source of arsenic at this residence is related to lead arsenate (either from its use, or possibly improper mixing, spills, or improper disposal practices). The elevated concentrations of arsenic in the other Rock Island area domestic wells also is more likely to be due to former lead arsenate use than from fume at the former silicon plant; however, in all cases, the source of arsenic in these domestic wells has not been confirmed.

9

References

Chemical Waste Management (CWM). 1992. Uniform Hazardous Waste Manifests, from Generator Silicon Metaltech, Inc., 100 S 4th Street, Rock Island, Washington. April 1992.

City of Rock Island. 2007. *Rock Island Tea Cup Area Comprehensive Plan, Rock Island, Washington*. July 2007
http://www.douglascountywa.net/departments/tls/growth/pdf/comp_ri.pdf.

Ecology and Environment, Inc. (E & E). 2012a, *Sampling and Quality Assurance Plan, Rock Island Silicon Plant (Former)*, prepared for the United States Environmental Protection Agency, Contract Number EP-S7-06-02. October 2012.

_____. 2012b. *Preliminary Assessment of the Rock Island Silicon Plant (Former)*, prepared for the United States Environmental Protection Agency, Contract Number EP-S7-06-02. January 2012.

Environmental Engineering & Consulting, Inc. (EEC). 1992. *Environmental Due Diligence for Purchase of Silicon Metaltech, Inc. at Rock Island, Washington*. November 1992.

_____. 1991a. Personal communication. Letter from Mr. Patrick Wicks, EEC, to Mr. Jim Trunzo, Silicon Metaltech. April 7, 1991.

_____. 1991b. Personal communication. Letter report: Carbon Block and Hard Pan Furnace Wastes Analytic Data Summary sent to Robert Miller, Silicon Metaltech, from Pat Wicks, EEC. May 2, 1991.

_____. 1990. *Underground Tank Closure, Silicon Metal Tech, Rock Island, Washington*, January 24, 1990.

ERM-Northwest, Inc. 1989. *Characterization of Mercury in Soil and Fill at Silicon Metaltech, Inc. – Rock Island, Washington*.

_____. 1988a. *Environmental Audit of M.H Hanna Company, Silicon Division, Rock Island, Washington*, prepared for Silicon Metals Tech, Inc. July 6, 1988.

9. References

- _____. 1988b. *Post Environmental Audit Site Characterization of Silicon Metaltech Inc., Rock Island, Washington*. December 5, 1988.
- Farallon Consulting. 2008. *Fume Characterization Summary Report, Specialty Chemical Products Rock Island Facility, Rock Island, Washington*. October 14, 2008.
- GeoEngineers. 2010. *Phase II Hydrogeologic Evaluation, Golf Course Well Site, City of Rock Island, Washington*. Prepared for Varela & Associates, Inc. January 2010.
- _____. 2009. *Phase I Hydrogeologic Evaluation, Proposed Golf Course Well Site, City of Rock Island, Washington*. Prepared for Varela & Associates, Inc. February 2009.
- _____. 2007. *Ground Water Production Well Evaluation, City of Rock Island, Washington*. Prepared for Varela & Associates, Inc. September 11, 2007.
- GoogleEarth™, July 1990 and December 2002. Historic satellite images of Rock Island, Washington. Webpage accessed on February 5, 2013.
- Landau Associates (Landau). 2006. *Technical Memorandum to the Washington State Department of Ecology regarding Arsenic and Lead Mobility in Area-Wide Contamination-Impacted Soil*. September 2006
- Prosch, D. 2012. Personal communication (telephone) between David Prosch, Chelan-Douglas Health District, Solid Waste Program, Environmental Health Specialist and Linda Ader, Ecology and Environment, Inc. regarding sampling of Rock Island ground water by the Chelan-Douglas Health District. December 2012.
- Science Applications International Corporation (SAIC). 1991. *Site Hazard Assessment (SHA) Report, Silicon Metaltech, Rock Island, Washington*. May 1991.
- Specialty Chemical Products. 2003. *Fume Quantity Analysis, Bill Brown, Specialty Chemical Products*. October 31, 2003.
- TechLaw, Inc. 2013. *Removal Assessment Trip Report for Rock Island Arsenic Site, October 2012, Douglas County, Washington*. Prepared for the United States Environmental Protection Agency, Region 10. February 2013.
- _____. 2012. *Rock Island Area July 2011 Removal Assessment Trip Report, Douglas County, Washington*. Prepared for the United States Environmental Protection Agency, Region 10. March 2012.

9. References

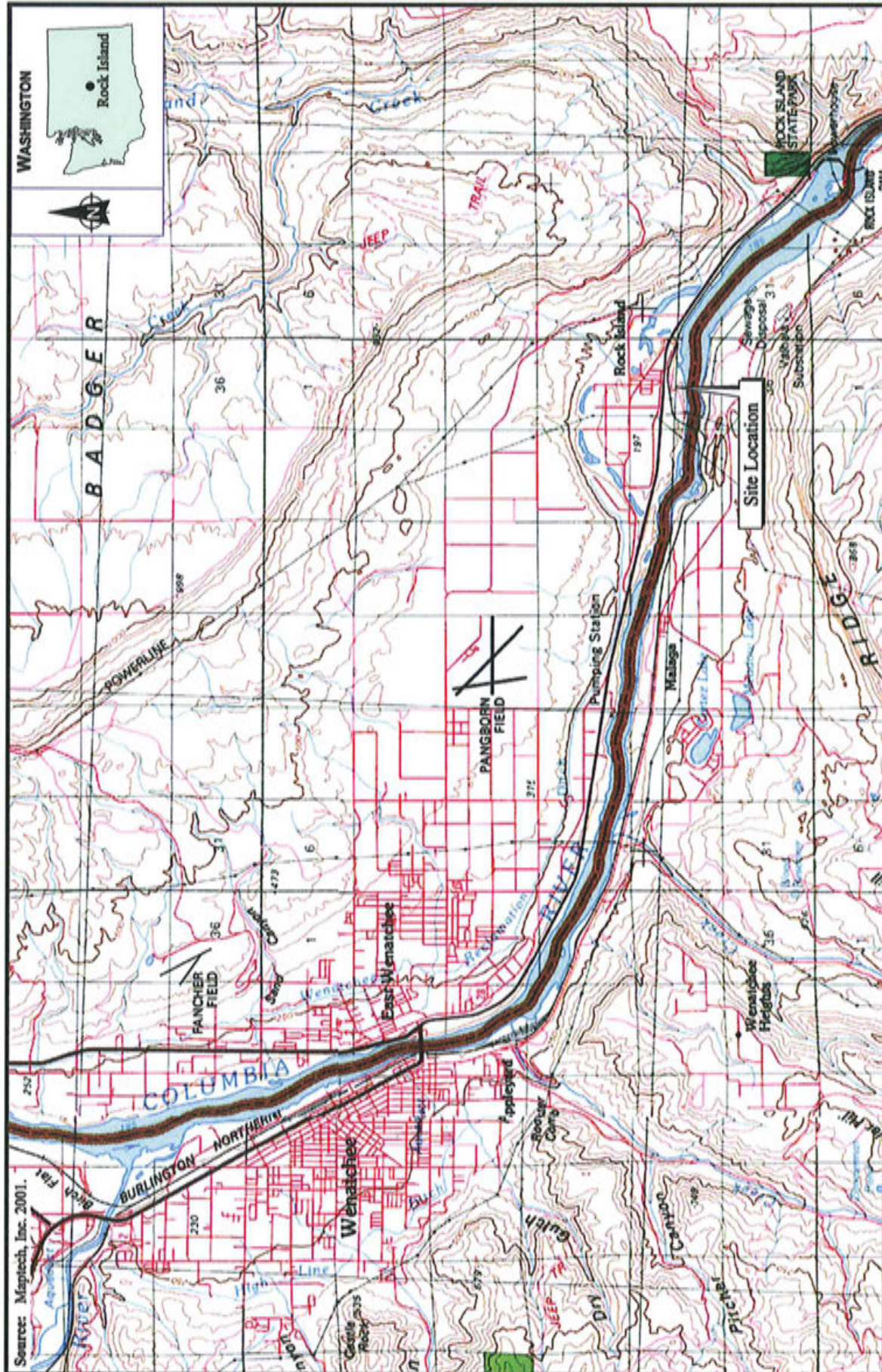
- Trunzo, J. 2012. Personal communication (email) between James Trunzo, Columbia Ventures Corporation, Specialty Chemical Product LLC, Vice President and Monica Tonel, U.S. Environmental Protection Agency, regarding dross. October 15, 2012.
- United States Department of Commerce (USDOC). 2001. Profiles of General Demographic Characteristics: 2000 Census of Population and Housing: Washington. May 2001.
- United States Environmental Protection Agency (EPA). 2011. *USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods, Multi-Media, Multi-Concentration, ISM01.3*. September 2011.
- _____. 2010. *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review*, OSWER 9240.1-51, EPA 540-R-10-011. January 2010.
- _____. 2009. *Guidance for Labeling Externally Validated Laboratory Data for Superfund Use*, EPA-540-R-08-005. January 2009.
- _____. 2000. *Guidance for the Data Quality Objectives Process*, EPA QA/G-4, Office of Research and Development, Washington, D.C., EPA/600/R-96/055. August 2000.
- United States Geological Survey (USGS). 1982. Wenatchee 1:100,000 quadrangle, Central Washington.
- Washington State Department of Ecology (Ecology). 2011a. Well Logs, Well Log ID: 207507, received 3/21/1994 <http://apps.ecy.wa.gov/welllog/>.
- _____. 2011b. Water Resources Columbia River Mainstem, <https://fortress.wa.gov/ecy/waterresources/map/WaterResourcesExplorer.aspx?appid=columbiariver>. Accessed July 11, 2011.
- _____. 2009. Fact Sheet for NPDES Permit No. WA-000286-1. Specialty Chemicals Products, LLC. April 6, 2009.
- _____. 2001. Personal communication (letter) from Ecology to AST, regarding Air Permit for AST facility in Rock Island, Washington. February 12, 2001,
- _____. 1999. Statement of Basis for Air Operating Permit No. DE 99AOP-C129 American Silicon Technologies Rock Island Smelter.
- _____. 1998. News Release, Ecology, AST smelter settle air pollution case. August 18, 1998. <http://www.ecy.wa.gov/news/1998news/98-139.html>.
- _____. 1990. Personal communication (memo) from Bob Raforth to John Fahsholtz regarding Water Quality at Rock Island. December 31, 1990.

9. References

- _____. 1982. Personal communication (memo) from Harold Porath to Russ Clark regarding Hanna Mining Company. October 1, 1982.
- _____. 1980. Personal communication (memo) from John Hodgson to Harold Porath regarding Rock Island Arsenic and Selenium Update. October 21, 1980.
- Washington State Department of Health (DOH). 1993. Personal communication (letter) from Milo Straus, DOH, to Anthony Grover, Washington State Department of Ecology. July 7, 1993.
- Washington State Department of Social and Health Services (DSHS). 1989. *Rock Island Summary Report*, April 6, 1989.
- Washington State University (WSU). August 1998, updated in July 2004. *Historical Use of Lead Arsenate Insecticides, Resulting Soil Contamination and Implications for Soil Remediation*.
- _____. 1979. *Pre and Post Flood Water Quality Investigation, Rock Island, Washington*. College of Engineering Research Division – Environmental Engineering and Geohydrology.
- _____. 1975. *Ground Water and Surface Water Quality – Biological, Physical and Chemical Aspects, Rock Island, Washington*.
- Wisconsin Department of Health and Family Services (WDHFS). 2002. *Human Health Hazards, Lead Arsenate Pesticides in Soil*.

Figures

This page intentionally left blank.



Source: Maptech, Inc. 2001.

WASHINGTON



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

Figure 2-1
SITE LOCATION MAP



Approximate Scale in Miles

Date: 1/7/13
Drawn by: AES

10:START-3\12050002\fig 2-1

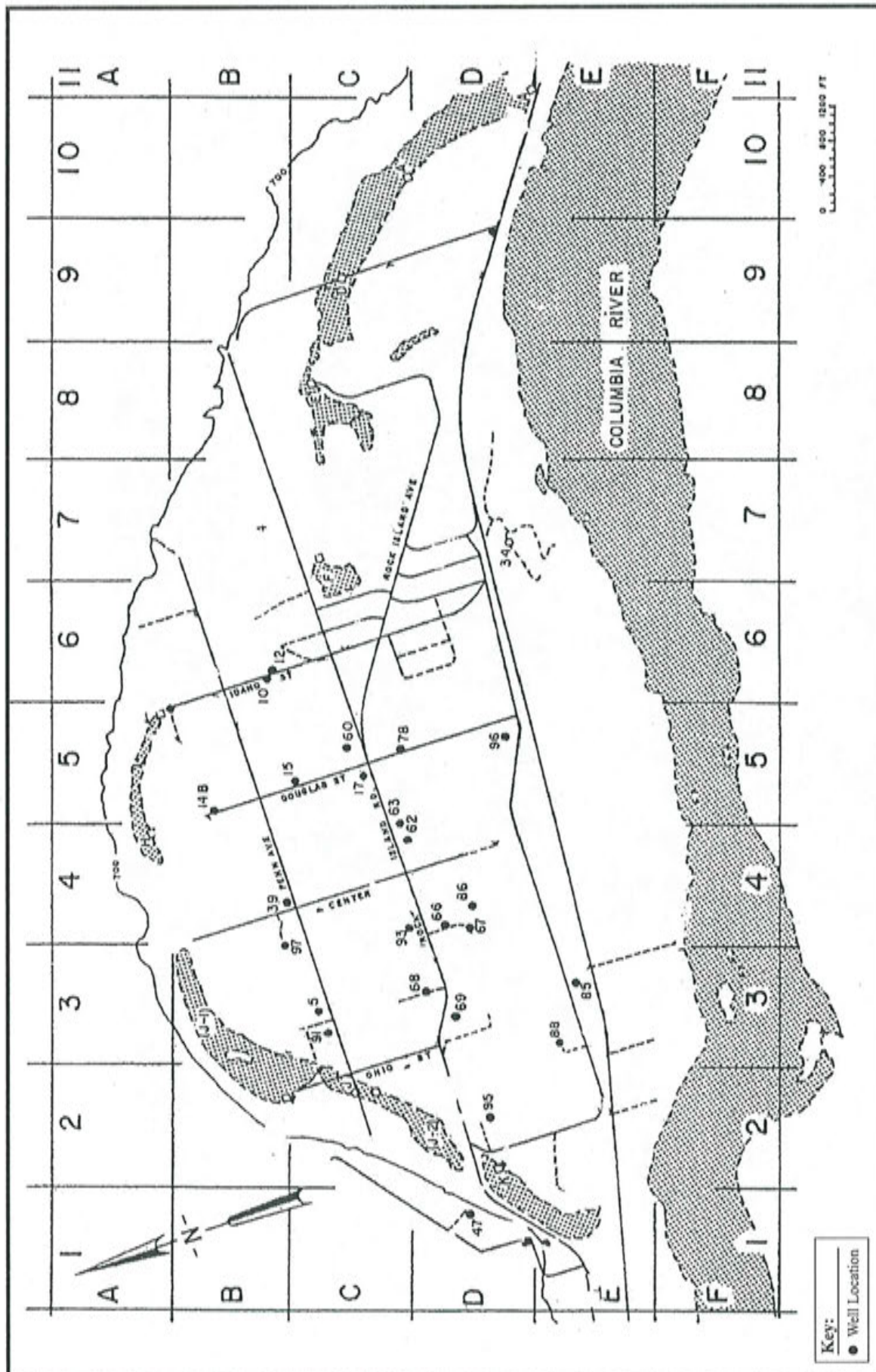
This page intentionally left blank.

Source: Google Earth Pro, 2011.



Source: Google Earth Pro, 2011; ERM 1988.





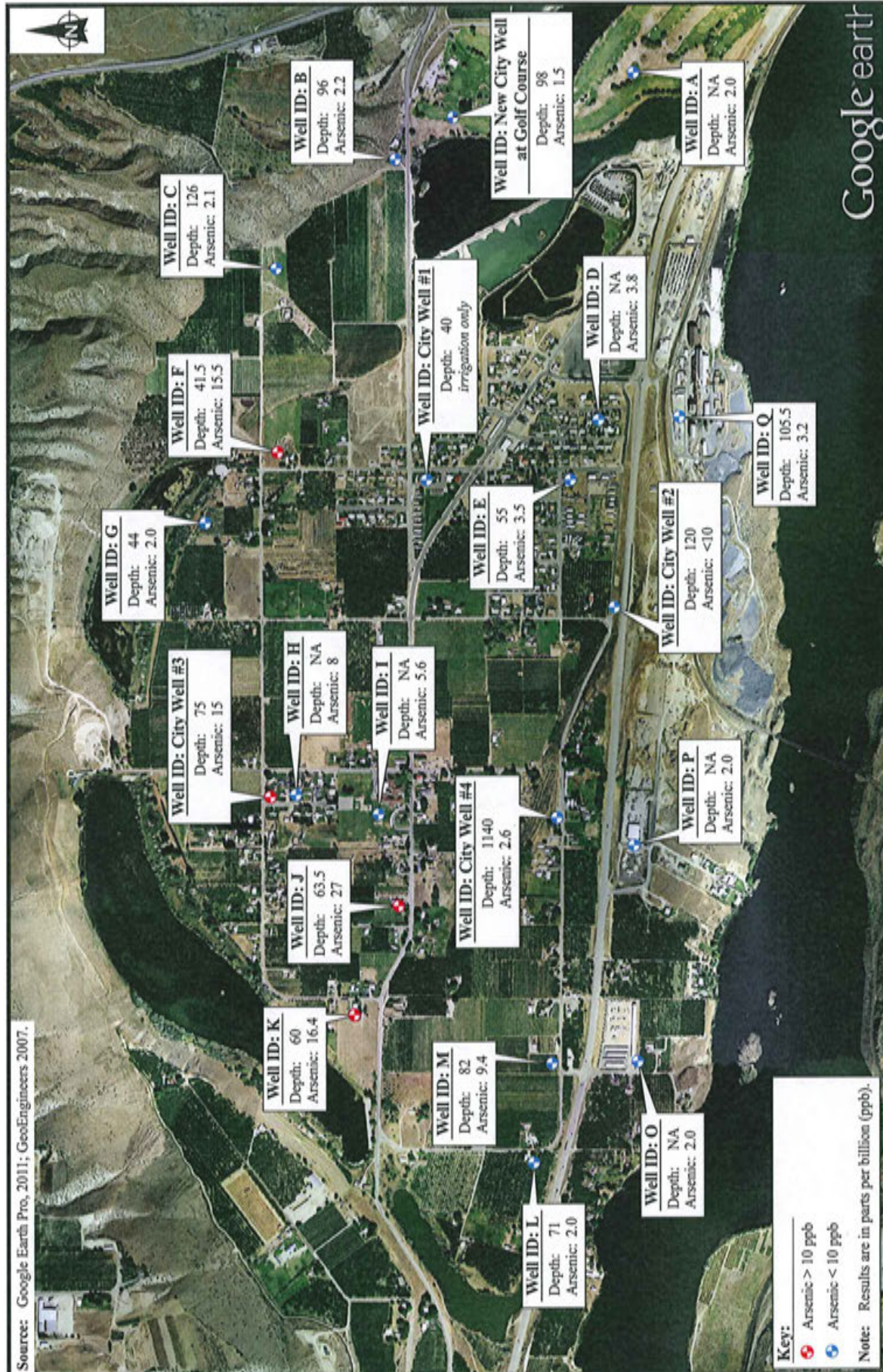
ecology and environment, inc. Global Specialists in the Environment Seattle, Washington	ROCK ISLAND SILICON PLANT (FORMER) Rock Island, Washington	Figure 2-4 ROCK ISLAND WELLS SAMPLED BY WSU IN 1978 - 1979		
Source: WSU 1979.	Date: 1/7/13	Drawn by: AES	10:START-3\12050002\fig 2-4	

Source: Google Earth Pro, 2011; WSU 1979.



ecology and environment, inc. Global Specialists in the Environment Seattle, Washington	ROCK ISLAND SILICON PLANT (FORMER) Rock Island, Washington	Figure 2-5 SURFACE WATER LOCATIONS SAMPLED BY WSU 1978 - 1979	ecology and environment, inc. Global Specialists in the Environment Seattle, Washington
Date: 1/7/13	Drawn by: AES	10:START-3\12050002\fig 2-5	10:START-3\12050002\fig 2-5

Source: Google Earth Pro, 2011; GeoEngineers 2007.



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

**ROCK ISLAND SILICON PLANT
(FORMER)**
Rock Island, Washington

Figure 2-6
**ARSENIC LEVELS IN ROCK ISLAND WELLS GROUND
WATER PRODUCTION EVALUATION, GEOENGINEERS 2007**

Date: 3/19/13

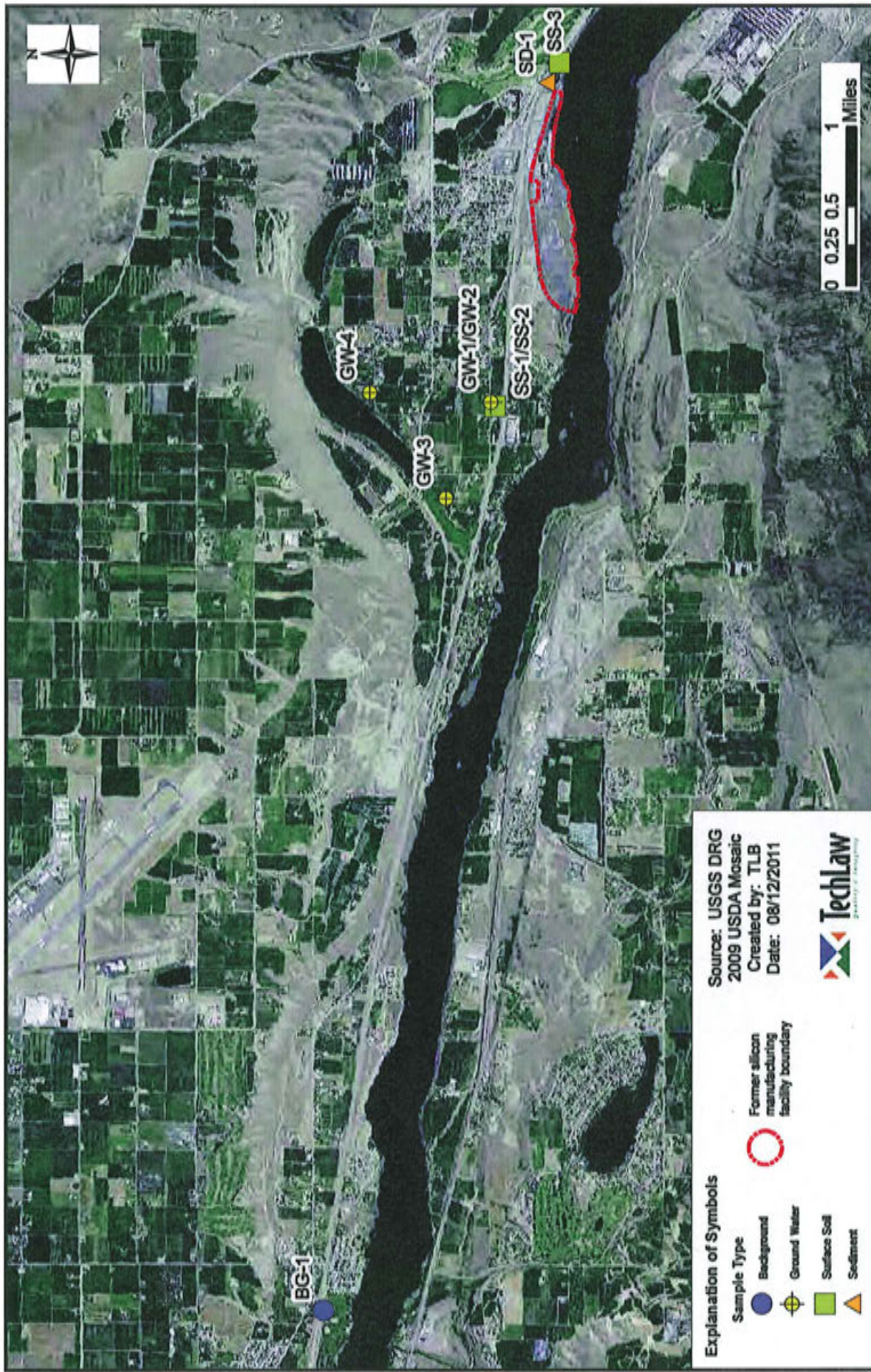
Drawn by: AES

10:START-3\12050002\fig 2-6

0 1225 2450
Approximate Scale in Feet

0 1225 2450
Approximate Scale in Feet

0 1225 2450
Approximate Scale in Feet

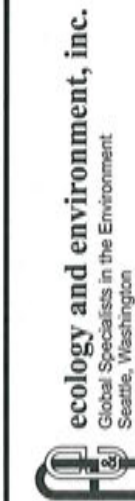


Source: USGS DRG
2009 USDA Mosaic
Created by: TLB
Date: 08/12/2011



Explanation of Symbols

- Sample Type**
- Background
 - Ground Water
 - Surface Soil
 - ▲ Sediment
 - Former silicon manufacturing facility boundary



ROCK ISLAND SILICON PLANT
(FORMER)
Rock Island, Washington

Base Map Reference: TechLaw 2011.

Figure 2-7

EPA REMOVAL ASSESSMENT
SAMPLE LOCATION MAP – JULY 2011

Date: 2/27/13
Drawn by: AES

10-START-3\12050002\fig 2-7

Source: Google Earth Pro, 2013.



Figure 2-8
CHELAN-DOUGLAS HEALTH DISTRICT
2012 ARSENIC RESULTS

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

Date: 1/8/13
Drawn by: AES
10-START-3\12050002\fig 2-8

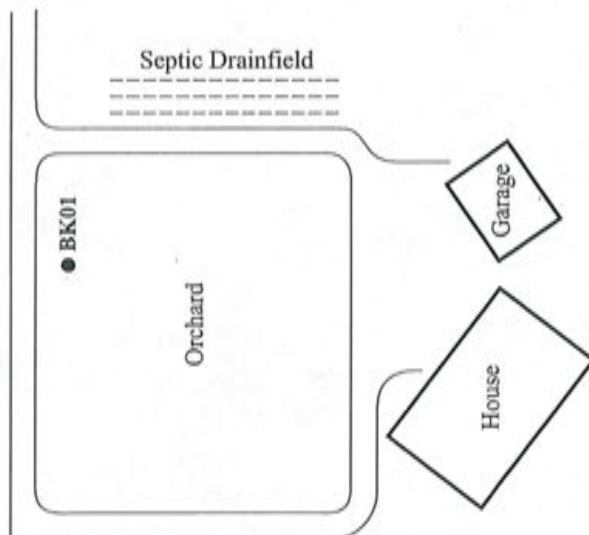
This page intentionally left blank.





Not to Scale

Highway 28



Columbia River



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

Figure 5-1
BACKGROUND LOCATION 1

Date:
1/7/13

Drawn by:
AES

10:START-3\12050002\fig 5-1



Not to Scale

Old
Pasture

● BK02SS/SB

⊕ Wellhead

House

House

● BK02GW ●

House

Street



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

Figure 5-2
BACKGROUND LOCATION 2

Date:
1/7/13

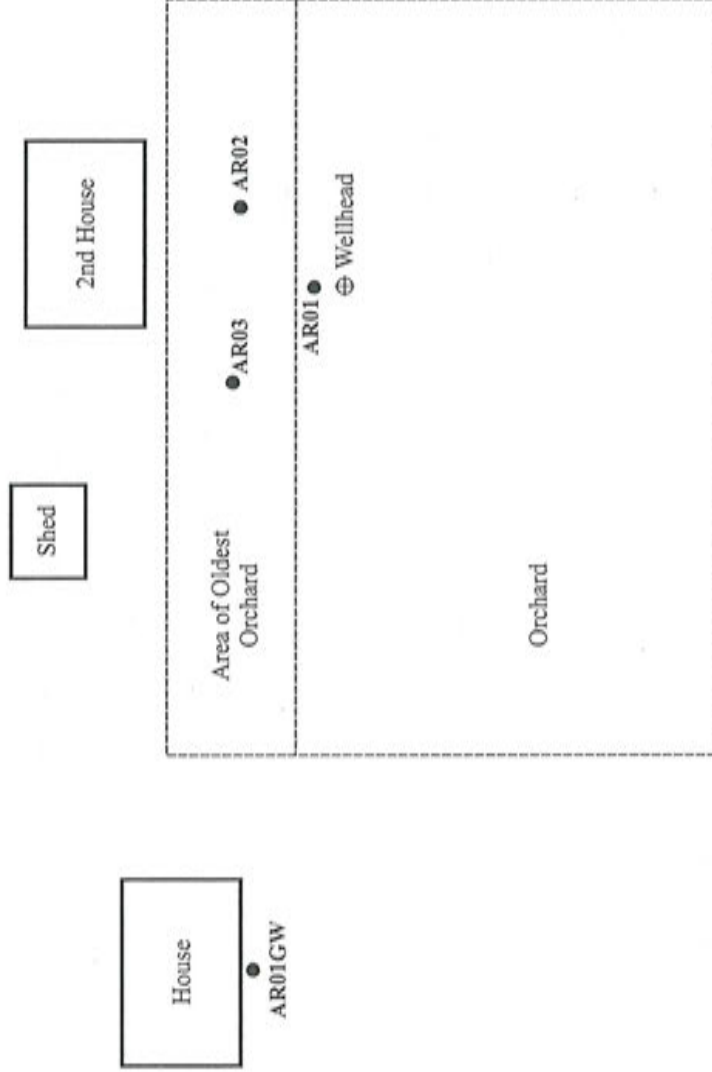
Drawn by:
AES

10:START-3\12050002\fig 5-2



Not to Scale

Street



ecology and environment, inc.

Global Specialists in the Environment
Seattle, Washington

ROCK ISLAND SILICON PLANT (FORMER)

Rock Island, Washington

Figure 6-1
AREA RESIDENCE 1

Date:
2/12/13

Drawn by:
AES

10:START-3\12050002\fig 6-1



Not to Scale

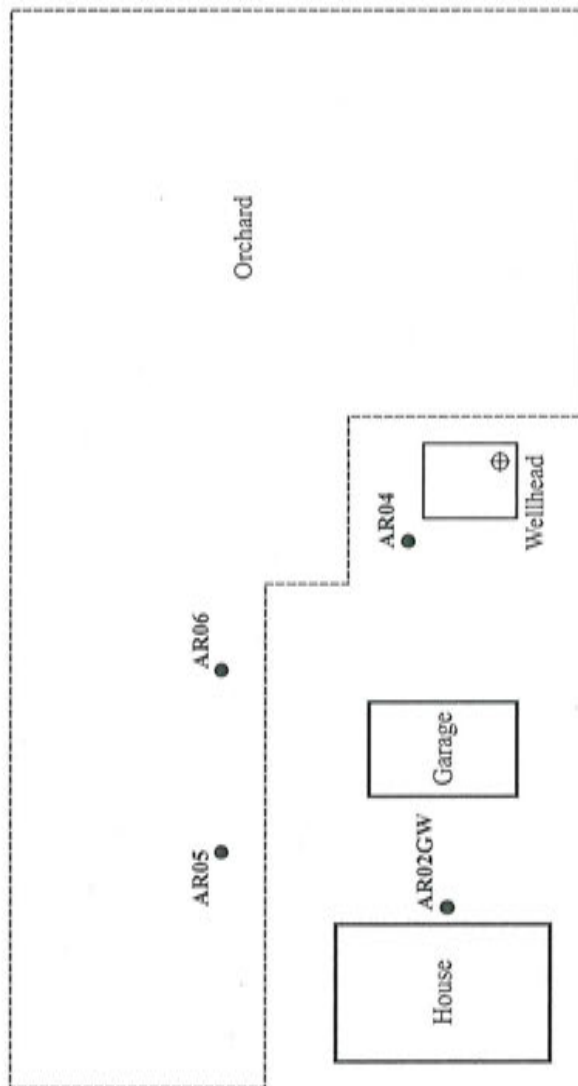


Figure 6-2
AREA RESIDENCE 2

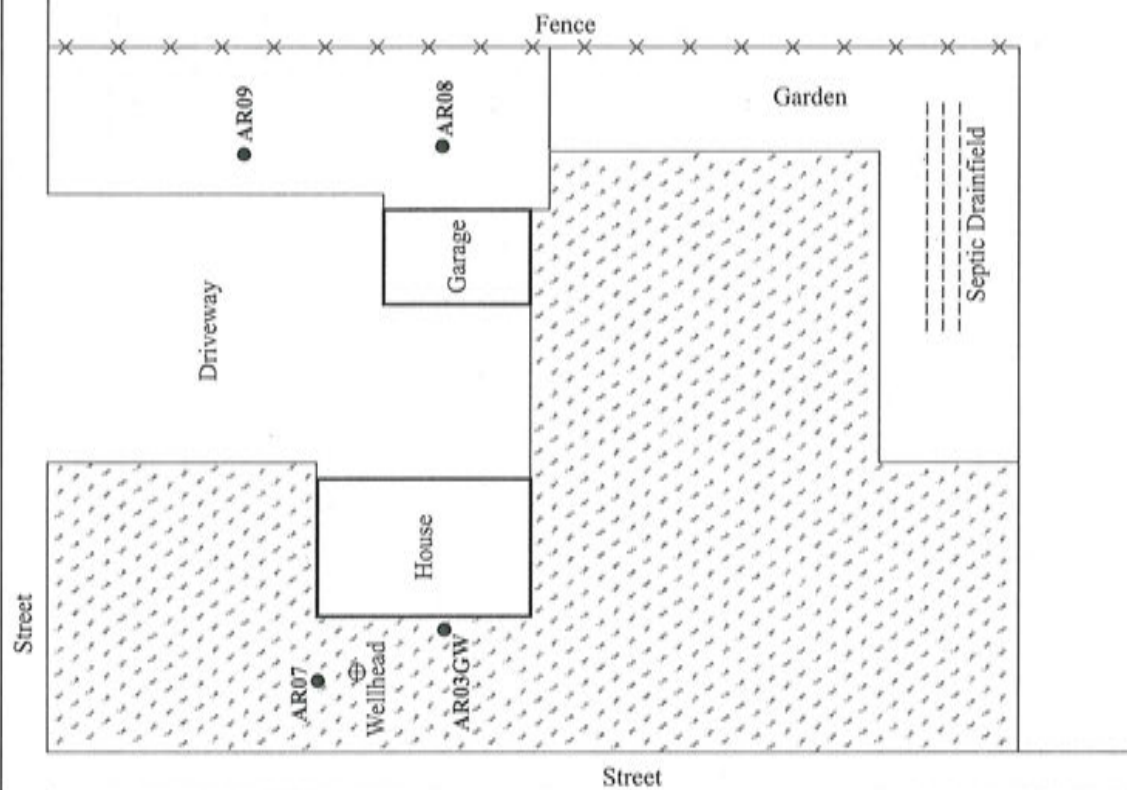
ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

Date: 2/12/13
Drawn by: AES
10-START-3\12050002\fig 6-2

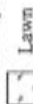


Not to Scale



Key

● Sample Location



Lawn



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

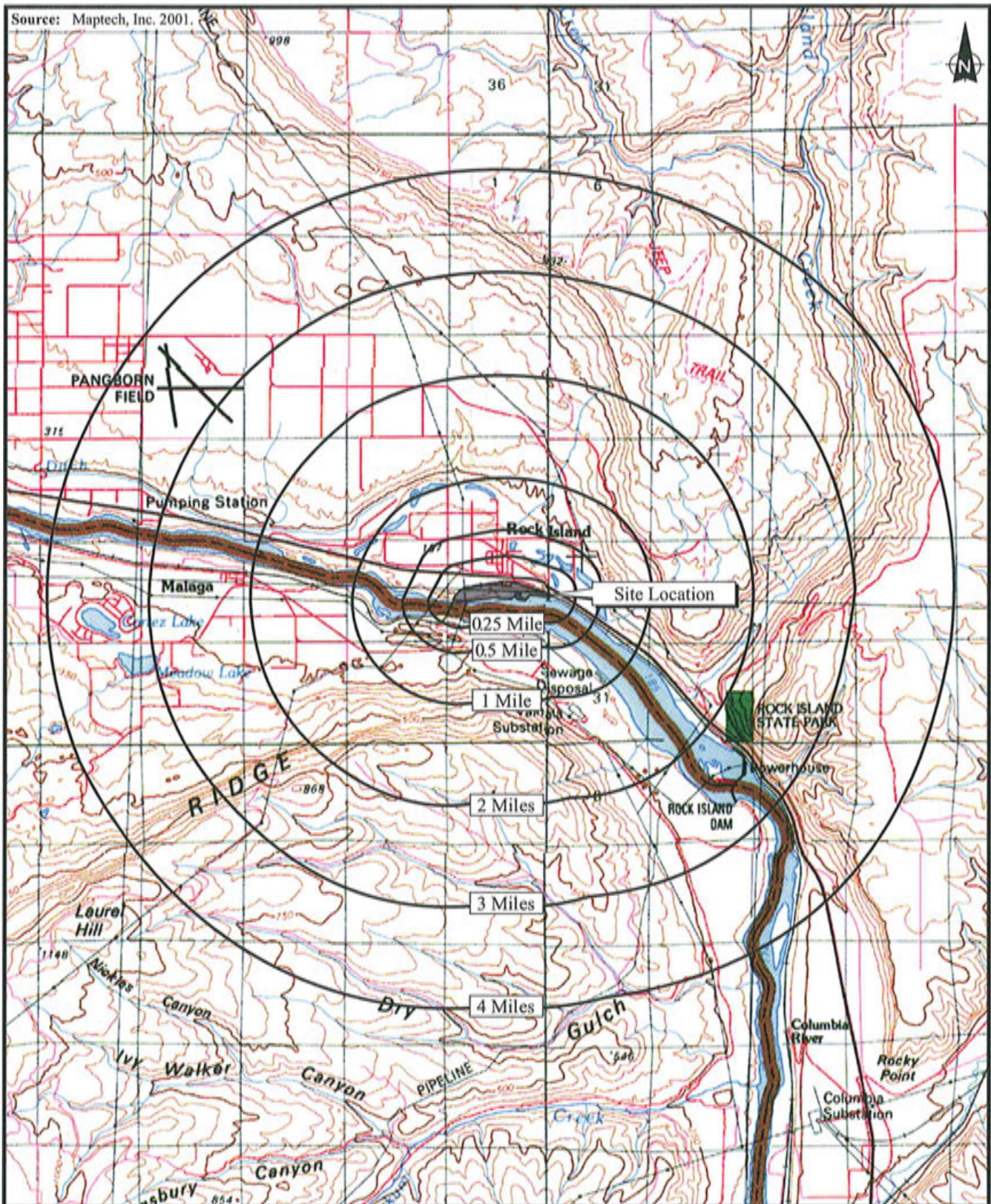
ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

Figure 6-3
AREA RESIDENCE 3

Date:
2/12/13

Drawn by:
AES

10-START-3\12050002\fig 6-3



ecology and environment, inc.
Global Specialists in the Environment
Seattle, Washington

**ROCK ISLAND
SILICON PLANT (FORMER)
Rock Island, Washington**

0 5 1
Approximate Scale in Miles

Figure 7-1

4-MILE TDL MAP

Date:
2-14-13

Drawn by:
AES

10:START-3\12050002\fig 7-1

This page intentionally left blank.

Tables

This page intentionally left blank.

Table 2-1 Summary of Analytical Results for Total Metals (mg/kg)

Analyte	Fume Ponds					Fume Storage Area				MTCA Method A or B Cleanup Level for Unrestricted Land Use
	Fume Pond 3 FW9	Fume Ponds 4 & 5 Composite FW8 & FW10	Fume Pond 6 Composite FW11 & FW12	Fume Pond 1 Composite FW13 & FW14	Fume Pond 2 Composite FW15 & FW16	Composite FW2 & FW3	Composite FW4 & FW5	Composite FW6 & FW7		
	10/4/1988	10/4/1988	10/4/1988	10/4/1988	10/4/1988	10/4/1988	10/4/1988	10/4/1988		
Date										
Antimony	<8.2	<2.2	2.5	2.5	<2.4	<2.4	<2.3	2.2	32	
Arsenic	<9.2	7.6	12	16	9.7	19	12	19	20	
Beryllium	<2.1	<0.76	<0.87	<0.87	<0.85	<0.85	<0.76	<0.77	160	
Cadmium	<0.61	0.97	1.6	1.1	<0.24	1.4	7.6	1.8	2	
Chromium	9.2	13	20	19	17	19	20	14	19 ^a /2,000 ^b	
Copper	40	68	49	63	4.8	47	54	56	3,000	
Lead	18	200	250	200	45	240	150	210	250	
Mercury	0.034	0.106	0.063	0.261	0.025	0.051	0.051	0.411	2	
Nickel	19	7.6	6.2	17	3.6	12	20	15	1,600 ^c	
Selenium	<9.2	<3.2	<3.7	<3.7	<3.6	<3.6	<3.3	<3.3	400	
Silver	<3.1	<1.1	1.2	<1.2	<1.2	2.2	<1.1	1.1	400	
Thallium	<9.2	<3.2	<3.7	<3.7	<3.6	<3.6	<3.3	<3.3	5.6 ^d	
Zinc	64	380	440	300	88	370	220	270	24,000	

Source: Farallon Consulting 2008

Note: **Bold** type indicates the sample result is above the detection limit.

Highlight indicates concentrations above cleanup levels.

a - MTCA Method A Soil Cleanup Level for Unrestricted Land Use of Chromium III.

b - MTCA Method A Soil Cleanup Level for Unrestricted Land Use of Chromium VI.

c - MTCA Method B Direct Contact Cleanup Level of Nickel Soluble Salts.

d - MTCA Method B Direct Contact Cleanup Level of Thallium Soluble Salts.

Key:

< = Less than the detection limit.

mg/kg = milligrams per kilogram.

This page intentionally left blank.

Table 2-2 Summary of Analytical Results for Total Metals - EP Toxicity and TCLP Leachate (mg/L)

Analyte	Fume Ponds									Fume Storage Area			TCLP Regulatory Levels
	FW9	Composite FW8 & FW10	Composite FW11 & FW12	Composite FW13 & FW14	Composite FW15 & FW16	Composite FW13 & FW15	FW8	Composite FW11 & FW12	Composite	Composite FW2 & FW3	Composite FW4 & FW5	Composite FW6 & FW7	
Date	10/4/1988	10/4/1988	10/4/1988	10/4/1988	10/4/1988	3/13/1991	3/13/1991	3/13/1991	7/19/1996	10/4/1988	10/4/1988	10/4/1988	8/17/2011
Arsenic	0.22	0.33	0.36	0.27	0.21	0.4	0.2	0.4	<0.1	0.22	0.36	0.36	5
Barium	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1.2	0.6	<0.5	<1.0	<1.0	<1.0	100
Cadmium	0.09	0.16	0.016	0.13	0.11	<0.01	<0.01	<0.01	<0.01	0.2	0.13	0.15	1
Chromium	<0.05	<0.05	0.14	<0.05	<0.05	<0.01	0.01	<0.01	<0.01	<0.05	<0.05	<0.05	5
Copper	<0.05	1.4	0.82	0.34	0.25	--	--	--	--	0.42	0.35	0.39	NE
Lead	0.14	3.9	4.1	1.3	0.69	0.26	0.22	0.15	<0.05	2.5	1.2	1.7	5
Mercury	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.2
Nickel	0.11	0.16	0.07	<0.05	<0.05	--	--	--	--	0.07	0.16	0.07	NE
Selenium	<0.05	0.08	0.09	0.07	0.06	<0.1	<0.1	0.1	<0.1	0.09	0.08	0.04	1
Silver	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	5
Zinc	0.89	16	11	4.0	2.0	--	--	--	--	9.0	3.0	6.0	NE

Source: Farallon Consulting 2008

Note: **Bold** type indicates the sample result is above the detection limit.

Samples analyzed in 1988 used the EP Toxicity method. Samples analyzed in 1991 and 1996 used the TCLP method.

Key:

-- = Not analyzed.

< = Less than the detection limit.

EP Toxicity = Extraction Procedure Toxicity Test Method.

mg/L = milligrams per liter.

NE = Not established.

TCLP = Toxicity Characteristic Leaching Procedure.

Table 3-1 Fixed Laboratory Sample Collection Summary

EPA Sample Number	Station	CLP Sample ID	Matrix	Date	Time	Depth	Sample Analysis					Description
							Sampler	TAL Metals	SPLP (As, Pb)	Anions (SO ₄ , Br, Cl)	Nitrate/Nitrite	Alkalinity & Bicarbonate
12444007	FP04SB02	MJ0AA7	SB	10/31/2012	1455	2-2.5 feet	JM	X	--	--	--	--
12444009	FP05SB01	MJ0AA9	SB	10/31/2012	1550	6-12 inches	JM	X	--	--	--	--
12444012	FP06SB01	MJ0AB2	SB	11/1/2012	0945	6-12 inches	JF	X	X	--	--	--
12444013	FP06SB02	MJ0AB3	SB	11/1/2012	1025	3.5-4 feet	JF	X	--	--	--	--
12444015	FP07SB01	MJ0AB5	SB	10/29/2012	1336	0.5-2 feet	JF	X	--	--	--	--
12444016	FP07SB02	MJ0AB6	SB	10/29/2012	1338	2.5-4 feet	JF	X	--	--	--	--
12444017	FP07SB03	MJ0AB7	SB	10/30/2012	1132	80-81 feet	JF	X	--	--	--	--
12444018	FS01SB	MJ0AB8	SB	10/29/2012	1500	6-9 inches	LA	X	X	--	--	--
12444019	FS02SB	MJ0AB9	SB	10/29/2012	1520	6-9 inches	LA	X	--	--	--	--
12444020	FS03SB	MJ0AC0	SB	10/29/2012	1533	6-9 inches	LA	X	--	--	--	--
12444021	FS04SB	MJ0AC1	SB	10/29/2012	1545	6-9 inches	LA	X	--	--	--	--
Surface Soil Samples												
12444022	AR01SS	MJ0AC2	SS	10/30/2012	1520	6-12 inches	LA	X	X	--	--	--
12444024	AR02SS	MJ0AC4	SS	10/30/2012	1605	6-12 inches	LA	X	X	--	--	--
12444026	AR03SS	MJ0AC6	SS	10/30/2012	1630	6-12 inches	LA	X	--	--	--	--
12444028	AR04SS	MJ0AC8	SS	10/31/2012	1330	5-9 inches	LA	X	X	--	--	--
12444030	AR05SS	MJ0AD0	SS	10/31/2012	1245	6-9 inches	LA	X	X	--	--	--
12444032	AR06SS	MJ0AD2	SS	10/31/2012	1400	6-12 inches	LA	X	--	--	--	--
12444034	AR07SS	MJ0AD4	SS	11/1/2012	1240	6-12 inches	LA	X	X	--	--	--
12444036	AR08SS	MJ0AD6	SS	11/1/2012	1140	6-12 inches	LA	X	X	--	--	--
12444038	AR09SS	MJ0AD8	SS	11/1/2012	1215	6-12 inches	LA	X	--	--	--	--
12444040	BK02SS	MJ0AE0	SS	10/31/2012	1640	6-12 inches	LA	X	X	--	--	--
Investigation-Derived Waste Samples												
12444058	ID01WT	MJ0AG0	WT	10/30/2012	1509	NA	JF	X	--	--	--	--
12444059	ID02WT	MJ0AF8	WT	10/31/2012	1640	NA	JF	X	--	--	--	--
12444060	ID03WT	MJ0AG1	WT	11/1/2012	1356	NA	JF	X	--	--	--	--
12444061	ID04WT	MJ0AG2	WT	11/2/2012	0816	NA	JF	X	--	--	--	--

Table 3-1 Fixed Laboratory Sample Collection Summary

EPA Sample Number	Station	CLP Sample ID	Matrix	Date	Time	Depth	Sample Analysis						Description
							Sampler	TAL Metals	SPLP (As, Pb)	Anions (SO ₄ , Br, Cl)	Nitrate/Nitrite	Alkalinity & Bicarbonate	
Rinsate Samples													
12444054	RS01WT	MJ0AF5	WT	11/2/2012	0851	NA	JF	X	--	--	--	--	Rinsate sample of split-spoon sampler.
12444055	RS02WT	MJ0AF6	WT	11/2/2012	0857	NA	JF	X	--	--	--	--	Rinsate sample of ground water pump.
12444056	RS03WT	MJ0AF7	WT	10/31/2012	1220	NA	LA	X	--	--	--	--	Rinsate sample of hand auger

Key:

-- = The sample was not analyzed for this parameter.

As = Arsenic.

Br = Bromide.

Cl = Chloride.

CLP = Contract Laboratory Program.

cm = centimeter.

EPA = United States Environmental Protection Agency.

GW = Ground water.

ID = Identification.

JF = J. Feters.

JM = J. Moerson.

LA = L. Ader.

mm = millimeter.

MS/MSD = Matrix Spike/Matrix Spike Duplicate.

NA = Not applicable.

Pb = Lead.

SB = Subsurface soil.

SO₄ = Sulfate.

SPLP = Synthetic Precipitation Leaching Procedure.

SS = Surface soil.

TAL = Target Analyte List.

WT = Water.

X = The sample was analyzed for this parameter.

Table 3-2 Sample Coding

Digits	Description	Code	Example
1,2	Source Code	FP	Fume Pond
		FS	Fume Storage Area
		BG	Background
		AR	Area Residence
3,4	Consecutive Number	01	First number of source code
5,6	Matrix Code	GW	Ground Water
		SB	Subsurface Soil
		SS	Surface Soil
		WT	Water
7,8	Consecutive Number	01	First sampled depth

Table 3-3 Investigation-Derived Waste Samples Analytical Results Summary

EPA Sample ID CLP Sample ID Station Number	12444058 MJ0AG0 ID01WT	12444059 MJ0AF8 ID02WT	12444060 MJ0AG1 ID03WT	12444061 MJ0AG2 ID04WT
TAL Metals (µg/L)				
Aluminum	146000	334	9150	126000
Antimony	2.0 U	2.0 U	4.3	8.0
Arsenic	1.9 JQ	8.0	13.7	31.6
Barium	314	82.2	209	215
Beryllium	5.8	1.0 U	0.52 JQ	5.1
Cadmium	0.48 JQ	0.16 JQ	2.1	4.5
Calcium	97500	90400	117000	80100
Chromium	38	2.0 U	10.1	15.2
Cobalt	32.9	1.0 U	9.7	10.1
Copper	103	2.4	63.2	54.7
Iron	142000	329	18200	122000
Lead	29.3	3.6	195	515
Magnesium	35000	40900	50600	25300
Manganese	1730	174	2730	1080
Nickel	61.0	3.3	15.3	33.5
Potassium	10300	14000	9510	19200
Sodium	39300	45400	121000	84500
Vanadium	88.1	10.5	33.7	77.1
Zinc	271	32.4	222	877

Note: **Bold** type indicates the sample result is above the contract required quantitation limit.

Key:

CLP = Contract Laboratory Program.

CRQL = Contract Required Quantitation Limit.

EPA = United States Environmental Protection Agency.

ID = Identification.

J = The associated value is an estimated quantity.

Q = The detected concentration is below the CRQL but is above the method detection limit.

TAL = Target Analyte List.

U = The analyte was not detected at or above the associated value.

µg/L = micrograms per liter.

This page intentionally left blank.

Table 6-1 Fume Pond Soil/Fume Samples Analytical Results Summary

EPA Sample ID	12444065	12444066	12444000	12444001	12444002	12444003	12444004	12444005	12444006	12444007	12444009	12444012	12444013	12444015	12444016	12444017
CLP Sample ID	MJ0AG6	MJ0AG7	MJSE79	MJ0AA1	MJ0AA2	MJ0AA3	MJ0AA4	MJ0AA5	MJ0AA6	MJ0AA7	MJ0AA9	MJ0AB2	MJ0AB3	MJ0AB5	MJ0AB6	MJ0AB7
Station Number	BK01SB01	BK01SB02	FP01SB01	FP01SB02	FP01SB03	FP02SB01	FP02SB02	FP02SB03	FP04SB01	FP04SB02	FP05SB01	FP06SB01	FP06SB02	FP07SB01	FP07SB02	FP07SB03
Sample Depth (feet bgs)	0.5 - 1.5	8 - 9	0.5 - 2	8 - 9.5	24.5 - 25.5	0.5 - 2	8.5 - 10	15 - 16.5	0.5 - 1	2 - 2.5	0.5 - 1	0.5 - 1	3.5 - 4	0.5 - 2	2.5 - 4	80 - 81
Location	Background		Fume Pond 1			Fume Pond 2			Fume Pond 4		Fume Pond 5	Fume Pond 6		Fume Pond 7		
TAL Metals (mg/kg)																
Aluminum	9310	9360	124	182	5390	259	237	7970	183	1350	1190	260	96.2	552	758	12000
Arsenic	6.6	4.4	5.7	5.4	2.9	15.7	7.6	4.7	1.9	18.9	4.4	2.6	1.8	0.98	2.2	0.81 U
Barium	89.5	87.3	9.4 JQ	20.5 U	41.9	24.7 U	24.5 U	69.6	22 U	22.7	19.2	21.5 U	21.4 U	19.2 U	18.4 U	56.2
Cadmium	0.14 JQ (SQL = 0.40)	0.1 JQ (SQL = 0.45)	<u>1.1</u>	<u>1.4</u>	0.11 JQ	<u>2</u>	<u>1.6</u>	0.17 JQ	0.15 JQ	0.44 JQ	0.43 JQ	0.18 JQ	0.16 JQ	0.13 JQ	0.12 JQ	0.084 JQ
Calcium	3840	3870	1060	1180	2310	869	502 JQ	17800	747	621	5400	1030	319 JQ	1160	1820	4740
Chromium	21.9	22.1	7.1	10	11.1	27.4	5.7	19.1	2.5	10.9	4.8	3.6	1.5	4.5	4.1	19.2
Cobalt	7.7 JL	7.9 JL	6.1 U	5.1 UJL	4.7 JL	6.2 UJL	6.1 UJL	7.7 JL	5.5 UJL	5.5 U	4.7 U	5.4 UJL	5.4 UJL	4.8 UJL	4.6 UJL	8.1
Copper	14.3 JL	21.2 JL	31.6	56.2 JL	11.9 JL	<u>210 JL</u>	29.2 JL	10.9 JL	14.3 JK	<u>87 JH</u>	17.7 JH	21.2 JK	10.9 JK	35 JL	32 JL	26.2
Iron	19800	17800	426	671	10300	1880	783	17300	303	4570	1790	590	158	1040	1790	15900
Lead	14.6 JK	8 JK	<u>113</u>	<u>177 JK</u>	12.7 JK	<u>316 JK</u>	<u>83.9 JK</u>	8.1 JK	9.9 JK	<u>130</u>	15.5	9 JK	7 JK	5 JK	5.4 JK	3.6
Magnesium	4130	5140	830	1320	3570	945	611 U	7710	549 U	611	988	538 U	536 U	480 U	461 U	3290
Manganese	337 JL	327 JL	175	90.6 JL	192 JL	211 JL	51.6 JL	298 JL	47.9 JL	66.4	70.2	23.1 JL	6.3 JL	28.9 JL	51.4 JL	189
Nickel	17.4	18	8.2	8.1	10.5	20	9.8	16.6	4.4 U	10.4	6.1	4.3 U	4.3 U	6.7	6.9	12.5
Potassium	1810	2110	747	1130	1050	1360	611 U	1490	549 U	834	755	1300	669	952	512	1630
Selenium	2.8 U	3.2 U	4.3 U	3.6 U	3.1 U	4.3 U	4.3 U	3.3 U	3.8 U	3.9 U	<u>4.7</u>	3.8 U	3.8 U	3.4 U	3.2 U	2.8 U
Silver	0.8 UJL	0.9 UJL	1.2 UJL	1 UJL	0.88 UJL	<u>1.4 JL</u>	1.2 UJL	0.95 UJL	1.1 UJL	1.1 UJL	0.94 UJL	1.1 UJL	1.1 UJL	0.96 UJL	0.92 UJL	0.81 UJL
Sodium	157 JQ	152 JQ	349 JQ	524	125 JQ	532 JQ	149 JQ	264 JQ	118 JQ	145 JQ	241 JQ	284 JQ	157 JQ	181 JQ	111 JQ	2420
Vanadium	41	36	6.1 U	5.1 U	22.3	6.2 U	13.7	35.4	5.5 U	16.1	11.6	7.8	5.4 U	12	9.8	28.9
Zinc	58.4 JL	55.8 JL	<u>230</u>	<u>398 JL</u>	40.7 JL	<u>763 JL</u>	76.8 JL	43.6 JL	102 JL	93	<u>474</u>	<u>448 JL</u>	<u>343 JL</u>	<u>235 JL</u>	136 JL	73.5
SPLP Metals (µg/L)																
Arsenic	4.9	NA	<u>85.8</u>	NA	NA	NA	NA	NA	NA	NA	NA	<u>49.4</u>	NA	NA	NA	NA
Lead	1.4 JK	NA	<u>100 JK</u>	NA	NA	NA	NA	NA	NA	NA	NA	1.8 JK	NA	NA	NA	NA

Note: **Bold** type indicates the sample result is above the contract required quantitation limit.
 Underline type indicates the sample result is significant as defined in Section 5.

Key:

bgs = below ground surface.

CLP = Contract Laboratory Program.

CRQL = Contract Required Quantitation Limit.

EPA = United States Environmental Protection Agency.

ID = Identification.

H = High bias.

J = The associated value is an estimated quantity.

L = Low bias.

K = Unknown bias.

mg/kg = milligrams per kilogram.

NA = Not Applicable

Q = The detected concentration is below the CRQL but is above the method detection limit.

SPLP = Synthetic Precipitation Leaching Procedure.

SQL = Sample Quantitation Limit.

TAL = Target Analyte List.

U = The analyte was not detected at or above the associated value.

µg/L = micrograms per liter.

This page intentionally left blank.

Table 6-3 Area Residence Sample Analytical Results Summary

EPA Sample ID	12444065	12444022	12444023	12444024	12444025	12444026	12444027	12444028	12444029	12444030	12444031	12444032	12444033	12444034	12444036	12444037	12444038	12444040	1244404
CLP Sample ID	MJ0AG6	MJ0AC2	MJ0AC3	MJ0AC4	MJ0AC5	MJ0AC6	MJ0AC7	MJ0AC8	MJ0AC9	MJ0AD0	MJ0AD1	MJ0AD2	MJ0AD3	MJ0AD4	MJ0AD6	MJ0AD7	MJ0AD8	MJ0AE0	MJ0AE1
Station Number	BK01SB01	AR01SS	AR01SB	AR02SS	AR02SB	AR03SS	AR03SB	AR04SS	AR04SB	AR05SS	AR05SB	AR06SS	AR06SB	AR07SS	AR08SS	AR08SB	AR09SS	BK02SS	BK02SB
Sample Depth (inches bgs)	0.5 - 1.5	6 - 12	24 - 30	6 - 12	30 - 36	6 - 12	24 to 30	5 - 9	9 - 15	6 - 9	9 - 15	6 - 12	11 - 15	6 - 12	6 - 12	13 - 15	6 - 12	6 - 12	12 - 15
Location	Background	Area Residence 1						Area Residence 2						Area Residence 3				Original Background Area Residence	
TAL Metals (mg/kg)																			
Aluminum	9310	9820	7250	7260	7130	7460	7680	8750	10500	9750	11800	11600	10600	10900	13900	13400	16000	9200	10200
Arsenic	6.6	685	30.9	31.9	16	10.2	7.4	25.1	19.9	28.4	21.6	86.4	45.3	4.4	6.6	5.1	6.4	44.8	32.3
Barium	89.5	150	56	70.5	68.6	74.3	77	499	91.5	88.2	99.2	90.4	81.9	85.1	111	105	115	77.3	92.4
Cadmium	0.14 JQ (SQL = 0.40)	1.2	0.37 U	0.08 JQ	0.028 JQ	0.13 JQ	0.11 JQ	0.29 JQ	0.064 JQ	0.049 JQ	0.39 U	0.4 U	0.44 U	0.13 JQ	0.15 JQ	0.14 JQ	0.14 JQ	0.43 U	0.44 U
Calcium	3840	6830	2540	3910	2720	6380	3000	12800	4300	4070	3530	3950	3160	4180	4310	4090	3980	3200	3200
Chromium	21.9	18.5	13.3	13.3	13.6	13.7	13.3	20	18.6	17.5	20.5	19.4	16.7	20	22.9	21.5	23.6	18.3	18
Cobalt	7.7 JL	6.8	6.4	5.4	5.7	5.5	5.8	8.1	8	8	8.6	8.7	7.5	8.8 JL	10.3 JL	10.2 JL	11.1 JL	7.7	7.9
Copper	14.3 JL	12.3 JH	5.2	8.2	7.0 JH	12.4	8.9 JH	57.4	21.6 JH	34.1	12.3 JH	28.6	13.6 JH	12.5 JL	13.1 JL	12.9 JK	12.9 JL	8	9.4 JH
Iron	19800	15500	13200	13000	13600	13400	13600	23400	17900	17700	19800	19200	16900	17400	20700	20400	22100	18400	18200
Lead	14.6 JK	4390	104	675	65.8	135	36.1	354	169	364	16.9	710	92.8	12 JK	19.2 JK	12.5 JK	9.4 JK	198	17.1
Magnesium	4130	4110	3790	3220	3510	3300	3320	3820	3790	3570	4020	3880	3450	4050	3930	3910	4360	3680	3790
Manganese	337 JL	261	215	225	212	231	225	405	337	331	355	380	316	351 JL	444 JL	431 JL	458 JL	315	310
Mercury	0.1 U	0.075 JQ	0.097 U	0.11 U	0.34	0.095 U	0.095 U	0.064 JQ	0.11 U	0.11 U	0.10 U	0.11 U	0.11 U	0.11 U	0.10 U	0.11 U	0.099 U	0.097 U	0.091 U
Nickel	17.4	15.9	11.8	11.3	12.5	11.9	12.1	16.7	14.3	13.8	15.6	15.3	13.3	17.7	15.3	14.7	17.2	13.5	14.4
Potassium	1810	1640	1080	1180	1180	1400	1410	1810	2130	1940	2150	2070	1420	1770	2430	2280	2550	1810	1990
Vanadium	41	30	24.6	24.9	25.4	25	25.2	34.2	35.8	37.4	39.7	41.4	33.7	38.2	48.5	45.9	49.6	38.1	36.9
Zinc	58.4 JL	143	34.9	87.3	36.3	75.3	45.1	354	81.4	108	51.7	80.3	45.2	54 JL	81.2 JL	65 JL	60 JL	42.1	40.7
SPLP Metals (µg/L)																			
Arsenic	4.9	3670	NA	11.7	NA	NA	NA	12.6	NA	16	NA	NA	NA	5.42	6.7	NA	NA	162	NA
Lead	1.4 JK	67 JK	NA	41 JK	NA	NA	NA	15 JK	NA	12 JK	NA	NA	NA	0.62 JK	0.81 JK	NA	NA	7.2 JK	NA

Note: **Bold** type indicates the sample result is above the contract required quantitation limit.
 Underline type indicates the sample result is significant as defined in Section 5.

Key:

bgs = Below ground surface.

CLP = Contract Laboratory Program.

CRQL = Contract Required Quantitation Limit.

EPA = United States Environmental Protection Agency.

ID = Identification.

H = High bias.

J = The associated value is an estimated quantity.

L = Low bias.

K = Unknown bias.

mg/kg = milligrams per kilogram.

NA = Not applicable.

Q = The detected concentration is below the CRQL but is above the method detection limit.

SPLP = Synthetic Precipitation Leaching Procedure.

SQL = Sample Quantitation Limit.

TAL = Target Analyte List.

U = The analyte was not detected at or above the associated value.

µg/L = micrograms per liter.

Table 7-2 Fume Pond Ground Water Sample Analytical Results Summary

EPA Sample ID CLP Sample ID Station Number Location	12444049 MJ0AF0 BK01GW Background	12444042 MJ0AE2 FP01GW Fume Pond 1	12444043 MJ0AE3 FP02GW Fume Pond 2
TAL Metals (µg/L)			
Arsenic	1.5	<u>7.9</u>	4.1
Barium	81.2	79.6	62.1
Calcium	54700	85300	70600
Cobalt	1.0 U	1.0 U	1.2
Copper	2.6	1.3 JQ	0.71 JQ
Magnesium	14700	38800	44100
Manganese	29.5	<u>164</u>	<u>1370</u>
Nickel	1.1	3.1	2.4
Potassium	5310	13800	6930
Sodium	41900	45500	103000
Vanadium	2.4 JQ (SQL = 5.0)	<u>10.6</u>	2.9 JQ
Zinc	2.0 U	<u>18.7</u>	<u>5.0</u>
Select Anions and Alkalinity (mg/L)			
Bromide	0.20 U	0.344	0.854
Chloride	39.3	35.6	79.9
Nitrate plus Nitrite	8.20	7.01	0.113
Sulfate	38.6	85.8	127
Alkalinity as CaCO ₃ , Total	176	339	353
Bicarbonate as CaCO ₃	176	335	353

Note:

Bold type indicates the sample result is above the contract required quantitation limit.

Underline type indicates the sample result is elevated as defined in Section 5.

Key:

CaCO₃ = Calcium carbonate.

CLP = Contract Laboratory Program.

CRQL = Contract Required Quantitation Limit.

EPA = United States Environmental Protection Agency.

ID = Identification.

J = The associated value is an estimated quantity.

mg/L = milligrams per liter.

Q = The detected concentration is below the CRQL but is above the method detection limit.

SQL = Sample Quantitation Limit.

TAL = Target Analyte List.

U = The analyte was not detected at or above the associated value.

µg/L = micrograms per liter.

Table 7-3 Production Well and Residential Well Ground Water Analytical Results Summary

EPA Sample ID CLP Sample ID Station Number	12444050 MJ0AF1 BK02GW	12444063 MJ0AG4 PW01GW	12444051 MJ0AF2 AR01GW	12444052 MJ0AF3 AR02GW	12444053 MJ0AF4 AR03GW
Location	Background	Production Well 2	Area Residence 1	Area Residence 2	Area Residence 3
TAL Metals (µg/L)					
Arsenic	2.7	2.6	<u>123</u>	<u>23.9</u>	<u>13</u>
Barium	21.3	<u>78.4</u>	<u>86.4</u>	47.4	<u>70.5</u>
Calcium	49800	95600	113000	48400	65300
Chromium	3.6	2.0 U	2.0 U	2.0 U	2.9
Copper	0.88 JQ (SQL = 2.0)	<u>16.3</u>	<u>16.4</u>	<u>21.2</u>	<u>16.3</u>
Iron	100 U	268	100 U	100 U	100 U
Lead	1.0	<u>56.2</u>	0.97 JQ	0.18 JQ	0.52 JQ
Magnesium	13800	20500	28900	15100	19200
Manganese	1.0 U	<u>36.1</u>	1.0 U	<u>1040</u>	1.0 U
Nickel	0.3 JQ (SQL = 1.0)	<u>1.4</u>	<u>1.5</u>	<u>3.3</u>	0.74 JQ
Potassium	4610 JQ	6410	5090	3820 JQ	5270
Sodium	17500	24000	22300	31500	31700
Vanadium	5.6	3.9 JQ	8.0	4.1 JQ	9.4
Zinc	6.4	7.5	13.0	9.7	12.6
Select Anions and Alkalinity (mg/L)					
Bromide	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Chloride	4.22	23.8	15.4	12.2	9.20
Nitrate plus Nitrite	6.07	12.1	13.7	0.435	10.7
Sulfate	24.6	42.3	50.3	18.3	34.1
Alkalinity as CaCO ₃ , Total	157	267	323	217	226
Bicarbonate as CaCO ₃	157	267	317	217	226

Note: **Bold** type indicates the sample result is above the contract required quantitation limit.

Underline type indicates the sample result is elevated as defined in Section 5.

Key:

CaCO₃ = Calcium carbonate.

CLP = Contract Laboratory Program.

CRQL = Contract Required Quantitation Limit.

EPA = United States Environmental Protection Agency.

ID = Identification.

J = The associated value is an estimated quantity.

mg/L = milligrams per liter.

Q = The detected concentration is below the CRQL but is above the method detection limit.

SQL = Sample Quantitation Limit.

TAL = Target Analyte List.

U = The analyte was not detected at or above the associated value.

µg/L = micrograms per liter.

This page intentionally left blank.

A

Sample Plan Alteration Forms

This page intentionally left blank.

SAMPLE PLAN ALTERATION FORM

Project Name and Number: Rock Island Silicon Plant (Former); TDD: 12-05-0002

Material to be sampled:

Subsurface soil and ground water from boreholes.

Measurement Parameters:

Analysis of subsurface soil and ground water for target analyte list (TAL) metals including mercury; and ground water for select anion, cations, and pH.

Standard Procedure for Field Collection and Laboratory Analysis (cite references):

Seven boreholes were planned for placement on the Silicon Plant property with six in the fume ponds (i.e., fume ponds 1, 2, 4, 5, 6, and 7) and one northwest of these ponds. Three subsurface soil samples were to be collected from each borehole with one of these samples collected of native soil from a 1.5-foot interval beginning at the water table. Further, one ground water sample was to be collected from each borehole. Drilling of onsite boreholes was to be conducted using a track-mounted hallow-stem auger. Subsurface soil samples from these boreholes were to be collected with a decontaminated spilt-spoon sampler.

Analysis of subsurface soil and ground water for TAL metals including mercury; and ground water for select anion, cations, and pH.

Reason for Change in Field Procedure or Analytical Variation:

Fume ponds 4, 5, 6, and 7 are located on a plateau that is approximately 60 to 70 feet higher in elevation than fume ponds 1 and 2. The same is the case for the selected location for the borehole that was to be placed northwest of the fume ponds. During drilling, the presence of subterranean boulders prevented drilling beyond 4 feet below ground surface (bgs) at the location northwest of the fume ponds though the drill rig was offset four times in an attempt to drill deeper.

Drilling at fume pond 7 also experience adverse soil conditions. Clay was encountered beneath the fume material which extended from 7.5 feet bgs to the total depth of the borehole at 80 feet bgs. The drill rig's engine was taxed and subject to overheating while drilling as it attempted to drill through the clay to ground water. At 80 feet bgs, drilling could not continue without risking significant damage to the drill rig. For this reason, ground water was not reached.

Since it had been determined that the drill rig would not be successful at reaching ground water at fume ponds located on the plateau, no further hallow stem auger drilling occurred in this area. Instead, shallow boreholes (maximum depth of 4 feet bgs) were advanced at the remaining fume ponds (i.e., fume ponds 4, 5, and 6) using decontaminated stainless-steel hand augers. At fume pond 5, densely packed fume material prevented augering below 12 inches bgs. Native soil at the water table and ground water could not be reached in fume ponds 4, 5, and 6 with the hand auger.

Ground water was encountered at a depth more shallow than expected at the background soil borehole.

Variation from Field or Analytical Procedure:

The borehole that was to be placed northeast of the fume ponds was not drilled and no soil or ground water samples were collected from this location.

Native soil was not collected within the water table at fume pond 7, since ground water was not reached. In addition, native soil samples were not collected at the water table at fume ponds 4, 5, and 6; nor were ground

SAMPLE PLAN ALTERATION FORM

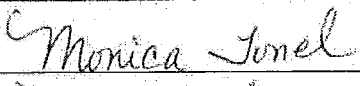
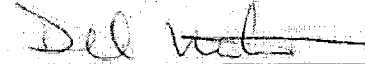
water samples collected. Finally, fume samples from fume ponds 4, 5, and 6 were collected using a decontaminated stainless steel hand auger, rather than a spilt spoon sampler, and only one fume sample was collected from fume pond 5.

At the background borehole location, only two, rather than three, subsurface soil samples were collected.

One change was made to planned analytical strategy. Instead of field screening ground water samples for nitrate and sending only those samples with nitrate levels above 2 parts per million for fixed laboratory nitrate/nitrite analyses; screening was not conducted and all ground water were submitted for nitrate/nitrate analyses. There were no other changes to the planned analytical procedures.

Special Equipment, Materials, or Personnel Required:

Stainless steel hand augers were used to collected fume samples from fume ponds 4, 5, and 6. No special materials or personnel were required.

CONTACT	APPROVED SIGNATURE	DATE
Initiator: Linda Ader		11-26-2012
START PL: Linda Ader		11-26-2012
EPA TM: Monica Tonel		11/26/2012
EPA QA Manager : Gina Grepa-Grove		11/26/2012

SAMPLE PLAN ALTERATION FORM

Project Name and Number: Rock Island Silicon Plant (Former); TDD: 12-05-0002

Material to be sampled:

Residential soil samples.

Measurement Parameters:

Analysis of soil samples for target analyte list (TAL) metals including mercury.

Standard Procedure for Field Collection and Laboratory Analysis (cite references):

Soil samples were to be collected from residential properties. With the exception of the background property, soil samples were to be collected from up to three locations on each property; two in an orchard and one at the wellhead. At each location, one surface soil sample was to be collected from 0 to 6 inches below ground surface (bgs) and one subsurface soil sample was to be collected from 2 to 4 feet bgs.

Analysis of soil samples for TAL metals.

Reason for Change in Field Procedure or Analytical Variation:

During sampling, it was determined that the upper 6 inches of soil at most locations contained irrigation hoses or pipes, indicating that this surficial layer had been disturbed over time.

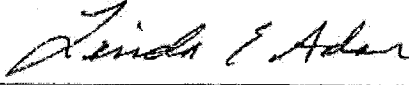
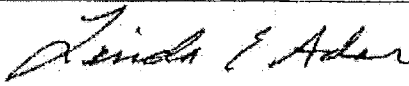
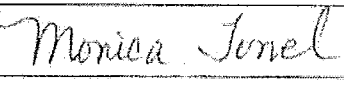
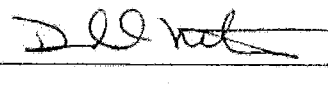
Also during sampling, the presence of rocky soil prevented augering to the desired depth of 4 feet bgs.

Variation from Field or Analytical Procedure:

Instead of sampling the 0 to 6-inch interval, the first interval sampled generally started at 6 inches bgs and extended to 9 or 12 inches bgs, depending on the depth rocks were encountered. The second sample interval also was modified at each location due to early refusal from rocky conditions; and at two locations, a second sample could not be collected.

Special Equipment, Materials, or Personnel Required:

No special equipment, materials, or personnel were required.

CONTACT	APPROVED SIGNATURE	DATE
Initiator: Linda Ader		11-26-2012
START PL: Linda Ader		11-26-2012
EPA TM: Monica Tonel		11/26/2012
EPA QA Manager : Gina Grepa-Grove		11/27/2012

This page intentionally left blank.

B

Photographic Documentation

This page intentionally left blank.

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

TDD Number: 12-05-0002
Photographed by: Linda Adler



Photo 1 Wellhead of production well No. 2.

Direction: East Date: 10/29/12 Time: 13:16



Photo 2 Sample PW01GW from Well No. 2.

Direction: North Date: 10/29/12 Time: 13:45



Photo 3 Sample FP07SB01 from Fume Pond 7.

Direction: East Date: 10/29/12 Time: 14:20

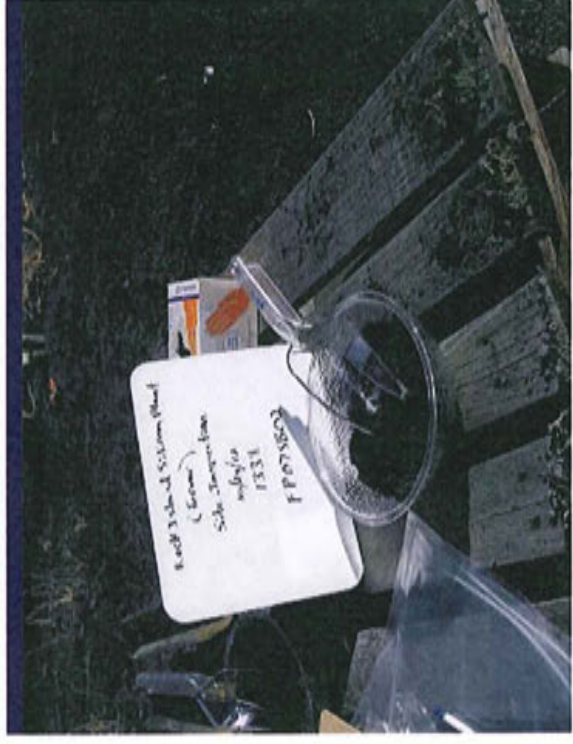


Photo 4 Sample FP07SB02 from Fume Pond 7.

Direction: East Date: 10/29/12 Time: 14:20

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington



Photo 5 Location of borehole FP07 and drill rig on location.

Direction: East Date: 10/29/12 Time: 14:21



Photo 7 Location of FS01SB from fume stockpile in fume storage area.

Direction: North Date: 10/29/12 Time: 15:06

TDD Number: 12-05-0002
Photographed by: Linda Adler



Photo 6 Sample FS01SB (incorrectly labeled FW01SB on white board) from fume storage area.

Direction: North Date: 10/29/12 Time: 15:06

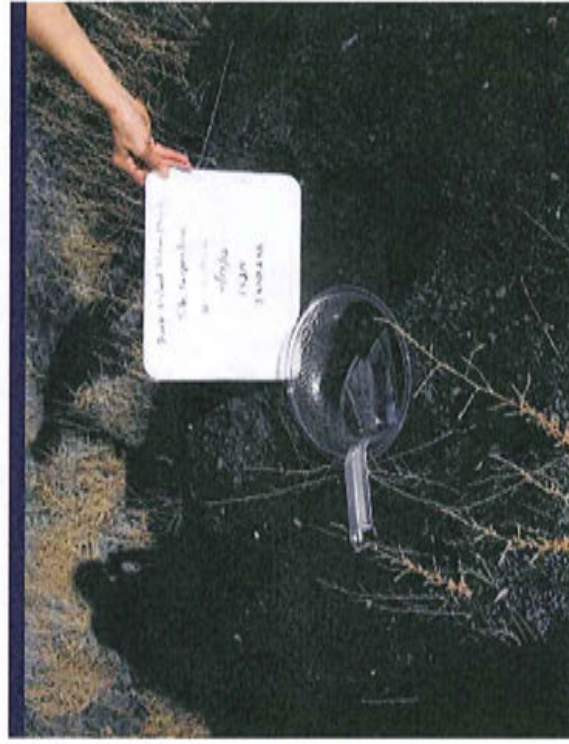


Photo 8 Sample FS02SB (incorrectly labeled FW02SB on white board) from fume storage area.

Direction: North Date: 10/29/12 Time: 15:22

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

TDD Number: 12-05-0002
Photographed by: Linda Adler



Photo 9 Location of FS02SB in fume storage area.

Direction: North	Date: 10/29/12	Time: 15:25
------------------	----------------	-------------

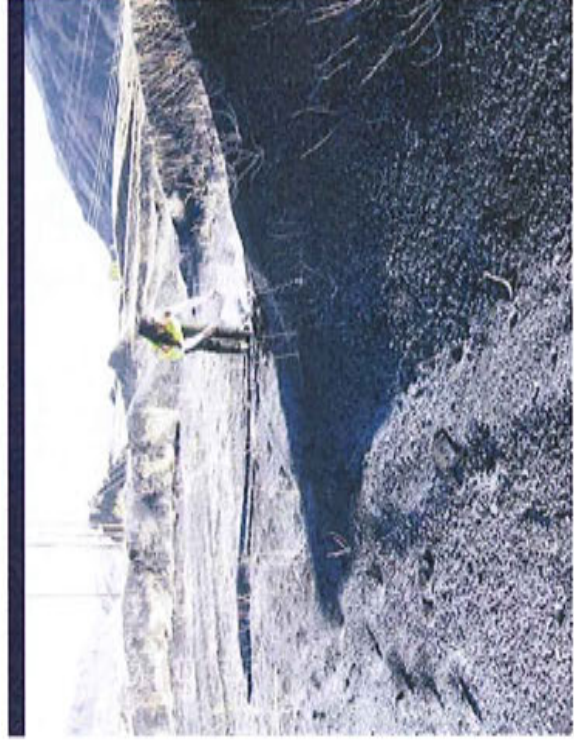


Photo 11 Location of FS03SB in fume storage area.

Direction: East	Date: 10/29/12	Time: 15:35
-----------------	----------------	-------------

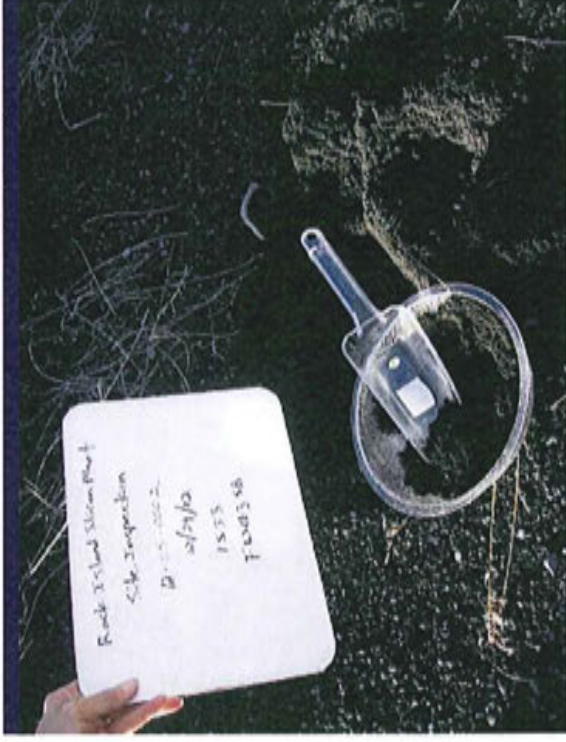


Photo 10 Sample FS03SB (incorrectly labeled FW03SB on white board) from fume storage area.

Direction: Southwest	Date: 10/29/12	Time: 15:35
----------------------	----------------	-------------

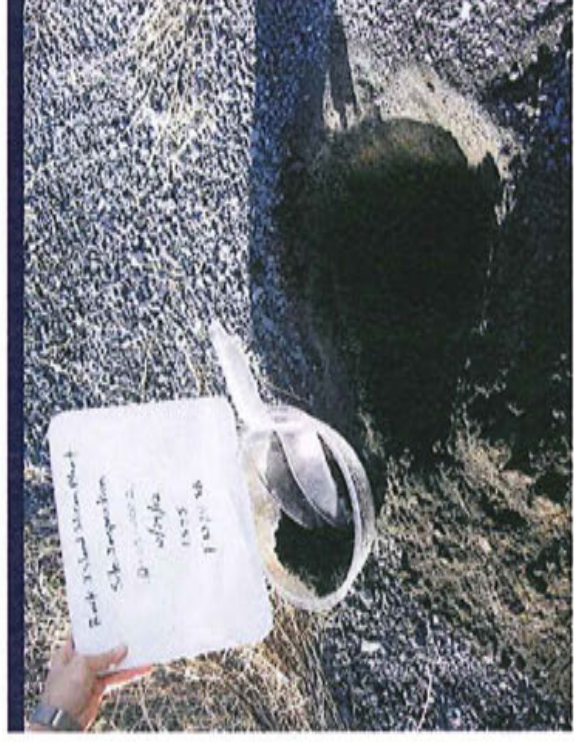


Photo 12 Sample FS04SB (incorrectly labeled FW04SB on white board) from fume storage area.

Direction: East	Date: 10/29/12	Time: 15:47
-----------------	----------------	-------------

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington



Photo 13 Location of FS04SB in fume storage area.

Direction: North Date: 10/29/12 Time: 15:47



Photo 15 Sample FP07SB03 from Fume Pond 7 and material sampled shown in cutting shoe.

Direction: Down Date: 10/30/12 Time: 11:51

TDD Number: 12-05-0002
Photographed by: Linda Adler



Photo 14 Investigation-derived waste drums from FP07. Seven drums of soil cuttings. All are labeled.

Direction: East Date: 10/30/12 Time: 10:58



Photo 16 Sample AR01GW and spigot used to collect sample at residential well AR01.

Direction: North Date: 10/30/12 Time: 15:02

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

TDD Number: 12-05-0002
Photographed by: Linda Adler



Photo 17 Sample AR01SS near residential wellhead.

Direction: West Date: 10/30/12 Time: 15:24



Photo 19 Sample AR01SB collected near wellhead.

Direction: West Date: 10/30/12 Time: 15:37

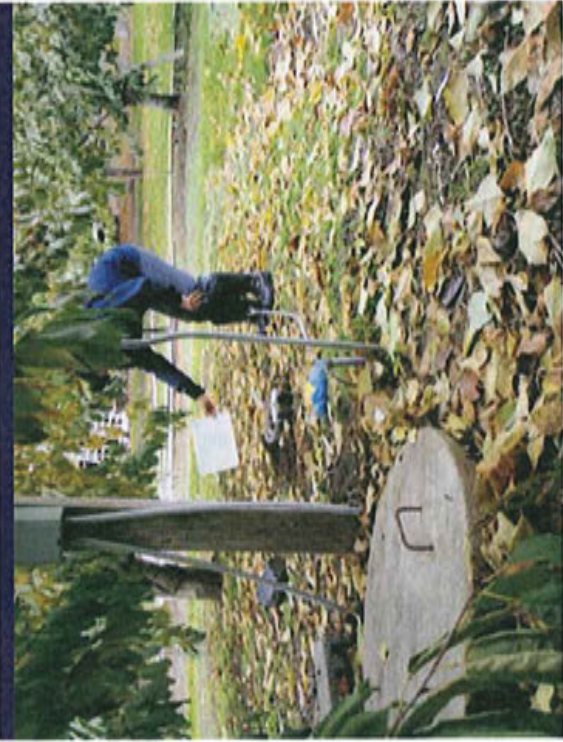


Photo 18 Sample AR01SS with wellhead in foreground and oldest orchard in background.

Direction: North Date: 10/30/12 Time: 15:24

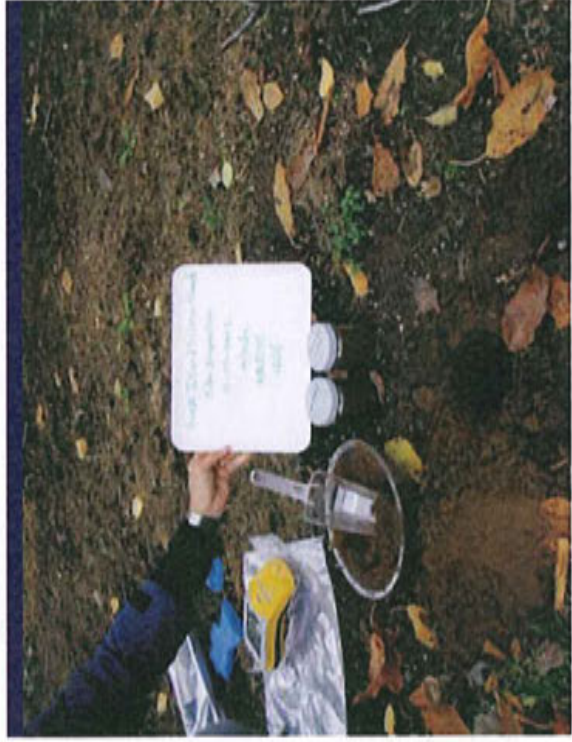


Photo 20 Sample AR02SS in oldest orchard.

Direction: North Date: 10/30/12 Time: 16:07

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

TDD Number: 12-05-0002
Photographed by: Linda Adler



Photo 21 Sample AR02SB collected from oldest orchard.

Direction: North Date: 10/30/12 Time: 16:20



Photo 23 Sample AR03SB collected from oldest orchard.

Direction: North Date: 10/30/12 Time: 16:42



Photo 22 Sample AR03SS collected from oldest orchard.

Direction: North Date: 10/30/12 Time: 16:32



Photo 24 Location of AR02GW.

Direction: West Date: 10/31/12 Time: 12:26

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

TDD Number: 12-05-0002
Photographed by: Linda Ader



Photo 25 Sample AR02GW from residential well at AR02.

Direction: West Date: 10/31/12 Time: 12:33



Photo 27 Sample AR05SB from residential orchard.

Direction: Southwest Date: 10/31/12 Time: 13:05



Photo 26 Sample AR05SS from residential orchard.

Direction: South Date: 10/31/12 Time: 12:47



Photo 28 Photo of area in general. Blue glove marks location of AR05SS/AR05SB in cherry orchard.

Direction: West Date: 10/31/12 Time: 13:06

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

TDD Number: 12-05-0002
Photographed by: Linda Adler



Photo 29 Sample AR04SS collected near wellhead at AR02.

Direction: East Date: 10/31/12 Time: 13:33



Photo 31 Sample AR04SB collected near wellhead at AR02.

Direction: East Date: 10/31/12 Time: 13:50



Photo 30 Wellhead at AR02.

Direction: East Date: 10/31/12 Time: 13:33



Photo 32 Sample AR06SS collected from residential orchard.

Direction: East Date: 10/31/12 Time: 14:01

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

TDD Number: 12-05-0002
Photographed by: Linda Adler



Photo 33 Sample AR06SB collected from residential orchard.

Direction: East	Date: 10/31/12	Time: 14:08
-----------------	----------------	-------------



Photo 34 General location of AR06SB.

Direction: East	Date: 10/31/12	Time: 14:09
-----------------	----------------	-------------



Photo 35 Location of sample BK02GW at BK02.

Direction: East	Date: 10/31/12	Time: 16:09
-----------------	----------------	-------------



Photo 36 Wellhead at BK02.

Direction: South	Date: 10/31/12	Time: 16:10
------------------	----------------	-------------

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

TDD Number: 12-05-0002
Photographed by: Linda Ader



Photo 37 Sample BK02SS from residential soil.

Direction: South Date: 10/31/12 Time: 16:40



Photo 38 Sample BK02SB from residential soil.

Direction: East Date: 10/31/12 Time: 16:47

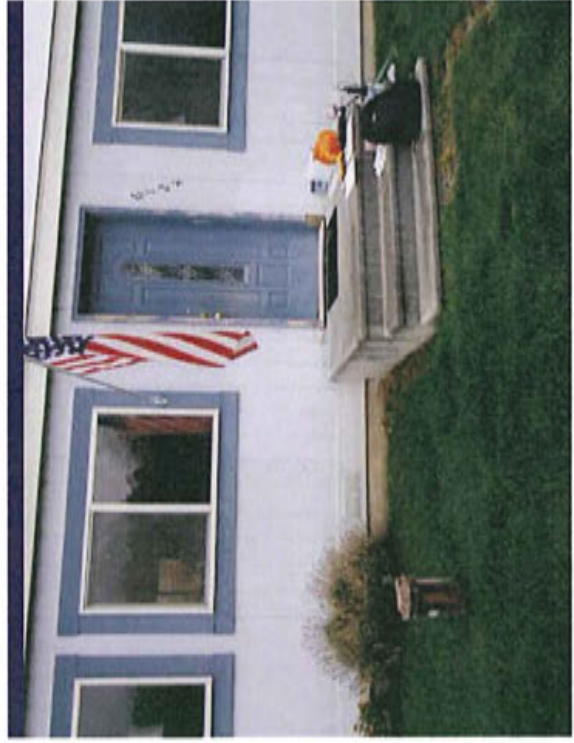


Photo 39 Wellhead at AR03 and sampled spigot to right of front door.

Direction: East Date: 11/1/12 Time: 09:59



Photo 40 Sample AR03GW.

Direction: West Date: 11/1/12 Time: 10:21

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

TDD Number: 12-05-0002
Photographed by: Linda Ader



Photo 41 Sample AR08SS from east side of garage at AR03.

Direction: South Date: 11/1/12 Time: 11:48



Photo 43 Sample AR08SB.

Direction: South Date: 11/1/12 Time: 12:09



Photo 42 Location of AR08SS in foreground.

Direction: North Date: 11/1/12 Time: 11:49

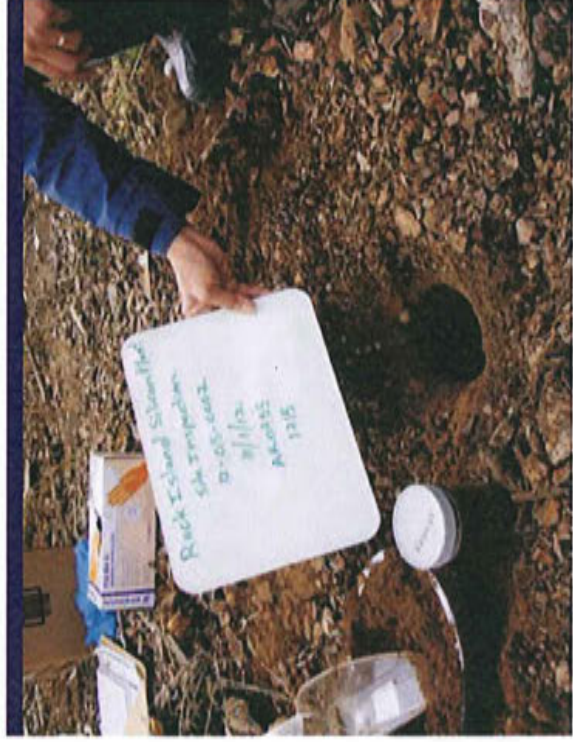


Photo 44 Sample AR09SS.

Direction: South Date: 11/1/12 Time: 12:17

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

TDD Number: 12-05-0002
Photographed by: Linda Adler



Photo 45 Sample AR07SS collected near wellhead.

Direction: South Date: 11/1/12 Time: 12:43



Photo 46 Location of AR07SS and wellhead in view to left of frame.

Direction: South Date: 11/1/12 Time: 12:44



Photo 47 Location of background borehole in newly developed orchard.

Direction: South Date: 11/2/12 Time: 07:46



Photo 48 Sample FP05SB01 from Furne Pond 5.

Direction: North Date: 11/2/12 Time: 08:42

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

TDD Number: 12-05-0002
Photographed by: Linda Adler



Photo 49 Sample FP06SB01 from Fume Pond 6.

Direction: South Date: 11/2/12 Time: 08:47



Photo 50 Sample FP06SB02 from Fume Pond 6.

Direction: South Date: 11/2/12 Time: 08:49



Photo 51 Sample FP04SB01 from Fume Pond 4.

Direction: East Date: 11/2/12 Time: 08:53



Photo 52 Sample FP04SB02 from Fume Pond 4.

Direction: East Date: 11/2/12 Time: 08:54

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington



Photo 53 Sample FP02SB01 from Fume Pond 2.

Direction: East Date: 11/2/12 Time: 09:14



Photo 55 Sample FP02SB03 from Fume Pond 2.

Direction: East Date: 11/2/12 Time: 09:16

TDD Number: 12-05-0002
Photographed by: Linda Ader



Photo 54 Sample FP02SB02 from Fume Pond 2.

Direction: East Date: 11/2/12 Time: 09:15



Photo 56 Sample FP01SB01 from Fume Pond 1.

Direction: North Date: 11/2/12 Time: 09:21

ROCK ISLAND SILICON PLANT (FORMER)
Rock Island, Washington

TDD Number: 12-05-0004
Photographed by: Linda Ader



Photo 57 Sample FP01SB02 from Fume Pond 1.

Direction: North Date: 11/2/12 Time: 09:22



Photo 58 Sample FP01SB03 from Fume Pond 1.

Direction: North Date: 11/2/12 Time: 09:23

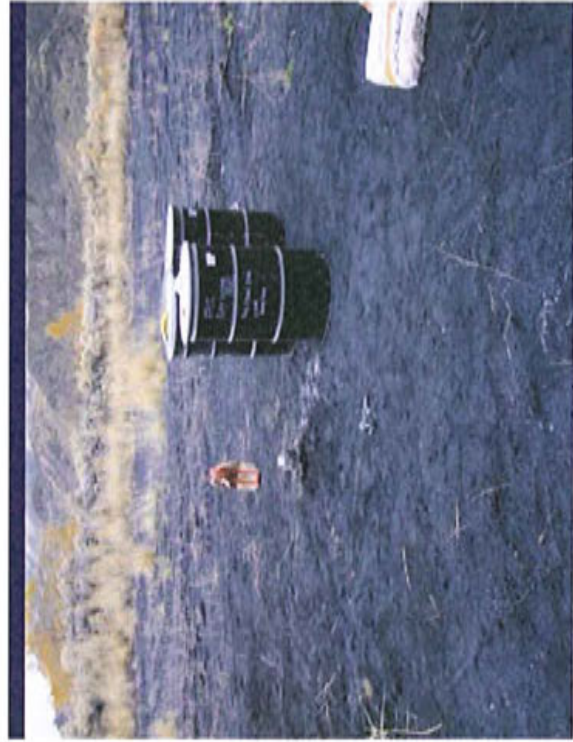


Photo 59 Location of borehole/well FP02.

Direction: South Date: 11/2/12 Time: 09:32



Photo 60 Sample BK01SB02 from background borehole BK02.

Direction: East Date: 11/2/12 Time: 09:50

This page intentionally left blank.

C

Drilling Logs

This page intentionally left blank.



ecology and environment, inc.
International Specialists in the Environment

Drilling Log for FP01

Project Name: Rock Island Silicon Plant (Former)

Site Location: Rock Island, Washington

Date Started/Finished: 10-31-2012

Driller's Name: Curtis (Cascade Drilling)

Geologist's Name: J Feters

Geologist's Signature: J Feters

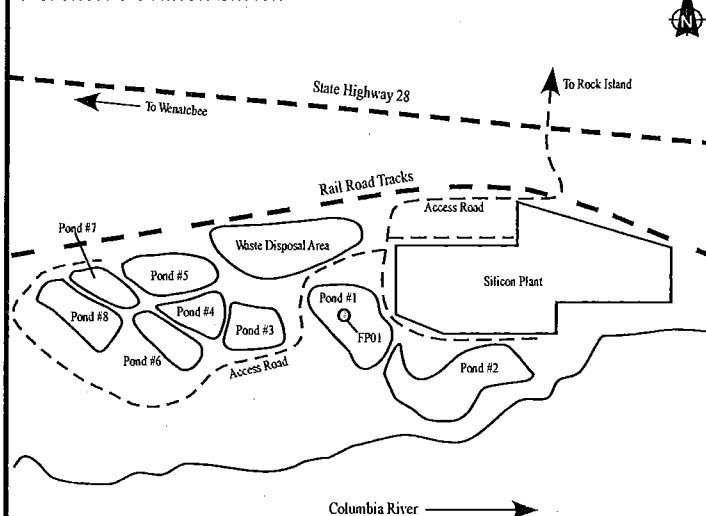
Rig Type(s): Hollow Stem Auger

Static water level: 12.35' bgs (10/31/12)

Depth to Water: Water level during drilling unknown

Total Depth of Borehole: 25.5-feet bgs

Borehole Location Sketch



GPS Coordinates: _____

Depth (Feet)	Sample Number	Sample Times	Core Recovery	Soil Type	Comments
1 —	FP01-SB01 6" - 2'	10/31/12 09:50			0 - 5' - Fume waste: Silty, black, moist. Material is laminated due to waste being slurried from plant to pond. Laminations have medium to high strength.
2 —					
3 —					
4 —					
5 —					
6 —	FP01-SB02 8 - 9.5'	10/31/12 10:15			5 - 10' - Lithology same as above
7 —					
8 —					
9 —					
10 —					
11 —					10 - 15' - Lithology same as above
12 —					

Depth (Feet)	Sample Number	Sample Times	Core Recovery	Soil Type	Comments
12				▼	Static water level (10-31-12) - 12.35-feet bgs
13					
14					
15					15 - 20' - Lithology same as above
16					
17					
18					
19					
20	FP01- GW	10/31/12 16:18			20 - 23.5' - Lithology same as above
21					
22					
23					23.5' - Gravel noted as evident by drilling rate and drill rig "bouncing"
24	FP01- SB03	10/31/12 1100			24.5 - 25.5 - Sand (SW-SM): Coarse to medium, angular, trace gravel, rounded to sub-rounded, trace silt.
25	24.5- 25.5'				Total depth = 24.5-feet bgs Split spoon driven from 24.5 to 25.5-feet bgs Borehole abandoned with Cetco Medium Bentonite Chips from TD to 0.5-feet bgs, Fume waste from 0.5-feet to ground surface.
26					
27					
28					
29					Temporary 5-Foot, 10-slot, 2-inch, Sch. 40 PVC Screen and riser installed into borehole. Well screen placed at 24 to 19-foot bgs. 2/12 silica sand used for temporary filter pack.
30					
31					
32					



ecology and environment, inc.
International Specialists in the Environment

Drilling Log for FP02_A

Project Name: Rock Island Silicon Plant (Former)

Site Location: Rock Island, Washington

Date Started/Finished: 10-31-2012

Driller's Name: Curtis (Cascade Drilling)

Geologist's Name: J Fetters

Geologist's Signature: J Fetters

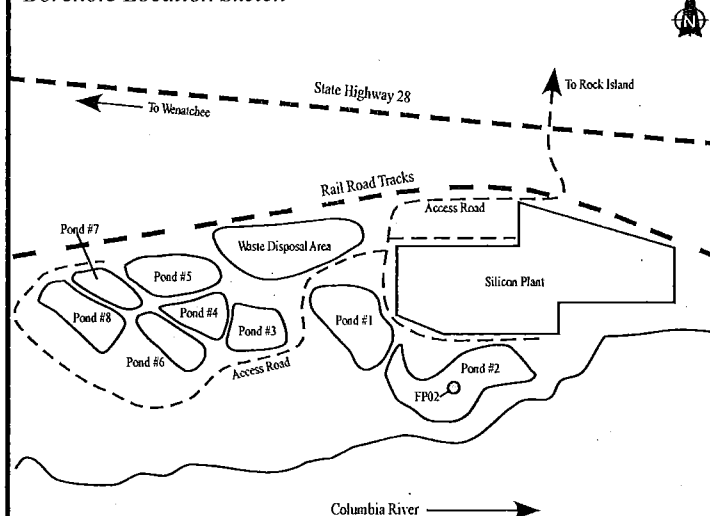
Rig Type(s): Hollow Stem Auger

Static water level 6.6' bgs (11/1/12)

Depth to Water: Water level during drilling 8.9' bgs

Total Depth of Borehole: 16.5-feet bgs

Borehole Location Sketch



GPS Coordinates: _____

Depth (Feet)	Sample Number	Sample Times	Core Recovery	Soil Type	Comments
1	FP02-SB01 6" - 2'	10/31/12 1410			0 - 5' - Fume waste: Silty, black, moist. Material is laminated due to waste being slurried from plant to pond. Laminations have medium to high strength.
2					
3					
4					
5					
6	FP02-SB02 8.5 - 10'	10/31/12 1430			5 - 10' - Lithology same as above
7				▼	Static water level (11-01-12) - 6.6-feet bgs
8					
9				▽	Water level during drilling (10-31-12) - 8.9-feet bgs
10					10 - 15' - Lithology same as above
11					
12					

Depth (Feet)	Sample Number	Sample Times	Core Recovery	Soil Type	Comments
12					
13					
14					
15					15 - 16.5' - Sand (SW-SM): Sand: very fine, angular; Silt: Saturated, light brown
16	FP02- SB03 15- 16.5'	10/31/12 1438			
17					Total depth = 16.5-feet bgs
18					Borehole abandoned with Cetco Medium Bentonite Chips from TD to 0.5-feet bgs, Fume waste from 0.5-feet to ground surface.
19					Temporary 5-Foot, 10-slot, 2-inch, Sch. 40 PVC Screen and riser installed into borehole.
20					Well screen placed at 9 to 14-foot bgs. 2/12 silica sand used for temporary filter pack.
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					



ecology and environment, inc.
International Specialists in the Environment

Drilling Log for FP02_B

Project Name: Rock Island Silicon Plant (Former)

Site Location: Rock Island, Washington

Date Started/Finished: 11-01-2012

Driller's Name: Curtis (Cascade Drilling)

Geologist's Name: J Feters

Geologist's Signature: J Feters

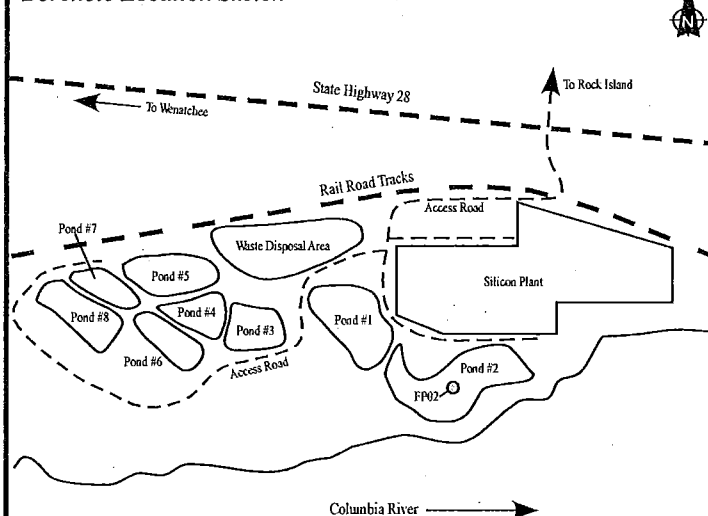
Rig Type(s): Hollow Stem Auger

Static water level: 5.8' bgs (11/1/12)

Depth to Water: Water level during drilling unknown

Total Depth of Borehole: 25-feet bgs

Borehole Location Sketch



GPS Coordinates: _____

Depth (Feet)	Sample Number	Sample Times	Core Recovery	Soil Type	Comments
1					0 - 5' - Fume waste: Silty, black, moist. Material is laminated due to waste being slurried from plant to pond. Laminations have medium to high strength.
2					
3					
4					
5					
6				▼	5 - 10' - Lithology same as above Static water level (11-01-12) - 5.8-feet bgs
7					
8					
9					
10					
11					10 - 15' - Lithology same as above
12					

Depth (Feet)	Sample Number	Sample Times	Core Recovery	Soil Type	Comments
12	FP02- GW	11/01/12 14:27			
13					
14					
15					15 - 16.5' - Sand (SW-SM): Sand: very fine, angular; Silt: Saturated, light brown
16					
17					
18					
19					
20					20 - 25' - Lithology same as above
21					
22					
23					
24					
25					Total depth = 25-feet bgs Borehole abandoned with Cetco Medium Bentonite Chips from TD to 0.5-feet bgs, Fume waste from 0.5-feet to ground surface. Temporary 10-Foot, 10-slot, 2-inch, Sch. 40 PVC Screen and riser installed into borehole. Well screen placed at 24 to 14-foot bgs. 2/12 silica sand used for temporary filter pack.
26					
27					
28					
29					
30					
31					
32					

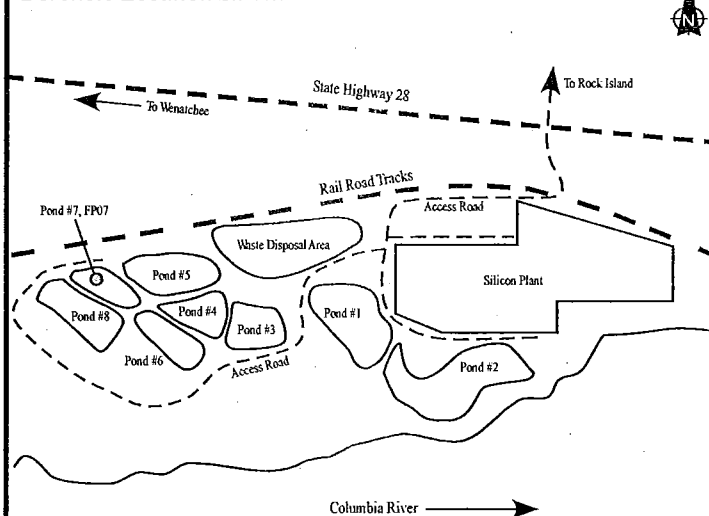


ecology and environment, inc.
International Specialists in the Environment

Drilling Log for FP07

Project Name: Rock Island Silicon Plant (Former)
Site Location: Rock Island, Washington
Date Started/Finished: 10-29-2012 / 10-30-2012
Driller's Name: Curtis (Cascade Drilling)
Geologist's Name: J Feters
Geologist's Signature: *J Feters*
Rig Type(s): Hollow Stem Auger
Depth to Water: NA
Total Depth of Borehole: 80-feet bgs

Borehole Location Sketch



GPS Coordinates: _____

Depth (Feet)	Sample Number	Sample Times	Core Recovery	Soil Type	Comments
1 —	FP07-SB01 6" - 2'	10/29/12 1336			0 - 5' - Fume waste: Silty, black, slightly moist. Material is laminated due to waste being slurried from plant to pond. Laminations have medium to high strength.
2 —					
3 —	FP07-SB02 2.5 - 4'	10/29/12 1338			
4 —					
5 —					
6 —					
7 —					
8 —					7.5' - Gravels noted, estimated contact of fume waste and native lithology. 7.5 - 10' - Clay (CL): Moist, 2.5y 5/6 light olive brown, medium to high plasticity
9 —					
10 —					10 - 15' - Lithology same as above
11 —					
12 —					

Depth (Feet)	Sample Number	Sample Times	Core Recovery	Soil Type	Comments
12 —					
13 —					
14 —					
15 —					
16 —					15 - 20' - Lithology same as above
17 —					
18 —					
19 —					
20 —					20 - 25' - Lithology same as above
21 —					
22 —					
23 —					
24 —					25 - 30' - Lithology same as above
25 —					
26 —					
27 —					
28 —					30 - 35' - Lithology same as above
29 —					
30 —					
31 —					
32 —					

Depth (Feet)	Sample Number	Sample Times	Core Recovery	Soil Type	Comments
32					
33					
34					
35					35 - 40' - Lithology same as above
36					
37					
38					
39					
40					40 - 45' - Lithology same as above
41					
42					
43					
44					
45					45 - 47.5' - Lithology same as above
46					
47					
48					47.5 - 50' - Clay (CL): decreased moisture, 10yr 4/2, dark grayish brown, low plasticity. Trace very fine sand.
49					
50					50 - 55' - Lithology same as above
51					
52					

Depth (Feet)	Sample Number	Sample Times	Core Recovery	Soil Type	Comments
52					
53					
54					
55					55 - 60' - Lithology same as above
56					
57					
58					
59					
60					60 - 65' - Lithology same as above
61					
62					
63					
64					
65					65 - 70' - Lithology same as above
66					
67					
68					
69					
70					70 - 75' - Lithology same as above
71					
72					

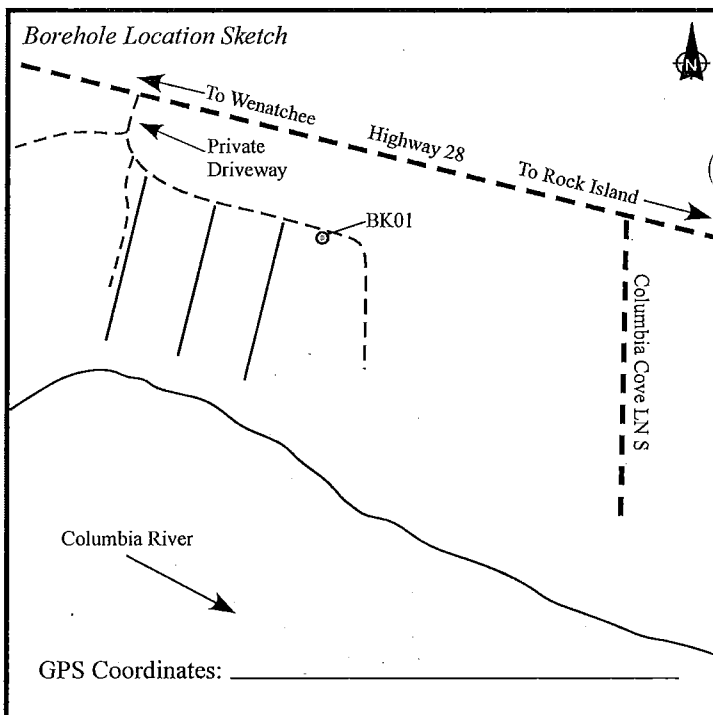
Depth (Feet)	Sample Number	Sample Times	Core Recovery	Soil Type	Comments
73					
73					
74					
75					75 - 80' - Lithology same as above
76					
77					
78					
79					Total depth = 80-feet bgs Split spoon driven from 80 to 81-feet bgs
80		FP07- SB03	10/30/12		80 - 81' - Silt (ML): trace very fine sand, dry, 10yr 6/1 gray, very compact
81		80 - 81'	1132		
82					
83					
84					Borehole abandoned with Cetco Medium Bentonite Chips from TD to 2-feet bgs, Concrete from 2 to .5-feet bgs, Fume waste from 0.5-feet to ground surface.
85					
86					
87					
88					
89					
90					
91					
92					



ecology and environment, inc.
International Specialists in the Environment

Drilling Log for BK01

Project Name: Rock Island Silicon Plant (Former)
Site Location: Rock Island, Washington
Date Started/Finished: 11-01-2012 / 11-02-2012
Driller's Name: Curtis (Cascade Drilling)
Geologist's Name: J Feters
Geologist's Signature: [Signature]
Rig Type(s): Hollow Stem Auger
Static water level: 5.42' bgs (11/02/12)
Depth to Water: Water level during drilling: 9.0' bgs
Total Depth of Borehole: 15-feet bgs



Depth (Feet)	Sample Number	Sample Times	Core Recovery	Soil Type	Comments
1 —	BK01-SB01 6" - 1.5'	11/01/12 15:12			0 - 1.5' - Sandy Loam (SM); Sand: fine, angular; Silt: moist, brown 10yr 3/3, high organics noted (grass and tree roots).
2 —					1.5 - 5' - Silty Gravel (GM); Gravel: >25cm to 2mm, rounded; Silt: same as above.
3 —					
4 —					
5 —	BK01-SB02 8 - 9.5'	11/1/12 16:20		▼	5 - 10' - Lithology same as above, Gravel <12cm to 2mm (predominantly >3cm). Static water level (11-02-12) - 5.42-feet bgs
6 —					
7 —					
8 —					
9 —				▽	Ground water encountered at 9.0-feet bgs during drilling (11-01-12)
10 —					
11 —					
12 —					10 - 15' - Lithology same as above

Depth (Feet)	Sample Number	Sample Times	Core Recovery	Soil Type	Comments
12	BK01- GW	11/02/12 18:50			
13					
14					
15					Total depth = 15-feet bgs Borehole abandoned with Cetco Medium Bentonite Chips from TD to 0.5-feet bgs, Native soil from 0.5-feet to ground surface. Temporary 10-Foot, 10-slot, 2-inch, Sch. 40 PVC Screen and riser installed into borehole. Well screen placed at 15 to 5-foot bgs. 2/12 silica sand used for temporary filter pack.
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					

This page intentionally left blank.

D

Chain-of-Custody Documentation

This page intentionally left blank.

USEPA CLP Inorganics COC (LAB COPY)

Date Shipped: 11/5/2012

Carrier Name: FedEx

Airbill No: 878405533336

CHAIN OF CUSTODY RECORD

Project Code: SFP-036A

Case #: 42864

Cooler #:

SDS: MSDAA1
 No: 10-110212-120945-0007
 Lab: Test America Laboratories
 Lab Contact: Kirk Young
 Lab Phone: 802-660-1990

Inorganic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Organic Sample #	For Lab Use Only
MJ0AB2	Soil Subsurface/ J. Feters	Grab	AES & MS	1012 (1)	12444012	11/01/2012 09:45		
MJ0AB3	Soil Subsurface/ J. Feters	Grab	AES & MS	1013 (1)	12444013	11/01/2012 10:25		
MJ0AB5	Soil Subsurface/ J. Feters	Grab	AES & MS	1015 (1)	12444015	10/29/2012 13:36		
MJ0AB6	Soil Subsurface/ J. Feters	Grab	AES & MS	1016 (1)	12444016	10/29/2012 13:38		
MJ0AB8	Soil Subsurface/ L. Ader	Grab	AES & MS	1018 (1)	12444018	10/29/2012 15:00		
MJ0AB9	Soil Subsurface/ L. Ader	Grab	AES & MS	1019 (1)	12444019	10/29/2012 15:20		
MJ0AC0	Soil Subsurface/ L. Ader	Grab	AES & MS	1020 (1)	12444020	10/29/2012 15:33		
MJ0AC1	Soil Subsurface/ L. Ader	Grab	AES & MS	1021 (1)	12444021	10/29/2012 15:45		
MJ0AD4	Soil Surface/ L. Ader	Grab	AES & MS	1034 (1)	12444034	11/01/2012 12:40		
MJ0AD6	Soil Surface/ L. Ader	Grab	AES & MS	1036 (1)	12444036	11/01/2012 11:40		
MJ0AD7	Soil Subsurface/ L. Ader	Grab	AES & MS	1037 (1)	12444037	11/01/2012 12:05		

Special Instructions:

5:10e No sent # No temp blank

 Shipment for Case Complete? ☒ N 1A
 Samples Transferred From Chain of Custody #

Analysis Key: AES & MS=TAL Metals ICP-AES & ICP-MS (Incl. Hg)

Items/Reason	Relinquished by	Date	Received by	Date	Time	Relinquished By	Date	Received by	Date	Time
	2. Ader	11/5/12	Bul - 11/6/12	09:45						

CHAIN OF CUSTODY RECORD

Project Code: SFP-036A

Case #: 42864

Cooler #:

Spd	Final	Samples
-----	-------	---------

Shipment for Case Complete? ☒ Yes ☐ No

Samples Transferred From Chain of Custody #

5.1e No Seal to's No Temp blank

[illegible]

USEPA CLP Inorganics COC (LAB COPY)

Date Shipped: 11/5/2012

Carrier Name: FedEx

Airbill No: 876405533314

CHAIN OF CUSTODY RECORD

Project Code: SFP-036A

Case #: 42864

Cooler #:

SDG: MSQAA1

No: 10-110212-122808-0009

Lab: Test America Laboratories

Lab Contact: Kirk Young

Lab Phone: 802-660-1990

Inorganic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Organic Sample #	For Lab Use Only
MJ0AA1	Soil Subsurface/ J. Feters	Grab	AES & MS	1001 (1)	12444001	10/31/2012 10:15		
MJ0AA2	Soil Subsurface/ J. Feters	Grab	AES & MS	1002 (1)	12444002	10/31/2012 11:00		
MJ0AA3	Soil Subsurface/ J. Feters	Grab	AES & MS	1003 (1)	12444003	10/31/2012 14:10		
MJ0AA4	Soil Subsurface/ J. Feters	Grab	AES & MS	1004 (1)	12444004	10/31/2012 14:30		
MJ0AA5	Soil Subsurface/ J. Feters	Grab	AES & MS	1005 (1)	12444005	10/31/2012 14:38		
MJ0AA6	Soil Subsurface/ J. Moersen	Grab	AES & MS	1006 (1)	12444006	10/31/2012 13:10		
MJ0AA7	Soil Subsurface/ J. Moersen	Grab	AES & MS	1007 (1)	12444007	10/31/2012 14:55		
MJ0AA9	Soil Subsurface/ J. Moersen	Grab	AES & MS	1009 (1)	12444009	10/31/2012 15:50		
MJ0AB7	Soil Subsurface/ J. Feters	Grab	AES & MS	1017 (1)	12444017	10/30/2012 11:32		
MJ0AC2	Soil Surface/ Ader	Grab	AES & MS	1022 (1)	12444022	10/30/2012 15:20		
MJ0AC3	Soil Subsurface/ L. Ader	Grab	AES & MS	1023 (1)	12444023	10/30/2012 15:35		

Shipment for Case Complete? Y

Samples Transferred From Chain of Custody #

Special Instructions:

Analysis Key: AES & MS=TAL Metals ICP-AES & ICP-MS (incl. Hg)

5.3°C No Sample No time blank

Items/Reason	Relinquished by	Date	Received by	Date	Time
	J. Feters	11/5/12	J. Feters	11/6/12	0945

USEPA CLP Inorganics COC (LAB COPY)

Date Shipped: 11/5/2012

Carrier Name: FedEx

Airbill No: 876405533314

CHAIN OF CUSTODY RECORD

Project Code: SFP-036A

Case #: 42864

Cooler #:

No: 10-110212-122808-0009

Lab: Test America Laboratories

Lab Contact: Kirk Young

Lab Phone: 802-660-1990

SDG: M30AA7

Inorganic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Organic Sample #	For Lab Use Only
MJ0AA1	Soil Subsurface/ J. Fetters	Grab	AES & MS	1001 (1)	12444001	10/31/2012 10:15		
MJ0AA2	Soil Subsurface/ J. Fetters	Grab	AES & MS	1002 (1)	12444002	10/31/2012 11:00		
MJ0AA3	Soil Subsurface/ J. Fetters	Grab	AES & MS	1003 (1)	12444003	10/31/2012 14:10		
MJ0AA4	Soil Subsurface/ J. Fetters	Grab	AES & MS	1004 (1)	12444004	10/31/2012 14:30		
MJ0AA5	Soil Subsurface/ J. Fetters	Grab	AES & MS	1005 (1)	12444005	10/31/2012 14:38		
MJ0AA6	Soil Subsurface/ J. Moersen	Grab	AES & MS	1006 (1)	12444006	10/31/2012 13:10		
MJ0AA7	Soil Subsurface/ J. Moersen	Grab	AES & MS	1007 (1)	12444007	10/31/2012 14:55		
MJ0AA9	Soil Subsurface/ J. Moersen	Grab	AES & MS	1009 (1)	12444009	10/31/2012 15:50		
MJ0AB7	Soil Subsurface/ J. Fetters	Grab	AES & MS	1017 (1)	12444017	10/30/2012 11:32		
MJ0AC2	Soil Surface/ L. Ader	Grab	AES & MS	1022 (1)	12444022	10/30/2012 15:20		
MJ0AC3	Soil Subsurface/ L. Ader	Grab	AES & MS	1023 (1)	12444023	10/30/2012 15:35		

Special Instructions:

Shipments for Case Complete? Y

Samples Transferred From Chain of Custody #

513°C No Seal, No Temp Blank

Analysis Key: AES & MS=TAL Metals ICP-AES & ICP-MS (incl. Hg)

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
	J. Fetters	11/5/12	[Signature]	11/6/12	09:45						

ORIGINAL ON FILE

ETR # 13594

USEPA CLP Inorganics COC (LAB COPY)

Date Shipped: 11/5/2012

Carrier Name: FedEx

Airbill No: 876405533314

CHAIN OF CUSTODY RECORD

Project Code: SFP-036A

Case #: 42864

Cooler #:

No: 10-110212-122808-0009

Lab: Test America Laboratories

Lab Contact: Kirk Young

Lab Phone: 802-660-1990

Inorganic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Organic Sample #	For Lab Use Only
MJ0AC4	Soil Surface/ L. Ader	Grab	AES & MS	1024 (1)	12444024	10/30/2012 16:05		
MJ0AC5	Soil Subsurface/ L. Ader	Grab	AES & MS	1025 (1)	12444025	10/30/2012 16:15		
MJ0AC6	Soil Surface/ L. Ader	Grab	AES & MS	1026 (1)	12444026	10/30/2012 16:30		
MJ0AC7	Soil Subsurface/ L. Ader	Grab	AES & MS	1027 (1)	12444027	10/30/2012 16:40		
MJ0AC8	Soil Surface/ L. Ader	Grab	AES & MS	1028 (1)	12444028	10/31/2012 13:30		
MJ0AC9	Soil Subsurface/ L. Ader	Grab	AES & MS	1029 (1)	12444029	10/31/2012 13:50		
MJ0AD0	Soil Surface/ L. Ader	Grab	AES & MS	1030 (1)	12444030	10/31/2012 12:45		
MJ0AD1	Soil Subsurface/ L. Ader	Grab	AES & MS	1031 (1)	12444031	10/31/2012 13:05		
MJ0AD2	Soil Surface/ L. Ader	Grab	AES & MS	1032 (1)	12444032	10/31/2012 14:00		
MJ0AD3	Soil Subsurface/ L. Ader	Grab	AES & MS	1033 (1)	12444033	10/31/2012 14:08		
MJ0AE0	Soil Surface/ L. Ader	Grab	AES & MS	1040 (1)	12444040	10/31/2012 16:40		

Shipment for Case Complete? Y

Samples Transferred From Chain of Custody #

Sample(s) to be used for Lab QC: MJ0AE0, MJ0AE1

Analysis Key: AES & MS=TAL Metals ICP-AES & ICP-MS (Incl. Hg)

5030c No Seal #s No Temp Blank

Items/Reason	Relinquished by	Date	Received by	Date	Items/Reason	Relinquished By	Date	Received by	Date	Time
	2. Ader	11/5/12	SPC TABER	11/6/12						

CHAIN OF CUSTODY RECORD

Project Code: SFP-036A

Case #: 42864

Cooler #:

Lab: Test America Laboratories

Lab Contact: Kirk Young

Lab Phone: 802-680-1990

[illegible]

Sample(s) to be used for Lab QC: MJ0AE1	5.3°C	No Seal #5	No Temp Blank	Shipment for Case Complete? Y
Analysis Key: AES & MS=TAL Metals ICP-AES & ICP-MS (Incl. Hg)				Samples Transferred From Chain of Custody #

[illegible]

USEPA CLP Inorganics COC (LAB COPY)

Date Shipped: 11/5/2012

Carrier Name: FedEx

Airbill No: 876405533336

CHAIN OF CUSTODY RECORD

Project Code: SFP-036A

Case #: 42864

Cooler #:

No: 10-110212-120945-0007

Lab: Test America Laboratories

Lab Contact: Kirk Young

Lab Phone: 802-660-1990

Inorganic Sample #	Matrix/Sampler	Coll. Method	Analysis/Turnaround	Tag/Preservative/Bottles	Station Location	Collected	Organic Sample #	For Lab Use Only
MJ0AD8	Soil Surface/ L. Ader	Grab	AES & MS	1038 (1)	12444038	11/01/2012 12:15		
MJ0AE3	Filtered Water/ J. Feters	Grab	ICP/MS	1043 (HNO3 pH<2) (1)	12444043	11/01/2012 14:27		
MJ0AF0	Filtered Water/ J. Feters	Grab	ICP/MS	1050 (HNO3 pH<2) (1)	12444049	11/01/2012 18:50		
MJ0AF5	Water/ J. Feters	Grab	ICP/MS	1055 (HNO3 pH<2) (1)	12444054	11/02/2012 08:51		
MJ0AF6	Water/ J. Feters	Grab	ICP/MS	1056 (HNO3 pH<2) (1)	12444055	11/02/2012 08:57		
MJ0AG1	Water/ J. Feters	Grab	ICP/MS	1061 (HNO3 pH<2) (1)	12444060	11/01/2012 13:56		
MJ0AG2	Water/ J. Feters	Grab	ICP/MS	1062 (HNO3 pH<2) (1)	12444061	11/02/2012 08:16		
MJ0AG6	Soil Subsurface/ J. Feters	Grab	AES & MS	1066 (1)	12444065	11/01/2012 15:12		
MJ0AG7	Soil Subsurface/ J. Feters	Grab	AES & MS	1067 (1)	12444066	11/01/2012 16:20		

Sample(s) to be used for Lab QC: MJ0AG7	Shipment for Case Complete? <i>Yes</i>
Analysis Key: AES & MS=TAL Metals ICP-AES & ICP-MS (Incl. Hg), ICP/MS=CLP TAL Metals ICP-MS (Incl. Hg)	Samples Transferred From Chain of Custody #

Items/Reason	Relinquished by	Date	Received by	Date	Received by	Date	Time
	<i>J. Ader</i>	<i>11/5/12</i>	<i>11/5/12</i>				

COPY ORIGINAL ON FILE
 Date: 11/5/12 ETR # 13594

USEPA CLP Inorganics COC (LAB COPY)

DateShipped: 11/5/2012

CarrierName: FedEx

Airbill No: 87840533325

CHAIN OF CUSTODY RECORD

Project Code: SFP-036A

Case #: 42864

Cooler #:

No: 10-110212-122358-0008

Lab: Test America Laboratories

Lab Contact: Kirk Young

Lab Phone: 802-660-1990

[illegible]

Sample(s) to be used for Lab QC: MJ0AF-1	5.3cc No Seal #2 No Tag Blank	Shipment for Case Complete? N
Analysis Key: ICP/MS=CLP TAL Metals ICP-MS (Incl. Hg)		Samples Transferred From Chain of Custody #

[illegible]

USEPA CLP Generic COC (LAB COPY)

DateShipped: 11/5/2012

CarrierName: FedEx

Airbill No: 876405533347

CHAIN OF CUSTODY RECORD

Site #: SFP-036A

Project Code: SFP-036A

Cooler #:

No: 10-110212-120042-0005

Lab: ALS Environmental

Lab Contact: Shar Samy

Lab Phone: 360-577-7222

[illegible]

Special Instructions:

Analysis Key: A & B=Alkalinity & Bicarbonate

Shipment for Case Complete? ☒ **YES**
 Samples Transferred From Chain of Custody # **64**

[illegible]

PC Shaw

Cooler Receipt and Preservation Form

Client / Project: US EPAService Request K12 11151Received: 11/6/12 Opened: 11/6/12 By: BT Unloaded: 11/6/12 By: BT

1. Samples were received via? Mail Fed Ex UPS DHL PDX Courier Hand Delivered
2. Samples were received in: (circle) Cooler Box Envelope Other NA
3. Were custody seals on coolers? NA Y N If yes, how many and where? 2 front
- If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Temp	Corr. Temp	Raw Blank	Corr. Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
0.4	0.5	0.0	0.1	+0.1	314	10-10212-	8764 0553 3347	

7. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves Shredded material
8. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
9. Did all bottles arrive in good condition (unbroken)? Indicate in the table below. NA Y N
10. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
11. Did all sample labels and tags agree with custody papers? Indicate major discrepancies in the table on page 2. NA Y N
12. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
13. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA Y N
14. Were VOA vials received without headspace? Indicate in the table below. NA Y N
15. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions:

USEPA CLP Generic COC (LAB COPY)

DateShipped: 11/1/2012

CarrierName: FedEx

AirbillNo: 870485054568

CHAIN OF CUSTODY RECORD

Site #: SFP-036A

Project Code: SFP-036A

Cooler #:

No: 10-103112-212518-0004

Lab: ALS Environmental

Lab Contact: Shar Samy

Lab Phone: 360-577-7222

U21067

[illegible]

Sample(s) to be used for Lab QC: 12444050	Shipment for Case Complete? N
Samples Transferred From Chain of Custody #	
Analysis Kev. A & B=Alkalinity & Bicarbonate	

[illegible]

PC Shar

Cooler Receipt and Preservation Form

Client / Project: US EPAService Request K1211067Received: 11/2/12 Opened: 11/2/12 By: BT Unloaded: 11/2/12 By: BT

1. Samples were received via? Mail Fed Ex UPS DHL PDX Courier Hand Delivered
2. Samples were received in: (circle) Cooler Box Envelope Other NA
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 1 front
- If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Temp	Corr Temp	Raw Blank	Corr. Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
-0.4	-0.5	-	-	-0.1	320	10-103112-212518-0004			X

7. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves
8. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
9. Did all bottles arrive in good condition (unbroken)? Indicate in the table below. NA (Y) N
10. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
11. Did all sample labels and tags agree with custody papers? Indicate major discrepancies in the table on page 2. NA (Y) N
12. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
13. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? Indicate in the table below NA Y N
14. Were VOA vials received without headspace? Indicate in the table below. NA Y N
15. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head- space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions:

USEPA CLP Generic COC (LAB COPY)

DateShipped: 11/1/2012

CarrierName: FedEx

ArbJINo: 870485054579

CHAIN OF CUSTODY RECORD

Site #: SFP-036A

Project Code: SFP-036A

Cooler #:

No: 10-103112-211414-0003

Lab: Manchester Environmental Laboratory

Lab Contact: Karen Woods

Lab Phone: 360-871-8728

[illegible]

Sample(s) to be used for Lab QC: 12444040, 12444050	Shipment for Case Complete? N
	Samples Transferred From Chain of Custody #

Analysis Key: SPLP=SPLP (As, Pb), N/N=Nitrate + Nitrite (NO₂ + NO₃), Anions=Anions (SO₄, Br, Cl)

[illegible]

USEPA CLP Generic COC (LAB COPY)

DateShipped: 11/1/2012

CarrierName: FedEx

AirbillNo: 870482839613

CHAIN OF CUSTODY RECORD

Site #: SFP-036A

Project Code: SFP-036A

Cooler #:

No: 10-103112-205729-0002

Lab: Manchester Environmental Laboratory

Lab Contact: Karen Woods

Lab Phone: 360-871-8728

[illegible]

Special Instructions:

Shipment for Case Complete? N

Samples Transferred From Chain of Custody #

Analysis Key: N/N=Nitrate + Nitrite (NO₂ + NO₃), Anions=Anions (SO₄, Br, Cl)

[illegible]

This page intentionally left blank.

E

Data Validation Memoranda

This page intentionally left blank.



ecology and environment, inc.

Global Environmental Specialists

720 Third Avenue, Suite 1700, Seattle, WA 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: December 26, 2012
TO: Linda Ader, Project Manager, E & E, Seattle, Washington
FROM: Mark Woodke, START-3 Chemist, E & E, Seattle, Washington *MW*
SUBJ: Inorganic Data Summary Check,
Rock Island Silicon Plant (Former), Wenatchee, Washington
REF: TDD: 12-05-0002 PAN: EE-002233-0786-01TTO

The data summary check of 11 soil samples collected from the Rock Island Silicon Plant (Former) site in Wenatchee, Washington, has been completed. Analyses for SPLP metals were performed at the EPA Region 10 Laboratory, Port Orchard, Washington.

The samples were numbered:

12444000	12444012	12444018	12444022	12444024
12444028	12444030	12444034	12444036	12444040
12444065				

No discrepancies were noted.

The following bias qualifier was added to estimated results by the secondary reviewer:

K - Unknown bias.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 LABORATORY
7411 Beach Dr. East
Port Orchard, Washington 98366

MEMORANDUM

SUBJECT: Data Release for Inorganics Results from the USEPA
Region 10 Laboratory

PROJECT NAME: Rock Island Silicon Plant

PROJECT CODE: SFP-036A

FROM: Gerald Dodo, Chemistry Supervisor
Office of Environmental Assessment
USEPA Region 10 Laboratory

TO: Monica Tonel, RPM
Office of Environmental Cleanup, Assessment and
Brownfields Unit, USEPA Region 10

CC: Renee Nordeen – E & E

I have authorized release of this data package. Attached you will find the Synthetic Precipitation Leaching Procedure (SPLP) Metals results for the Rock Island Silicon Plant project for the samples received on 11/02/2012 and 11/06/2012. For further information regarding the attached data, contact Stephanie Le at (360) 871-8715.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 LABORATORY
7411 Beach Dr. East
Port Orchard, Washington 98366

QUALITY ASSURANCE MEMORANDUM
FOR INORGANIC CHEMICAL ANALYSES

DATE: December 20, 2012

TO: Monica Tonel, Project Manager
Office of Environmental Cleanup, Assessment and Brownfields Unit,
USEPA Region 10

FROM: Stephanie Le, Chemist
Office of Environmental Assessment, US EPA Region 10 Laboratory

SUBJECT: Quality Assurance Review of the Rock Island Silicon Plant

Project Code: SFP-036A
Account Code: 2013T10P303DD210ZZLA00

CC : Renee Nordeen, E & E

The following is a quality assurance review of the results of the analyses of 11 soil samples for Synthetic Precipitation Leaching Procedure (SPLP) metals. The samples were submitted for the Rock Island Silicon Plant Project. The analyses were performed by ESAT at the US EPA Region 10 Laboratory in Port Orchard, WA, following US EPA and Laboratory guidelines.

This review was conducted for the following samples:

12444000	12444012	12444018	12444022	12444024	12444028	12444030
12444034	12444036	12444040	12444065			

Data Qualifications

Comments below refer to the quality control specifications outlined in the Laboratory's current Quality Assurance Manual, Standard Operating Procedures (SOPs) and the Quality Assurance Project Plan (QAPP). No excursions were required from the method Standard Operating Procedure.

The quality control measures which did not meet Laboratory/QAPP criteria are annotated in the title of each affected subsection with "Laboratory/QAPP Criteria Not Met."

For those tests for which the USEPA Region 10 Laboratory has been accredited by the National Environmental Laboratory Accreditation Conference (NELAC), all requirements of the current NELAC Standard have been met. The Region 10 Laboratory's Quality System has been accredited to the standards of the National Environmental Laboratory Accreditation Conference (NELAC).

1. Sample Transport and Receipt

Upon sample receipt, all conditions met Laboratory/QAPP requirements for this project.

2. Sample Holding Times

The concentration of an analyte in a sample or sample extract may increase or decrease over time depending on the nature of the analyte. For this reason, holding time limits are recommended for samples. The samples covered by this review met method holding time recommendations, where applicable.

3. Sample Preparation

Samples were prepared according to the method outlined in the SOP for these analytes for these types of matrixes. No qualification of the data was required based on sample preparation.

4. Initial Calibration and Calibration Verification

The linear regressions generated for the initial calibrations met method criteria. The low point of the calibration curve is usually the Minimum Reporting Level (MRL) of the method. All calibration verification checks met the frequency and recovery criteria on the day of analysis. No qualification was required based on calibration or calibration verification.

5. Laboratory Control Samples

All laboratory control sample results met the recovery acceptance criteria for the methods. No qualification was required based on laboratory control sample analysis.

6. Blank Analysis

The method blanks did not contain levels of analyte which would require data qualification.

7. Duplicate Analysis - Laboratory/QAPP Criteria Not Met

Duplicate analyses were performed on sample 12444040. Sample results which were greater than the LRS level were within the $\pm 20\%$ RPD requirement with the exception of lead at 94% RPD. All lead results were qualified "J", estimated. No other qualification was required based on duplicate analysis.

8. Matrix Spike/Matrix Spike Duplicate Analysis

Matrix spike analyses were performed on sample 12444040. Sample results were within the 75-125% recovery requirements. No qualification was required based on matrix spike analyses.

9. Instrument Peak Integrations

No manual integrations were performed for this analysis.

10. Interferences

Serial dilution checks were analyzed to demonstrate that interferences were under control. All results of these checks met laboratory acceptance criteria.

11. Reporting Limits

All sample results that fall below the MRL are assigned the value of the MRL and the 'U' qualifier is attached.

12. Data Qualifiers

The (U) qualifier was attached to those results which were below the Method Reporting Limit (MRL). All lead results were qualified (J), estimated, due to poor duplication. No other qualification was required.

The definition for the data qualifier is as follows:

- U - The analyte was not detected at or above the reported value.
- J - The identification of the analyte is acceptable; however the reported value is an estimate.

The usefulness of qualified data should be treated according to the severity of the qualifier in light of the project's data quality objectives. Should questions arise regarding the data, contact Stephanie Le at the Region 10 Laboratory, phone number (360) 871- 8715.

13. Definitions

Accuracy - the degree of conformity of a measured or calculated quantity to its actual value.

Duplicate Analysis - when a duplicate of a sample (DU), a matrix spike (MSD), or a laboratory control sample (LCS) is analyzed, it is possible to use the comparison of the results in terms of relative percent difference (RPD) to calculate precision.

Laboratory Control Sample (LCS) - a clean matrix spiked with known quantities of analytes. The LCS is processed with samples through every step of preparation and analysis. Measuring percent recovery of each analyte in the LCS provides a measurement of accuracy for the analyte in the project samples. A laboratory control sample is prepared and analyzed at a frequency no less than one for every 20 project samples.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) - Sample analyses performed to provide information about the effect of the sample matrix on analyte recovery and measurement within the project samples. To create the MS/MSD, a project sample is spiked with known quantities of analytes and the percent recoveries of the analytes are determined.

Method Blank- An analytical control that is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background and reagent contamination. A method blank is prepared and analyzed for every batch of samples at a minimum frequency of one per every 20 samples. To produce unqualified data, the result of the method blank analysis is required to be less than the MRL and less than 10 times the amount of analyte found in any project sample.

Minimum Reporting Level (MRL) - the smallest measured concentration of a substance that can be reliably measured using a given analytical method.

Peak Integrations - The output of many analytical instruments is a peak which represents the quantity of analyte in the sample. The instrument automatically integrates the peak area to provide the concentration of the analyte; however, sometimes these peaks need to be manually integrated by the analyst.

Precision - the degree of mutual agreement or repeatability among a series of individual results.

Reference materials - Samples with analyte values that are homogeneous and well established. This allows the reference material to be used to assess the accuracy of the measurement method.

Relative Percent Difference - The difference between two sample results divided by their mean and expressed as a percentage.

US EPA Region 10 Laboratory

Multi-Analyte Final Report



Project Code : SFP-036A

Site : ROCK ISLAND SILICON PLANT

Contact : Monica Tonel

Account : 2013T10P303DD210KPLA00

Sample : 12444000

Description : FP01SB01

Matrix : Soil

Weight Basis : N/A

Collected : 10/31/2012 9:50:00AM

Parameter : ICP/MS

Lab Matrix : SPLP Extract

Fraction : Total

Prep Method: 1312/200.2 - SPLP Extraction for Metals followed by Digestion of Leachate for metals

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
Target Analyte Results:						
7440382	Arsenic	85.8	ug/L		12/3/12	10
7439921	Lead	100	ug/L	J K ML	12/3/12	2

Sample : 12444012

Description : FP06SB01

Matrix : Soil

Weight Basis : N/A

Collected : 11/1/2012 9:45:00AM

Parameter : ICP/MS

Lab Matrix : SPLP Extract

Fraction : Total

Prep Method: 1312/200.2 - SPLP Extraction for Metals followed by Digestion of Leachate for metals

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
Target Analyte Results:						
7440382	Arsenic	49.4	ug/L		12/3/12	20
7439921	Lead	1.8	ug/L	J K ML	12/3/12	2

Sample : 12444018

Description : FS01SB

Matrix : Soil

Collected : 10/29/2012 3:00:00PM

Weight Basis : N/A

Parameter : ICP/MS

Lab Matrix : SPLP Extract

Fraction : Total

Prep Method: 1312/200.2 - SPLP Extraction for Metals followed by Digestion of Leachate for metals

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
Target Analyte Results:						
7440382	Arsenic	14.8	ug/L		12/3/12	4
7439921	Lead	3.7	ug/L	J K mw	12/3/12	2

Sample : 12444022

Description : AR01SS

Matrix : Soil

Collected : 10/30/2012 3:20:00PM

Weight Basis : N/A

Parameter : ICP/MS

Lab Matrix : SPLP Extract

Fraction : Total

Prep Method: 1312/200.2 - SPLP Extraction for Metals followed by Digestion of Leachate for metals

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
Target Analyte Results:						
7440382	Arsenic	3670	ug/L		12/3/12	50
7439921	Lead	67	ug/L	J K mw	12/3/12	2

Sample : 12444024

Description : AR02SS

Matrix : Soil

Collected : 10/30/2012 4:05:00PM

Weight Basis : N/A

Parameter : ICP/MS

Lab Matrix : SPLP Extract

Fraction : Total

Prep Method: 1312/200.2 - SPLP Extraction for Metals followed by Digestion of Leachate for metals

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
Target Analyte Results:						
7440382	Arsenic	11.7	ug/L		12/3/12	2
7439921	Lead	41	ug/L	J K mw	12/3/12	2

Sample : 12444028

Description : AR04SS

Matrix : Soil

Collected : 10/31/2012 1:30:00PM

Weight Basis : N/A

Parameter : ICP/MS

Lab Matrix : SPLP Extract

Fraction : Total

Prep Method: 1312/200.2 - SPLP Extraction for Metals followed by Digestion of Leachate for metals

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result Unit	Qual.	Analysis Date	Dilution
Target Analyte Results:					
7440382	Arsenic	12.6 ug/L		12/3/12	2
7439921	Lead	15 ug/L	J K	12/3/12	2

Sample : 12444030

Description : AR05SS

Matrix : Soil

Collected : 10/31/2012 12:45:00PM

Weight Basis : N/A

Parameter : ICP/MS

Lab Matrix : SPLP Extract

Fraction : Total

Prep Method: 1312/200.2 - SPLP Extraction for Metals followed by Digestion of Leachate for metals

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result Unit	Qual.	Analysis Date	Dilution
Target Analyte Results:					
7440382	Arsenic	16.0 ug/L		12/3/12	2
7439921	Lead	12 ug/L	J K	12/3/12	2

Sample : 12444034

Description : AR07SS

Matrix : Soil

Collected : 11/1/2012 12:40:00PM

Weight Basis : N/A

Parameter : ICP/MS

Lab Matrix : SPLP Extract

Fraction : Total

Prep Method: 1312/200.2 - SPLP Extraction for Metals followed by Digestion of Leachate for metals

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result Unit	Qual.	Analysis Date	Dilution
Target Analyte Results:					
7440382	Arsenic	5.42 ug/L		12/3/12	2
7439921	Lead	0.62 ug/L	J K	12/3/12	2

Sample : 12444036

Description : AR08SS

Matrix : Soil

Collected : 11/1/2012 11:40:00AM

Weight Basis : N/A

Parameter : ICP/MS

Lab Matrix : SPLP Extract

Fraction : Total

Prep Method: 1312/200.2 - SPLP Extraction for Metals followed by Digestion of Leachate for metals

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
Target Analyte Results:						
7440382	Arsenic	6.70	ug/L		12/3/12	2
7439921	Lead	0.81	ug/L	JK	12/3/12	2

Sample : 12444040

Description : BK02SS

Matrix : Soil

Collected : 10/31/2012 4:40:00PM

Weight Basis : N/A

Parameter : ICP/MS

Lab Matrix : SPLP Extract

Fraction : Total

Prep Method: 1312/200.2 - SPLP Extraction for Metals followed by Digestion of Leachate for metals

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
Target Analyte Results:						
7440382	Arsenic	162	ug/L		12/3/12	4
7439921	Lead	7.2	ug/L	JK	12/3/12	2

Sample : 12444065

Description : BK01SB01

Matrix : Soil

Collected : 11/1/2012 3:12:00PM

Weight Basis : N/A

Parameter : ICP/MS

Lab Matrix : SPLP Extract

Fraction : Total

Prep Method: 1312/200.2 - SPLP Extraction for Metals followed by Digestion of Leachate for metals

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
Target Analyte Results:						
7440382	Arsenic	4.9	ug/L		12/3/12	2
7439921	Lead	1.4	ug/L	JK	12/3/12	2

Sample : 12444040 Sample Duplicate

Description : BK02SS

Matrix : Soil

Weight Basis : N/A

Collected : 10/31/2012 4:40:00PM

Parameter : ICP/MS

Lab Matrix : SPLP Extract

Fraction : Total

Prep Method: 1312/200.2 - SPLP Extraction for Metals followed by Digestion of Leachate for metals

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result Unit	Qual.	Analysis Date	Dilution
Target Analyte Results:					
7440382	Arsenic	174 ug/L		12/3/12	4
7439921	Lead	20 ug/L	J K me	12/3/12	2

Sample : 12444040 Matrix Spike

Description : BK02SS

Matrix : Soil

Weight Basis : N/A

Collected : 10/31/2012 4:40:00PM

Parameter : ICP/MS

Lab Matrix : SPLP Extract

Fraction : Total

Prep Method: 1312/200.2 - SPLP Extraction for Metals followed by Digestion of Leachate for metals

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result Unit	Qual.	Analysis Date	Dilution
Spiked Compounds:					
7440382	Arsenic	94 %Rec		12/3/12	4
7439921	Lead	96 %Rec		12/3/12	2

Sample : 12444040 Matrix Spike#2

Description : BK02SS

Matrix : Soil

Weight Basis : N/A

Collected : 10/31/2012 4:40:00PM

Parameter : ICP/MS

Lab Matrix : SPLP Extract

Fraction : Total

Prep Method: 1312/200.2 - SPLP Extraction for Metals followed by Digestion of Leachate for metals

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result Unit	Qual.	Analysis Date	Dilution
Spiked Compounds:					
7440382	Arsenic	99 %Rec		12/3/12	4
7439921	Lead	97 %Rec		12/3/12	2

Sample : IS111512ABL Blank

Description : Blank

Matrix : SPLP Extract

Weight Basis : N/A

Parameter : ICP/MS

Fraction : Total

Prep Method: 1312/200.2 - SPLP Extraction for Metals followed by Digestion of Leachate for metals

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
Target Analyte Results:						
7440382	Arsenic	0.022	ug/L	U	12/3/12	2
7439921	Lead	0.054	ug/L	U	12/3/12	2

Sample : IW112812ABL Blank

Description : Blank

Matrix : Liquid

Weight Basis : N/A

Parameter : ICP/MS

Fraction : Total

Prep Method: 200.2 - Metals, total recoverable, water, soil, EMSL-CIN

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
Target Analyte Results:						
7440382	Arsenic	0.020	ug/L	U	12/3/12	2
7439921	Lead	0.050	ug/L	U	12/3/12	2

Sample : IW112812AL1 Lab Control Std

Description : Lab Control Standard

Matrix : Liquid

Weight Basis : N/A

Parameter : ICP/MS

Fraction : Total

Prep Method: 200.2 - Metals, total recoverable, water, soil, EMSL-CIN

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
Spiked Compounds:						
7440382	Arsenic	95	%Rec		12/3/12	2
7439921	Lead	94	%Rec		12/3/12	2

Sample : IW112812AL2 Lab Control Std#2

Description : Lab Control Standard Dup.

Matrix : Liquid

Weight Basis : N/A

Parameter : ICP/MS

Fraction : Total

Prep Method: 200.2 - Metals, total recoverable, water, soil, EMSL-CIN

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
Spiked Compounds:						
7440382	Arsenic	95	%Rec		12/3/12	2
7439921	Lead	95	%Rec		12/3/12	2

Sample : IS111512BSB Lab Control Std#3

Description : Lab Control Standard Trip.

Matrix : SPLP Extract

Weight Basis : N/A

Parameter : ICP/MS

Fraction : Total

Prep Method: 1312/200.2 - SPLP Extraction for Metals followed by Digestion of Leachate for metals

Analysis Method: 200.8 - ICPMS 18 Elements

Analyte Code	Analyte Name	Result	Unit	Qual.	Analysis Date	Dilution
Spiked Compounds:						
7440382	Arsenic	96	%Rec		12/3/12	
7439921	Lead	96	%Rec		12/3/12	



ecology and environment, inc.

Global Environmental Specialists

720 Third Avenue, Suite 1700, Seattle, WA 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: November 20, 2012

TO: Linda Ader, Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-3 Chemist, E & E, Seattle, Washington *MW*

SUBJ: Organic Data Validation Memo,
Rock Island Silicon Plant (Former), Wenatchee, Washington

REF: TDD: 12-05-0002 PAN: EE-002233-0786-01TTO

The data validation of five water samples collected from the Rock Island Silicon Plant (Former) site in Wenatchee, Washington, has been completed. Analyses for Alkalinity (Standard Method 2320B) and Bicarbonate (Standard Method 2320B) were performed by ALS, Inc., Kelso, Washington. All sample analyses were evaluated following EPA's Stage 4 Data Validation Manual Process (S4VM).

The samples were numbered:

12444042 12444050 12444051 12444052 12444063

Data Qualifications:

1. Sample Holding Times: Acceptable.

The samples were maintained at $\leq 6^{\circ}\text{C}$. The samples were collected between October 29 and 31, 2012, and were analyzed by November 9, 2012, therefore meeting QC criteria of less than 14 days between collection and analysis.

2. Error Determination: Not Performed.

Samples necessary for bias and precision determination were not provided to the laboratory. All samples were flagged RND (Recovery Not Determined) and PND (Precision Not Determined), although the flags are not found on the Form I's.

3. Blanks: Acceptable.

A method blank was analyzed for each extraction batch for each matrix and analysis system. There were no detections in any method blank.

4. Performance Evaluation Samples: Not Provided.

Performance evaluation samples were not provided to the laboratory.

5. Duplicates: Acceptable.

Duplicate results were acceptable.

6. Laboratory Control Samples: Acceptable.

Laboratory control sample recoveries were within QC limits.

7. Quantitation and Quantitation Limits: Acceptable.

Sample concentrations were correctly calculated.

8. Laboratory Contact: Not Required.

No laboratory contact was required.

9. Overall Assessment of Data for Use

The overall usefulness of the data is based on the criteria outlined in the Sampling and Quality Assurance Plan and the analytical method. Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

JH - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a high bias.

JL - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a low bias.

JK - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with an unknown direction of bias.

JQ - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with an unknown direction of bias and falls between the MDL and the Minimum (or Practical) Quantitation Limit (MQL, PQL).

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: Ecology And Environment, Incorporated

Project: SPP-036A

Sample Matrix: Water

Analysis Method: SM 2320 B

Service Request: K1211067

Date Collected: 10/29/12 - 10/31/12

Date Received: 11/2/12

Units: mg/L

Basis: NA

Alkalinity as CaCO₃, Total

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Q
12444042	K1211067-001	339	9.0	1	11/07/12 16:06	J/M ↓
12444050	K1211067-002	157	9.0	1	11/07/12 16:06	
12444051	K1211067-003	323	9.0	1	11/07/12 16:06	
12444052	K1211067-004	217	9.0	1	11/09/12 15:00	
12444063	K1211067-005	267	9.0	1	11/09/12 15:00	
Method Blank	K1211067-MB1	ND U	9.0	1	11/07/12 16:06	MW 11-20-12
Method Blank	K1211067-MB2	ND U	9.0	1	11/07/12 16:06	
Method Blank	K1211067-MB3	ND U	9.0	1	11/09/12 15:00	
Method Blank	K1211067-MB4	ND U	9.0	1	11/09/12 15:00	

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: Ecology And Environment, Incorporated
Project: SFP-036A
Sample Matrix: Water
Analysis Method: SM 2320 B

Service Request: K1211067
Date Collected: 10/29/12 - 10/31/12
Date Received: 11/2/12

Units: mg/L
Basis: NA

Bicarbonate as CaCO₃

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Q
12444042	K1211067-001	335	9.0	1	11/07/12 16:06	541M ↓
12444050	K1211067-002	157	9.0	1	11/07/12 16:06	
12444051	K1211067-003	317	9.0	1	11/07/12 16:06	
12444052	K1211067-004	217	9.0	1	11/09/12 15:00	
12444063	K1211067-005	267	9.0	1	11/09/12 15:00	
Method Blank	K1211067-MB1	ND U	9.0	1	11/07/12 16:06	me
Method Blank	K1211067-MB2	ND U	9.0	1	11/07/12 16:06	
Method Blank	K1211067-MB3	ND U	9.0	1	11/09/12 15:00	
Method Blank	K1211067-MB4	ND U	9.0	1	11/09/12 15:00	



ecology and environment, inc.

Global Environmental Specialists

720 Third Avenue, Suite 1700, Seattle, WA 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: December 26, 2012
TO: Linda Ader, Project Manager, E & E, Seattle, Washington
FROM: Mark Woodke, START-3 Chemist, E & E, Seattle, Washington *MW*
SUBJ: Inorganic Data Summary Check,
Rock Island Silicon Plant (Former), Wenatchee, Washington
REF: TDD: 12-05-0002 PAN: EE-002233-0786-01TTO

The data summary check of 8 water samples collected from the Rock Island Silicon Plant (Former) site in Wenatchee, Washington, has been completed. Analyses for anions (bromide, chloride, and sulfate; EPA Method 300.0) were performed at the EPA Region 10 Laboratory, Port Orchard, Washington.

The samples were numbered:

12444042	12444043	12444049	12444050	12444051
12444052	12444053	12444063		

No discrepancies were noted.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 LABORATORY
7411 Beach Dr. East
Port Orchard, Washington 98366

MEMORANDUM

SUBJECT: Data Release for Inorganics Results from the USEPA
Region 10 Laboratory

PROJECT NAME: Rock Island Silicon Plant

PROJECT CODE: SFP-036A

FROM: Gerald Dodo, Chemistry Supervisor
Office of Environmental Assessment
USEPA Region 10 Laboratory

TO: Monica Tonel, RPM
Office of Environmental Cleanup, Assessment and
Brownfields Unit, USEPA Region 10

CC: Renee Nordeen – E & E

I have authorized release of this data package. Attached you will find the Anions (Bromide, Chloride, and Sulfate) results for the Rock Island Silicon Plant project for the samples received on 11/02/2012 and 11/06/2012. For further information regarding the attached data, contact Stephanie Le at (360) 871-8715.



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 LABORATORY
7411 Beach Dr. East
Port Orchard, Washington 98366**

**QUALITY ASSURANCE MEMORANDUM
FOR INORGANIC CHEMICAL ANALYSES**

DATE: December 17, 2012

TO: Monica Tonel, Project Manager
Office of Environmental Cleanup, Assessment and Brownfields Unit, US EPA Region 10

FROM: Stephanie Le, Chemist
Office of Environmental Assessment, US EPA Region 10 Laboratory

SUBJECT: Quality Assurance Review of the Rock Island Silicon Plant
For Anions

Project Code: SFP-036A
Account Code: 2013T10P303DD210KPLA00

CC: Renee Nordeen – E & E

The following is a quality assurance review of the results of 8 water samples for anions (bromide, chloride, and sulfate) analyses. These samples were submitted for the Rock Island Silicon Plant Project. The analyses were performed by ESAT chemists at the US EPA Region 10 Laboratory in Port Orchard, WA, following US EPA and Laboratory guidelines.

This review was conducted for the following samples:

12444042	12444043	12444049	12444050	12444051	12444052	12444053
12444063						

Data Qualifications

Comments below refer to the quality control specifications outlined in the Laboratory's current Quality Assurance Manual, Standard Operating Procedures (SOPs) and the Quality Assurance Project Plan (QAPP). No excursions were required from the method Standard Operating Procedure.

All measures of quality control met Laboratory/QAPP criteria.

For those tests for which the USEPA Region 10 Laboratory has been accredited by the National Environmental Laboratory Accreditation Conference (NELAC), all requirements of the current NELAC Standard have been met. The Region 10 Laboratory's Quality System has been accredited to the standards of the National Environmental Laboratory Accreditation Conference (NELAC).

1. Sample Transport and Receipt

Upon sample receipt, all conditions met Laboratory/QAPP requirements for this project.

2. Sample Holding Times

The concentration of an analyte in a sample or sample extract may increase or decrease over time depending on the nature of the analyte. For this reason, holding time limits are recommended for samples. The samples covered by this review met method holding time recommendations, where applicable.

3. Sample Preparation

Samples were prepared according to the SOP for these analytes for this type of matrix. No qualification of the data was required based on sample preparation.

4. Initial Calibration and Calibration Verification

The linear regression generated for the initial calibrations met method criteria. The low point of the calibration curve is usually the Minimum Reporting Level (MRL) of the method. All calibration verification checks met the frequency and recovery criteria on the day of analysis. No qualification was required based on calibration or calibration verification.

5. Laboratory Control Samples

All laboratory control sample results met the recovery acceptance criteria for the methods reported. No qualification was required based on laboratory control sample analysis.

6. Blank Analysis

The method blanks did not contain detectable levels of reported analytes which would require data qualification.

7. Duplicate Analysis

Duplicate analysis was performed on samples 12444042, 12444043, and 12444050. Sample results which were greater than 5 times of the MRL level were within the +/- 20% RPD requirement. No qualification was required based on duplicate analysis.

8. Matrix Spike/Matrix Spike Duplicate Analysis

Matrix spike analyses were performed on samples 12444042, 12444043, and 12444050. Sample results were within the 80-120% recovery requirements.

No qualification was required based on matrix spike analyses.

9. Instrument Peak Integrations

No manual integrations were performed.

10. Reporting Limits

All sample results that fall below the MRL are assigned the value of the MRL and the 'U' qualifier is attached.

11. Data Qualifiers

The U-qualifier was attached to the results which were below the MRL.

No qualification was required.

The definition for the data qualifier is as follows:

U - The analyte was not detected at or above the reported value.

The usefulness of qualified data should be treated according to the severity of the qualifier in light of the project's data quality objectives. Should questions arise regarding the data, contact Stephanie Le at the Region 10 Laboratory, phone number (360) 871- 8715.

12. Definitions

Accuracy - the degree of conformity of a measured or calculated quantity to its actual value.

Duplicate Analysis - when a duplicate of a sample (DS), a matrix spike (MSD), or a laboratory control sample (LCSD) is analyzed, it is possible to use the comparison of the results in terms of relative percent difference (RPD) to calculate precision.

Laboratory Control Sample (LCS) - a clean matrix spiked with known quantities of analytes. The LCS is processed with samples through every step of preparation and analysis. Measuring percent recovery of each analyte in the LCS provides a measurement of accuracy for the analyte in the project samples. A laboratory control sample is prepared and analyzed at a frequency no less than one for every 20 project samples.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) - Sample analyses performed to provide information about the effect of the sample matrix on analyte recovery and measurement within the project samples. To create the MS/MSD, a project sample is spiked with known quantities of analytes and the percent recoveries of the analytes are determined.

Method Blank- An analytical control that is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background and reagent contamination. A method blank is prepared and analyzed for every batch of samples at a minimum frequency of one per every 20 samples. To produce unqualified data, the result of the method blank analysis is required to be less than the MRL and less than 10 times the amount of analyte found in any project sample.

Minimum Reporting Level (MRL) - the smallest measured concentration of a substance that can be reliably measured using a given analytical method.

Peak Integrations - The output of many analytical instruments is a peak which represents the quantity of analyte in the sample. The instrument automatically integrates the peak area to provide the concentration of the analyte; however, sometimes these peaks need to be manually integrated by the analyst.

Precision - the degree of mutual agreement or repeatability among a series of individual results.

Relative Percent Difference - The difference between two sample results divided by their mean and expressed as a percentage

US EPA Region 10 Laboratory

Multi-Sample Final Report



Project Code : SFP-036A

Site : ROCK ISLAND SILICON PLANT

Contact : Monica Tonel

Account : 2013T10P303DD210KPLA00

Parameter(s): Anions

Analyte: *90009 - Bromide

Weight Basis : Wet

Prep Method(s): 300.0 - Inorganic Anions, Ion Chromatography

Analytical Method: 300.0 - Inorganic Anions, Ion Chromatography

Target Analyte Results:

Sample	COC Description	Lab Matrix	Result	Unit	Qual.	Analysis Date	Dilution
12444042 sam	FP01GW	Filtered	0.344	mg/L		11/14/12	1
12444043 sam	FP02GW	Filtered	0.854	mg/L		11/14/12	1
12444049 sam	BK01GW	Filtered	0.20	mg/L	U	11/14/12	1
12444050 sam	BK02GW	Water	0.20	mg/L	U	11/14/12	1
12444051 sam	AR01GW	Water	0.20	mg/L	U	11/14/12	1
12444052 sam	AR02GW	Water	0.20	mg/L	U	11/14/12	1
12444053 sam	AR03GW	Water	0.20	mg/L	U	11/14/12	1
12444063 sam	PW01GW	Water	0.20	mg/L	U	11/14/12	
12444050 du	BK02GW	Water	0.20	mg/L	U	11/14/12	
IW111412ABL blk	Blank	Liquid	0.20	mg/L	U	11/14/12	1

Spiked Compounds:

Sample	COC Description	Lab Matrix	Result	Unit	Qual.	Analysis Date	Dilution
12444050 ms	BK02GW	Water	99	%Rec		11/14/12	1
12444050 msd	BK02GW	Water	100	%Rec		11/14/12	1
IW111412AL1 lcs	Lab Control Standard	Liquid	103	%Rec		11/14/12	1
IW111412AL2 lc2	Lab Control Standard Dup.	Liquid	95	%Rec		11/14/12	1

Analyte: *90012 - Chloride

Weight Basis : Wet

Prep Method(s): 300.0 - Inorganic Anions, Ion Chromatography

Analytical Method: 300.0 - Inorganic Anions, Ion Chromatography

Target Analyte Results:

Sample	COC Description	Lab Matrix	Result	Unit	Qual.	Analysis Date	Dilution
12444042 sam	FP01GW	Filtered	35.6	mg/L		11/16/12	25
12444043 sam	FP02GW	Filtered	79.9	mg/L		11/16/12	50
12444049 sam	BK01GW	Filtered	39.3	mg/L		11/16/12	50
12444050 sam	BK02GW	Water	4.22	mg/L		11/14/12	5
12444051 sam	AR01GW	Water	15.4	mg/L		11/16/12	50
12444052 sam	AR02GW	Water	12.2	mg/L		11/14/12	
12444053 sam	AR03GW	Water	9.20	mg/L		11/14/12	5

Target Analyte Results (cont.):

Sample	COC Description	Lab Matrix	Result	Unit	Qual.	Analysis Date	Dilution
12444063 sam	PW01GW	Water	23.8	mg/L		11/16/12	50
12444042 du	FP01GW	Filtered	34.6	mg/L		11/16/12	25
12444043 du	FP02GW	Filtered	79.7	mg/L		11/16/12	50
12444050 du	BK02GW	Water	4.19	mg/L		11/14/12	5
IW111412ABL blk	Blank	Liquid	0.060	mg/L	U	11/14/12	1
IW111612ABL blk	Blank	Liquid	0.060	mg/L	U	11/16/12	1

Spiked Compounds:

Sample	COC Description	Lab Matrix	Result	Unit	Qual.	Analysis Date	Dilution
12444042 ms	FP01GW	Filtered	99	%Rec		11/16/12	25
12444043 ms	FP02GW	Filtered	100	%Rec		11/16/12	50
12444050 ms	BK02GW	Water	95	%Rec		11/14/12	5
12444042 msd	FP01GW	Filtered	98	%Rec		11/16/12	25
12444043 msd	FP02GW	Filtered	101	%Rec		11/16/12	50
12444050 msd	BK02GW	Water	95	%Rec		11/14/12	5
IW111412AL1 lcs	Lab Control Standard	Liquid	102	%Rec		11/14/12	1
IW111612AL1 lcs	Lab Control Standard	Liquid	101	%Rec		11/16/12	1
IW111412AL2 lc2	Lab Control Standard Dup.	Liquid	100	%Rec		11/14/12	1
IW111612AL2 lc2	Lab Control Standard Dup.	Liquid	100	%Rec		11/16/12	1

Analyte: *90054 - Sulfate

Weight Basis: Wet

Prep Method(s): 300.0 - Inorganic Anions, Ion Chromatography

Analytical Method: 300.0 - Inorganic Anions, Ion Chromatography

Target Analyte Results:

Sample	COC Description	Lab Matrix	Result	Unit	Qual.	Analysis Date	Dilution
12444042 sam	FP01GW	Filtered	85.8	mg/L		11/14/12	5
12444043 sam	FP02GW	Filtered	127	mg/L		11/16/12	50
12444049 sam	BK01GW	Filtered	38.6	mg/L		11/14/12	5
12444050 sam	BK02GW	Water	24.6	mg/L		11/14/12	5
12444051 sam	AR01GW	Water	50.3	mg/L		11/14/12	5
12444052 sam	AR02GW	Water	18.3	mg/L		11/14/12	5
12444053 sam	AR03GW	Water	34.1	mg/L		11/14/12	5
12444063 sam	PW01GW	Water	42.3	mg/L		11/14/12	5
12444043 du	FP02GW	Filtered	127	mg/L		11/16/12	50
12444050 du	BK02GW	Water	24.6	mg/L		11/14/12	5
IW111412ABL blk	Blank	Liquid	0.30	mg/L	U	11/14/12	1
IW111612ABL blk	Blank	Liquid	0.30	mg/L	U	11/16/12	1

Spiked Compounds:

Sample	COC Description	Lab Matrix	Result	Unit	Qual.	Analysis Date	Dilution
12444043 ms	FP02GW	Filtered	93	%Rec		11/16/12	50
12444050 ms	BK02GW	Water	97	%Rec		11/14/12	5
12444043 msd	FP02GW	Filtered	93	%Rec		11/16/12	50
12444050 msd	BK02GW	Water	98	%Rec		11/14/12	5
IW111412AL1 lcs	Lab Control Standard	Liquid	103	%Rec		11/14/12	1
IW111612AL1 lcs	Lab Control Standard	Liquid	102	%Rec		11/16/12	1
IW111412AL2 lc2	Lab Control Standard Dup.	Liquid	95	%Rec		11/14/12	1

Spiked Compounds (cont.):

Sample	COC Description	Lab Matrix	Result	Unit	Qual.	Analysis Date	Dilution
IW111612AL2 Ic2	Lab Control Standard Dup.	Liquid	95	%Rec		11/16/12	(



ecology and environment, inc.

Global Environmental Specialists

720 Third Avenue, Suite 1700, Seattle, WA 98104

Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: December 19, 2012

TO: Linda Ader, Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-3 Chemist, E & E, Seattle, Washington *MW*

SUBJ: Inorganic Data Summary Check,
Rock Island Silicon Plant (Former), Wenatchee, Washington

REF: TDD: 12-05-0002 PAN: EE-002233-0786-01TTO

The data summary check of eight water samples collected from the Rock Island Silicon Plant (Former) site in Wenatchee, Washington, has been completed. Analyses for Nitrate + Nitrite (EPA Method 353.2) were performed at the EPA Region 10 Laboratory, Port Orchard, WA.

The samples were numbered:

12444042	12444043	12444049	12444050
12444051	12444052	12444053	12444063

No discrepancies were noted.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 LABORATORY
7411 Beach Dr. East
Port Orchard, Washington 98366

MEMORANDUM

SUBJECT: Data Release for Inorganics Results from the USEPA
Region 10 Laboratory

PROJECT NAME: Rock Island Silicon Plant

PROJECT CODE: SFP-036A

FROM: Gerald Dodo, Chemistry Supervisor
Office of Environmental Assessment
USEPA Region 10 Laboratory

TO: Monica Tonel, RPM
Office of Environmental Cleanup, Assessment and
Brownfields Unit, USEPA Region 10

CC: Renee Nordeen, E & E

I have authorized release of this data package. Attached you will find the Nitrate plus Nitrite results for the Rock Island Silicon Plant project for the samples received on 11/02/2012 and 11/06/2012. For further information regarding the attached data, contact Stephanie Le at (360) 871-8715.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10 LABORATORY
7411 Beach Dr. East
Port Orchard, Washington 98366

QUALITY ASSURANCE MEMORANDUM
FOR INORGANIC CHEMICAL ANALYSES

DATE: December 17, 2012

TO: Monica Tonel, Project Manager
Office of Environmental Cleanup, Assessment and Brownfields Unit, US EPA Region 10

FROM: Stephanie Le, Chemist
Office of Environmental Assessment, US EPA Region 10 Laboratory

SUBJECT: Quality Assurance Review of Rock Island Silicon Plant for Nitrate plus Nitrite

Project Code: SFP-036A
Account Code: 2013T10P303DD210KPLA00

CC: Renee Nordeen, E & E

The following is a quality assurance review of the results of the analysis of 8 water samples for nitrate plus nitrite. The samples were submitted for the Rock Island Silicon Plant Project. The analysis was performed by ESAT chemists at the US EPA Region 10 Laboratory in Port Orchard, WA, following US EPA and Laboratory guidelines.

This review was conducted for the following samples:

12444042	12444043	12444049	12444050	12444051	12444052	12444053
12444063						

Data Qualifications

Comments below refer to the quality control specifications outlined in the Laboratory's current Quality Assurance Manual, Standard Operating Procedures (SOPs) and the Quality Assurance Project Plan (QAPP). No excursions were required from the method Standard Operating Procedure.

All measures of quality control met Laboratory/QAPP criteria.

For those tests for which the USEPA Region 10 Laboratory has been accredited by the National Environmental Laboratory Accreditation Conference (NELAC), all requirements of the current NELAC Standard have been met. The Region 10 Laboratory's Quality System has been accredited to the standards of the National Environmental Laboratory Accreditation Conference (NELAC).

1. Sample Transport and Receipt

Upon sample receipt, all conditions met Laboratory/QAPP requirements for this project.

2. Sample Holding Times

The concentration of an analyte in a sample or sample extract may increase or decrease over time depending on the nature of the analyte. For this reason, holding time limits are recommended for samples. The samples covered by this review met method holding time recommendations, where applicable.

3. Sample Preparation

Samples were prepared according to the method outlined in the SOP for these analytes for this type of matrix. No qualification of the data was required based on sample preparation.

4. Initial Calibration and Calibration Verification

The linear regression generated for the initial calibration met method criteria. The low point of the calibration curve is usually the Minimum Reporting Level (MRL) of the method. All calibration verification checks met the frequency and recovery criteria on the day of analysis. No qualification was required based on calibration or calibration verification.

5. Laboratory Control Samples

All laboratory control sample results met the recovery acceptance criteria for the method. No qualification was required based on laboratory control sample analysis.

6. Blank Analysis

The method blank did not contain detectable levels of analyte which would require data qualification.

7. Duplicate Analysis

Duplicate analysis was performed on samples 12444043 and 12444050. Sample results which were greater than five times the MRL level were within the $\pm 20\%$ RPD requirement. No qualification was required based on duplicate analysis.

8. Matrix Spike/Matrix Spike Duplicate Analysis

Matrix spike analyses were performed on samples 12444043 and 12444050. Sample results were within the 75-125% recovery requirements. No qualification was required based on matrix spike analyses.

9. Reporting Limits

All sample results that fall below the MRL are assigned the value of the MRL and the 'U' qualifier is attached.

10. Data Qualifiers

The (U) qualifier was attached to those results which were below the Method Reporting Limit (MRL). No other qualification was required. The definition for the data qualifier is as follows:

U - The analyte was not detected at or above the reported value.

The usefulness of qualified data should be treated according to the severity of the qualifier in light of the project's data quality objectives. Should questions arise regarding the data, contact Stephanie Le at the Region 10 Laboratory, phone number (360) 871-8715.

11. Definitions

Accuracy - the degree of conformity of a measured or calculated quantity to its actual value.

Duplicate Analysis - when a duplicate of a sample (DU), a matrix spike (MSD), or a laboratory control sample (LCS) is analyzed, it is possible to use the comparison of the results in terms of relative percent difference (RPD) to calculate precision.

Laboratory Control Sample (LCS) - a clean matrix spiked with known quantities of analytes. The LCS is processed with samples through every step of preparation and analysis. Measuring percent recovery of each analyte in the LCS provides a measurement of accuracy for the analyte in the project samples. A laboratory control sample is prepared and analyzed at a frequency no less than one for every 20 project samples.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) - Sample analyses performed to provide information about the effect of the sample matrix on analyte recovery and measurement within the project samples. To create the MS/MSD, a project sample is spiked with known quantities of analyte and the percent recovery of the analyte is determined.

Method Blank - An analytical control that is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background and reagent contamination. A method blank is prepared and analyzed for every batch of samples at a minimum frequency of one per every 20 samples. To produce unqualified data, the result of the method blank analysis is required to be less than the MRL and less than 10 times the amount of analyte found in any project sample.

Minimum Reporting Level (MRL) - the smallest measured concentration of a substance that can be reliably measured using a given analytical method.

Peak Integrations - The output of many analytical instruments is a peak which represents the quantity of analyte in the sample. The instrument automatically integrates the peak area to provide the concentration of the analyte; however, sometimes these peaks need to be manually integrated by the analyst.

Precision - the degree of mutual agreement or repeatability among a series of individual results.

Relative Percent Difference - The difference between two sample results divided by their mean and expressed as a percentage.

US EPA Region 10 Laboratory

Multi-Sample Final Report



Project Code : SFP-036A

Site : ROCK ISLAND SILICON PLANT

Contact : Monica Tonel

Account : 2013T10P303DD210KPLA00

Parameter(s): Nitrate+Nitrite

Analyte: *90040 - Nitrate+Nitrite as N

Weight Basis : Wet

Prep Method(s): 353.2 - Nitrogen, (Nitrate-Nitrite), Colorimetric, Automated Cadmium Reduction

Analytical Method: 353.2 - Nitrogen, (Nitrate-Nitrite), Colorimetric, Automated Cadmium Reduction

Target Analyte Results:

Sample	COC Description	Lab Matrix	Result	Unit	Qual.	Analysis Date	Dilution
12444042 sam	FP01GW	Filtered	7.01	mg/L		11/21/12	10
12444043 sam	FP02GW	Filtered	0.113	mg/L		11/21/12	1
12444049 sam	BK01GW	Filtered	8.20	mg/L		11/21/12	10
12444050 sam	BK02GW	Water	6.07	mg/L		11/21/12	10
12444051 sam	AR01GW	Water	13.7	mg/L		11/21/12	10
12444052 sam	AR02GW	Water	0.435	mg/L		11/21/12	1
12444053 sam	AR03GW	Water	10.7	mg/L		11/21/12	10
12444063 sam	PW01GW	Water	12.1	mg/L		11/21/12	
12444043 du	FP02GW	Filtered	0.118	mg/L		11/21/12	1
12444050 du	BK02GW	Water	6.09	mg/L		11/21/12	10
IW112112ABL blk	Blank	Liquid	0.050	mg/L	U	11/21/12	1

Spiked Compounds:

Sample	COC Description	Lab Matrix	Result	Unit	Qual.	Analysis Date	Dilution
12444043 ms	FP02GW	Filtered	106	%Rec		11/21/12	1
12444050 ms	BK02GW	Water	102	%Rec		11/21/12	10
12444043 msd	FP02GW	Filtered	104	%Rec		11/21/12	1
12444050 msd	BK02GW	Water	102	%Rec		11/21/12	10
IW112112AL1 lcs	Lab Control Standard	Liquid	98	%Rec		11/21/12	1
IW112112AL2 lc2	Lab Control Standard Dup.	Liquid	98	%Rec		11/21/12	1



ecology and environment, inc.

Global Environmental Specialists

720 Third Avenue, Suite 1700, Seattle, WA 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: November 16, 2012
TO: Linda Ader, Project Manager, E & E, Seattle, Washington
FROM: Mark Woodke, START-3 Chemist, E & E, Seattle, Washington *MW*
SUBJ: Inorganic Data Validation Memo,
Rock Island Silicon Plant (Former), Wenatchee, Washington
REF: TDD: 12-05-0002 PAN: EE-002233-0786-01TTO

The data validation of three filtered water samples collected from the Rock Island Silicon Plant (Former) site in Wenatchee, Washington, has been completed. Analyses for Alkalinity (Standard Method 2320B) and Bicarbonate (Standard Method 2320B) were performed by ALS, Inc., Kelso, Washington. All sample analyses were evaluated following EPA's Stage 4 Data Validation Manual Process (S4VM).

The samples were numbered:

12444043 12444049 12444053

Data Qualifications:

1. Sample Holding Times: Acceptable.

The samples were maintained at $< 6^{\circ}\text{C}$. The samples were collected on November 1, 2012, and were analyzed on November 9, 2012, therefore meeting QC criteria of less than 14 days between collection and analysis.

2. Error Determination: Not Performed.

Samples necessary for bias and precision determination were not provided to the laboratory. All samples were flagged RND (Recovery Not Determined) and PND (Precision Not Determined), although the flags are not found on the Form I's.

3. Blanks: Acceptable.

A method blank was analyzed for each extraction batch for each matrix and analysis system. There were no detections in any method blank.

4. Performance Evaluation Samples: Not Provided.

Performance evaluation samples were not provided to the laboratory.

5. Duplicates: Acceptable.

Duplicate results were acceptable.

6. Quantitation and Quantitation Limits: Acceptable.

Sample concentrations were correctly calculated.

7. Laboratory Contact: Not Required.

No laboratory contact was required.

8. Overall Assessment of Data for Use

The overall usefulness of the data is based on the criteria outlined in the Sampling and Quality Assurance Plan and the analytical method. Based upon the information provided, the data are acceptable for use with the above stated data qualifications.

Data Qualifiers and Definitions

- U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- JH - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a high bias.
- JL - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a low bias.
- JK - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with an unknown direction of bias.
- JQ - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with an unknown direction of bias and falls between the MDL and the Minimum (or Practical) Quantitation Limit (MQL, PQL).
- UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: Ecology And Environment, Incorporated
Project: SFP-036A
Sample Matrix: Water
Analysis Method: SM 2320 B

Service Request: K1211151

Date Collected: 11/1/12

Date Received: 11/6/12

Units: mg/L

Basis: NA

Alkalinity as CaCO₃, Total

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Q
12444043	K1211151-001	353	9.0	1	11/09/12 16:01	542M
12444049	K1211151-002	176	9.0	1	11/09/12 16:01	
12444053	K1211151-003	226	9.0	1	11/09/12 16:01	
Method Blank	K1211151-MB1	ND U	9.0	1	11/09/12 16:01	ML
Method Blank	K1211151-MB2	ND U	9.0	1	11/09/12 16:01	ML

ML
11-16-12

COLUMBIA ANALYTICAL SERVICES, INC.

Now part of the ALS Group

Analytical Report

Client: Ecology And Environment, Incorporated

Project: SFP-036A

Sample Matrix: Water

Analysis Method: SM 2320 B

Service Request: K1211151

Date Collected: 11/1/12

Date Received: 11/6/12

Units: mg/L

Basis: NA

Bicarbonate as CaCO3

Sample Name	Lab Code	Result	MRL	Dil.	Date Analyzed	Q
12444043	K1211151-001	353	9.0	1	11/09/12 16:01	sum
12444049	K1211151-002	176	9.0	1	11/09/12 16:01	
12444053	K1211151-003	226	9.0	1	11/09/12 16:01	
Method Blank	K1211151-MB1	ND U	9.0	1	11/09/12 16:01	mm
Method Blank	K1211151-MB2	ND U	9.0	1	11/09/12 16:01	mm



ecology and environment, inc.

Global Environmental Specialists

720 Third Avenue, Suite 1700, Seattle, WA 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: December 19, 2012

TO: Linda Ader, Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-3 Chemist, E & E, Seattle, Washington *MW*

SUBJ: Inorganic Data Summary Check,
Rock Island Silicon Plant (Former), Wenatchee, Washington

REF: TDD: 12-05-0002 PAN: EE-002233-0786-01TTO

The data summary check of 20 soil samples collected from the Rock Island Silicon Plant (Former) site in Wenatchee, Washington, has been completed. Analyses for metals (EPA CLP SOW SOM ISM01.3) were performed by Test America, Inc., Burlington, Vermont.

The samples were numbered:

MJ0AA1	MJ0AA2	MJ0AA3	MJ0AA4	MJ0AA5
MJ0AA6	MJ0AB2	MJ0AB3	MJ0AB5	MJ0AB6
MJ0AB8	MJ0AB9	MJ0AC0	MJ0AC1	MJ0AD4
MJ0AD6	MJ0AD7	MJ0AD8	MJ0AG6	MJ0AG7

No discrepancies were noted. The secondary reviewer added qualifiers (J) and bias qualifiers (H or K) to copper sample results (Samples MJ0AA6, MJ0AB2, MJ0AB3, and MJ0AD7) affected by rinsate blank results.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

December 17, 2012

Reply To: OEA-095

MEMORANDUM

SUBJECT: Data Validation Report for Metals Analysis of Samples Collected for the Rock Island Silicon Plant (Former) Site Inspection- Case 42864, SDG: MJ0AA1

FROM: Don Matheny, Chemist *DM*
Environmental Services Unit, OEA

TO: Monica Tonel, Site Assessment Manager

CC: Renee Nordeen, Ecology & Environment, Inc.

The quality assurance (QA) review of the analytical data generated from the analysis of twenty (20) soil samples, collected from the above referenced site, has been completed. These samples were analyzed for metals by Test America (STLV) located in Burlington, VT.

Sample analyses were evaluated following EPA's Stage 4 Data Validation Electronic/Manual Process (S4VEM). The validation was conducted according to the Quality Control Specifications outlined in:

- Rock Island Silicon Plant (Former) Sampling & Quality Assurance Plan (October, 2012)
- USEPA CLP Statement of Work for Inorganic Analyses (ISM01.3)
- National Functional Guidelines for Inorganic Superfund Data Review (EPA-540-R-10-011)
- Guidance for Labeling Externally Validated Laboratory Analytical Data (EPA-540-R08-005).

Some data may be qualified using the reviewer's professional judgment. The conclusions presented herein are based on the information provided for the review.

A summary of samples evaluated in this validation report and the pertinent dates for sample collection, sample receipt at the laboratory, extraction and analyses is attached along with the validated data.

I. QUALITY CONTROL RESULTS SUMMARY

Quality Control Test	Result Ranges	Outliers?	Evaluation Criteria
Blanks	Within criteria	Y*	Not Detected or <10% of Sample
Matrix Spike (MJ0AG7)	76- 99%	Y*	75 - 125%
Sample Duplicate (MJ0AG7)	≤ 30%	Y*	≤ 35% RPD or ± 2xCRQL
LCS (blank spike)	88 - 111%	N	70 - 130%; (Ag, Sb 50 - 150%)
Serial Dilution (MJ0AG7)	≤ 8%	Y*	≤ 10% Difference

*See the "Data Qualifications" section below for excursions and qualification of affected data.

II. DATA QUALIFICATIONS

Summary of Validation Qualifiers Applied

After the manual and electronic data review, the following data qualifications were applied:

Blanks
The following samples have analyte results $\geq$ MDLs but $\leq$ CRQLs. The associated instrument and/or preparation blank results are $\geq$ MDLs but $\leq$ CRQLs. Detected analytes are qualified U and the results reported at the CRQLs.
Antimony - MJ0AA1 - MJ0AA6, MJ0AB2, MJ0AB3, MJ0AB8, MJ0AB9, MJ0AC0, MJ0AC1, MJ0AD4, MJ0AD6, MJ0AD7, MJ0AD8, MJ0AG6, MJ0AG7
Barium - MJ0AA1, MJ0AA3, MJ0AA4, MJ0AA6, MJ0AB2, MJ0AB3, MJ0AB5, MJ0AB6, MJ0AB8, MJ0AB9, MJ0AC0, MJ0AC1
Beryllium - MJ0AB9, MJ0AC0, MJ0AA3, MJ0AC1, MJ0AB2, MJ0AA6, MJ0AB3, MJ0AB5, MJ0AB6, MJ0AB8, MJ0AA1
Cobalt - MJ0AA1, MJ0AA3, MJ0AA4, MJ0AA6, MJ0AB2, MJ0AB3, MJ0AB5, MJ0AB6, MJ0AB8 - MJ0AC1
Magnesium - MJ0AC0, MJ0AC1, MJ0AA4, MJ0AA6, MJ0AB2, MJ0AB3, MJ0AB5, MJ0AB6, MJ0AB8
Nickel - MJ0AB9, MJ0AC0, MJ0AA6, MJ0AB2, MJ0AB3
Potassium - MJ0AA4, MJ0AA6, MJ0AC1
Selenium - MJ0AA1 - MJ0AA4, MJ0AC0, MJ0AC1, MJ0AA6, MJ0AB2, MJ0AB3, MJ0AB5, MJ0AB6, MJ0AB8
Silver - MJ0AA1, MJ0AC0, MJ0AA4, MJ0AB3
Thallium - MJ0AB3, MJ0AB8
Vanadium - MJ0AB8, MJ0AA1, MJ0AB9, MJ0AA3, MJ0AA6, MJ0AB3
Detection Limit
The following samples have results $\geq$ MDLs but $<$ CRQLs. Detected analytes are qualified JQ.
Cadmium - MJ0AA2, MJ0AA5, MJ0AA6, MJ0AB2, MJ0AB3, MJ0AB5, MJ0AB6, MJ0AB8 - MJ0AC1, MJ0AD4, MJ0AD6 - MJ0AD8, MJ0AG6, MJ0AG7
Calcium - MJ0AB8, MJ0AA4, MJ0AB3
Mercury - MJ0AA1, MJ0AA3
Sodium - MJ0AA2 - MJ0AA6, MJ0AB2, MJ0AB3, MJ0AB5, MJ0AB6, MJ0AB8, MJ0AC0, MJ0AC1, MJ0AD4, MJ0AD6 - MJ0AD8, MJ0AG6, MJ0AG7
Duplicates
The following Duplicate or original sample results are $\leq$ 5xCRQL and the absolute difference between duplicate and original samples $>$ 2xCRQL. Detected analytes are qualified JK.
Lead - All samples
Matrix Spike
The following Matrix Spike samples have percent recoveries less than 30% and post-digestion spike samples have percent recoveries $\geq$ 75%. Detected analytes with results $\geq$ MDLs are qualified JL.
Manganese - All samples
The following Matrix Spike samples have percent recoveries in the range of 30-74% and post-digestion spike samples have recoveries $\geq$ 75%. Detected analytes with results $\geq$ MDLs are qualified JL. Non-detected analytes are qualified UJL.
Antimony, Copper, Silver, Zinc - All samples
Serial Dilution
The following ICP-AES Serial Dilution (SD) samples have percent difference (%D) $>$ 10% and initial sample results $>$ 50xMDLs. Detected analytes in samples with results $\geq$ MDLs are qualified JL. Non-detected analytes are qualified UJL.
Cobalt - All samples

Data Qualifiers

The following is a list of validation qualifiers applied to the sample result(s) when needed to indicate associated out-of-control QA/QC results.

Data Qualifiers	
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The associated value is an estimated quantity.
UJ	The analyte was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The data are unusable. The analyte may or may not be present in the sample.
Project Specific Data Qualifiers	
L	Low bias.
H	High bias.
K	Unknown Bias.
Q	Detected concentration is below the MRL / CRQL but is above the MDL.

III. SAMPLE INDEX

Sample ID	Matrix	Sample Date	Date Received	ICP- AES Analysis	Mercury Analysis
MJ0AA1	Soil	10/31/2012	11/6/2012	11/22/2012	11/27/2012
MJ0AA2	Soil	10/31/2012	11/6/2012	11/22/2012	11/27/2012
MJ0AA3	Soil	10/31/2012	11/6/2012	11/22/2012	11/27/2012
MJ0AA4	Soil	10/31/2012	11/6/2012	11/22/2012	11/27/2012
MJ0AA5	Soil	10/31/2012	11/6/2012	11/22/2012	11/27/2012
MJ0AA6	Soil	10/31/2012	11/6/2012	11/22/2012	11/27/2012
MJ0AB2	Soil	11/1/2012	11/6/2012	11/22/2012	11/27/2012
MJ0AB3	Soil	11/1/2012	11/6/2012	11/22/2012	11/27/2012
MJ0AB5	Soil	10/29/2012	11/6/2012	11/22/2012	11/27/2012*
MJ0AB6	Soil	10/29/2012	11/6/2012	11/22/2012	11/27/2012*
MJ0AB8	Soil	10/29/2012	11/6/2012	11/22/2012	11/27/2012*
MJ0AB9	Soil	10/29/2012	11/6/2012	11/22/2012	11/27/2012*
MJ0AC0	Soil	10/29/2012	11/6/2012	11/22/2012	11/27/2012*
MJ0AC1	Soil	10/29/2012	11/6/2012	11/22/2012	11/27/2012*
MJ0AD4	Soil	11/1/2012	11/6/2012	11/22/2012	11/27/2012
MJ0AD6	Soil	11/1/2012	11/6/2012	11/22/2012	11/27/2012
MJ0AD7	Soil	11/1/2012	11/6/2012	11/22/2012	11/27/2012
MJ0AD8	Soil	11/1/2012	11/6/2012	11/22/2012	11/27/2012
MJ0AG6	Soil	11/1/2012	11/6/2012	11/22/2012	11/27/2012
MJ0AG7	Soil	11/1/2012	11/6/2012	11/22/2012	11/27/2012

*Exceeded the 28 day holding time for waters by 1 day but this does not significantly impact soils.

Sample Summary Report

Case No: 42864	Contract: EPW09044	SDG No: MJ0AA1	Lab Code: STLV
Sample Number: LCSR6	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :		% Solids : 100.0	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	39.6	mg/kg	1.0			Yes	S4VEM
Antimony	11.8	mg/kg	1.0			Yes	S4VEM
Arsenic	1.9	mg/kg	1.0			Yes	S4VEM
Barium	41.1	mg/kg	1.0			Yes	S4VEM
Beryllium	0.98	mg/kg	1.0			Yes	S4VEM
Cadmium	0.94	mg/kg	1.0			Yes	S4VEM
Chromium	2.2	mg/kg	1.0			Yes	S4VEM
Cobalt	10.8	mg/kg	1.0			Yes	S4VEM
Copper	4.6	mg/kg	1.0			Yes	S4VEM
Iron	19.4	mg/kg	1.0			Yes	S4VEM
Lead	2.0	mg/kg	1.0			Yes	S4VEM
Manganese	3.1	mg/kg	1.0			Yes	S4VEM
Nickel	8.9	mg/kg	1.0			Yes	S4VEM
Selenium	7.2	mg/kg	1.0			Yes	S4VEM
Silver	2.0	mg/kg	1.0			Yes	S4VEM
Thallium	4.4	mg/kg	1.0			Yes	S4VEM
Vanadium	10.3	mg/kg	1.0			Yes	S4VEM
Zinc	12.2	mg/kg	1.0			Yes	S4VEM
Potassium	981	mg/kg	1.0			Yes	S4VEM
Calcium	1030	mg/kg	1.0			Yes	S4VEM
Sodium	976	mg/kg	1.0			Yes	S4VEM
Magnesium	974	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AA1	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444001	pH:		Sample Date:	10312012	Sample Time:	10:15:00
% Moisture :		% Solids :	66.3				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.044	mg/kg	1.0	J	JQ	Yes	S4VEM

No: 42864	Contract: EPW09044	SDG No: MJ0AA1	Lab Code: STLV
Sample Number: MJ0AA1	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: 12444001	pH:	Sample Date: 10312012	Sample Time: 10:15:00
% Moisture :		% Solids : 66.3	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	182	mg/kg	1.0			Yes	S4VEM
Antimony	6.2	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	5.4	mg/kg	1.0	*		Yes	S4VEM
Barium	20.5	mg/kg	1.0	J	U	Yes	S4VEM
Beryllium	0.51	mg/kg	1.0	J	U	Yes	S4VEM
Cadmium	1.4	mg/kg	1.0			Yes	S4VEM
Calcium	1180	mg/kg	1.0	*		Yes	S4VEM
Chromium	10.0	mg/kg	1.0			Yes	S4VEM
Cobalt	5.1	mg/kg	1.0	JE	UJL	Yes	S4VEM
Copper	56.2	mg/kg	1.0	*N	JL	Yes	S4VEM
Iron	671	mg/kg	1.0			Yes	S4VEM
Lead	177	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	1320	mg/kg	1.0			Yes	S4VEM
Manganese	90.6	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	8.1	mg/kg	1.0			Yes	S4VEM
Potassium	1130	mg/kg	1.0			Yes	S4VEM
Selenium	3.6	mg/kg	1.0	J	U	Yes	S4VEM
Silver	1.0	mg/kg	1.0	JN	UJL	Yes	S4VEM
Sodium	524	mg/kg	1.0			Yes	S4VEM
Thallium	2.6	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	5.1	mg/kg	1.0	J	U	Yes	S4VEM
Zinc	398	mg/kg	1.0	N	JL	Yes	S4VEM

Case No: 42864	Contract: EPW09044	SDG No: MJ0AA1	Lab Code: STL
Sample Number: MJ0AA2	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: 12444002	pH:	Sample Date: 10312012	Sample Time: 11:00:00
% Moisture :		% Solids : 80.8	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	5390	mg/kg	1.0			Yes	S4VEM
Antimony	5.3	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	2.9	mg/kg	1.0	*		Yes	S4VEM
Barium	41.9	mg/kg	1.0			Yes	S4VEM
Beryllium	0.44	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.11	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	2310	mg/kg	1.0	*		Yes	S4VEM
Chromium	11.1	mg/kg	1.0			Yes	S4VEM
Cobalt	4.7	mg/kg	1.0	E	JL	Yes	S4VEM
Copper	11.9	mg/kg	1.0	*N	JL	Yes	S4VEM
Iron	10300	mg/kg	1.0			Yes	S4VEM
Lead	12.7	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	3570	mg/kg	1.0			Yes	S4VEM
Manganese	192	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	10.5	mg/kg	1.0			Yes	S4VEM
Potassium	1050	mg/kg	1.0			Yes	S4VEM
Selenium	3.1	mg/kg	1.0	J	U	Yes	S4VEM
Silver	0.88	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	125	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.2	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	22.3	mg/kg	1.0			Yes	S4VEM
Zinc	40.7	mg/kg	1.0	N	JL	Yes	S4VEM

No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AA2	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444002	pH:		Sample Date:	10312012	Sample Time:	11:00:00
% Moisture:				% Solids:	80.8		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.11	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AAI	Lab Code:	STLV
Sample Number:	MJ0AA3	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444003	pH:		Sample Date:	10312012	Sample Time:	14:10:00
% Moisture :		% Solids :	67.4				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.060	mg/kg	1.0	J	JQ	Yes	S4VEM

No: 42864	Contract: EPW09044	SDG No: MJ0AA1	Lab Code: STLV
Sample Number: MJ0AA3	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: 12444003	pH:	Sample Date: 10312012	Sample Time: 14:10:00
% Moisture :		% Solids : 67.4	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	259	mg/kg	1.0			Yes	S4VEM
Antimony	7.4	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	15.7	mg/kg	1.0	*		Yes	S4VEM
Barium	24.7	mg/kg	1.0	J	U	Yes	S4VEM
Beryllium	0.62	mg/kg	1.0	J	U	Yes	S4VEM
Cadmium	2.0	mg/kg	1.0			Yes	S4VEM
Calcium	869	mg/kg	1.0	*		Yes	S4VEM
Chromium	27.4	mg/kg	1.0			Yes	S4VEM
Cobalt	6.2	mg/kg	1.0	JE	UJL	Yes	S4VEM
Copper	210	mg/kg	1.0	*N	JL	Yes	S4VEM
Iron	1880	mg/kg	1.0			Yes	S4VEM
Lead	316	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	945	mg/kg	1.0			Yes	S4VEM
Manganese	211	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	20.0	mg/kg	1.0			Yes	S4VEM
Potassium	1360	mg/kg	1.0			Yes	S4VEM
Selenium	4.3	mg/kg	1.0	J	U	Yes	S4VEM
Silver	1.4	mg/kg	1.0	N	JL	Yes	S4VEM
Sodium	532	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	3.1	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	6.2	mg/kg	1.0	J	U	Yes	S4VEM
Zinc	763	mg/kg	1.0	N	JL	Yes	S4VEM

Case No:	42864	Contract:	BPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AA4	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444004	pH:		Sample Date:	10312012	Sample Time:	14:30:00
% Moisture :		% Solids :	64.4				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.14	mg/kg	1.0	U	U	Yes	S4VEM

No: 42864	Contract: EPW09044	SDG No: MJ0AA1	Lab Code: STL
Sample Number: MJ0AA4	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: 12444004	pH:	Sample Date: 10312012	Sample Time: 14:30:00
% Moisture :		% Solids : 64.4	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	237	mg/kg	1.0			Yes	S4VEM
Antimony	7.3	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	7.6	mg/kg	1.0	*		Yes	S4VEM
Barium	24.5	mg/kg	1.0	J	U	Yes	S4VEM
Beryllium	0.61	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	1.6	mg/kg	1.0			Yes	S4VEM
Calcium	502	mg/kg	1.0	J*	JQ	Yes	S4VEM
Chromium	5.7	mg/kg	1.0			Yes	S4VEM
Cobalt	6.1	mg/kg	1.0	JE	UJL	Yes	S4VEM
Copper	29.2	mg/kg	1.0	*N	JL	Yes	S4VEM
Iron	783	mg/kg	1.0			Yes	S4VEM
Lead	83.9	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	611	mg/kg	1.0	J	U	Yes	S4VEM
Manganese	51.6	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	9.8	mg/kg	1.0			Yes	S4VEM
Potassium	611	mg/kg	1.0	J	U	Yes	S4VEM
Selenium	4.3	mg/kg	1.0	J	U	Yes	S4VEM
Silver	1.2	mg/kg	1.0	JN	UJL	Yes	S4VEM
Sodium	149	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	3.1	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	13.7	mg/kg	1.0			Yes	S4VEM
Zinc	76.8	mg/kg	1.0	N	JL	Yes	S4VEM

Case No:	42864	Contract:	BPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AA5	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444005	pH:		Sample Date:	10312012	Sample Time:	14:38:00
% Moisture :				% Solids :	75.0		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.12	mg/kg	1.0	U	U	Yes	S4VBM

No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AA5	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444005	pH:		Sample Date:	10312012	Sample Time:	14:38:00
% Moisture :		% Solids :	75.0				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	7970	mg/kg	1.0			Yes	S4VEM
Antimony	5.7	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	4.7	mg/kg	1.0	*		Yes	S4VEM
Barium	69.6	mg/kg	1.0			Yes	S4VEM
Beryllium	0.48	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.17	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	17800	mg/kg	1.0	*		Yes	S4VEM
Chromium	19.1	mg/kg	1.0			Yes	S4VEM
Cobalt	7.7	mg/kg	1.0	E	JL	Yes	S4VEM
Copper	10.9	mg/kg	1.0	*N	JL	Yes	S4VEM
Iron	17300	mg/kg	1.0			Yes	S4VEM
Lead	8.1	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	7710	mg/kg	1.0			Yes	S4VEM
Manganese	298	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	16.6	mg/kg	1.0			Yes	S4VEM
Potassium	1490	mg/kg	1.0			Yes	S4VEM
Selenium	3.3	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.95	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	264	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.4	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	35.4	mg/kg	1.0			Yes	S4VEM
Zinc	43.6	mg/kg	1.0	N	JL	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AA6	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444006	pH:		Sample Date:	10312012	Sample Time:	13:10:00
% Moisture :		% Solids :	71.7				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.12	mg/kg	1.0	U	U	Yes	S4VEM

No:	42864	Contract:	BPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AA6	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444006	pH:		Sample Date:	10312012	Sample Time:	13:10:00
% Moisture:				% Solids:	71.7		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	183	mg/kg	1.0			Yes	S4VEM
Antimony	6.6	mg/kg	1.0	J N	UJL	Yes	S4VEM
Arsenic	1.9	mg/kg	1.0	*		Yes	S4VEM
Barium	22.0	mg/kg	1.0	J	U	Yes	S4VEM
Beryllium	0.55	mg/kg	1.0	J	U	Yes	S4VEM
Cadmium	0.15	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	747	mg/kg	1.0	*		Yes	S4VEM
Chromium	2.5	mg/kg	1.0			Yes	S4VEM
Cobalt	5.5	mg/kg	1.0	J E	UJL	Yes	S4VEM
Copper	14.3	mg/kg	1.0	* N	JK	Yes	S4VEM
Iron	303	mg/kg	1.0			Yes	S4VEM
Lead	9.9	mg/kg	1.0	* N	JK	Yes	S4VEM
Magnesium	549	mg/kg	1.0	J	U	Yes	S4VEM
Manganese	47.9	mg/kg	1.0	* N	JL	Yes	S4VEM
Nickel	4.4	mg/kg	1.0	J	U	Yes	S4VEM
Potassium	549	mg/kg	1.0	J	U	Yes	S4VEM
Selenium	3.8	mg/kg	1.0	J	U	Yes	S4VEM
Silver	1.1	mg/kg	1.0	U N	UJL	Yes	S4VEM
Sodium	118	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.7	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	5.5	mg/kg	1.0	J	U	Yes	S4VEM
Zinc	102	mg/kg	1.0	N	JL	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AB2	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444012	pH:		Sample Date:	11012012	Sample Time:	09:45:00
% Moisture :				% Solids :	66.4		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.14	mg/kg	1.0	U	U	Yes	S4VEM

S No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AB2	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444012	pH:		Sample Date:	11012012	Sample Time:	09:45:00
% Moisture :				% Solids :	66.4		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	260	mg/kg	1.0			Yes	S4VEM
Antimony	6.5	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	2.6	mg/kg	1.0	*		Yes	S4VEM
Barium	21.5	mg/kg	1.0	J	U	Yes	S4VEM
Beryllium	0.54	mg/kg	1.0	J	U	Yes	S4VEM
Cadmium	0.18	mg/kg	1.0	J	IQ	Yes	S4VEM
Calcium	1030	mg/kg	1.0	*		Yes	S4VEM
Chromium	3.6	mg/kg	1.0			Yes	S4VEM
Cobalt	5.4	mg/kg	1.0	JB	UJL	Yes	S4VEM
Copper	21.2	mg/kg	1.0	*N	JK JK	Yes	S4VEM
Iron	590	mg/kg	1.0			Yes	S4VEM
Lead	9.0	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	538	mg/kg	1.0	J	U	Yes	S4VEM
Manganese	23.1	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	4.3	mg/kg	1.0	J	U	Yes	S4VEM
Potassium	1300	mg/kg	1.0			Yes	S4VEM
Selenium	3.8	mg/kg	1.0	J	U	Yes	S4VEM
Silver	1.1	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	284	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.7	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	7.8	mg/kg	1.0			Yes	S4VEM
Zinc	448	mg/kg	1.0	N	JL	Yes	S4VEM

Case No: 42864	Contract: BPW09044	SDG No: MJ0AA1	Lab Code: STLV
Sample Number: MJ0AB3	Method: JCP_ABS	Matrix: Soil	MA Number: DEFAULT
Sample Location: 12444013	pH:	Sample Date: 11/01/2012	Sample Time: 10:25:00
% Moisture:		% Solids: 69.1	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	96.2	mg/kg	1.0			Yes	S4VEM
Antimony	6.4	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	1.8	mg/kg	1.0	*		Yes	S4VEM
Barium	21.4	mg/kg	1.0	J	U	Yes	S4VEM
Beryllium	0.54	mg/kg	1.0	J	U	Yes	S4VEM
Cadmium	0.16	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	319	mg/kg	1.0	J*	JQ	Yes	S4VEM
Chromium	1.5	mg/kg	1.0			Yes	S4VEM
Cobalt	5.4	mg/kg	1.0	JE	UJL	Yes	S4VEM
Copper	10.9	mg/kg	1.0	*N	JK	Yes	S4VEM
Iron	158	mg/kg	1.0			Yes	S4VEM
Lead	7.0	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	536	mg/kg	1.0	J	U	Yes	S4VEM
Manganese	6.3	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	4.3	mg/kg	1.0	J	U	Yes	S4VEM
Potassium	669	mg/kg	1.0			Yes	S4VEM
Selenium	3.8	mg/kg	1.0	J	U	Yes	S4VEM
Silver	1.1	mg/kg	1.0	JN	UJL	Yes	S4VEM
Sodium	157	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.7	mg/kg	1.0	J	U	Yes	S4VEM
Vanadium	5.4	mg/kg	1.0	J	U	Yes	S4VEM
Zinc	343	mg/kg	1.0	N	JL	Yes	S4VEM

No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AB3	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444013	pH:		Sample Date:	11012012	Sample Time:	10:25:00
% Moisture :		% Solids :	69.1				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.13	mg/kg	1.0	U	U	Yes	S4VEM

Case No: 42864	Contract: EPW09044	SDG No: MJ0AA1	Lab Code: STL
Sample Number: MJ0AB5	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: 12444015	pH:	Sample Date: 10292012	Sample Time: 13:36:00
% Moisture :		% Solids : 73.9	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	552	mg/kg	1.0			Yes	S4VEM
Antimony	5.8	mg/kg	1.0	UN	UJL	Yes	S4VEM
Arsenic	0.98	mg/kg	1.0	*		Yes	S4VEM
Barium	19.2	mg/kg	1.0	J	U	Yes	S4VEM
Beryllium	0.48	mg/kg	1.0	J	U	Yes	S4VEM
Cadmium	0.13	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	1160	mg/kg	1.0	*		Yes	S4VEM
Chromium	4.5	mg/kg	1.0			Yes	S4VEM
Cobalt	4.8	mg/kg	1.0	JB	UJL	Yes	S4VEM
Copper	35.0	mg/kg	1.0	*N	JL	Yes	S4VEM
Iron	1040	mg/kg	1.0			Yes	S4VEM
Lead	5.0	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	480	mg/kg	1.0	J	U	Yes	S4VEM
Manganese	28.9	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	6.7	mg/kg	1.0			Yes	S4VEM
Potassium	952	mg/kg	1.0			Yes	S4VEM
Selenium	3.4	mg/kg	1.0	J	U	Yes	S4VEM
Silver	0.96	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	181	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.4	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	12.0	mg/kg	1.0			Yes	S4VEM
Zinc	235	mg/kg	1.0	N	JL	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AB5	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444015	pH:		Sample Date:	10292012	Sample Time:	13:36:00
% Moisture :				% Solids :	73.9		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.13	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	BPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AB6	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444016	pH:		Sample Date:	10292012	Sample Time:	13:38:00
% Moisture :				% Solids :	77.5		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	758	mg/kg	1.0			Yes	S4VEM
Antimony	5.5	mg/kg	1.0	UN	UJL	Yes	S4VEM
Arsenic	2.2	mg/kg	1.0	*		Yes	S4VEM
Barium	18.4	mg/kg	1.0	J	U	Yes	S4VEM
Beryllium	0.46	mg/kg	1.0	J	U	Yes	S4VEM
Cadmium	0.12	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	1820	mg/kg	1.0	*		Yes	S4VEM
Chromium	4.1	mg/kg	1.0			Yes	S4VEM
Cobalt	4.6	mg/kg	1.0	JB	UJL	Yes	S4VEM
Copper	32.0	mg/kg	1.0	*N	JL	Yes	S4VEM
Iron	1790	mg/kg	1.0			Yes	S4VEM
Lead	5.4	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	461	mg/kg	1.0	J	U	Yes	S4VEM
Manganese	51.4	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	6.9	mg/kg	1.0			Yes	S4VEM
Potassium	512	mg/kg	1.0			Yes	S4VEM
Selenium	3.2	mg/kg	1.0	J	U	Yes	S4VEM
Silver	0.92	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	111	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.3	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	9.8	mg/kg	1.0			Yes	S4VEM
Zinc	136	mg/kg	1.0	N	JL	Yes	S4VEM

No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AB6	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444016	pH:		Sample Date:	10292012	Sample Time:	13:38:00
% Moisture :		% Solids :	77.5				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.12	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AB8	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444018	pH:		Sample Date:	10292012	Sample Time:	15:00:00
% Moisture:				% Solids:	79.7		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	172	mg/kg	1.0			Yes	S4VEM
Antimony	5.6	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	2.3	mg/kg	1.0	*		Yes	S4VEM
Barium	18.6	mg/kg	1.0	J	U	Yes	S4VEM
Beryllium	0.46	mg/kg	1.0	J	U	Yes	S4VEM
Cadmium	0.095	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	409	mg/kg	1.0	J*	JQ	Yes	S4VEM
Chromium	2.7	mg/kg	1.0			Yes	S4VEM
Cobalt	4.6	mg/kg	1.0	JE	UJL	Yes	S4VEM
Copper	21.3	mg/kg	1.0	*N	JL	Yes	S4VEM
Iron	6300	mg/kg	1.0			Yes	S4VEM
Lead	5.9	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	465	mg/kg	1.0	J	U	Yes	S4VEM
Manganese	29.4	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	3.8	mg/kg	1.0			Yes	S4VEM
Potassium	697	mg/kg	1.0			Yes	S4VEM
Selenium	3.3	mg/kg	1.0	J	U	Yes	S4VEM
Silver	1.8	mg/kg	1.0	N	JL	Yes	S4VEM
Sodium	138	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.3	mg/kg	1.0	J	U	Yes	S4VEM
Vanadium	4.6	mg/kg	1.0	J	U	Yes	S4VEM
Zinc	226	mg/kg	1.0	N	JL	Yes	S4VEM

Job No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AB8	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	I2444018	pH:		Sample Date:	10292012	Sample Time:	15:00:00
% Moisture :				% Solids :	79.7		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.12	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	BPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AB9	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444019	pH:		Sample Date:	10292012	Sample Time:	15:20:00
% Moisture :				% Solids :	72.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.12	mg/kg	1.0	U	U	Yes	S4VEM

No: 42864	Contract: EPW09044	SDG No: MJ0AA1	Lab Code: STL
Sample Number: MJ0AB9	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: 12444019	pH:	Sample Date: 10292012	Sample Time: 15:20:00
% Moisture:		% Solids: 72.2	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	449	mg/kg	1.0			Yes	S4VEM
Antimony	6.9	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	3.2	mg/kg	1.0	*		Yes	S4VEM
Barium	23.1	mg/kg	1.0	J	U	Yes	S4VEM
Beryllium	0.58	mg/kg	1.0	J	U	Yes	S4VEM
Cadmium	0.18	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	1140	mg/kg	1.0	*		Yes	S4VEM
Chromium	1.9	mg/kg	1.0			Yes	S4VEM
Cobalt	5.8	mg/kg	1.0	JE	UJL	Yes	S4VEM
Copper	9.8	mg/kg	1.0	*N	JL	Yes	S4VEM
Iron	620	mg/kg	1.0			Yes	S4VEM
Lead	8.6	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	973	mg/kg	1.0			Yes	S4VEM
Manganese	23.4	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	4.6	mg/kg	1.0	J	U	Yes	S4VEM
Potassium	3340	mg/kg	1.0			Yes	S4VEM
Selenium	5.0	mg/kg	1.0			Yes	S4VEM
Silver	1.2	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	964	mg/kg	1.0			Yes	S4VEM
Thallium	2.9	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	5.8	mg/kg	1.0	J	U	Yes	S4VEM
Zinc	400	mg/kg	1.0	N	JL	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AC0	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444020	pH:		Sample Date:	10292012	Sample Time:	15:33:00
% Moisture :				% Solids :	69.4		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	406	mg/kg	1.0			Yes	S4VEM
Antimony	5.9	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	1.8	mg/kg	1.0	*		Yes	S4VEM
Barium	19.6	mg/kg	1.0	J	U	Yes	S4VEM
Beryllium	0.49	mg/kg	1.0	J	U	Yes	S4VEM
Cadmium	0.24	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	857	mg/kg	1.0	*		Yes	S4VEM
Chromium	3.0	mg/kg	1.0			Yes	S4VEM
Cobalt	4.9	mg/kg	1.0	JE	UJL	Yes	S4VEM
Copper	16.5	mg/kg	1.0	*N	JL	Yes	S4VEM
Iron	836	mg/kg	1.0			Yes	S4VEM
Lead	14.1	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	490	mg/kg	1.0	J	U	Yes	S4VEM
Manganese	29.6	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	3.9	mg/kg	1.0	J	U	Yes	S4VEM
Potassium	635	mg/kg	1.0			Yes	S4VEM
Selenium	3.4	mg/kg	1.0	J	U	Yes	S4VEM
Silver	0.98	mg/kg	1.0	JN	UJL	Yes	S4VEM
Sodium	93.9	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.5	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	5.7	mg/kg	1.0			Yes	S4VEM
Zinc	405	mg/kg	1.0	N	JL	Yes	S4VEM

No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AC0	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444020	pH:		Sample Date:	10292012	Sample Time:	15:33:00
% Moisture :				% Solids :	69.4		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.13	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AC1	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444021	pH:		Sample Date:	10292012	Sample Time:	15:45:00
% Moisture :				% Solids :	70.1		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.13	mg/kg	1.0	U	U	Yes	S4VEM

No: 42864	Contract: EPW09044	SDG No: MJ0AA1	Lab Code: STL
Sample Number: MJ0AC1	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: 12444021	pH:	Sample Date: 10292012	Sample Time: 15:45:00
% Moisture :		% Solids : 70.1	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	491	mg/kg	1.0			Yes	S4VEM
Antimony	6.4	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	3.0	mg/kg	1.0	*		Yes	S4VEM
Barium	21.5	mg/kg	1.0	J	U	Yes	S4VEM
Beryllium	0.54	mg/kg	1.0	J	U	Yes	S4VEM
Cadmium	0.21	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	1020	mg/kg	1.0	*		Yes	S4VEM
Chromium	3.1	mg/kg	1.0			Yes	S4VEM
Cobalt	5.4	mg/kg	1.0	JE	UJL	Yes	S4VEM
Copper	20.5	mg/kg	1.0	*N	JL	Yes	S4VEM
Iron	1090	mg/kg	1.0			Yes	S4VEM
Lead	8.9	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	536	mg/kg	1.0	J	U	Yes	S4VEM
Manganese	33.3	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	4.6	mg/kg	1.0			Yes	S4VEM
Potassium	536	mg/kg	1.0	J	U	Yes	S4VEM
Selenium	3.8	mg/kg	1.0	J	U	Yes	S4VEM
Silver	1.1	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	57.1	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.7	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	7.7	mg/kg	1.0			Yes	S4VEM
Zinc	476	mg/kg	1.0	N	JL	Yes	S4VEM

Case No:	42864	Contract:	BPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AD4	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444034	pH:		Sample Date:	11012012	Sample Time:	12:40:00
% Moisture :		% Solids :	88.2				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.11	mg/kg	1.0	U	U	Yes	S4VEM

Sample No: 42864	Contract: EPW09044	SDG No: MJ0AA1	Lab Code: STL
Sample Number: MJ0AD4	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: 12444034	pH:	Sample Date: 11012012	Sample Time: 12:40:00
% Moisture :		% Solids : 88.2	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	10900	mg/kg	1.0			Yes	S4VEM
Antimony	5.4	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	4.4	mg/kg	1.0	*		Yes	S4VEM
Barium	85.1	mg/kg	1.0			Yes	S4VEM
Beryllium	0.45	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.13	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	4180	mg/kg	1.0	*		Yes	S4VEM
Chromium	20.0	mg/kg	1.0			Yes	S4VEM
Cobalt	8.8	mg/kg	1.0	E	JL	Yes	S4VEM
Copper	12.5	mg/kg	1.0	*N	JL	Yes	S4VEM
Iron	17400	mg/kg	1.0			Yes	S4VEM
Lead	12.0	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	4050	mg/kg	1.0			Yes	S4VEM
Manganese	351	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	17.7	mg/kg	1.0			Yes	S4VEM
Potassium	1770	mg/kg	1.0			Yes	S4VEM
Selenium	3.1	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.90	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	172	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.2	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	38.2	mg/kg	1.0			Yes	S4VEM
Zinc	54.0	mg/kg	1.0	N	JL	Yes	S4VEM

Case No:	42864	Contract:	BPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AD6	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444036	pH:		Sample Date:	11012012	Sample Time:	11:40:00
% Moisture :				% Solids :	88.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	13900	mg/kg	1.0			Yes	S4VEM
Antimony	5.7	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	6.6	mg/kg	1.0	*		Yes	S4VEM
Barium	111	mg/kg	1.0			Yes	S4VEM
Beryllium	0.48	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.15	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	4310	mg/kg	1.0	*		Yes	S4VEM
Chromium	22.9	mg/kg	1.0			Yes	S4VEM
Cobalt	10.3	mg/kg	1.0	E	JL	Yes	S4VEM
Copper	13.1	mg/kg	1.0	*N	JL	Yes	S4VEM
Iron	20700	mg/kg	1.0			Yes	S4VEM
Lead	19.2	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	3930	mg/kg	1.0			Yes	S4VEM
Manganese	444	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	15.3	mg/kg	1.0			Yes	S4VEM
Potassium	2430	mg/kg	1.0			Yes	S4VEM
Selenium	3.3	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.95	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	144	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.4	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	48.5	mg/kg	1.0			Yes	S4VEM
Zinc	81.2	mg/kg	1.0	N	JL	Yes	S4VEM

No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AD6	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444036	pH:		Sample Date:	11012012	Sample Time:	11:40:00
% Moisture :				% Solids :	88.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.10	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AD7	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444037	pH:		Sample Date:	11012012	Sample Time:	12:05:00
% Moisture :				% Solids :	89.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.11	mg/kg	1.0	U	U	Yes	S4VEM

No: 42864	Contract: EPW09044	SDG No: MJ0AA1	Lab Code: STLV
Sample Number: MJ0AD7	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: 12444037	pH:	Sample Date: 11012012	Sample Time: 12:05:00
% Moisture:		% Solids: 89.2	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	13400	mg/kg	1.0			Yes	S4VEM
Antimony	4.9	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	5.1	mg/kg	1.0	*		Yes	S4VEM
Barium	105	mg/kg	1.0			Yes	S4VEM
Beryllium	0.41	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.14	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	4090	mg/kg	1.0	*		Yes	S4VEM
Chromium	21.5	mg/kg	1.0			Yes	S4VEM
Cobalt	10.2	mg/kg	1.0	E	JL	Yes	S4VEM
Copper	12.9	mg/kg	1.0	*N	JK	Yes	S4VEM
Iron	20400	mg/kg	1.0			Yes	S4VEM
Lead	12.5	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	3910	mg/kg	1.0			Yes	S4VEM
Manganese	431	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	14.7	mg/kg	1.0			Yes	S4VEM
Potassium	2280	mg/kg	1.0			Yes	S4VEM
Selenium	2.8	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.81	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	128	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.0	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	45.9	mg/kg	1.0			Yes	S4VEM
Zinc	65.0	mg/kg	1.0	N	JL	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AD8	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444038	pH:		Sample Date:	11012012	Sample Time:	12:15:00
% Moisture :		% Solids :	88.6				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.099	mg/kg	1.0	U	U	Yes	S4VEM

No:	42864	Contract:	EPW09044	SDG No:	MI0AA1	Lab Code:	STLV
Sample Number:	MI0AD8	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444038	pH:		Sample Date:	11012012	Sample Time:	12:15:00
% Moisture :				% Solids :	88.6		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	16000	mg/kg	1.0			Yes	S4VEM
Antimony	4.7	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	6.4	mg/kg	1.0	*		Yes	S4VEM
Barium	115	mg/kg	1.0			Yes	S4VEM
Beryllium	0.39	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.14	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	3980	mg/kg	1.0	*		Yes	S4VEM
Chromium	23.6	mg/kg	1.0			Yes	S4VEM
Cobalt	11.1	mg/kg	1.0	E	JL	Yes	S4VEM
Copper	12.9	mg/kg	1.0	*N	JL	Yes	S4VEM
Iron	22100	mg/kg	1.0			Yes	S4VEM
Lead	9.4	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	4360	mg/kg	1.0			Yes	S4VEM
Manganese	458	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	17.2	mg/kg	1.0			Yes	S4VEM
Potassium	2550	mg/kg	1.0			Yes	S4VEM
Selenium	2.8	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.79	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	137	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.0	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	49.6	mg/kg	1.0			Yes	S4VEM
Zinc	60.0	mg/kg	1.0	N	JL	Yes	S4VEM

Case No:	42864	Contract:	BPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AG6	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444065	pH:		Sample Date:	11012012	Sample Time:	15:12:00
% Moisture :				% Solids :	91.0		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	9310	mg/kg	1.0			Yes	S4VEM
Antimony	4.8	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	6.6	mg/kg	1.0	*		Yes	S4VEM
Barium	89.5	mg/kg	1.0			Yes	S4VEM
Beryllium	0.40	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.14	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	3840	mg/kg	1.0	*		Yes	S4VEM
Chromium	21.9	mg/kg	1.0			Yes	S4VEM
Cobalt	7.7	mg/kg	1.0	E	JL	Yes	S4VEM
Copper	14.3	mg/kg	1.0	*N	JL	Yes	S4VEM
Iron	19800	mg/kg	1.0			Yes	S4VEM
Lead	14.6	mg/kg	1.0	*N	JK	Yes	S4VEM
Magnesium	4130	mg/kg	1.0			Yes	S4VEM
Manganese	337	mg/kg	1.0	*N	JL	Yes	S4VEM
Nickel	17.4	mg/kg	1.0			Yes	S4VEM
Potassium	1810	mg/kg	1.0			Yes	S4VEM
Selenium	2.8	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.80	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	157	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.0	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	41.0	mg/kg	1.0			Yes	S4VEM
Zinc	58.4	mg/kg	1.0	N	JL	Yes	S4VEM

No: 42864	Contract: EPW09044	SDG No: MJ0AA1	Lab Code: STLV
Sample Number: MJ0AG6	Method: Hg	Matrix: Soil	MA Number: DEFAULT
Sample Location: 12444065	pH:	Sample Date: 11012012	Sample Time: 15:12:00
% Moisture :		% Solids : 91.0	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.10	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AG7	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444066	pH:		Sample Date:	11012012	Sample Time:	16:20:00
% Moisture :				% Solids :	79.8		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	9360	mg/kg	1.0			Yes	S4VEM
Antimony	5.4	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	4.4	mg/kg	1.0	*		Yes	S4VEM
Barium	87.3	mg/kg	1.0			Yes	S4VEM
Beryllium	0.45	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.10	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	3870	mg/kg	1.0	*		Yes	S4VEM
Chromium	22.1	mg/kg	1.0			Yes	S4VEM
Cobalt	7.9	mg/kg	1.0	B	JL	Yes	S4VEM
Copper	21.2	mg/kg	1.0	* N	JL	Yes	S4VEM
Iron	17800	mg/kg	1.0			Yes	S4VEM
Lead	8.0	mg/kg	1.0	* N	JK	Yes	S4VEM
Magnesium	5140	mg/kg	1.0			Yes	S4VEM
Manganese	327	mg/kg	1.0	* N	JL	Yes	S4VEM
Nickel	18.0	mg/kg	1.0			Yes	S4VEM
Potassium	2110	mg/kg	1.0			Yes	S4VEM
Selenium	3.2	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.90	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	152	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.3	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	36.0	mg/kg	1.0			Yes	S4VEM
Zinc	55.8	mg/kg	1.0	N	JL	Yes	S4VEM

No: 42864	Contract: BPW09044	SDG No: MJ0AA1	Lab Code: STL
Sample Number: MJ0AG7	Method: Hg	Matrix: Soil	MA Number: DEFAULT
Sample Location: 12444066	pH:	Sample Date: 11/01/2012	Sample Time: 16:20:00
% Moisture :		% Solids : 79.8	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.11	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	BPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AG7A	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444066	pH:		Sample Date:	11012012	Sample Time:	16:20:00
% Moisture :				% Solids :	79.8		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	10.6	mg/kg	1.0			Yes	S4VEM
Copper	61.3	mg/kg	1.0			Yes	S4VEM
Lead	21.1	mg/kg	1.0			Yes	S4VEM
Manganese	924	mg/kg	1.0			Yes	S4VEM
Silver	1.5	mg/kg	1.0			Yes	S4VEM
Zinc	153	mg/kg	1.0			Yes	S4VEM

Job No: 42864	Contract: BPW09044	SDG No: MJ0AA1	Lab Code: STL
Sample Number: MJ0AG7D	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location:	pH:	Sample Date: 11/01/2012	Sample Time: 16:20:00
% Moisture:		% Solids: 79.6	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	8440	mg/kg	1.0			Yes	S4VEM
Antimony	6.1	mg/kg	1.0	J	U	Yes	S4VEM
Arsenic	3.2	mg/kg	1.0	*		Yes	S4VEM
Barium	74.3	mg/kg	1.0			Yes	S4VEM
Beryllium	0.51	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.080	mg/kg	1.0	J	J	Yes	S4VEM
Calcium	2850	mg/kg	1.0	*		Yes	S4VEM
Chromium	21.0	mg/kg	1.0			Yes	S4VEM
Cobalt	7.3	mg/kg	1.0			Yes	S4VEM
Copper	16.5	mg/kg	1.0	*		Yes	S4VEM
Iron	15600	mg/kg	1.0			Yes	S4VEM
Lead	4.3	mg/kg	1.0	*		Yes	S4VEM
Magnesium	5220	mg/kg	1.0			Yes	S4VEM
Manganese	256	mg/kg	1.0	*		Yes	S4VEM
Nickel	17.6	mg/kg	1.0			Yes	S4VEM
Potassium	2270	mg/kg	1.0			Yes	S4VEM
Selenium	3.5	mg/kg	1.0	U	U	Yes	S4VEM
Silver	1.0	mg/kg	1.0	U	U	Yes	S4VEM
Sodium	143	mg/kg	1.0	J	J	Yes	S4VEM
Thallium	2.5	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	32.5	mg/kg	1.0			Yes	S4VEM
Zinc	45.8	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AG7D	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444066	pH:		Sample Date:	11012012	Sample Time:	16:20:00
% Moisture :		% Solids :	79.6				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.11	mg/kg	1.0	U	U	Yes	S4VEM

No: 42864	Contract: EPW09044	SDG No: MJ0AA1	Lab Code: STL
Sample Number: MJ0AG7S	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location:	pH:	Sample Date: 11012012	Sample Time: 16:20:00
% Moisture :		% Solids : 79.8	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	10.1	mg/kg	1.0	N		Yes	S4VEM
Arsenic	10.0	mg/kg	1.0			Yes	S4VEM
Barium	415	mg/kg	1.0			Yes	S4VEM
Beryllium	9.0	mg/kg	1.0			Yes	S4VEM
Cadmium	9.0	mg/kg	1.0			Yes	S4VEM
Chromium	52.4	mg/kg	1.0			Yes	S4VEM
Cobalt	99.5	mg/kg	1.0			Yes	S4VEM
Copper	55.4	mg/kg	1.0	N		Yes	S4VEM
Lead	7.0	mg/kg	1.0	N		Yes	S4VEM
Manganese	314	mg/kg	1.0	N		Yes	S4VEM
Nickel	106	mg/kg	1.0			Yes	S4VEM
Selenium	8.7	mg/kg	1.0			Yes	S4VEM
Silver	6.2	mg/kg	1.0	N		Yes	S4VEM
Thallium	7.4	mg/kg	1.0			Yes	S4VEM
Vanadium	115	mg/kg	1.0			Yes	S4VEM
Zinc	124	mg/kg	1.0	N		Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	MJ0AG7S	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444066	pH:		Sample Date:	11012012	Sample Time:	16:20:00
% Moisture :				% Solids :	79.8		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	mg/kg	1.0			Yes	S4VEM

No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	PBSC4	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	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA1	Lab Code:	STLV
Sample Number:	PBSR6	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	1.0	U	U	Yes	S4VEM
Antimony	6.0	mg/kg	1.0	U	U	Yes	S4VEM
Arsenic	1.0	mg/kg	1.0	U	U	Yes	S4VEM
Barium	20.0	mg/kg	1.0	U	U	Yes	S4VEM
Beryllium	0.50	mg/kg	1.0	J	J	Yes	S4VEM
Cadmium	0.50	mg/kg	1.0	U	U	Yes	S4VEM
Calcium	500	mg/kg	1.0	U	U	Yes	S4VEM
Chromium	1.0	mg/kg	1.0	U	U	Yes	S4VEM
Cobalt	5.0	mg/kg	1.0	J	J	Yes	S4VEM
Copper	2.5	mg/kg	1.0	U	U	Yes	S4VEM
Iron	10.0	mg/kg	1.0	U	U	Yes	S4VEM
Lead	1.0	mg/kg	1.0	U	U	Yes	S4VEM
Magnesium	500	mg/kg	1.0	U	U	Yes	S4VEM
Manganese	1.5	mg/kg	1.0	U	U	Yes	S4VEM
Nickel	4.0	mg/kg	1.0	U	U	Yes	S4VEM
Potassium	500	mg/kg	1.0	U	U	Yes	S4VEM
Selenium	3.5	mg/kg	1.0	U	U	Yes	S4VEM
Silver	1.0	mg/kg	1.0	U	U	Yes	S4VEM
Sodium	500	mg/kg	1.0	U	U	Yes	S4VEM
Thallium	2.5	mg/kg	1.0	J	J	Yes	S4VEM
Vanadium	5.0	mg/kg	1.0	U	U	Yes	S4VEM
Zinc	6.0	mg/kg	1.0	U	U	Yes	S4VEM

Edit History Report

Case No: 42864

Contract: EPW09044

SDG No: MJ0AA1

Lab Code: STLV

Method: ICP_AES

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
LCSR6	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AA1	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AA1	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:32 AM	
MJ0AA1	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:32 AM	
MJ0AA1	Soil	Calcium	Validation Flag	J		Don Matheny	12/17/12 10:32 AM	
MJ0AA1	Soil	Cobalt	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:32 AM	
MJ0AA1	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:32 AM	
MJ0AA1	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:32 AM	
MJ0AA1	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:32 AM	
MJ0AA1	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:32 AM	
MJ0AA1	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:32 AM	
MJ0AA2	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AA2	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:14 AM	
MJ0AA2	Soil	Arsenic	Validation Flag	JQ		Don Matheny	12/17/12 10:16 AM	
MJ0AA2	Soil	Arsenic	Validation Flag	J	JQ	Don Matheny	12/17/12 10:14 AM	
MJ0AA2	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:14 AM	
MJ0AA2	Soil	Calcium	Validation Flag	JQ		Don Matheny	12/17/12 10:16 AM	
MJ0AA2	Soil	Calcium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:14 AM	
MJ0AA2	Soil	Cobalt	Validation Flag	J	JL	Don Matheny	12/17/12 10:14 AM	
MJ0AA2	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:14 AM	
MJ0AA2	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:14 AM	
MJ0AA2	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:14 AM	
MJ0AA2	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:14 AM	
MJ0AA2	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:14 AM	
MJ0AA2	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:14 AM	
MJ0AA3	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AA3	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:22 AM	
MJ0AA3	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:22 AM	
MJ0AA3	Soil	Calcium	Validation Flag	J		Don Matheny	12/17/12 10:22 AM	
MJ0AA3	Soil	Cobalt	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:22 AM	
MJ0AA3	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:22 AM	
MJ0AA3	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:22 AM	
MJ0AA3	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:22 AM	
MJ0AA3	Soil	Silver	Validation Flag	J	JL	Don Matheny	12/17/12 10:22 AM	
MJ0AA3	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:22 AM	
MJ0AA3	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:22 AM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJ0AA4	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AA4	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:22 AM	
MJ0AA4	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:22 AM	
MJ0AA4	Soil	Calcium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:22 AM	
MJ0AA4	Soil	Cobalt	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:22 AM	
MJ0AA4	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:22 AM	
MJ0AA4	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:22 AM	
MJ0AA4	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:22 AM	
MJ0AA4	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:22 AM	
MJ0AA4	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:22 AM	
MJ0AA4	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:22 AM	
MJ0AA5	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AA5	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:33 AM	
MJ0AA5	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:33 AM	
MJ0AA5	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:33 AM	
MJ0AA5	Soil	Calcium	Validation Flag	J		Don Matheny	12/17/12 10:33 AM	
MJ0AA5	Soil	Cobalt	Validation Flag	J	JL	Don Matheny	12/17/12 10:33 AM	
MJ0AA5	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:33 AM	
MJ0AA5	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:33 AM	
MJ0AA5	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:33 AM	
MJ0AA5	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:33 AM	
MJ0AA5	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:33 AM	
MJ0AA5	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:33 AM	
MJ0AA6	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AA6	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:26 AM	
MJ0AA6	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:26 AM	
MJ0AA6	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:26 AM	
MJ0AA6	Soil	Calcium	Validation Flag	J		Don Matheny	12/17/12 10:26 AM	
MJ0AA6	Soil	Cobalt	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:26 AM	
MJ0AA6	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:26 AM	
MJ0AA6	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:26 AM	
MJ0AA6	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:26 AM	
MJ0AA6	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:26 AM	
MJ0AA6	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:26 AM	
MJ0AA6	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:26 AM	
MJ0AB2	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AB2	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:24 AM	
MJ0AB2	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:24 AM	
MJ0AB2	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:24 AM	
MJ0AB2	Soil	Calcium	Validation Flag	J		Don Matheny	12/17/12 10:24 AM	
MJ0AB2	Soil	Cobalt	Validation	UJ	UJL	Don	12/17/12 10:24 AM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJ0AB2	Soil	Cobalt	Flag	UJ	UJL	Matheny	12/17/12 10:24 AM	
MJ0AB2	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:24 AM	
MJ0AB2	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:24 AM	
MJ0AB2	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:24 AM	
MJ0AB2	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:24 AM	
MJ0AB2	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:24 AM	
MJ0AB2	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:24 AM	
MJ0AB3	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AB3	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:18 AM	
MJ0AB3	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:18 AM	
MJ0AB3	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:18 AM	
MJ0AB3	Soil	Calcium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:18 AM	
MJ0AB3	Soil	Cobalt	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:18 AM	
MJ0AB3	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:18 AM	
MJ0AB3	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:18 AM	
MJ0AB3	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:18 AM	
MJ0AB3	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:18 AM	
MJ0AB3	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:18 AM	
MJ0AB3	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:18 AM	
MJ0AB5	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AB5	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:23 AM	
MJ0AB5	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:23 AM	
MJ0AB5	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:23 AM	
MJ0AB5	Soil	Calcium	Validation Flag	J		Don Matheny	12/17/12 10:23 AM	
MJ0AB5	Soil	Cobalt	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:44 AM	
MJ0AB5	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:23 AM	
MJ0AB5	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:23 AM	
MJ0AB5	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:23 AM	
MJ0AB5	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:23 AM	
MJ0AB5	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:23 AM	
MJ0AB5	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:23 AM	
MJ0AB6	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AB6	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:19 AM	
MJ0AB6	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:19 AM	
MJ0AB6	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:19 AM	
MJ0AB6	Soil	Calcium	Validation Flag	J		Don Matheny	12/17/12 10:19 AM	
MJ0AB6	Soil	Cobalt	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:19 AM	
MJ0AB6	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:19 AM	
MJ0AB6	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:19 AM	
MJ0AB6	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:19 AM	
MJ0AB6	Soil	Silver	Validation	UJ	UJL	Don	12/17/12 10:19 AM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJ0AB6	Soil	Silver	Flag	UJ	UJL	Matheny	12/17/12 10:19 AM	
MJ0AB6	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:19 AM	
MJ0AB6	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:19 AM	
MJ0AB8	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AB8	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:31 AM	
MJ0AB8	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:31 AM	
MJ0AB8	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:31 AM	
MJ0AB8	Soil	Calcium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:31 AM	
MJ0AB8	Soil	Cobalt	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:31 AM	
MJ0AB8	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:31 AM	
MJ0AB8	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:31 AM	
MJ0AB8	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:31 AM	
MJ0AB8	Soil	Silver	Validation Flag	J	JL	Don Matheny	12/17/12 10:31 AM	
MJ0AB8	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:31 AM	
MJ0AB8	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:31 AM	
MJ0AB9	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AB9	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:27 AM	
MJ0AB9	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:27 AM	
MJ0AB9	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:27 AM	
MJ0AB9	Soil	Calcium	Validation Flag	J		Don Matheny	12/17/12 10:27 AM	
MJ0AB9	Soil	Cobalt	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:27 AM	
MJ0AB9	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:27 AM	
MJ0AB9	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:27 AM	
MJ0AB9	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:27 AM	
MJ0AB9	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:27 AM	
MJ0AB9	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:27 AM	
MJ0AC0	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AC0	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:27 AM	
MJ0AC0	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:27 AM	
MJ0AC0	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:27 AM	
MJ0AC0	Soil	Calcium	Validation Flag	J		Don Matheny	12/17/12 10:27 AM	
MJ0AC0	Soil	Cobalt	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:27 AM	
MJ0AC0	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:27 AM	
MJ0AC0	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:27 AM	
MJ0AC0	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:45 AM	
MJ0AC0	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:27 AM	
MJ0AC0	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:27 AM	
MJ0AC0	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:27 AM	
MJ0AC1	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	
MJ0AC1	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:28 AM	
MJ0AC1	Soil	Arsenic	Validation	J		Don	12/17/12 10:28 AM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJ0AC1	Soil	Arsenic	Flag	J		Matheny	12/17/12 10:28 AM	
MJ0AC1	Soil	Cadmium	Validation Flag	JL	JQ	Don Matheny	12/17/12 10:43 AM	
MJ0AC1	Soil	Cadmium	Validation Flag	J	JL	Don Matheny	12/17/12 10:28 AM	
MJ0AC1	Soil	Calcium	Validation Flag	J		Don Matheny	12/17/12 10:28 AM	
MJ0AC1	Soil	Cobalt	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:28 AM	
MJ0AC1	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:28 AM	
MJ0AC1	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:28 AM	
MJ0AC1	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:28 AM	
MJ0AC1	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:28 AM	
MJ0AC1	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:28 AM	
MJ0AC1	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:28 AM	
MJ0AD4	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AD4	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:34 AM	
MJ0AD4	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:34 AM	
MJ0AD4	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:34 AM	
MJ0AD4	Soil	Calcium	Validation Flag	J		Don Matheny	12/17/12 10:34 AM	
MJ0AD4	Soil	Cobalt	Validation Flag	J	JL	Don Matheny	12/17/12 10:34 AM	
MJ0AD4	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:34 AM	
MJ0AD4	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:34 AM	
MJ0AD4	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:34 AM	
MJ0AD4	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:34 AM	
MJ0AD4	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:34 AM	
MJ0AD4	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:34 AM	
MJ0AD6	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AD6	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:21 AM	
MJ0AD6	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:21 AM	
MJ0AD6	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:21 AM	
MJ0AD6	Soil	Calcium	Validation Flag	J		Don Matheny	12/17/12 10:21 AM	
MJ0AD6	Soil	Cobalt	Validation Flag	J	JL	Don Matheny	12/17/12 10:21 AM	
MJ0AD6	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:21 AM	
MJ0AD6	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:21 AM	
MJ0AD6	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:21 AM	
MJ0AD6	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:21 AM	
MJ0AD6	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:21 AM	
MJ0AD6	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:21 AM	
MJ0AD7	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AD7	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:30 AM	
MJ0AD7	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:30 AM	
MJ0AD7	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:30 AM	
MJ0AD7	Soil	Calcium	Validation Flag	J		Don Matheny	12/17/12 10:30 AM	
MJ0AD7	Soil	Cobalt	Validation	J	JL	Don	12/17/12 10:30 AM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJ0AD7	Soil	Cobalt	Flag	J	JL	Matheny	12/17/12 10:30 AM	
MJ0AD7	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:30 AM	
MJ0AD7	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:30 AM	
MJ0AD7	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:30 AM	
MJ0AD7	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:30 AM	
MJ0AD7	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:30 AM	
MJ0AD7	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:30 AM	
MJ0AD8	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AD8	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:29 AM	
MJ0AD8	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:29 AM	
MJ0AD8	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:29 AM	
MJ0AD8	Soil	Calcium	Validation Flag	J		Don Matheny	12/17/12 10:29 AM	
MJ0AD8	Soil	Cobalt	Validation Flag	J	JL	Don Matheny	12/17/12 10:29 AM	
MJ0AD8	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:29 AM	
MJ0AD8	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:29 AM	
MJ0AD8	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:29 AM	
MJ0AD8	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:29 AM	
MJ0AD8	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:29 AM	
MJ0AD8	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:29 AM	
MJ0AG6	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	
MJ0AG6	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:32 AM	
MJ0AG6	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:32 AM	
MJ0AG6	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:32 AM	
MJ0AG6	Soil	Calcium	Validation Flag	J		Don Matheny	12/17/12 10:32 AM	
MJ0AG6	Soil	Cobalt	Validation Flag	J	JL	Don Matheny	12/17/12 10:32 AM	
MJ0AG6	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:32 AM	
MJ0AG6	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:32 AM	
MJ0AG6	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:32 AM	
MJ0AG6	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:32 AM	
MJ0AG6	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:32 AM	
MJ0AG6	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:32 AM	
MJ0AG7	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AG7	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/17/12 10:15 AM	
MJ0AG7	Soil	Arsenic	Validation Flag	J		Don Matheny	12/17/12 10:15 AM	
MJ0AG7	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:15 AM	
MJ0AG7	Soil	Calcium	Validation Flag	J		Don Matheny	12/17/12 10:15 AM	
MJ0AG7	Soil	Cobalt	Validation Flag	J	JL	Don Matheny	12/17/12 10:15 AM	
MJ0AG7	Soil	Copper	Validation Flag	J	JL	Don Matheny	12/17/12 10:15 AM	
MJ0AG7	Soil	Lead	Validation Flag	J	JK	Don Matheny	12/17/12 10:15 AM	
MJ0AG7	Soil	Manganese	Validation Flag	J	JL	Don Matheny	12/17/12 10:15 AM	
MJ0AG7	Soil	Silver	Validation	UJ	UJL	Don	12/17/12 10:15 AM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJ0AG7	Soil	Silver	Flag	UJ	UJL	Matheny	12/17/12 10:15 AM	
MJ0AG7	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:15 AM	
MJ0AG7	Soil	Zinc	Validation Flag	J	JL	Don Matheny	12/17/12 10:15 AM	
MJ0AG7A	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AG7D	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AG7D	Soil	Cadmium	Validation Flag	JQ	J	Don Matheny	12/18/12 3:10 PM	
MJ0AG7D	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:30 AM	
MJ0AG7D	Soil	Sodium	Validation Flag	JQ	J	Don Matheny	12/18/12 3:10 PM	
MJ0AG7D	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/17/12 10:30 AM	
MJ0AG7S	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
PBSR6	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y

Method: Hg

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJ0AA1	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AA1	Soil	Mercury	Validation Flag	J	JQ	Don Matheny	12/17/12 10:06 AM	
MJ0AA2	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AA3	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AA3	Soil	Mercury	Validation Flag	J	JQ	Don Matheny	12/17/12 10:06 AM	
MJ0AA4	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AA5	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AA6	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AB2	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AB3	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AB5	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AB5	Soil	Mercury	Validation Flag	R	U	Don Matheny	12/17/12 10:07 AM	
MJ0AB6	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AB6	Soil	Mercury	Validation Flag	R	U	Don Matheny	12/17/12 10:12 AM	
MJ0AB8	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AB8	Soil	Mercury	Validation Flag	R	U	Don Matheny	12/17/12 10:11 AM	
MJ0AB9	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AB9	Soil	Mercury	Validation Flag	R	U	Don Matheny	12/17/12 10:11 AM	
MJ0AC0	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AC0	Soil	Mercury	Validation Flag	R	U	Don Matheny	12/17/12 10:11 AM	
MJ0AC1	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AC1	Soil	Mercury	Validation Flag	R	U	Don Matheny	12/17/12 10:12 AM	
MJ0AD4	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJ0AD6	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AD7	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	
MJ0AD8	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AG6	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AG7	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AG7D	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
MJ0AG7S	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y
PBSC4	Soil		Validation Level		S4VEM	Don Matheny	12/17/12 10:35 AM	Y



ecology and environment, inc.

Global Environmental Specialists

720 Third Avenue, Suite 1700, Seattle, WA 98104
Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: December 19, 2012

TO: Linda Ader, Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-3 Chemist, E & E, Seattle, Washington *MW*

SUBJ: Inorganic Data Summary Check,
Rock Island Silicon Plant (Former), Wenatchee, Washington

REF: TDD: 12-05-0002 PAN: EE-002233-0786-01TTO

The data summary check of 18 soil samples collected from the Rock Island Silicon Plant (Former) site in Wenatchee, Washington, has been completed. Analyses for Metals (EPA CLP SOM ISM01.3) were performed by Test America, Inc., Burlington, Vermont.

The samples were numbered:

MJ0AA7	MJ0AA9	MJ0AB7	MJ0AC2	MJ0AC3
MJ0AC4	MJ0AC5	MJ0AC6	MJ0AC7	MJ0AC8
MJ0AC9	MJ0AD0	MJ0AD1	MJ0AD2	MJ0AD3
MJ0AE0	MJ0AE1	MJSE79		

No discrepancies were noted. The secondary reviewer added qualifiers (J) and bias qualifiers (H or K) to copper sample results (samples MJ0AA7, MJ0AA9, MJ0AC2, MJ0AC5, MJ0AC7, MJ0AC9, MJ0AD1, MJ0AD3, and MJ0AE1) affected by rinsate blank results.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 10

1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

December 12, 2012

Reply To: OEA-095

MEMORANDUM

SUBJECT: Data Validation Report for Metals Analysis of Samples Collected for the Rock Island Silicon Plant (Former) Site Inspection- Case 42864, SDG: MJ0AA7

FROM: Don Matheny, Chemist *DM*
Environmental Services Unit, OEA

TO: Monica Tonel, Site Assessment Manager

CC: Renee Nordeen, Ecology & Environment, Inc.

The quality assurance (QA) review of the analytical data generated from the analysis of eighteen (18) soil samples, collected from the above referenced site, has been completed. These samples were analyzed for metals by Test America (STLV) located in Burlington, VT.

Sample analyses were evaluated following EPA's Stage 4 Data Validation Electronic/Manual Process (S4VEM). The validation was conducted according to the Quality Control Specifications outlined in:

- Rock Island Silicon Plant (Former) Sampling & Quality Assurance Plan (October, 2012)
- USEPA CLP Statement of Work for Inorganic Analyses (ISM01.3)
- National Functional Guidelines for Inorganic Superfund Data Review (EPA-540-R-10-011)
- Guidance for Labeling Externally Validated Laboratory Analytical Data (EPA-540-R08-005).

Some data may be qualified using the reviewer's professional judgment. The conclusions presented herein are based on the information provided for the review.

A summary of samples evaluated in this validation report and the pertinent dates for sample collection, sample receipt at the laboratory, extraction and analyses is attached along with the validated data.

I. QUALITY CONTROL RESULTS SUMMARY

Quality Control Test	Result Ranges	Outliers?	Evaluation Criteria
Blanks	Within criteria	Y*	Not Detected or <10% of Sample
Matrix Spike (MJ0AE0)	77 - 104%	Y*	75 - 125%
Sample Duplicate (MJ0AE0)	≤ 8%	N	≤ 35% RPD or ± 2xCRQL
LCS (blank spike)	87 - 111%	N	70 - 130%; (Ag, Sb 50 - 150%)
Serial Dilution (MJ0AE0)	≤ 7%	N	≤ 10% Difference

*See the "Data Qualifications" section below for excursions and qualification of affected data.

II. DATA QUALIFICATIONS

Summary of Validation Qualifiers Applied

After the manual and electronic data review, the following data qualifications were applied:

Blanks	
The following samples have analyte results $\geq$ MDLs but $\leq$ CRQLs. The associated instrument and/or preparation blank results are $\geq$ MDLs but $\leq$ CRQLs. Detected analytes are qualified U and the results reported at the CRQLs.	
Antimony - All samples Beryllium - MJ0AA9, MJSE79, MJ0AB7 Cobalt - MJ0AA7, MJ0AA9, MJSE79 Silver - MJ0AA7, MJ0AA9, MJSE79 Selenium - MJ0AA7, MJ0AC2, MJSE79, MJ0AC6, MJ0AC7, MJ0AC8 Vanadium - MJSE79	
Detection Limit	
The following samples have results $\geq$ MDLs but $<$ CRQLs. Detected analytes are qualified JQ:	
Barium - MJSE79 Cadmium - MJ0AA7, MJ0AA9, MJ0AB7, MJ0AC4 - MJ0AD0 Mercury - MJ0AC2, MJ0AC8, MJ0AA7 Sodium - MJ0AA7, MJ0AA9, MJ0AC2 - MJ0AC9, MJ0AD0 - MJ0AD3, MJ0AE0, MJ0AE1, MJSE79	
Matrix Spike	
The following Matrix Spike samples have percent recoveries in the range of 30-74% and post-digestion spike samples have recoveries $\geq$ 75%. Non-detected analytes are qualified UJL.	
Antimony, Silver - All samples	

Data Qualifiers

The following is a list of validation qualifiers applied to the sample result(s) when needed to indicate associated out-of-control QA/QC results.

Data Qualifiers	
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The associated value is an estimated quantity.
UJ	The analyte was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The data are unusable. The analyte may or may not be present in the sample.
Project Specific Data Qualifiers	
L	Low bias.
H	High bias.
K	Unknown Bias.
Q	Detected concentration is below the MRL / CRQL but is above the MDL.

III. SAMPLE INDEX

Sample ID	Matrix	Sample Date	Date Received	ICP- AES Analysis	Mercury Analysis
MJ0AA7	Soil	10/31/2012	11/6/2012	11/21/2012	11/26/2012
MJ0AA9	Soil	10/31/2012	11/6/2012	11/21/2012	11/26/2012
MJ0AB7	Soil	10/30/2012	11/6/2012	11/21/2012	11/26/2012
MJ0AC2	Soil	10/30/2012	11/6/2012	11/21-26/2012	11/26/2012
MJ0AC3	Soil	10/30/2012	11/6/2012	11/21/2012	11/26/2012
MJ0AC4	Soil	10/30/2012	11/6/2012	11/21/2012	11/26/2012
MJ0AC5	Soil	10/30/2012	11/6/2012	11/21/2012	11/26/2012
MJ0AC6	Soil	10/30/2012	11/6/2012	11/21/2012	11/26/2012
MJ0AC7	Soil	10/30/2012	11/6/2012	11/21/2012	11/26/2012
MJ0AC8	Soil	10/31/2012	11/6/2012	11/21/2012	11/26/2012
MJ0AC9	Soil	10/31/2012	11/6/2012	11/21/2012	11/26/2012
MJ0AD0	Soil	10/31/2012	11/6/2012	11/21/2012	11/26/2012
MJ0AD1	Soil	10/31/2012	11/6/2012	11/21/2012	11/26/2012
MJ0AD2	Soil	10/31/2012	11/6/2012	11/21/2012	11/26/2012
MJ0AD3	Soil	10/31/2012	11/6/2012	11/21/2012	11/26/2012
MJ0AE0	Soil	10/31/2012	11/6/2012	11/21/2012	11/26/2012
MJ0AE1	Soil	10/31/2012	11/6/2012	11/21/2012	11/26/2012
MJSE79	Soil	10/31/2012	11/6/2012	11/21/2012	11/26/2012

Sample Summary Report

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	LCSR7	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:		pH:		Sample Date:		Sample Time:	
% Moisture :				% Solids :	100.0		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	38.5	mg/kg	1.0			Yes	S4VEM
Antimony	12.0	mg/kg	1.0			Yes	S4VEM
Arsenic	1.7	mg/kg	1.0			Yes	S4VEM
Barium	40.6	mg/kg	1.0			Yes	S4VEM
Beryllium	0.98	mg/kg	1.0			Yes	S4VEM
Cadmium	0.94	mg/kg	1.0			Yes	S4VEM
Chromium	2.2	mg/kg	1.0			Yes	S4VEM
Cobalt	10.8	mg/kg	1.0			Yes	S4VEM
Copper	4.7	mg/kg	1.0			Yes	S4VEM
Iron	20.5	mg/kg	1.0			Yes	S4VEM
Lead	2.0	mg/kg	1.0			Yes	S4VEM
Manganese	3.2	mg/kg	1.0			Yes	S4VEM
Nickel	8.9	mg/kg	1.0			Yes	S4VEM
Selenium	7.0	mg/kg	1.0			Yes	S4VEM
Silver	2.0	mg/kg	1.0			Yes	S4VEM
Thallium	4.5	mg/kg	1.0			Yes	S4VEM
Vanadium	10.3	mg/kg	1.0			Yes	S4VEM
Zinc	12.2	mg/kg	1.0			Yes	S4VEM
Calcium	1020	mg/kg	1.0			Yes	S4VEM
Magnesium	969	mg/kg	1.0			Yes	S4VEM
Sodium	983	mg/kg	1.0			Yes	S4VEM
Potassium	993	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AA7	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444007	pH:		Sample Date:	10312012	Sample Time:	14:55:00
% Moisture :				% Solids :	78.8		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	1350	mg/kg	1.0			Yes	S4VEM
Antimony	6.6	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	18.9	mg/kg	1.0			Yes	S4VEM
Barium	22.7	mg/kg	1.0			Yes	S4VEM
Beryllium	0.55	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.44	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	621	mg/kg	1.0			Yes	S4VEM
Chromium	10.9	mg/kg	1.0			Yes	S4VEM
Cobalt	5.5	mg/kg	1.0	J	U	Yes	S4VEM
Copper	87.0	mg/kg	1.0		JH	Yes	S4VEM
Iron	4570	mg/kg	1.0			Yes	S4VEM
Lead	130	mg/kg	1.0			Yes	S4VEM
Magnesium	611	mg/kg	1.0			Yes	S4VEM
Manganese	66.4	mg/kg	1.0			Yes	S4VEM
Nickel	10.4	mg/kg	1.0			Yes	S4VEM
Potassium	834	mg/kg	1.0			Yes	S4VEM
Selenium	3.9	mg/kg	1.0	J	U	Yes	S4VEM
Silver	1.1	mg/kg	1.0	JN	UJL	Yes	S4VEM
Sodium	145	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.8	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	16.1	mg/kg	1.0			Yes	S4VEM
Zinc	93.0	mg/kg	1.0			Yes	S4VEM

Job No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AA7	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444007	pH:		Sample Date:	10312012	Sample Time:	14:55:00
% Moisture :				% Solids :	78.8		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.043	mg/kg	1.0	J	JQ	Yes	S4VEM

Case No: 42864	Contract: BPW09044	SDG No: MJ0AA7	Lab Code: STL
Sample Number: MJ0AA9	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: 12444009	pH:	Sample Date: 10312012	Sample Time: 15:50:00
% Moisture:		% Solids: 72.7	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	1190	mg/kg	1.0			Yes	S4VEM
Antimony	5.6	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	4.4	mg/kg	1.0			Yes	S4VEM
Barium	19.2	mg/kg	1.0			Yes	S4VEM
Beryllium	0.47	mg/kg	1.0	J	U	Yes	S4VEM
Cadmium	0.43	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	5400	mg/kg	1.0			Yes	S4VEM
Chromium	4.8	mg/kg	1.0			Yes	S4VEM
Cobalt	4.7	mg/kg	1.0	J	U	Yes	S4VEM
Copper	17.7	mg/kg	1.0		JH	Yes	S4VEM
Iron	1790	mg/kg	1.0			Yes	S4VEM
Lead	15.5	mg/kg	1.0			Yes	S4VEM
Magnesium	988	mg/kg	1.0			Yes	S4VEM
Manganese	70.2	mg/kg	1.0			Yes	S4VEM
Nickel	6.1	mg/kg	1.0			Yes	S4VEM
Potassium	755	mg/kg	1.0			Yes	S4VEM
Selenium	4.7	mg/kg	1.0			Yes	S4VEM
Silver	0.94	mg/kg	1.0	JN	UJL	Yes	S4VEM
Sodium	241	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.3	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	11.6	mg/kg	1.0			Yes	S4VEM
Zinc	474	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AA9	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444009	pH:		Sample Date:	10312012	Sample Time:	15:50:00
% Moisture :		% Solids :	72.7				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.13	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AB7	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444017	pH:		Sample Date:	10302012	Sample Time:	11:32:00
% Moisture :				% Solids :	87.0		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	12000	mg/kg	1.0			Yes	S4VEM
Antimony	4.9	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	0.81	mg/kg	1.0	U	U	Yes	S4VEM
Barium	56.2	mg/kg	1.0			Yes	S4VEM
Beryllium	0.40	mg/kg	1.0	J	U	Yes	S4VEM
Cadmium	0.084	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	4740	mg/kg	1.0			Yes	S4VEM
Chromium	19.2	mg/kg	1.0			Yes	S4VEM
Cobalt	8.1	mg/kg	1.0			Yes	S4VEM
Copper	26.2	mg/kg	1.0			Yes	S4VEM
Iron	15900	mg/kg	1.0			Yes	S4VEM
Lead	3.6	mg/kg	1.0			Yes	S4VEM
Magnesium	3290	mg/kg	1.0			Yes	S4VEM
Manganese	189	mg/kg	1.0			Yes	S4VEM
Nickel	12.5	mg/kg	1.0			Yes	S4VEM
Potassium	1630	mg/kg	1.0			Yes	S4VEM
Selenium	2.8	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.81	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	2420	mg/kg	1.0			Yes	S4VEM
Thallium	2.0	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	28.9	mg/kg	1.0			Yes	S4VEM
Zinc	73.5	mg/kg	1.0			Yes	S4VEM

Job No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AB7	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444017	pH:		Sample Date:	10302012	Sample Time:	11:32:00
% Moisture :		% Solids :	87.0				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.10	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AC2	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444022	pH:		Sample Date:	10302012	Sample Time:	15:20:00
% Moisture :		% Solids :	82.7				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.075	mg/kg	1.0	J	JQ	Yes	S4VEM

Job No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AC2	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444022	pH:		Sample Date:	10302012	Sample Time:	15:20:00
% Moisture :				% Solids :	82.7		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	9820	mg/kg	1.0			Yes	S4VEM
Antimony	5.3	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	685	mg/kg	10.0	D		Yes	S4VEM
Barium	150	mg/kg	1.0			Yes	S4VEM
Beryllium	0.44	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	1.2	mg/kg	1.0			Yes	S4VEM
Calcium	6830	mg/kg	1.0			Yes	S4VEM
Chromium	18.5	mg/kg	1.0			Yes	S4VEM
Cobalt	6.8	mg/kg	1.0			Yes	S4VEM
Copper	12.3	mg/kg	1.0		JH	Yes	S4VEM
Iron	15500	mg/kg	1.0			Yes	S4VEM
Lead	4390	mg/kg	10.0	D		Yes	S4VEM
Magnesium	4110	mg/kg	1.0			Yes	S4VEM
Manganese	261	mg/kg	1.0			Yes	S4VEM
Nickel	15.9	mg/kg	1.0			Yes	S4VEM
Potassium	1640	mg/kg	1.0			Yes	S4VEM
Selenium	3.1	mg/kg	1.0	J	U	Yes	S4VEM
Silver	0.89	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	158	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.2	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	30.0	mg/kg	1.0			Yes	S4VEM
Zinc	143	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AC3	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444023	pH:		Sample Date:	10302012	Sample Time:	15:35:00
% Moisture :		% Solids :	90.2				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.097	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AC3	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444023	pH:		Sample Date:	10302012	Sample Time:	15:35:00
% Moisture :				% Solids :	90.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	7250	mg/kg	1.0			Yes	S4VEM
Antimony	4.5	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	30.9	mg/kg	1.0			Yes	S4VEM
Barium	56.0	mg/kg	1.0			Yes	S4VEM
Beryllium	0.37	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.37	mg/kg	1.0	U	U	Yes	S4VEM
Calcium	2540	mg/kg	1.0			Yes	S4VEM
Chromium	13.3	mg/kg	1.0			Yes	S4VEM
Cobalt	6.4	mg/kg	1.0			Yes	S4VEM
Copper	5.2	mg/kg	1.0			Yes	S4VEM
Iron	13200	mg/kg	1.0			Yes	S4VEM
Lead	104	mg/kg	1.0			Yes	S4VEM
Magnesium	3790	mg/kg	1.0			Yes	S4VEM
Manganese	215	mg/kg	1.0			Yes	S4VEM
Nickel	11.8	mg/kg	1.0			Yes	S4VEM
Potassium	1080	mg/kg	1.0			Yes	S4VEM
Selenium	2.6	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.75	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	117	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	1.9	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	24.6	mg/kg	1.0			Yes	S4VEM
Zinc	34.9	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AC4	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444024	pH:		Sample Date:	10302012	Sample Time:	16:05:00
% Moisture :		% Solids :	90.3				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.11	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AC4	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444024	pH:		Sample Date:	10302012	Sample Time:	16:05:00
% Moisture :				% Solids :	90.3		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	7260	mg/kg	1.0			Yes	S4VEM
Antimony	4.8	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	31.9	mg/kg	1.0			Yes	S4VEM
Barium	70.5	mg/kg	1.0			Yes	S4VEM
Beryllium	0.40	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.080	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	3910	mg/kg	1.0			Yes	S4VEM
Chromium	13.3	mg/kg	1.0			Yes	S4VEM
Cobalt	5.4	mg/kg	1.0			Yes	S4VEM
Copper	8.2	mg/kg	1.0			Yes	S4VEM
Iron	13000	mg/kg	1.0			Yes	S4VEM
Lead	675	mg/kg	1.0			Yes	S4VEM
Magnesium	3220	mg/kg	1.0			Yes	S4VEM
Manganese	225	mg/kg	1.0			Yes	S4VEM
Nickel	11.3	mg/kg	1.0			Yes	S4VEM
Potassium	1180	mg/kg	1.0			Yes	S4VEM
Selenium	2.8	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.80	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	117	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.0	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	24.9	mg/kg	1.0			Yes	S4VEM
Zinc	87.3	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AC5	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444025	pH:		Sample Date:	10302012	Sample Time:	16:15:00
% Moisture:				% Solids:	92.3		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	7130	mg/kg	1.0			Yes	S4VEM
Antimony	4.7	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	16.0	mg/kg	1.0			Yes	S4VEM
Barium	68.6	mg/kg	1.0			Yes	S4VEM
Beryllium	0.39	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.028	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	2720	mg/kg	1.0			Yes	S4VEM
Chromium	13.6	mg/kg	1.0			Yes	S4VEM
Cobalt	5.7	mg/kg	1.0			Yes	S4VEM
Copper	7.0	mg/kg	1.0		JH _{mu}	Yes	S4VEM
Iron	13600	mg/kg	1.0			Yes	S4VEM
Lead	65.8	mg/kg	1.0			Yes	S4VEM
Magnesium	3510	mg/kg	1.0			Yes	S4VEM
Manganese	212	mg/kg	1.0			Yes	S4VEM
Nickel	12.5	mg/kg	1.0			Yes	S4VEM
Potassium	1180	mg/kg	1.0			Yes	S4VEM
Selenium	2.7	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.78	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	124	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	1.9	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	25.4	mg/kg	1.0			Yes	S4VEM
Zinc	36.3	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AC5	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444025	pH:		Sample Date:	10302012	Sample Time:	16:15:00
% Moisture :		% Solids :	92.3				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.34	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AC6	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444026	pH:		Sample Date:	10302012	Sample Time:	16:30:00
% Moisture :		% Solids :	90.8				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.095	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AC6	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444026	pH:		Sample Date:	10302012	Sample Time:	16:30:00
% Moisture :				% Solids :	90.8		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	7460	mg/kg	1.0			Yes	S4VEM
Antimony	5.6	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	10.2	mg/kg	1.0			Yes	S4VEM
Barium	74.3	mg/kg	1.0			Yes	S4VEM
Beryllium	0.47	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.13	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	6380	mg/kg	1.0			Yes	S4VEM
Chromium	13.7	mg/kg	1.0			Yes	S4VEM
Cobalt	5.5	mg/kg	1.0			Yes	S4VEM
Copper	12.4	mg/kg	1.0			Yes	S4VEM
Iron	13400	mg/kg	1.0			Yes	S4VEM
Lead	135	mg/kg	1.0			Yes	S4VEM
Magnesium	3300	mg/kg	1.0			Yes	S4VEM
Manganese	231	mg/kg	1.0			Yes	S4VEM
Nickel	11.9	mg/kg	1.0			Yes	S4VEM
Potassium	1400	mg/kg	1.0			Yes	S4VEM
Selenium	3.3	mg/kg	1.0	J	U	Yes	S4VEM
Silver	0.94	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	147	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.4	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	25.0	mg/kg	1.0			Yes	S4VEM
Zinc	75.3	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AC7	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444027	pH:		Sample Date:	10302012	Sample Time:	16:40:00
% Moisture :				% Solids :	92.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	7680	mg/kg	1.0			Yes	S4VEM
Antimony	5.7	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	7.4	mg/kg	1.0			Yes	S4VEM
Barium	77.0	mg/kg	1.0			Yes	S4VEM
Beryllium	0.48	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.11	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	3000	mg/kg	1.0			Yes	S4VEM
Chromium	13.3	mg/kg	1.0			Yes	S4VEM
Cobalt	5.8	mg/kg	1.0			Yes	S4VEM
Copper	8.9	mg/kg	1.0		JH _{mu}	Yes	S4VEM
Iron	13600	mg/kg	1.0			Yes	S4VEM
Lead	36.1	mg/kg	1.0			Yes	S4VEM
Magnesium	3320	mg/kg	1.0			Yes	S4VEM
Manganese	225	mg/kg	1.0			Yes	S4VEM
Nickel	12.1	mg/kg	1.0			Yes	S4VEM
Potassium	1410	mg/kg	1.0			Yes	S4VEM
Selenium	3.3	mg/kg	1.0	J	U	Yes	S4VEM
Silver	0.95	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	127	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.4	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	25.2	mg/kg	1.0			Yes	S4VEM
Zinc	45.1	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AC7	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444027	pH:		Sample Date:	10302012	Sample Time:	16:40:00
% Moisture :				% Solids :	92.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.095	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AC8	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444028	pH:		Sample Date:	10312012	Sample Time:	13:30:00
% Moisture :				% Solids :	83.3		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	8750	mg/kg	1.0			Yes	S4VEM
Antimony	5.0	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	25.1	mg/kg	1.0			Yes	S4VEM
Barium	499	mg/kg	1.0			Yes	S4VEM
Beryllium	0.42	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.29	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	12800	mg/kg	1.0			Yes	S4VEM
Chromium	20.0	mg/kg	1.0			Yes	S4VEM
Cobalt	8.1	mg/kg	1.0			Yes	S4VEM
Copper	57.4	mg/kg	1.0			Yes	S4VEM
Iron	23400	mg/kg	1.0			Yes	S4VEM
Lead	354	mg/kg	1.0			Yes	S4VEM
Magnesium	3820	mg/kg	1.0			Yes	S4VEM
Manganese	405	mg/kg	1.0			Yes	S4VEM
Nickel	16.7	mg/kg	1.0			Yes	S4VEM
Potassium	1810	mg/kg	1.0			Yes	S4VEM
Selenium	2.9	mg/kg	1.0	J	U	Yes	S4VEM
Silver	0.83	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	197	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.1	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	34.2	mg/kg	1.0			Yes	S4VEM
Zinc	354	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AC8	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444028	pH:		Sample Date:	10312012	Sample Time:	13:30:00
% Moisture :		% Solids :	83.3				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.064	mg/kg	1.0	J	JQ	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AC9	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444029	pH:		Sample Date:	10312012	Sample Time:	13:50:00
% Moisture :				% Solids :	86.2		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	10500	mg/kg	1.0			Yes	S4VEM
Antimony	5.2	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	19.9	mg/kg	1.0			Yes	S4VEM
Barium	91.5	mg/kg	1.0			Yes	S4VEM
Beryllium	0.44	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.064	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	4300	mg/kg	1.0			Yes	S4VEM
Chromium	18.6	mg/kg	1.0			Yes	S4VEM
Cobalt	8.0	mg/kg	1.0			Yes	S4VEM
Copper	21.6	mg/kg	1.0		JH	Yes	S4VEM
Iron	17900	mg/kg	1.0			Yes	S4VEM
Lead	169	mg/kg	1.0			Yes	S4VEM
Magnesium	3790	mg/kg	1.0			Yes	S4VEM
Manganese	337	mg/kg	1.0			Yes	S4VEM
Nickel	14.3	mg/kg	1.0			Yes	S4VEM
Potassium	2130	mg/kg	1.0			Yes	S4VEM
Selenium	3.1	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.87	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	170	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.2	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	35.8	mg/kg	1.0			Yes	S4VEM
Zinc	81.4	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AC9	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444029	pH:		Sample Date:	10312012	Sample Time:	13:50:00
% Moisture :		% Solids :	86.2				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.11	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AD0	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444030	pH:		Sample Date:	10312012	Sample Time:	12:45:00
% Moisture :				% Solids :	85.1		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	9750	mg/kg	1.0			Yes	S4VEM
Antimony	5.1	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	28.4	mg/kg	1.0			Yes	S4VEM
Barium	88.2	mg/kg	1.0			Yes	S4VEM
Beryllium	0.42	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.049	mg/kg	1.0	J	JQ	Yes	S4VEM
Calcium	4070	mg/kg	1.0			Yes	S4VEM
Chromium	17.5	mg/kg	1.0			Yes	S4VEM
Cobalt	8.0	mg/kg	1.0			Yes	S4VEM
Copper	34.1	mg/kg	1.0			Yes	S4VEM
Iron	17700	mg/kg	1.0			Yes	S4VEM
Lead	364	mg/kg	1.0			Yes	S4VEM
Magnesium	3570	mg/kg	1.0			Yes	S4VEM
Manganese	331	mg/kg	1.0			Yes	S4VEM
Nickel	13.8	mg/kg	1.0			Yes	S4VEM
Potassium	1940	mg/kg	1.0			Yes	S4VEM
Selenium	3.0	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.85	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	152	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.1	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	37.4	mg/kg	1.0			Yes	S4VEM
Zinc	108	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AD0	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444030	pH:		Sample Date:	10312012	Sample Time:	12:45:00
% Moisture :		% Solids :	85.1				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.11	mg/kg	1.0	U	U	Yes	S4VEM

Case No: 42864	Contract: EPW09044	SDG No: MJ0AA7	Lab Code: STL
Sample Number: MJ0AD1	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: 12444031	pH:	Sample Date: 10312012	Sample Time: 13:05:00
% Moisture :		% Solids : 87.2	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	11800	mg/kg	1.0			Yes	S4VEM
Antimony	4.6	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	21.6	mg/kg	1.0			Yes	S4VEM
Barium	99.2	mg/kg	1.0			Yes	S4VEM
Beryllium	0.39	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.39	mg/kg	1.0	U	U	Yes	S4VEM
Calcium	3530	mg/kg	1.0			Yes	S4VEM
Chromium	20.5	mg/kg	1.0			Yes	S4VEM
Cobalt	8.6	mg/kg	1.0			Yes	S4VEM
Copper	12.3	mg/kg	1.0		JH	Yes	S4VEM
Iron	19800	mg/kg	1.0			Yes	S4VEM
Lead	16.9	mg/kg	1.0			Yes	S4VEM
Magnesium	4020	mg/kg	1.0			Yes	S4VEM
Manganese	355	mg/kg	1.0			Yes	S4VEM
Nickel	15.6	mg/kg	1.0			Yes	S4VEM
Potassium	2150	mg/kg	1.0			Yes	S4VEM
Selenium	2.7	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.77	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	168	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	1.9	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	39.7	mg/kg	1.0			Yes	S4VEM
Zinc	51.7	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AD1	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444031	pH:		Sample Date:	10312012	Sample Time:	13:05:00
% Moisture :		% Solids :	87.2				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.10	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AD2	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444032	pH:		Sample Date:	10312012	Sample Time:	14:00:00
% Moisture :		% Solids :	85.7				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	11600	mg/kg	1.0			Yes	S4VEM
Antimony	4.8	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	86.4	mg/kg	1.0			Yes	S4VEM
Barium	90.4	mg/kg	1.0			Yes	S4VEM
Beryllium	0.40	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.40	mg/kg	1.0	U	U	Yes	S4VEM
Calcium	3950	mg/kg	1.0			Yes	S4VEM
Chromium	19.4	mg/kg	1.0			Yes	S4VEM
Cobalt	8.7	mg/kg	1.0			Yes	S4VEM
Copper	28.6	mg/kg	1.0			Yes	S4VEM
Iron	19200	mg/kg	1.0			Yes	S4VEM
Lead	710	mg/kg	1.0			Yes	S4VEM
Magnesium	3880	mg/kg	1.0			Yes	S4VEM
Manganese	380	mg/kg	1.0			Yes	S4VEM
Nickel	15.3	mg/kg	1.0			Yes	S4VEM
Potassium	2070	mg/kg	1.0			Yes	S4VEM
Selenium	2.8	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.79	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	157	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.0	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	41.4	mg/kg	1.0			Yes	S4VEM
Zinc	80.3	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AD2	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444032	pH:		Sample Date:	10312012	Sample Time:	14:00:00
% Moisture :		% Solids :	85.7				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.11	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AD3	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444033	pH:		Sample Date:	10312012	Sample Time:	14:08:00
% Moisture:				% Solids:	84.8		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	10600	mg/kg	1.0			Yes	S4VEM
Antimony	5.3	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	45.3	mg/kg	1.0			Yes	S4VEM
Barium	81.9	mg/kg	1.0			Yes	S4VEM
Beryllium	0.44	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.44	mg/kg	1.0	U	U	Yes	S4VEM
Calcium	3160	mg/kg	1.0			Yes	S4VEM
Chromium	16.7	mg/kg	1.0			Yes	S4VEM
Cobalt	7.5	mg/kg	1.0			Yes	S4VEM
Copper	13.6	mg/kg	1.0		JH	Yes	S4VEM
Iron	16900	mg/kg	1.0			Yes	S4VEM
Lead	92.8	mg/kg	1.0			Yes	S4VEM
Magnesium	3450	mg/kg	1.0			Yes	S4VEM
Manganese	316	mg/kg	1.0			Yes	S4VEM
Nickel	13.3	mg/kg	1.0			Yes	S4VEM
Potassium	1420	mg/kg	1.0			Yes	S4VEM
Selenium	3.1	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.89	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	146	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.2	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	33.7	mg/kg	1.0			Yes	S4VEM
Zinc	45.2	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AD3	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444033	pH:		Sample Date:	10312012	Sample Time:	14:08:00
% Moisture :		% Solids :	84.8				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.11	mg/kg	1.0	U	U	Yes	S4VEM

Case No: 42864	Contract: EPW09044	SDG No: MJ0AA7	Lab Code: STL
Sample Number: MJ0AE0	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location: 12444040	pH:	Sample Date: 10312012	Sample Time: 16:40:00
% Moisture :		% Solids : 95.5	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	9200	mg/kg	1.0			Yes	S4VEM
Antimony	5.2	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	44.8	mg/kg	1.0			Yes	S4VEM
Barium	77.3	mg/kg	1.0			Yes	S4VEM
Beryllium	0.43	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.43	mg/kg	1.0	U	U	Yes	S4VEM
Calcium	3200	mg/kg	1.0			Yes	S4VEM
Chromium	18.3	mg/kg	1.0			Yes	S4VEM
Cobalt	7.7	mg/kg	1.0			Yes	S4VEM
Copper	8.0	mg/kg	1.0			Yes	S4VEM
Iron	18400	mg/kg	1.0			Yes	S4VEM
Lead	198	mg/kg	1.0			Yes	S4VEM
Magnesium	3680	mg/kg	1.0			Yes	S4VEM
Manganese	315	mg/kg	1.0			Yes	S4VEM
Nickel	13.5	mg/kg	1.0			Yes	S4VEM
Potassium	1810	mg/kg	1.0			Yes	S4VEM
Selenium	3.0	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.87	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	116	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.2	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	38.1	mg/kg	1.0			Yes	S4VEM
Zinc	42.1	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AE0	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444040	pH:		Sample Date:	10312012	Sample Time:	16:40:00
% Moisture :				% Solids :	95.5		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.097	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AE0A	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444040	pH:		Sample Date:	10312012	Sample Time:	16:40:00
% Moisture :		% Solids :	95.5				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	10.3	mg/kg	1.0			Yes	S4VEM
Silver	1.4	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AE0D	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444040	pH:		Sample Date:	10312012	Sample Time:	16:40:00
% Moisture :		% Solids :	96.2				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.10	mg/kg	1.0	U	U	Yes	S4VEM

Case No: 42864	Contract: EPW09044	SDG No: MJ0AA7	Lab Code: STL
Sample Number: MJ0AE0D	Method: ICP_AES	Matrix: Soil	MA Number: DEFAULT
Sample Location:	pH:	Sample Date: 10312012	Sample Time: 16:40:00
% Moisture :		% Solids : 96.2	

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	9650	mg/kg	1.0			Yes	S4VEM
Antimony	4.6	mg/kg	1.0	J	U	Yes	S4VEM
Arsenic	44.3	mg/kg	1.0			Yes	S4VEM
Barium	72.9	mg/kg	1.0			Yes	S4VEM
Beryllium	0.38	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.38	mg/kg	1.0	U	U	Yes	S4VEM
Calcium	3150	mg/kg	1.0			Yes	S4VEM
Chromium	18.6	mg/kg	1.0			Yes	S4VEM
Cobalt	8.3	mg/kg	1.0			Yes	S4VEM
Copper	8.2	mg/kg	1.0			Yes	S4VEM
Iron	18500	mg/kg	1.0			Yes	S4VEM
Lead	198	mg/kg	1.0			Yes	S4VEM
Magnesium	3980	mg/kg	1.0			Yes	S4VEM
Manganese	331	mg/kg	1.0			Yes	S4VEM
Nickel	14.6	mg/kg	1.0			Yes	S4VEM
Potassium	1900	mg/kg	1.0			Yes	S4VEM
Selenium	2.7	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.76	mg/kg	1.0	U	U	Yes	S4VEM
Sodium	116	mg/kg	1.0	J	J	Yes	S4VEM
Thallium	1.9	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	37.6	mg/kg	1.0			Yes	S4VEM
Zinc	44.9	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AE0S	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444040	pH:		Sample Date:	10312012	Sample Time:	16:40:00
% Moisture :				% Solids :	95.5		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AE0S	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:		pH:		Sample Date:	10312012	Sample Time:	16:40:00
% Moisture :				% Solids :	95.5		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	8.1	mg/kg	1.0	N		Yes	S4VEM
Arsenic	50.1	mg/kg	1.0			Yes	S4VEM
Barium	392	mg/kg	1.0			Yes	S4VEM
Beryllium	8.3	mg/kg	1.0			Yes	S4VEM
Cadmium	8.2	mg/kg	1.0			Yes	S4VEM
Chromium	52.3	mg/kg	1.0			Yes	S4VEM
Cobalt	92.5	mg/kg	1.0			Yes	S4VEM
Copper	48.0	mg/kg	1.0			Yes	S4VEM
Lead	202	mg/kg	1.0			Yes	S4VEM
Manganese	399	mg/kg	1.0			Yes	S4VEM
Nickel	98.9	mg/kg	1.0			Yes	S4VEM
Selenium	8.0	mg/kg	1.0			Yes	S4VEM
Silver	5.8	mg/kg	1.0	N		Yes	S4VEM
Thallium	6.7	mg/kg	1.0			Yes	S4VEM
Vanadium	121	mg/kg	1.0			Yes	S4VEM
Zinc	126	mg/kg	1.0			Yes	S4VEM

Job No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AE1	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444041	pH:		Sample Date:	10312012	Sample Time:	16:47:00
% Moisture:				% Solids :	96.4		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.091	mg/kg	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJ0AE1	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444041	pH:		Sample Date:	10312012	Sample Time:	16:47:00
% Moisture:		% Solids:	96.4				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	10200	mg/kg	1.0			Yes	S4VEM
Antimony	5.2	mg/kg	1.0	JN	UJL	Yes	S4VEM
Arsenic	32.3	mg/kg	1.0			Yes	S4VEM
Barium	92.4	mg/kg	1.0			Yes	S4VEM
Beryllium	0.44	mg/kg	1.0	U	U	Yes	S4VEM
Cadmium	0.44	mg/kg	1.0	U	U	Yes	S4VEM
Calcium	3200	mg/kg	1.0			Yes	S4VEM
Chromium	18.0	mg/kg	1.0			Yes	S4VEM
Cobalt	7.9	mg/kg	1.0			Yes	S4VEM
Copper	9.4	mg/kg	1.0		JH	Yes	S4VEM
Iron	18200	mg/kg	1.0			Yes	S4VEM
Lead	17.1	mg/kg	1.0			Yes	S4VEM
Magnesium	3790	mg/kg	1.0			Yes	S4VEM
Manganese	310	mg/kg	1.0			Yes	S4VEM
Nickel	14.4	mg/kg	1.0			Yes	S4VEM
Potassium	1990	mg/kg	1.0			Yes	S4VEM
Selenium	3.1	mg/kg	1.0	U	U	Yes	S4VEM
Silver	0.87	mg/kg	1.0	UN	UJL	Yes	S4VEM
Sodium	134	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	2.2	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	36.9	mg/kg	1.0			Yes	S4VEM
Zinc	40.7	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJSE79	Method:	ICP_AES	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444000	pH:		Sample Date:	10312012	Sample Time:	09:50:00
% Moisture :		% Solids :	67.2				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	124	mg/kg	1.0			Yes	S4VEM
Antimony	7.4	mg/kg	1.0	J N	UJL	Yes	S4VEM
Arsenic	5.7	mg/kg	1.0			Yes	S4VEM
Barium	9.4	mg/kg	1.0	J	JQ	Yes	S4VEM
Beryllium	0.61	mg/kg	1.0	J	U	Yes	S4VEM
Cadmium	1.1	mg/kg	1.0			Yes	S4VEM
Calcium	1060	mg/kg	1.0			Yes	S4VEM
Chromium	7.1	mg/kg	1.0			Yes	S4VEM
Cobalt	6.1	mg/kg	1.0	J	U	Yes	S4VEM
Copper	31.6	mg/kg	1.0			Yes	S4VEM
Iron	426	mg/kg	1.0			Yes	S4VEM
Lead	113	mg/kg	1.0			Yes	S4VEM
Magnesium	830	mg/kg	1.0			Yes	S4VEM
Manganese	175	mg/kg	1.0			Yes	S4VEM
Nickel	8.2	mg/kg	1.0			Yes	S4VEM
Potassium	747	mg/kg	1.0			Yes	S4VEM
Selenium	4.3	mg/kg	1.0	J	U	Yes	S4VEM
Silver	1.2	mg/kg	1.0	J N	UJL	Yes	S4VEM
Sodium	349	mg/kg	1.0	J	JQ	Yes	S4VEM
Thallium	3.1	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	6.1	mg/kg	1.0	J	U	Yes	S4VEM
Zinc	230	mg/kg	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	MJSE79	Method:	Hg	Matrix:	Soil	MA Number:	DEFAULT
Sample Location:	12444000	pH:		Sample Date:	10312012	Sample Time:	09:50:00
% Moisture :		% Solids :	67.2				

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.14	mg/kg	1.0	U	U	Yes	S4VEM

Case No: 42864	Contract: EPW09044	SDG No: MJ0AA7	Lab Code: STL
Sample Number: PBSC3	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	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AA7	Lab Code:	STLV
Sample Number:	PBSR7	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	1.0	U	U	Yes	S4VEM
Antimony	6.0	mg/kg	1.0	U	U	Yes	S4VEM
Arsenic	1.0	mg/kg	1.0	U	U	Yes	S4VEM
Barium	20.0	mg/kg	1.0	U	U	Yes	S4VEM
Beryllium	0.50	mg/kg	1.0	J	J	Yes	S4VEM
Cadmium	0.50	mg/kg	1.0	U	U	Yes	S4VEM
Calcium	500	mg/kg	1.0	U	U	Yes	S4VEM
Chromium	0.056	mg/kg	1.0	J	J	Yes	S4VEM
Cobalt	5.0	mg/kg	1.0	J	J	Yes	S4VEM
Copper	2.5	mg/kg	1.0	U	U	Yes	S4VEM
Iron	10.0	mg/kg	1.0	U	U	Yes	S4VEM
Lead	1.0	mg/kg	1.0	U	U	Yes	S4VEM
Magnesium	500	mg/kg	1.0	U	U	Yes	S4VEM
Manganese	1.5	mg/kg	1.0	U	U	Yes	S4VEM
Nickel	4.0	mg/kg	1.0	U	U	Yes	S4VEM
Potassium	500	mg/kg	1.0	U	U	Yes	S4VEM
Selenium	3.5	mg/kg	1.0	U	U	Yes	S4VEM
Silver	1.0	mg/kg	1.0	U	U	Yes	S4VEM
Sodium	500	mg/kg	1.0	U	U	Yes	S4VEM
Thallium	2.5	mg/kg	1.0	U	U	Yes	S4VEM
Vanadium	5.0	mg/kg	1.0	U	U	Yes	S4VEM
Zinc	6.0	mg/kg	1.0	U	U	Yes	S4VEM

(1)

(2)

(3)

Edit History Report

Case No: 42864

Contract: EPW09044

SDG No: MJ0AA7

Lab Code: STL.V

Method: Hg

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJ0AA7	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AA7	Soil	Mercury	Validation Flag	J	JQ	Don Matheny	12/12/12 7:36 PM	
MJ0AA9	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AB7	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AC2	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AC2	Soil	Mercury	Validation Flag	J	JQ	Don Matheny	12/12/12 7:35 PM	
MJ0AC3	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AC4	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AC5	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AC6	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AC7	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AC8	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AC8	Soil	Mercury	Validation Flag	J	JQ	Don Matheny	12/12/12 7:36 PM	
MJ0AC9	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AD0	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AD1	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	
MJ0AD2	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AD3	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AE0	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AE0D	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AE0S	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AE1	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJSE79	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
PBSC3	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y

Method: ICP_AES

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
LCSR7	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AA7	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AA7	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:42 PM	
MJ0AA7	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:42 PM	
MJ0AA7	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:42 PM	
MJ0AA7	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:42 PM	
MJ0AA9	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AA9	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:48 PM	
MJ0AA9	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:48 PM	
MJ0AA9	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:48 PM	
MJ0AA9	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:48 PM	
MJ0AB7	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AB7	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:40 PM	
MJ0AB7	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:40 PM	
MJ0AB7	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:40 PM	
MJ0AC2	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AC2	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:50 PM	
MJ0AC2	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:50 PM	
MJ0AC2	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:50 PM	
MJ0AC3	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AC3	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:45 PM	
MJ0AC3	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:45 PM	
MJ0AC3	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:45 PM	
MJ0AC4	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AC4	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:42 PM	
MJ0AC4	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:42 PM	
MJ0AC4	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:42 PM	
MJ0AC4	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:42 PM	
MJ0AC5	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AC5	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:49 PM	
MJ0AC5	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:49 PM	
MJ0AC5	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:49 PM	
MJ0AC5	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:49 PM	
MJ0AC6	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AC6	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:47 PM	
MJ0AC6	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:47 PM	
MJ0AC6	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:47 PM	
MJ0AC6	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:47 PM	
MJ0AC7	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AC7	Soil	Antimony	Validation	UJ	UJL	Don	12/12/12 7:48 PM	

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJ0AC7	Soil	Antimony	Flag	UJ	UJL	Matheny	12/12/12 7:48 PM	
MJ0AC7	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:48 PM	
MJ0AC7	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:48 PM	
MJ0AC7	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:48 PM	
MJ0AC8	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AC8	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:45 PM	
MJ0AC8	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:45 PM	
MJ0AC8	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:45 PM	
MJ0AC8	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:45 PM	
MJ0AC9	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AC9	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:46 PM	
MJ0AC9	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:46 PM	
MJ0AC9	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:46 PM	
MJ0AC9	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:46 PM	
MJ0AD0	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AD0	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:40 PM	
MJ0AD0	Soil	Cadmium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:40 PM	
MJ0AD0	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:40 PM	
MJ0AD0	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:40 PM	
MJ0AD1	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	
MJ0AD1	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:41 PM	
MJ0AD1	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:41 PM	
MJ0AD1	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:41 PM	
MJ0AD2	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AD2	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:41 PM	
MJ0AD2	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:41 PM	
MJ0AD2	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:41 PM	
MJ0AD3	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AD3	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:44 PM	
MJ0AD3	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:44 PM	
MJ0AD3	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:44 PM	
MJ0AE0	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AE0	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:43 PM	
MJ0AE0	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:43 PM	
MJ0AE0	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:43 PM	
MJ0AE0A	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AE0D	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AE0D	Soil	Sodium	Validation Flag	JQ	J	Don Matheny	12/18/12 3:12 PM	
MJ0AE0D	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:43 PM	
MJ0AE0S	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJ0AE1	Soil		Validation		S4VEM	Don	12/12/12 7:51 PM	Y

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJ0AE1	Soil		Level		S4VEM	Matheny	12/12/12 7:51 PM	Y
MJ0AE1	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:45 PM	
MJ0AE1	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:45 PM	
MJ0AE1	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:45 PM	
MJSE79	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y
MJSE79	Soil	Antimony	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:47 PM	
MJSE79	Soil	Barium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:47 PM	
MJSE79	Soil	Silver	Validation Flag	UJ	UJL	Don Matheny	12/12/12 7:47 PM	
MJSE79	Soil	Sodium	Validation Flag	J	JQ	Don Matheny	12/12/12 7:47 PM	
PBSR7	Soil		Validation Level		S4VEM	Don Matheny	12/12/12 7:51 PM	Y



ecology and environment, inc.

Global Environmental Specialists

720 Third Avenue, Suite 1700, Seattle, WA 98104

Tel: (206) 624-9537, Fax: (206) 621-9832

MEMORANDUM

DATE: December 19, 2012

TO: Linda Ader, Project Manager, E & E, Seattle, Washington

FROM: Mark Woodke, START-3 Chemist, E & E, Seattle, Washington *MV*

SUBJ: Inorganic Data Summary Check,
Rock Island Silicon Plant (Former), Wenatchee, Washington

REF: TDD: 12-05-0002 PAN: EE-002233-0786-01TTO

The data summary check of 15 water samples collected from the Rock Island Silicon Plant (Former) site in Wenatchee, Washington, has been completed. Analyses for metals (EPA CLP SOW SOM ISM01.3) were performed by Test America, Inc., Burlington, Vermont.

The samples were numbered:

MJ0AE2	MJ0AE3	MJ0AF0	MJ0AF1	MJ0AF2
MJ0AF3	MJ0AF4	MJ0AF5	MJ0AF6	MJ0AF7
MJ0AF8	MJ0AG0	MJ0AG1	MJ0AG2	MJ0AG4

No discrepancies were noted.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 10

1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

December 18, 2012

Reply To: OEA-095

MEMORANDUM

SUBJECT: Data Validation Report for Metals Analysis of Samples Collected for the Rock Island Silicon Plant (Former) Site Inspection- Case 42864, SDG: MJ0AE2

FROM: Don Matheny, Chemist 
Environmental Services Unit, OEA

TO: Monica Tonel, Site Assessment Manager

CC: Renee Nordeen, Ecology & Environment, Inc.

The quality assurance (QA) review of the analytical data generated from the analysis of fifteen (15) water samples, collected from the above referenced site, has been completed. These samples were analyzed for metals by Test America (STLV) located in Burlington, VT.

Sample analyses were evaluated following EPA's Stage 4 Data Validation Electronic/Manual Process (S4VEM). The validation was conducted according to the Quality Control Specifications outlined in:

- Rock Island Silicon Plant (Former) Sampling & Quality Assurance Plan (October, 2012)
- USEPA CLP Statement of Work for Inorganic Analyses (ISM01.3)
- National Functional Guidelines for Inorganic Superfund Data Review (EPA-540-R-10-011)
- Guidance for Labeling Externally Validated Laboratory Analytical Data (EPA-540-R08-005).

Some data may be qualified using the reviewer's professional judgment. The conclusions presented herein are based on the information provided for the review.

A summary of samples evaluated in this validation report and the pertinent dates for sample collection, sample receipt at the laboratory, extraction and analyses is attached along with the validated data.

I. QUALITY CONTROL RESULTS SUMMARY

Quality Control Test	Result Ranges	Outliers?	Evaluation Criteria
Blanks	Within criteria	Y*	Not Detected or <10% of Sample
Matrix Spike (MJ0AE2-filtered, MJ0AF1-total)	86- 114%	N	75 - 125%
Sample Duplicate (MJ0AE2-filtered, MJ0AF1-total)	≤ 9%	N	≤ 20% RPD or ± CRQL
LCS (blank spike)	83 - 120%	N	70 - 130%
Serial Dilution (MJ0AE2-filtered, MJ0AF1-total)	≤ 4%	N	≤ 10% Difference

*See the "Data Qualifications" section below for excursions and qualification of affected data.

II. DATA QUALIFICATIONS

Summary of Validation Qualifiers Applied

After the manual and electronic data review, the following data qualifications were applied:

Blanks
The following samples have analyte results $\geq$ MDLs but $\leq$ CRQLs. The associated instrument and/or preparation blank results are $\geq$ MDLs but $\leq$ CRQLs. Detected analytes are qualified U and the results reported at the CRQLs.
Aluminum - MJ0AF2, MJ0AF4, MJ0AG4, MJ0AF0 Antimony - MJ0AE3, MJ0AF0, MJ0AE2, MJ0AF8, MJ0AF2, MJ0AF4 Chromium - MJ0AE3, MJ0AF0, MJ0AF5, MJ0AF6, MJ0AE2, MJ0AF7, MJ0AF8, MJ0AF2, MJ0AF3, MJ0AG4 Cobalt - MJ0AG4, MJ0AF0, MJ0AE2, MJ0AF4, MJ0AF1, MJ0AF2, MJ0AF3, MJ0AF8 Iron - MJ0AF7, MJ0AF5 Manganese - MJ0AF1, MJ0AF4, MJ0AF5, MJ0AF6, MJ0AF7 Selenium - MJ0AE3, MJ0AF0, MJ0AG1, MJ0AE2, MJ0AF4, MJ0AF8, MJ0AF1 Silver - MJ0AG2 Thallium - MJ0AG1, MJ0AG0 Zinc - MJ0AF0, MJ0AF6
Detection Limit
The following samples have results $\geq$ MDLs but $<$ CRQLs. Detected analytes are qualified JQ:
Arsenic - MJ0AG0 Beryllium - MJ0AG1 Cadmium - MJ0AE2, MJ0AF8, MJ0AG0, MJ0AG4 Copper - MJ0AE3, MJ0AE2, MJ0AF7, MJ0AF1 Lead - MJ0AE2, MJ0AF4, MJ0AF2, MJ0AF3 Nickel - MJ0AF4, MJ0AF1 Potassium - MJ0AF1, MJ0AF3 Selenium - MJ0AG2 Silver - MJ0AG1 Sodium - MJ0AF7 Vanadium - MJ0AG4, MJ0AE3, MJ0AF0, MJ0AF3

Data Qualifiers

The following is a list of validation qualifiers applied to the sample result(s) when needed to indicate associated out-of-control QA/QC results.

Data Qualifiers	
U	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.
J	The associated value is an estimated quantity.
UJ	The analyte was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
R	The data are unusable. The analyte may or may not be present in the sample.
Project Specific Data Qualifiers	
L	Low bias.
H	High bias.
K	Unknown Bias.
Q	Detected concentration is below the MRL / CRQL but is above the MDL.

III. SAMPLE INDEX

Sample ID	Matrix	Sample Date	Date Received	ICP- AES Analysis	ICP- MS Analysis	Mercury Analysis
MJ0AE2	Water*	10/31/2012	11/6/2012	11/21/2012	11/21/2012	11/21/2012
MJ0AB3	Water*	11/1/2012	11/6/2012	11/21-26/2012	11/21-26/2012	11/21/2012
MJ0AF0	Water*	11/1/2012	11/6/2012	11/21/2012	11/21/2012	11/21/2012
MJ0AF1	Water	10/31/2012	11/6/2012	11/21/2012	11/21/2012	11/21/2012
MJ0AF2	Water	10/30/2012	11/6/2012	11/21/2012	11/21/2012	11/21/2012
MJ0AF3	Water	10/31/2012	11/6/2012	11/21/2012	11/21-26/2012	11/21/2012
MJ0AF4	Water	11/1/2012	11/6/2012	11/21/2012	11/21/2012	11/21/2012
MJ0AF5	Water	11/2/2012	11/6/2012	11/21/2012	11/21/2012	11/21/2012
MJ0AF6	Water	11/2/2012	11/6/2012	11/21/2012	11/21/2012	11/21/2012
MJ0AF7	Water	10/31/2012	11/6/2012	11/21/2012	11/21/2012	11/21/2012
MJ0AF8	Water	10/31/2012	11/6/2012	11/21/2012	11/21/2012	11/21/2012
MJ0AG0	Water	10/30/2012	11/6/2012	11/21/2012	11/21-26/2012	11/21/2012
MJ0AG1	Water	11/1/2012	11/6/2012	11/21-26/2012	11/21-26/2012	11/21/2012
MJ0AG2	Water	11/2/2012	11/6/2012	11/21/2012	11/21-26/2012	11/21/2012
MJ0AG4	Water	10/29/2012	11/6/2012	11/21/2012	11/21/2012	11/21/2012

* Field filtered water samples, the remaining samples are unfiltered.

Sample Summary Report

Case No: 42864	Contract: EPW09044	SDG No: MJ0AE2	Lab Code: STEV
Sample Number: LCSD5	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location:	pH:	Sample Date:	Sample Time:
% Moisture :	% Solids :		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	4.2	ug/L	1.0			Yes	S4VEM
Arsenic	1.9	ug/L	1.0			Yes	S4VEM
Barium	19.5	ug/L	1.0			Yes	S4VEM
Beryllium	2.1	ug/L	1.0			Yes	S4VEM
Cadmium	2.2	ug/L	1.0			Yes	S4VEM
Chromium	4.4	ug/L	1.0			Yes	S4VEM
Cobalt	2.2	ug/L	1.0			Yes	S4VEM
Copper	4.6	ug/L	1.0			Yes	S4VEM
Lead	2.1	ug/L	1.0			Yes	S4VEM
Manganese	2.2	ug/L	1.0			Yes	S4VEM
Nickel	2.2	ug/L	1.0			Yes	S4VEM
Selenium	11.1	ug/L	1.0			Yes	S4VEM
Silver	2.4	ug/L	1.0			Yes	S4VEM
Thallium	1.9	ug/L	1.0			Yes	S4VEM
Vanadium	10.3	ug/L	1.0			Yes	S4VEM
Zinc	4.3	ug/L	1.0			Yes	S4VEM

Sample No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	LCSD8	Method:	ICP_AES	Matrix:	Water	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	387	ug/L	1.0			Yes	S4VEM
Iron	166	ug/L	1.0			Yes	S4VEM
Calcium	9960	ug/L	1.0			Yes	S4VEM
Sodium	10000	ug/L	1.0			Yes	S4VEM
Magnesium	9560	ug/L	1.0			Yes	S4VEM
Potassium	10100	ug/L	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AE2	Method:	ICP_MS	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444042	pH:	2	Sample Date:	10312012	Sample Time:	16:18:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	2.0	ug/L	1.0	J	U	Yes	S4VEM
Arsenic	7.9	ug/L	1.0			Yes	S4VEM
Barium	79.6	ug/L	1.0			Yes	S4VEM
Beryllium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Cadmium	0.13	ug/L	1.0	J	JQ	Yes	S4VEM
Chromium	2.0	ug/L	1.0	J	U	Yes	S4VEM
Cobalt	1.0	ug/L	1.0	J	U	Yes	S4VEM
Copper	1.3	ug/L	1.0	J	JQ	Yes	S4VEM
Lead	0.40	ug/L	1.0	J	JQ	Yes	S4VEM
Manganese	164	ug/L	1.0			Yes	S4VEM
Nickel	3.1	ug/L	1.0			Yes	S4VEM
Selenium	5.0	ug/L	1.0	J	U	Yes	S4VEM
Silver	1.0	ug/L	1.0	U	U	Yes	S4VEM
Thallium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Vanadium	10.6	ug/L	1.0			Yes	S4VEM
Zinc	18.7	ug/L	1.0			Yes	S4VEM

Job No:	42864	Contract:	BPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AE2	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444042	pH:	2	Sample Date:	10312012	Sample Time:	16:18:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	200	ug/L	1.0	U	U	Yes	S4VEM
Calcium	85300	ug/L	1.0			Yes	S4VEM
Iron	100	ug/L	1.0	U	U	Yes	S4VEM
Magnesium	38800	ug/L	1.0			Yes	S4VEM
Potassium	13800	ug/L	1.0			Yes	S4VEM
Sodium	45500	ug/L	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AE2	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444042	pH:	2	Sample Date:	10312012	Sample Time:	16:18:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	ug/L	1.0	U	U	Yes	S4VEM

se No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AE2D	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:		pH:	2	Sample Date:	10312012	Sample Time:	16:18:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	200	ug/L	1.0	J	U	Yes	S4VEM
Calcium	88000	ug/L	1.0			Yes	S4VEM
Iron	100	ug/L	1.0	U	U	Yes	S4VEM
Magnesium	39900	ug/L	1.0			Yes	S4VEM
Potassium	13900	ug/L	1.0			Yes	S4VEM
Sodium	45900	ug/L	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AE2D	Method:	ICP_MS	Matrix:	Water	MA Number:	DEFAULT
Sample Location:		pH:	2	Sample Date:	10312012	Sample Time:	16:18:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	2.0	ug/L	1.0	J	U	Yes	S4VEM
Arsenic	7.4	ug/L	1.0			Yes	S4VEM
Barium	76.3	ug/L	1.0			Yes	S4VEM
Beryllium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Cadmium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Chromium	2.0	ug/L	1.0	J	U	Yes	S4VEM
Cobalt	1.0	ug/L	1.0	J	U	Yes	S4VEM
Copper	1.2	ug/L	1.0	J	J	Yes	S4VEM
Lead	0.38	ug/L	1.0	J	J	Yes	S4VEM
Manganese	155	ug/L	1.0			Yes	S4VEM
Nickel	2.9	ug/L	1.0			Yes	S4VEM
Selenium	5.0	ug/L	1.0	J	U	Yes	S4VEM
Silver	1.0	ug/L	1.0	U	U	Yes	S4VEM
Thallium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Vanadium	10.0	ug/L	1.0			Yes	S4VEM
Zinc	17.0	ug/L	1.0			Yes	S4VEM

Sample No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AE2D	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444042	pH:	2	Sample Date:	10312012	Sample Time:	16:18:00
% Moisture :		% Solids :					

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	ng/L	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AE2S	Method:	ICP_MS	Matrix:	Water	MA Number:	DEFAULT
Sample Location:		pH:	2	Sample Date:	10312012	Sample Time:	16:18:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	107	ug/L	1.0			Yes	S4VEM
Arsenic	50.2	ug/L	1.0			Yes	S4VEM
Barium	2130	ug/L	1.0			Yes	S4VEM
Beryllium	54.4	ug/L	1.0			Yes	S4VEM
Cadmium	54.9	ug/L	1.0			Yes	S4VEM
Chromium	207	ug/L	1.0			Yes	S4VEM
Cobalt	519	ug/L	10.0			Yes	S4VEM
Copper	254	ug/L	1.0			Yes	S4VEM
Lead	21.9	ug/L	1.0			Yes	S4VEM
Manganese	669	ug/L	10.0			Yes	S4VEM
Nickel	527	ug/L	10.0			Yes	S4VEM
Selenium	110	ug/L	1.0			Yes	S4VEM
Silver	43.1	ug/L	1.0			Yes	S4VEM
Thallium	50.3	ug/L	1.0			Yes	S4VEM
Vanadium	501	ug/L	1.0			Yes	S4VEM
Zinc	587	ug/L	10.0			Yes	S4VEM

se No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AE2S	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444042	pH:	2	Sample Date:	10312012	Sample Time:	16:18:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.92	ug/L	1.0			Yes	S4VEM

Case No:	42864	Contract:	BPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AE2S	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:		pH:	2	Sample Date:	10312012	Sample Time:	16:18:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	1940	ug/L	1.0			Yes	S4VEM
Iron	998	ug/L	1.0			Yes	S4VEM

se No: 42864	Contract: EPW09044	SDG No: MJ0AE2	Lab Code: STLV
Sample Number: MJ0AE3	Method: ICP_AES	Matrix: Water	MA Number: DEFAULT
Sample Location: 12444043	pH: 2	Sample Date: 11012012	Sample Time: 14:27:00
% Moisture :	% Solids :		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	200	ug/L	1.0	U	U	Yes	S4VEM
Calcium	70600	ug/L	1.0			Yes	S4VEM
Iron	100	ug/L	1.0	U	U	Yes	S4VEM
Magnesium	44100	ug/L	1.0			Yes	S4VEM
Potassium	6930	ug/L	1.0			Yes	S4VEM
Sodium	103000	ug/L	2.0	D		Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AE3	Method:	ICP_MS	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444043	pH:	2	Sample Date:	11012012	Sample Time:	14:27:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	2.0	ug/L	1.0	J	U	Yes	S4VEM
Arsenic	4.1	ug/L	1.0			Yes	S4VEM
Barium	62.1	ug/L	1.0			Yes	S4VEM
Beryllium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Cadmium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Chromium	2.0	ug/L	1.0	J	U	Yes	S4VEM
Cobalt	1.2	ug/L	1.0			Yes	S4VEM
Copper	0.71	ug/L	1.0	J	JQ	Yes	S4VEM
Lead	1.0	ug/L	1.0	U	U	Yes	S4VEM
Manganese	1370	ug/L	10.0	D		Yes	S4VEM
Nickel	2.4	ug/L	1.0			Yes	S4VEM
Selenium	5.0	ug/L	1.0	J	U	Yes	S4VEM
Silver	1.0	ug/L	1.0	U	U	Yes	S4VEM
Thallium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Vanadium	2.9	ug/L	1.0	J	JQ	Yes	S4VEM
Zinc	5.0	ug/L	1.0			Yes	S4VEM

se No:	42864	Contract:	BPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AE3	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444043	pH:	2	Sample Date:	11012012	Sample Time:	14:27:00
% Moisture :		% Solids :					

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	ug/L	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF0	Method:	ICP_MS	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444049	pH:	2	Sample Date:	11012012	Sample Time:	18:50:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	2.0	ug/L	1.0	J	U	Yes	S4VEM
Arsenic	1.5	ug/L	1.0			Yes	S4VEM
Barium	81.2	ug/L	1.0			Yes	S4VEM
Beryllium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Cadmium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Chromium	2.0	ug/L	1.0	J	U	Yes	S4VEM
Cobalt	1.0	ug/L	1.0	J	U	Yes	S4VEM
Copper	2.6	ug/L	1.0			Yes	S4VEM
Lead	1.0	ug/L	1.0	U	U	Yes	S4VEM
Manganese	29.5	ug/L	1.0			Yes	S4VEM
Nickel	1.1	ug/L	1.0			Yes	S4VEM
Selenium	5.0	ug/L	1.0	J	U	Yes	S4VEM
Silver	1.0	ug/L	1.0	U	U	Yes	S4VEM
Thallium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Vanadium	2.4	ug/L	1.0	J	JQ	Yes	S4VEM
Zinc	2.0	ug/L	1.0	J	U	Yes	S4VEM

se No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF0	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444049	pH:	2	Sample Date:	11012012	Sample Time:	18:50:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	ug/L	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF0	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444049	pH:	2	Sample Date:	11012012	Sample Time:	18:50:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	200	ug/L	1.0	J	U	Yes	S4VEM
Calcium	54700	ug/L	1.0			Yes	S4VEM
Iron	100	ug/L	1.0	U	U	Yes	S4VEM
Magnesium	14700	ug/L	1.0			Yes	S4VEM
Potassium	5310	ug/L	1.0			Yes	S4VEM
Sodium	41900	ug/L	1.0			Yes	S4VEM

Sample No:	42864	Contract:	BPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF1	Method:	ICP_MS	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444050	pH:	2	Sample Date:	10312012	Sample Time:	16:05:00
% Moisture:				% Solids:			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	2.0	ug/L	1.0	U	U	Yes	S4VEM
Arsenic	2.7	ug/L	1.0			Yes	S4VEM
Barium	21.3	ug/L	1.0			Yes	S4VEM
Beryllium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Cadmium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Chromium	3.6	ug/L	1.0			Yes	S4VEM
Cobalt	1.0	ug/L	1.0	J	U	Yes	S4VEM
Copper	0.88	ug/L	1.0	J	JQ	Yes	S4VEM
Lead	1.0	ug/L	1.0			Yes	S4VEM
Manganese	1.0	ug/L	1.0		U	Yes	S4VEM
Nickel	0.30	ug/L	1.0	J	JQ	Yes	S4VEM
Selenium	5.0	ug/L	1.0	J	U	Yes	S4VEM
Silver	1.0	ug/L	1.0	U	U	Yes	S4VEM
Thallium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Vanadium	5.6	ug/L	1.0			Yes	S4VEM
Zinc	6.4	ug/L	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF1	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444050	pH:	2	Sample Date:	10312012	Sample Time:	16:05:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	200	ug/L	1.0	U	U	Yes	S4VEM
Calcium	49800	ug/L	1.0			Yes	S4VEM
Iron	100	ug/L	1.0	U	U	Yes	S4VEM
Magnesium	13800	ug/L	1.0			Yes	S4VEM
Potassium	4610	ug/L	1.0	J	JQ	Yes	S4VEM
Sodium	17500	ug/L	1.0			Yes	S4VEM

sc No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF1	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444050	pH:	2	Sample Date:	10312012	Sample Time:	16:05:00
% Moisture :		% Solids :					

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	ug/L	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF1D	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444050	pH:	2	Sample Date:	10312012	Sample Time:	16:05:00
% Moisture :		% Solids :					

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	ug/L	1.0	U	U	Yes	S4VEM

se No: 42864	Contract: EPW09044	SDG No: MJ0AE2	Lab Code: STLV
Sample Number: MJ0AF1D	Method: ICP_AES	Matrix: Water	MA Number: DEFAULT
Sample Location:	pH: 2	Sample Date: 10312012	Sample Time: 16:05:00
% Moisture :	% Solids :		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	200	ug/L	1.0	U	U	Yes	S4VEM
Calcium	45700	ug/L	1.0			Yes	S4VEM
Iron	100	ug/L	1.0	U	U	Yes	S4VEM
Magnesium	12600	ug/L	1.0			Yes	S4VEM
Potassium	4260	ug/L	1.0	J	J	Yes	S4VEM
Sodium	16100	ug/L	1.0			Yes	S4VEM

Case No: 42864	Contract: EPW09044	SDG No: MJ0AE2	Lab Code: STLV
Sample Number: MJ0AFID	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location:	pH: 2	Sample Date: 10312012	Sample Time: 16:05:00
% Moisture :	% Solids :		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	2.0	ug/L	1.0	U	U	Yes	S4VEM
Arsenic	2.5	ug/L	1.0			Yes	S4VEM
Barium	21.9	ug/L	1.0			Yes	S4VEM
Beryllium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Cadmium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Chromium	3.5	ug/L	1.0			Yes	S4VEM
Cobalt	1.0	ug/L	1.0	U	U	Yes	S4VEM
Copper	0.85	ug/L	1.0	J	J	Yes	S4VEM
Lead	1.0	ug/L	1.0	U	U	Yes	S4VEM
Manganese	1.0	ug/L	1.0	J	U	Yes	S4VEM
Nickel	0.26	ug/L	1.0	J	J	Yes	S4VEM
Selenium	5.0	ug/L	1.0	J	U	Yes	S4VEM
Silver	1.0	ug/L	1.0	U	U	Yes	S4VEM
Thallium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Vanadium	6.2	ug/L	1.0			Yes	S4VEM
Zinc	6.2	ug/L	1.0			Yes	S4VEM

se No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF1S	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:		pH:	2	Sample Date:	10312012	Sample Time:	16:05:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	1960	ug/L	1.0			Yes	S4VEM
Iron	1040	ug/L	1.0			Yes	S4VEM

Case No: 42864	Contract: EPW09044	SDG No: MJ0AE2	Lab Code: STLV
Sample Number: MJ0AF1S	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location:	pH: 2	Sample Date: 10312012	Sample Time: 16:05:00
% Moisture :	% Solids :		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	107	ug/L	1.0			Yes	S4VEM
Arsenic	45.1	ug/L	1.0			Yes	S4VEM
Barium	2070	ug/L	1.0			Yes	S4VEM
Beryllium	54.5	ug/L	1.0			Yes	S4VEM
Cadmium	56.1	ug/L	1.0			Yes	S4VEM
Chromium	213	ug/L	1.0			Yes	S4VEM
Cobalt	522	ug/L	10.0			Yes	S4VEM
Copper	263	ug/L	1.0			Yes	S4VEM
Lead	21.4	ug/L	1.0			Yes	S4VEM
Manganese	514	ug/L	10.0			Yes	S4VEM
Nickel	533	ug/L	10.0			Yes	S4VEM
Selenium	112	ug/L	1.0			Yes	S4VEM
Silver	46.2	ug/L	1.0			Yes	S4VEM
Thallium	51.1	ug/L	1.0			Yes	S4VEM
Vanadium	499	ug/L	1.0			Yes	S4VEM
Zinc	576	ug/L	10.0			Yes	S4VEM

No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF1S	Method:	Hg	Matrix:	Water	MA Number:	DBFAULT
Sample Location:	12444050	pH:	2	Sample Date:	10312012	Sample Time:	16:05:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.90	ug/L	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF2	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444051	pH:	2	Sample Date:	10302012	Sample Time:	15:00:00
% Moisture :		% Solids :					

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	ug/L	1.0	U	U	Yes	S4VEM

e No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF2	Method:	ICP_MS	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444051	pH:	2	Sample Date:	10302012	Sample Time:	15:00:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	2.0	ug/L	1.0	J	U	Yes	S4VEM
Arsenic	123	ug/L	1.0			Yes	S4VEM
Barium	86.4	ug/L	1.0			Yes	S4VEM
Beryllium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Cadmium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Chromium	2.0	ug/L	1.0	J	U	Yes	S4VEM
Cobalt	1.0	ug/L	1.0	J	U	Yes	S4VEM
Copper	16.4	ug/L	1.0			Yes	S4VEM
Lead	0.97	ug/L	1.0	J	JQ	Yes	S4VEM
Manganese	1.0	ug/L	1.0	U	U	Yes	S4VEM
Nickel	1.5	ug/L	1.0			Yes	S4VEM
Selenium	5.0	ug/L	1.0	U	U	Yes	S4VEM
Silver	1.0	ug/L	1.0	U	U	Yes	S4VEM
Thallium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Vanadium	8.0	ug/L	1.0			Yes	S4VEM
Zinc	13.0	ug/L	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF2	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444051	pH:	2	Sample Date:	10302012	Sample Time:	15:00:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	200	ug/L	1.0	J	U	Yes	S4VEM
Calcium	113000	ug/L	1.0			Yes	S4VEM
Iron	100	ug/L	1.0	U	U	Yes	S4VEM
Magnesium	28900	ug/L	1.0			Yes	S4VEM
Potassium	5090	ug/L	1.0			Yes	S4VEM
Sodium	22300	ug/L	1.0			Yes	S4VEM

e No: 42864	Contract: EPW09044	SDG No: MJ0AE2	Lab Code: STLV
Sample Number: MJ0AF3	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: 12444052	pH: 2	Sample Date: 10312012	Sample Time: 12:30:00
% Moisture :	% Solids :		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	2.0	ug/L	1.0	U	U	Yes	S4VEM
Arsenic	23.9	ug/L	1.0			Yes	S4VEM
Barium	47.4	ug/L	1.0			Yes	S4VEM
Beryllium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Cadmium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Chromium	2.0	ug/L	1.0	J	U	Yes	S4VEM
Cobalt	1.0	ug/L	1.0	J	U	Yes	S4VEM
Copper	21.2	ug/L	1.0			Yes	S4VEM
Lead	0.18	ug/L	1.0	J	JQ	Yes	S4VEM
Manganese	1040	ug/L	10.0	D		Yes	S4VEM
Nickel	3.3	ug/L	1.0			Yes	S4VEM
Selenium	5.0	ug/L	1.0	U	U	Yes	S4VEM
Silver	1.0	ug/L	1.0	U	U	Yes	S4VEM
Thallium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Vanadium	4.1	ug/L	1.0	J	JQ	Yes	S4VEM
Zinc	9.7	ug/L	1.0			Yes	S4VEM

Case No:	42864	Contract:	BPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF3	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444052	pH:	2	Sample Date:	10312012	Sample Time:	12:30:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	200	ug/L	1.0	U	U	Yes	S4VEM
Calcium	48400	ug/L	1.0			Yes	S4VEM
Iron	100	ug/L	1.0	U	U	Yes	S4VEM
Magnesium	15100	ug/L	1.0			Yes	S4VEM
Potassium	3820	ug/L	1.0	J	JQ	Yes	S4VEM
Sodium	31500	ug/L	1.0			Yes	S4VEM

e No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF3	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444052	pH:	2	Sample Date:	10312012	Sample Time:	12:30:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	ug/L	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF4	Method:	ICP_MS	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444053	pH:	2	Sample Date:	11012012	Sample Time:	10:25:00
% Moisture:				% Solids:			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	2.0	ug/L	1.0	J	U	Yes	S4VEM
Arsenic	13.0	ug/L	1.0			Yes	S4VEM
Barium	70.5	ug/L	1.0			Yes	S4VEM
Beryllium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Cadmium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Chromium	2.9	ug/L	1.0			Yes	S4VEM
Cobalt	1.0	ug/L	1.0	J	U	Yes	S4VEM
Copper	16.3	ug/L	1.0			Yes	S4VEM
Lead	0.52	ug/L	1.0	J	JQ	Yes	S4VEM
Manganese	1.0	ug/L	1.0	J	U	Yes	S4VEM
Nickel	0.74	ug/L	1.0	J	JQ	Yes	S4VEM
Selenium	5.0	ug/L	1.0	J	U	Yes	S4VEM
Silver	1.0	ug/L	1.0	U	U	Yes	S4VEM
Thallium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Vanadium	9.4	ug/L	1.0			Yes	S4VEM
Zinc	12.6	ug/L	1.0			Yes	S4VEM

se No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF4	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444053	pH:	2	Sample Date:	11012012	Sample Time:	10:25:00
% Moisture:				% Solids:			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	ug/L	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	BPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF4	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444053	pH:	2	Sample Date:	11012012	Sample Time:	10:25:00
% Moisture :		% Solids :					

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	200	ug/L	1.0	J	U	Yes	S4VEM
Calcium	65300	ug/L	1.0			Yes	S4VEM
Iron	100	ug/L	1.0	U	U	Yes	S4VEM
Magnesium	19200	ug/L	1.0			Yes	S4VEM
Potassium	5270	ug/L	1.0			Yes	S4VEM
Sodium	31700	ug/L	1.0			Yes	S4VEM

Sample No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF5	Method:	ICP_MS	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444054	pH:	2	Sample Date:	11022012	Sample Time:	08:51:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	2.0	ug/L	1.0	U	U	Yes	S4VEM
Arsenic	1.0	ug/L	1.0	U	U	Yes	S4VEM
Barium	10.0	ug/L	1.0	U	U	Yes	S4VEM
Beryllium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Cadmium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Chromium	2.0	ug/L	1.0	J	U	Yes	S4VEM
Cobalt	1.0	ug/L	1.0	U	U	Yes	S4VEM
Copper	2.0	ug/L	1.0	U	U	Yes	S4VEM
Lead	1.0	ug/L	1.0	U	U	Yes	S4VEM
Manganese	1.0	ug/L	1.0	J	U	Yes	S4VEM
Nickel	1.0	ug/L	1.0	U	U	Yes	S4VEM
Selenium	5.0	ug/L	1.0	U	U	Yes	S4VEM
Silver	1.0	ug/L	1.0	U	U	Yes	S4VEM
Thallium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Vanadium	5.0	ug/L	1.0	U	U	Yes	S4VEM
Zinc	2.0	ug/L	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF5	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444054	pH:	2	Sample Date:	11022012	Sample Time:	08:51:00
% Moisture:				% Solids:			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	ug/L	1.0	U	U	Yes	S4VEM

Sample No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF5	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444054	pH:	2	Sample Date:	11022012	Sample Time:	08:51:00
% Moisture :		% Solids :					

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	200	ug/L	1.0	U	U	Yes	S4VEM
Calcium	5000	ug/L	1.0	U	U	Yes	S4VEM
Iron	100	ug/L	1.0	J	U	Yes	S4VEM
Magnesium	5000	ug/L	1.0	U	U	Yes	S4VEM
Potassium	5000	ug/L	1.0	U	U	Yes	S4VEM
Sodium	5000	ug/L	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF6	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444055	pH:	2	Sample Date:	11022012	Sample Time:	08:57:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	ug/L	1.0	U	U	Yes	S4VEM

Job No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF6	Method:	ICP_MS	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444055	pH:	2	Sample Date:	11022012	Sample Time:	08:57:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	2.0	ug/L	1.0	U	U	Yes	S4VEM
Arsenic	1.0	ug/L	1.0	U	U	Yes	S4VEM
Barium	10.0	ug/L	1.0	U	U	Yes	S4VEM
Beryllium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Cadmium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Chromium	2.0	ug/L	1.0	J	U	Yes	S4VEM
Cobalt	1.0	ug/L	1.0	U	U	Yes	S4VEM
Copper	2.0	ug/L	1.0	U	U	Yes	S4VEM
Lead	1.0	ug/L	1.0	U	U	Yes	S4VEM
Manganese	1.0	ug/L	1.0	J	U	Yes	S4VEM
Nickel	1.0	ug/L	1.0	U	U	Yes	S4VEM
Selenium	5.0	ug/L	1.0	U	U	Yes	S4VEM
Silver	1.0	ug/L	1.0	U	U	Yes	S4VEM
Thallium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Vanadium	5.0	ug/L	1.0	U	U	Yes	S4VEM
Zinc	2.0	ug/L	1.0	J	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF6	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444055	pH:	2	Sample Date:	11022012	Sample Time:	08:57:00
% Moisture:				% Solids:			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	200	ug/L	1.0	U	U	Yes	S4VEM
Calcium	5000	ug/L	1.0	U	U	Yes	S4VEM
Iron	100	ug/L	1.0	U	U	Yes	S4VEM
Magnesium	5000	ug/L	1.0	U	U	Yes	S4VEM
Potassium	5000	ug/L	1.0	U	U	Yes	S4VEM
Sodium	5000	ug/L	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF7	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444056	pH:	2	Sample Date:	10312012	Sample Time:	12:20:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	ug/L	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AB2	Lab Code:	STLV
Sample Number:	MJ0AF7	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444056	pH:	2	Sample Date:	10312012	Sample Time:	12:20:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	200	ug/L	1.0	U	U	Yes	S4VEM
Calcium	5000	ug/L	1.0	U	U	Yes	S4VEM
Iron	100	ug/L	1.0	J	U	Yes	S4VEM
Magnesium	5000	ug/L	1.0	U	U	Yes	S4VEM
Potassium	5000	ug/L	1.0	U	U	Yes	S4VEM
Sodium	8.9	ug/L	1.0	J	JQ	Yes	S4VEM

Sample No:	42864	Contract:	BPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF7	Method:	ICP_MS	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444056	pH:	2	Sample Date:	10312012	Sample Time:	12:20:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	2.0	ug/L	1.0	U	U	Yes	S4VEM
Arsenic	1.0	ug/L	1.0	U	U	Yes	S4VEM
Barium	10.0	ug/L	1.0	U	U	Yes	S4VEM
Beryllium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Cadmium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Chromium	2.0	ug/L	1.0	J	U	Yes	S4VEM
Cobalt	1.0	ug/L	1.0	U	U	Yes	S4VEM
Copper	0.80	ug/L	1.0	J	JQ	Yes	S4VEM
Lead	1.0	ug/L	1.0	U	U	Yes	S4VEM
Manganese	1.0	ug/L	1.0	J	U	Yes	S4VEM
Nickel	1.0	ug/L	1.0	U	U	Yes	S4VEM
Selenium	5.0	ug/L	1.0	U	U	Yes	S4VEM
Silver	1.0	ug/L	1.0	U	U	Yes	S4VEM
Thallium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Vanadium	5.0	ug/L	1.0	U	U	Yes	S4VEM
Zinc	2.0	ug/L	1.0	U	U	Yes	S4VEM

Case No: 42864	Contract: EPW09044	SDG No: MJ0AE2	Lab Code: STLV
Sample Number: MJ0AF8	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: 12444059	pH: 2	Sample Date: 10312012	Sample Time: 16:40:00
% Moisture :	% Solids :		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	2.0	ug/L	1.0	J	U	Yes	S4VEM
Arsenic	8.0	ug/L	1.0			Yes	S4VEM
Barium	82.2	ug/L	1.0			Yes	S4VEM
Beryllium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Cadmium	0.16	ug/L	1.0	J	JQ	Yes	S4VEM
Chromium	2.0	ug/L	1.0	J	U	Yes	S4VEM
Cobalt	1.0	ug/L	1.0	J	U	Yes	S4VEM
Copper	2.4	ug/L	1.0			Yes	S4VEM
Lead	3.6	ug/L	1.0			Yes	S4VEM
Manganese	174	ug/L	1.0			Yes	S4VEM
Nickel	3.3	ug/L	1.0			Yes	S4VEM
Selenium	5.0	ug/L	1.0	J	U	Yes	S4VEM
Silver	1.0	ug/L	1.0	U	U	Yes	S4VEM
Thallium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Vanadium	10.5	ug/L	1.0			Yes	S4VEM
Zinc	32.4	ug/L	1.0			Yes	S4VEM

Job No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF8	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444059	pH:	2	Sample Date:	10312012	Sample Time:	16:40:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	334	ug/L	1.0			Yes	S4VEM
Calcium	90400	ug/L	1.0			Yes	S4VEM
Iron	329	ug/L	1.0			Yes	S4VEM
Magnesium	40900	ug/L	1.0			Yes	S4VEM
Potassium	14000	ug/L	1.0			Yes	S4VEM
Sodium	45400	ug/L	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AF8	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444059	pH:	2	Sample Date:	10312012	Sample Time:	16:40:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	ug/L	1.0	U	U	Yes	S4VEM

Job No:	42864	Contract:	BPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AG0	Method:	ICP_MS	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444058	pH:	2	Sample Date:	10302012	Sample Time:	15:09:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	2.0	ug/L	1.0	U	U	Yes	S4VEM
Arsenic	1.9	ug/L	2.0	JD	JQ	Yes	S4VEM
Barium	314	ug/L	1.0			Yes	S4VEM
Beryllium	5.8	ug/L	1.0			Yes	S4VEM
Cadmium	0.48	ug/L	2.0	JD	JQ	Yes	S4VEM
Chromium	38.0	ug/L	1.0			Yes	S4VEM
Cobalt	32.9	ug/L	1.0			Yes	S4VEM
Copper	103	ug/L	1.0			Yes	S4VEM
Lead	29.3	ug/L	1.0			Yes	S4VEM
Manganese	1730	ug/L	2.0	D		Yes	S4VEM
Nickel	61.0	ug/L	1.0			Yes	S4VEM
Selenium	10.0	ug/L	2.0	U	U	Yes	S4VEM
Silver	2.0	ug/L	2.0	U	U	Yes	S4VEM
Thallium	1.0	ug/L	1.0	J	U	Yes	S4VEM
Vanadium	88.1	ug/L	1.0			Yes	S4VEM
Zinc	271	ug/L	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AG0	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444058	pH:	2	Sample Date:	10302012	Sample Time:	15:09:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	146000	ug/L	1.0			Yes	S4VEM
Calcium	97500	ug/L	1.0			Yes	S4VEM
Iron	142000	ug/L	1.0			Yes	S4VEM
Magnesium	35000	ug/L	1.0			Yes	S4VEM
Potassium	10300	ug/L	1.0			Yes	S4VEM
Sodium	39300	ug/L	1.0			Yes	S4VEM

Job No:	42864	Contract:	BPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AG0	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444058	pH:	2	Sample Date:	10302012	Sample Time:	15:09:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	ug/L	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	BPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AG1	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444060	pH:	2	Sample Date:	11012012	Sample Time:	13:56:00
% Moisture :		% Solids :					

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	ug/L	1.0	U	U	Yes	S4VEM

Job No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AG1	Method:	ICP_MS	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444060	pH:	2	Sample Date:	11012012	Sample Time:	13:56:00
% Moisture :		% Solids :					

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	4.3	ug/L	1.0			Yes	S4VEM
Arsenic	13.7	ug/L	1.0			Yes	S4VEM
Barium	209	ug/L	1.0			Yes	S4VEM
Beryllium	0.52	ug/L	1.0	J	JQ	Yes	S4VEM
Cadmium	2.1	ug/L	1.0			Yes	S4VEM
Chromium	10.1	ug/L	1.0			Yes	S4VEM
Cobalt	9.7	ug/L	1.0			Yes	S4VEM
Copper	63.2	ug/L	1.0			Yes	S4VEM
Lead	195	ug/L	1.0			Yes	S4VEM
Manganese	2730	ug/L	20.0	D		Yes	S4VEM
Nickel	15.3	ug/L	1.0			Yes	S4VEM
Selenium	5.0	ug/L	1.0	J	U	Yes	S4VEM
Silver	0.032	ug/L	1.0	J	JQ	Yes	S4VEM
Thallium	1.0	ug/L	1.0	J	U	Yes	S4VEM
Vanadium	33.7	ug/L	1.0			Yes	S4VEM
Zinc	222	ug/L	1.0			Yes	S4VEM

Case No:	42864	Contract:	BPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AG1	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444060	pH:	2	Sample Date:	11012012	Sample Time:	13:56:00
% Moisture :		% Solids :					

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	9150	ug/L	1.0			Yes	S4VEM
Calcium	117000	ug/L	1.0			Yes	S4VEM
Iron	18200	ug/L	1.0			Yes	S4VEM
Magnesium	50600	ug/L	1.0			Yes	S4VEM
Potassium	9510	ug/L	1.0			Yes	S4VEM
Sodium	121000	ug/L	2.0	D		Yes	S4VEM

Se No: 42864	Contract: EPW09044	SDG No: MJ0AE2	Lab Code: STLV
Sample Number: MJ0AG2	Method: ICP_MS	Matrix: Water	MA Number: DEFAULT
Sample Location: 12444061	pH: 2	Sample Date: 11022012	Sample Time: 08:16:00
% Moisture :	% Solids :		

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	8.0	ug/L	1.0			Yes	S4VEM
Arsenic	31.6	ug/L	2.0	D		Yes	S4VEM
Barium	215	ug/L	1.0			Yes	S4VEM
Beryllium	5.1	ug/L	1.0			Yes	S4VEM
Cadmium	4.5	ug/L	2.0	D		Yes	S4VEM
Chromium	15.2	ug/L	1.0			Yes	S4VEM
Cobalt	10.1	ug/L	1.0			Yes	S4VEM
Copper	54.7	ug/L	1.0			Yes	S4VEM
Lead	515	ug/L	10.0	D		Yes	S4VEM
Manganese	1080	ug/L	10.0	D		Yes	S4VEM
Nickel	33.5	ug/L	1.0			Yes	S4VEM
Selenium	2.8	ug/L	2.0	JD	JQ	Yes	S4VEM
Silver	2.0	ug/L	2.0	JD	U	Yes	S4VEM
Thallium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Vanadium	77.1	ug/L	1.0			Yes	S4VEM
Zinc	877	ug/L	2.0	D		Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AG2	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444061	pH:	2	Sample Date:	11022012	Sample Time:	08:16:00
% Moisture :		% Solids :					

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	ug/L	1.0	U	U	Yes	S4VEM

ic No:	42864	Contract:	BPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AG2	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444061	pH:	2	Sample Date:	11022012	Sample Time:	08:16:00
% Moisture :		% Solids :					

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	126000	ug/L	1.0			Yes	S4VEM
Calcium	80100	ug/L	1.0			Yes	S4VEM
Iron	122000	ug/L	1.0			Yes	S4VEM
Magnesium	25300	ug/L	1.0			Yes	S4VEM
Potassium	19200	ug/L	1.0			Yes	S4VEM
Sodium	84500	ug/L	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AG4	Method:	Hg	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444063	pH:	2	Sample Date:	10292012	Sample Time:	13:40:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Mercury	0.20	ug/L	1.0	U	U	Yes	S4VEM

Sample No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	MJ0AG4	Method:	ICP_AES	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444063	pH:	2	Sample Date:	10292012	Sample Time:	13:40:00
% Moisture :		% Solids :					

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Aluminum	200	ug/L	1.0	J	U	Yes	S4VEM
Calcium	95600	ug/L	1.0			Yes	S4VEM
Iron	268	ug/L	1.0			Yes	S4VEM
Magnesium	20500	ug/L	1.0			Yes	S4VEM
Potassium	6410	ug/L	1.0			Yes	S4VEM
Sodium	24000	ug/L	1.0			Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AEZ	Lab Code:	STLV
Sample Number:	MJ0AG4	Method:	ICP_MS	Matrix:	Water	MA Number:	DEFAULT
Sample Location:	12444063	pH:	2	Sample Date:	10292012	Sample Time:	13:40:00
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	2.0	ug/L	1.0	U	U	Yes	S4VEM
Arsenic	2.6	ug/L	1.0			Yes	S4VEM
Barium	78.4	ug/L	1.0			Yes	S4VEM
Beryllium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Cadmium	0.30	ug/L	1.0	J	JQ	Yes	S4VEM
Chromium	2.0	ug/L	1.0	J	U	Yes	S4VEM
Cobalt	1.0	ug/L	1.0	J	U	Yes	S4VEM
Copper	16.3	ug/L	1.0			Yes	S4VEM
Lead	56.2	ug/L	1.0			Yes	S4VEM
Manganese	36.1	ug/L	1.0			Yes	S4VEM
Nickel	1.4	ug/L	1.0			Yes	S4VEM
Selenium	5.0	ug/L	1.0	U	U	Yes	S4VEM
Silver	1.0	ug/L	1.0	U	U	Yes	S4VEM
Thallium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Vanadium	3.9	ug/L	1.0	J	JQ	Yes	S4VEM
Zinc	7.5	ug/L	1.0			Yes	S4VEM

Sample No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	PBWB1	Method:	Hg	Matrix:	Water	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	0.20	ug/L	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	PBWD5	Method:	ICP_MS	Matrix:	Water	MA Number:	DEFAULT
Sample Location:		pH:		Sample Date:		Sample Time:	
% Moisture :				% Solids :			

Analyte Name	Result	Units	Dilution Factor	Lab Flag	Validation	Reportable	Validation Level
Antimony	2.0	ug/L	1.0	U	U	Yes	S4VEM
Arsenic	1.0	ug/L	1.0	U	U	Yes	S4VEM
Barium	10.0	ug/L	1.0	U	U	Yes	S4VEM
Beryllium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Cadmium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Chromium	2.0	ug/L	1.0	J	U	Yes	S4VEM
Cobalt	0.041	ug/L	1.0	J	J	Yes	S4VEM
Copper	2.0	ug/L	1.0	U	U	Yes	S4VEM
Lead	1.0	ug/L	1.0	U	U	Yes	S4VEM
Manganese	1.0	ug/L	1.0	U	U	Yes	S4VEM
Nickel	-0.17	ug/L	1.0	J	J	Yes	S4VEM
Selenium	5.0	ug/L	1.0	U	U	Yes	S4VEM
Silver	-0.037	ug/L	1.0	J	J	Yes	S4VEM
Thallium	1.0	ug/L	1.0	U	U	Yes	S4VEM
Vanadium	-0.35	ug/L	1.0	J	J	Yes	S4VEM
Zinc	2.0	ug/L	1.0	U	U	Yes	S4VEM

Case No:	42864	Contract:	EPW09044	SDG No:	MJ0AE2	Lab Code:	STLV
Sample Number:	PBWD8	Method:	ICP_AES	Matrix:	Water	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	200	ug/L	1.0	U	U	Yes	S4VEM
Calcium	5000	ug/L	1.0	U	U	Yes	S4VEM
Iron	100	ug/L	1.0	U	U	Yes	S4VEM
Magnesium	5000	ug/L	1.0	U	U	Yes	S4VEM
Potassium	5000	ug/L	1.0	U	U	Yes	S4VEM
Sodium	-12	ug/L	1.0	J	J	Yes	S4VEM

Edit History Report

Case No: 42864

Contract: EPW09044

SDG No: MJ0AE2

Lab Code: STLV

Method: ICP_MS

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
LCSD5	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AE2	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AE2	Water	Cadmium	Validation Flag	J	JQ	Don Matheny	12/18/12 1:35 PM	
MJ0AE2	Water	Copper	Validation Flag	J	JQ	Don Matheny	12/18/12 1:35 PM	
MJ0AE2	Water	Lead	Validation Flag	J	JQ	Don Matheny	12/18/12 1:35 PM	
MJ0AE2D	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AE2S	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AE3	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AE3	Water	Copper	Validation Flag	J	JQ	Don Matheny	12/18/12 1:39 PM	
MJ0AE3	Water	Vanadium	Validation Flag	J	JQ	Don Matheny	12/18/12 1:39 PM	
MJ0AF0	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF0	Water	Vanadium	Validation Flag	J	JQ	Don Matheny	12/18/12 1:37 PM	
MJ0AF1	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF1	Water	Copper	Validation Flag	J	JQ	Don Matheny	12/18/12 1:35 PM	
MJ0AF1	Water	Nickel	Validation Flag	J	JQ	Don Matheny	12/18/12 1:35 PM	
MJ0AF1D	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	
MJ0AF1D	Water	Copper	Validation Flag	JQ	J	Don Matheny	12/18/12 1:42 PM	
MJ0AF1D	Water	Copper	Validation Flag	J	JQ	Don Matheny	12/18/12 1:42 PM	
MJ0AF1D	Water	Nickel	Validation Flag	JQ	J	Don Matheny	12/18/12 1:42 PM	
MJ0AF1D	Water	Nickel	Validation Flag	J	JQ	Don Matheny	12/18/12 1:42 PM	
MJ0AF1S	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF2	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF2	Water	Lead	Validation Flag	J	JQ	Don Matheny	12/18/12 1:34 PM	
MJ0AF3	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF3	Water	Lead	Validation Flag	J	JQ	Don Matheny	12/18/12 1:38 PM	
MJ0AF3	Water	Vanadium	Validation Flag	J	JQ	Don Matheny	12/18/12 1:38 PM	
MJ0AF4	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF4	Water	Lead	Validation Flag	J	JQ	Don Matheny	12/18/12 1:41 PM	
MJ0AF4	Water	Nickel	Validation Flag	J	JQ	Don Matheny	12/18/12 1:41 PM	
MJ0AF5	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF6	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF7	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF7	Water	Copper	Validation Flag	J	JQ	Don Matheny	12/18/12 1:36 PM	
MJ0AF8	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	
MJ0AF8	Water	Cadmium	Validation Flag	J	JQ	Don Matheny	12/18/12 1:34 PM	
MJ0AG0	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJ0AG0	Water	Arsenic	Validation Flag	J	JQ	Don Matheny	12/18/12 1:38 PM	
MJ0AG0	Water	Cadmium	Validation Flag	J	JQ	Don Matheny	12/18/12 1:38 PM	
MJ0AG1	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AG1	Water	Beryllium	Validation Flag	J	JQ	Don Matheny	12/18/12 1:38 PM	
MJ0AG1	Water	Silver	Validation Flag	J	JQ	Don Matheny	12/18/12 1:38 PM	
MJ0AG2	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AG2	Water	Selenium	Validation Flag	J	JQ	Don Matheny	12/18/12 1:34 PM	
MJ0AG4	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AG4	Water	Cadmium	Validation Flag	J	JQ	Don Matheny	12/18/12 1:39 PM	
MJ0AG4	Water	Vanadium	Validation Flag	J	JQ	Don Matheny	12/18/12 1:39 PM	
PBWD5	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y

Method: ICP_AES

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
LCSD8	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AE2	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AE2D	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AE2S	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AE3	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF0	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF1	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF1	Water	Potassium	Validation Flag	J	JQ	Don Matheny	12/18/12 1:32 PM	
MJ0AF1D	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF1S	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF2	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF3	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF3	Water	Potassium	Validation Flag	J	JQ	Don Matheny	12/18/12 1:33 PM	
MJ0AF4	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF5	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF6	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF7	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF7	Water	Sodium	Validation Flag	J	JQ	Don Matheny	12/18/12 1:33 PM	
MJ0AF8	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AG0	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AG1	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AG2	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AG4	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
PBWD8	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y

Method: Hg

Sample	Matrix	Analyte Name	Data Field	Old Value	New Value	User	Edit Date Time	Global
MJ0AE2	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AE2D	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AE2S	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AE3	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF0	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF1	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF1D	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF1S	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF2	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF3	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF4	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF5	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF6	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF7	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AF8	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AG0	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AG1	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AG2	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
MJ0AG4	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y
PBWB1	Water		Validation Level		S4VEM	Don Matheny	12/18/12 1:13 PM	Y

F

Global Positioning System Coordinates

This page intentionally left blank.

Global Positioning System Station Coordinates

Station	Latitude	Longitude
AR01	47.372939	-120.161686
AR01GW	47.372922	-120.161677
AR02	47.373093	-120.161661
AR02GW	47.378901	-120.161609
AR03	47.373082	-120.161845
AR03GW	47.380401	-120.143490
AR04	47.378912	-120.161684
AR05	47.379034	-120.161829
AR06	47.379099	-120.161358
AR07	47.380409	-120.143491
AR08	47.380286	-120.143105
AR09	47.380395	-120.143099
BK01	47.373114	-120.169590
BK02	47.381006	-120.160183
BK02GW	47.380905	-120.160212
FP01	47.369496	-120.143662
FP02	47.368884	-120.141923
FP04	47.369611	-120.146796
FP05	47.369944	-120.147031
FP06	47.369475	-120.147313
FP07	47.369935	-120.148622
FS01SB	47.369201	-120.150944
FS02SB	47.368810	-120.150850
FS03SB	47.368621	-120.151574
FS04SB	47.368812	-120.152247
PW01GW	47.370578	-120.140234

This page intentionally left blank.